

Better Crops PLANT FOOD

July 1927

10 Cents



The Pocket Book of Agriculture.

Foreword

HIS is the second issue of Better Crops With Plant Food.

Better Crops began publication in September, 1923, and Plant Food came into print in January, 1926. The former was issued monthly and the latter every two months.

The mission of the two magazines has been virtually identical—to serve the agricultural leaders of the country, first, by publishing sound, dependable information on crops and fertilizers and, second, by acting as a forum through which authorities might exchange opinions and give others the benefit of their experience.

This similarity of aim, together with the fusion of the scientific and agricultural departments of the German and the French Potash interests, has made the combination of the two magazines advisable. It is hoped this will result in a more efficient service and a bigger and better publication.

BETTER CROPS WITH PLANT FOOD will strive to promote and maintain an interest in factors pertaining to a more profitable agriculture.

Sound agricultural research and experimental work is one of the most important of these factors. It will therefore be the policy of this magazine to actively support all groups and agencies doing such work and cooperate heartily with the agencies that carry the results to the farmer.

In working toward these objectives Better Crops With Plant Food will constantly strive to be interesting, attractive, and thoroughly dependable.

Better

	T	he Whole	Truth-	-Not	Selected	Trut	h
R.	H.	STINCHFIELD,	Managing	Editor	Sid	Noble,	Editor

Editorial Offices: 19 West 44th Street, New York.

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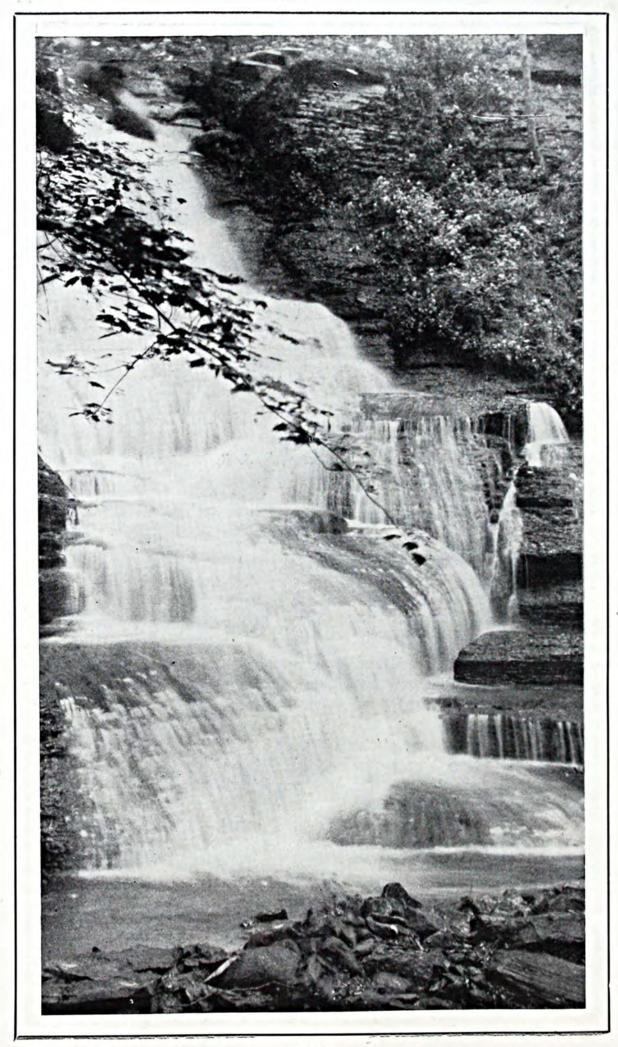
Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY. of Amsterdam, Holland

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Directors: J. N. HARPER

G. J. CALLISTER



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VOL. IX

NEW YORK, JULY, 1927

No. 2

RECREATION

By Jeff M Dermid

ACATION time is here for the non-agricultural twothirds of America. Carking care is supposed to give way to corking content. The summer solstice ushers in the universal exodus!

As the world pays a big price for its -a violent effort to relax while the

pondering. Trite but true, before making an investment, we must investigate.

Recreation in its best sense means re-creation. The human engine goes to the garage of the great outdoors to have the carbon removed, the valves tightened and ground for another season of stress and strain.

In its worst aspects, it is "wreck-re-ation"

recreation, it must be a subject worth muscles are tense, which can't be

IEFFISMS

Recreation in its best sense means re-creation. In its worst aspects, it is "wreck-re-ation."

* * *

You can get benefit from a vacation spent in making play out of work, but not by making work out of play.

You might as well forget the nominal cost of a vacation, for you'll pay for it whether you take it or not.

Cashing out beats cashing in!

done. Wreck-reation is the solace of feverish fools and the breeder of headaches, indigestion, broken limbs, and flat bank books. It is the enemy of genuine recreation in the sense that the upholders of the blue laws cannot see the difference between honest fun and dissipation. Therefore, the good dog is blamed for worrying the sheep, whereas the mongrel cur is the real

culprit.

Recreation assumes various forms. It may be play, sport, change of avocation, or just doing nothing. Your doctor may prescribe the best form for you, but a stern banker friend and my Scotch ancestry decide it all for me.

You can get benefit from a vacation spent in making play out of work, but not by making work out of play. I have an illustration of this in mind.

A legal friend of mine sought a northern haven of supposed solitude in order to catch blue-gills, rock bass, wall-eyed pike, or whatever it was that the resorters used for allurement to the adventurous.

On the first day in the bosky retreat he met an unfortunate comrade of the World War, living on a cutover land farm, whose wife was sick. Help was scarce, and this blueberry farmer had to build a barn to shelter his cows and chickens, as fresh milk and eggs meant longer life to the woman.

My friend forgot his fishing fever, rolled up his sleeves and grabbed hammer, saw, and axe. Together they toiled at the heavy job and cooked their own meals besides. Blisters, slivers, bruises, bumps, scrapes, and contusions were the body marks earned by my friend in addition to the "natural tan" mentioned in the circular. Nary a fish bite, but he said it was a snap just the same.

He made play out of work; they finished the shack and put a new roof on the dwelling besides; and the only thing he lost by it was a stock of fish stories he might have peddled in the court room afterwards.

Another less cosmopolitan friend, newly rich and bored to death, set out the same season for a hunting and fishing trip in the mountains. Loaded down like the Compleat Angler, fixed up with more of an arsenal than the Mexican Army, equipped with a steamer trunk full of club house sum-

mer duds, including golf and tennis kits and a box of the "best sells" to read—this misguided friend spent all his time in the inventory and baggage business.

Guides stole his guns and lost him in the woods, introduced him to poison ivy and chiggers, scattered his flossy raiment from Thunder Peak to Shindig Pass, gave him a ducking in a lake, a wild mule ride, and a dose of ptomaine. He got some patchy coats of tan for his money, and also a tanning from an irate lumber-jack. He finally emerged after three weeks of mosquitoes, miasma, and misery, looking like Rip Van Winkle and the Wandering Jew combined.

If that kind of play is a recess, then give me a job carrying water to the

Mississippi!

SPORT is a word which has somewhat outgrown its ancient meanings. You know, it comes from the word disport—to divert, amuse, or deride, and mock. When it assumed its crudest forms in the days of Nero and the Caesars those who sat on the stone benches of the amphitheater had little of the true sporting instinct. They came to mock unhappy victims of conquest. They had none of the generous admiration that we have for a game loser. In other words, possessing no Babe Ruth, they were ruthless in more ways than one.

Down a few centuries later when Merrie England was busy at cockfighting, bear-baiting, horse-racing, and the sport of hare and hounds, we see another meaning creeping into this form of recreation. Sport was then defined as "diversion of the field, as fowling, hunting, racing, games, and the like, especially when money is staked."

The element of hazard and the custom of wager ruined the future for sport in its chances for pioneering in America. The dour and straight-laced folk who landed on that bleak

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Alabama negro agents and rural nurse with their movable school, a memorial to
Booker T. Washington

Wheeled Schools

deliver education

By

WILLIAM J. MADDOX

U. S. Department of Agriculture

MANCIPA -TION of a new kind is coming to the negro farmers of the South.

This time it is re-

lease from agricultural ignorance, which has been a stumbling block not only of the blacks but of the entire South, for there are close to a million farms below the Mason and Dixon Line operated by negroes.

Agricultural schools on wheels are

effecting the change.

It is an instance of Mohammed going to the mountain. The negro farmer as a rule is diffident about attending the regular agricultural instruction given at central points in the various communities. And the more ignorant he is the more difficult it is to get him out.

To Booker T. Washington and his faith in the simple principle of learning by doing, the new scheme of things owes its beginning and its promise of great achievement. He knew the negro farmer well enough to know that there was no hope for advancement unless

modern training could be carried to

his very doorstep.

In 1906, Washington built the "Jesup Agricultural Wagon." It was fitted with farm implements, dairy apparatus, garden tools, and crates containing specimens of improved types of crops and livestock. It was pretty crowded but it managed to rumble along over the rough roads pulled by two fair to middlin' horses.

With the wagon went an agricultural extension demonstrator. Nothing more ambitious than the county surrounding Tuskegee Institute was attempted. But it was a success, so much so that later when automobiles came in, a truck known as the Knapp Agricultural Truck was substituted. This could cover more territory and

ing of farmers to

listen to a display of

carry more equipment.

This truck has carried better farming and home - making into every county in the State where there are negro extension agents and is still in use.

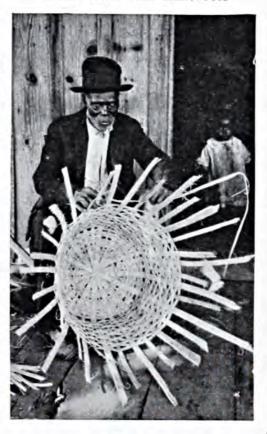
BUT the scheme was to be pushed further. In 1923, contributions from some 30,000 negro farmers and their friends, a large truck especially designed for the work was built. It is "The known as Booker T. Washing-Agricultural ton School on Wheels."

This truck carries a complete stock of

farm implements and home conveniences such as the average farmer would be able to buy or construct and operate. With it goes a man to demonstrate the use of the equipment and to teach improved methods of farming; a woman to show how to make and use the home conveniences and to cook, can, care for poultry, and conduct the home on a more healthful and economic basis; and a rural nurse who gives demonstrations in care of the sick and simple practices of home sanitation and hygiene. It carries, too, a complete motion picture outfit and phonograph.

Of course, it is all very elementary. A good picture of a demonstration is given by a rural negro preacher in a letter to a county agent connected with the work.

"I am sure you will recall how reluctant I was to say I would spend four days in a movable school at such a busy season. Of course I knew nothing about it, but felt that as usual it was nothing more than the gather-



U. S. Department of Agriculture

A better cotton basket as a result of

lessons taught by the school on wheels

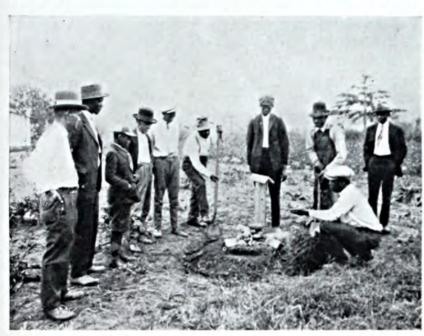
oratory on what a farmer could do. The order given at Monday night's meeting for all to meet Tuesday morning at 8 o'clock at the home of Mr. Cowan was about the only thing that got me out the first day. I wondered what could really happen at 8 o'clock with grown-ups. I put on my preacher suit, of course, and rode out to the meeting about 10 o'clock. On reaching the house, I found myself completely upset in my imaginations and wholly out of harmony with the

work; everybody in their work clothes and too busy to see me.

"The class in terracing was in a nearby field where the farmers were given lessons on the use of the tripod and target in running terraces. Another class was standing around a large barrel where they were given lessons in the making and applying of whitewash and the mixing of stains. Other classes were in rug making, rural nursing, canning, testing eggs, dyeing, care of the sick room, poultry house building, sanitary toilet, soap making, lawn building, and in fact everything that brings to rural life more happiness and contentment. This was my first day's experience in a movable school.

HE second day I was there on time with my old discarded handsaw and suit of overalls which fitted me for the occasion. I soon learned to sharpen and set my saw, along with 18 other farmers. We were given lessons on the use of the square and the cutting

of rafters, then on the cutting out and building of a poultry house which gave us all a chance to try our saws on cutting to the line, which everyone enjoyed. Each hour throughout the day revealed some new phase of the work.



U. S. Department of Agriculture. Negro agent demonstrating banking sweet potatoes for storage

vice in sanitation. Special attention is given to baby welfare, the eradication of vermin—flies, bed-bugs, mosquitoes—and diseases due to unsanitary conditions. Cases of illness requiring medical attention are turned over to local physicians for treatment.

Nor is it all work when a wagon comes to a community. Play has a place on the curriculum. Strange as it may seem few of the "students" know how to play.

At the end of each day's session they are brought together. Simple games are explained and played, all including good sport and healthful recreation—volley-ball, tug of war, foot racing, shoe racing, and such.

One of the most interesting phases of

"The community welcomes the school's return at any time. Cowan's home stands out as a living demonstration of what can be done with an old dilapidated house and broken - down surroundings."

HE program is arranged with an eye to meeting the local needs of the individual community. The various groups are taught the things

they prefer to learn. The course is adapted to the problems encountered.

At some time during the day the rural nurse makes community surveys of the homes and gives first-hand ad-



U. S. Department of Agriculture.

A baby clinic being held at the home of a negro farmer

this part of the program is to see the influence of sports on the old folks who thought they were past athletic activity. Even the old "rheumatiz" (Turn to Page 58)



J. N. Wilson, Clyde, Texas, and a peach tree six months after it was set on unfertilized ground.

Only eight inches of growth developed by the middle of summer.

An Orchard for Cowboys

ACK in the Longhorn days, when everybody else was interested in steers, I caught a vision of an orchard and of the profit that it would yield. Cowboys liked apples and they never could get enough

peaches on the cow trails to balance the ration of bacon and steaks. When I first cleared away the shin oaks, a lot of people laughed and said, 'Wilson, you're goine to grow as thin as a coyote foolin' with them things. Who ever heard of fruit trees making a crop out in this dry West?'"

J. N. Wilson of Clyde, Texas, was telling me how he happened to start an orchard. I was visiting him to see the results of some applications of fertilizers which he had recently made.

The story of a man who went ahead when others laughed and said it could not be done

By

J. R. MASTERSON

County Agent, Abilene, Texas

But let Mr. Wilson continue his story. He is an interesting talker.

"I knew that somebody had to do a thing the first time or nothing would be done. So I set several acres to berries, grapes, apples, peaches and

plums, and waited until the trees were old enough to bear. Within three years, the first orchard of this section produced a normal yield, and the laughter that the other fellow made began to turn about. People from the different parts of this section heard that I had fruit to sell, and fan-tailed ponies kept the roads that lead to my house clouded with dust.

"Soon the Government heard about my undertaking, and a number of grape vines were sent to me to be tried out in this semi-arid West." Mr. Wilson had noted that his old orchard was showing the mark of years. The branches were losing their vigor and the trunks were becoming rough and barky. New trees were ordered and five acres of young trees were set.

On the lower side of the young orchard, the soil was regarded as fertile enough to expect a normal tree development, but along the upper slope of the hill, the sand had leached and erosion had occurred. The potash and lime were exhausted from the dirt of the higher ground, and so Mr. Wilson fertilized the trees that were set in the depleted soil, but depended upon the native dirt in the valley section to take care of itself. Six months after the trees were set, Mr. Wilson and I made a careful study of the two areas, and the pictures duplicated here illustrate the difference in growth that was made. Nurserymen who wanted to make experiments in new territory shipped a number of varieties to be planted in the Western sand.

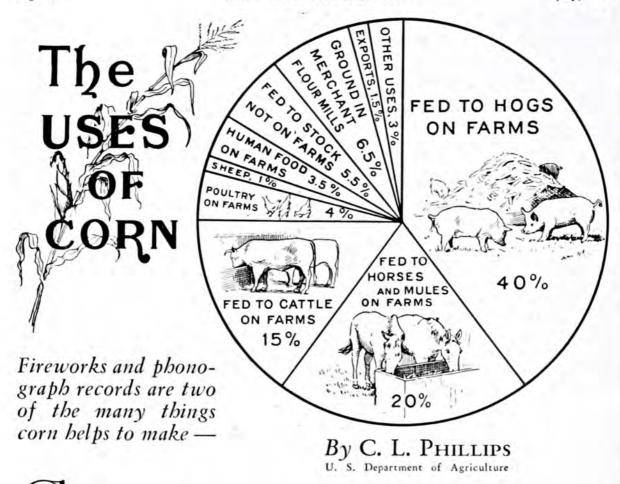
"Of course, insects came; immature fruit fell; and over-prolific trees threw off the surplus that the root system could not maintain," Mr. Wilson continued. "What to do with these immaturely fallen fruits became a problem. I didn't know how to make use of this under-sized, wind-blown crop. The cowboys hadn't learned to drink cider then; red whiskey had enough of the mustang's kick to satisfy the wildest Westerner; and apple juice was a bit tame for a fellow who could wrestle with a Longhorn steer.

66, NCIDENTALLY I heard of our state agricultural college, and, seeking information that would promise a profitable disposition of the immature, worm-eaten, and wind-blown crop, I boarded the train that was bound for College Station. That ride profited me more than \$1,000 the first year. The college specialists taught me how to preserve the undersized fruit in the can, and in a little while I had built up a profitable business in the cow camps. And every cowpuncher howled to the foreman of the ranch for Wilson's products. A cowpuncher has a remarkable palate for apple jelly and peach preserves.

(Turn to Page 58)



Mr. Wilson with a peach tree six months after it was set in ground that he fertilized when the nursery stock was planted. More than three feet of growth developed by mid-summer.



ORN may well be called the king of plants. The treasures it yields are innumerable. Besides being food for man and beast, it has of late years entered in some form into nearly every imaginable industry, including the radio, telephone, and the manufacture of lumber, paper, starch, candy, soap, buttons, glue, oilcloth, paint, shoes, automobile tires, ice cream, and fireworks.

The chemists of the United States Department of Agriculture, the Iowa Experiment Station, and other investigators have been delving for several years into the secrets lying buried in the corncob. Through their efforts the position of the lowly cob has been raised from feed for hogs in the pen to a station in the parlor in the form of a phonograph record. This has been made possible through the extraction of a corn by-product known as Furfural is an aromatic furfural. liquid almost water-white when pure but dark in color when exposed to air and light.

This compound bids fair to become an important commercial chemical. The importance of furfural in industry is apparent when it is realized that such widely different products as printing plates, phonograph records, varnishes, substitute for hard rubber used in the making of buttons and electrical parts, pipe stems, glue, and a hundred kindred products are being manufactured from it.

ERHAPS the largest commercial use for furfural is in the manufacture of synthetic resins. From these resins can be made telephone receivers, phonograph records, radio equipment, noiseless gears, printing plates, and various other molded articles. These resins have insulating qualities, great strength, and great resistance to water

and chemicals. Formaldehyde was formerly used in the preparation of resin, but it has been learned that furfural is an excellent substitute for

this purpose.

The fact that furfural is a solvent has led to its introduction in the varnish industry. It can be used as a solvent and a hardening agent. sides all these uses Dr. Hugh McGurgan of the University of Illinois has demonstrated that furfural has decided antiseptic and germicidal properties. A small amount put in glue will keep it from going bad for several weeks. It can be used instead of formaldehyde in the preservation of anatomic specimens. The Iowa State College is working on the use of furfural as an insecticide and expects that it will have extensive application in this line. Another use for furfural is in the preparation of dyes, used chiefly for such articles as crepe paper and other temporary decorations.

IN furnishing a motor fuel for automobiles the humble corn cob may in the future run in competition with the oil wells. Dr. La Forge of the United States Bureau of Chemistry and H. P. Wolcott of the Iowa State College have reported that a successful motor fuel can be obtained by the use of furfural with mutually soluble compounds as acetone, ether, alcohol, kerosene, and gasoline. The Iowa Experiment Station report says:

"At present prices of furfural and gasoline the use of furfural is out of the question. The growing shortage of petroleum, the possible production of furfural in enormous quantities, and the possible recovery of valuable by-products may make it of impor-

tance in the future."

The method of extracting furfural is not a difficult one. The corncobs with some water and a very little sulfuric acid are placed in a cylinder or pressure cooker and digested for about two hours with steam under

135 pounds pressure per square inch.

The furfural comes out of the cobs and is blown off with steam passed through a condenser and collected as a solution of furfural in water. This solution is then distilled to separate the furfural from the water. possible to obtain furfural from other vegetable substances such as oat hulls and bran, but Dr. La Forge reports that analysis has shown that corncobs contain a higher percentage of furfural than is obtained from any other material. On account of the high cost of methods of producing it, only limited amounts were used in the United States in 1920, possibly 50 pounds a year and that only as a laboratory reagent. It sold for \$30 a pound. Now 500,000 to 1,000,000 pounds a year are being produced by a factory located in Cedar Rapids, Iowa, and sold in Chicago for about 15 cents a pound.

But we have not yet mentioned all the possibilities lying dormant in the lowly corncob. A mucilage or gum can be easily extracted which is useful as an adhesive in the paper box industry, for wall papering, bill posting, for pasting paperbags, and for other purposes not demanding high grade, strong adhesives. Oxalic acid and acetic acids are also important by-products. Oxalic acid and its salts are largely used in the industries.

It is employed in the production of celluloid and artificial silk, purification of glycerine and stearin, leather manufacture and dressing, printing, bleaching of straw and wax, and in tanning. Due to its solvent properties it is used in the manufacture of blue ink, and is valuable for cleaning metallic surfaces and for removing rust and ink stains from fabrics. It is in much demand by laundries as a "sour wash," where it is used to neutralize the alkali on the clothes as they come from the wash. It plays an important role as a precipitating agent in the manufacture of rare earth products. The salts find application in photography and in the

manufacture of safety explosives.

As if this was not enough it is now proposed to utilize corncobs in the manufacture of a lumber substitute. A patent has been issued to Paul Gruber and H. C. Baschroim of Pittsburgh, Pa., for this purpose. Dr. Darling of Milliken University at Decatur, Illinois, claims that this substitute will withstand a pressure of 10,000 pounds to the square inch and that its endurance is as great as any The material may be hardwood. shaped with wood-working tools the same as lumber. It is especially desirable for making spools and it is claimed that they can be produced cheaper than similar spools from birchwood. It is adapted for making picture frames and mouldings or may be used for wallboard and many other uses where high tensile strength is not required.

BESIDES these major uses of the corn-cob many minor uses have been studied. Among these are the making of paper pulp, cardboard, and cork in the manufacture of linoleum, wood flour substitutes, and plaster boards.

The work done on the corncob has thus revealed remarkable opportunities for the profitable utilization of a product heretofore almost entirely wasted. There are perhaps 20 million tons of corncobs produced annually. These have immense potential value, and may yet become a big economic asset to the wealth of this country.

Thus far we have mentioned only the products derived from the cob. The chief products obtained from the corn kernel by the wet process are cornstarch, corn sirup, corn sugar, dextrose, grits, dextrine, British gums, corn oil, corn gluten feed, and other stock feeds, glycerine, and soap stocks.

The corn kernel may be separated into the germ, the body or endosperm, and the hull. From the germ is obtained the oil, oil cake, and oil meal; the starches, sugar, dextrines and glutens are derived from the endosperm;

and from the hull is obtained the bran. From a bushel of corn is obtained approximately 32 pounds of starch, 1½ pounds of corn oil, 3½ pounds corn germ, and 13 pounds of corn gluten feed.

The corn oil is a by-product in the manufacture of starch. The oil is contained in the germ of the corn kernel which in the process of manufacture is separated from the remaining portions of the corn and dried, ground, and subjected to hydraulic pressure whereby the oil is extracted. One authority reports that corn oil can be obtained at a manufacturing cost of about 10 cents a pound. The edible corn oil is used in salad oil, shortening, frying, oleomargarine, compound lard, liniments, and cam-The crude oil enters phorated oils. into the manufacture of soap, paint, oilcloth, leather, and rubber substi-Vulcanized with sulphur trichloride, corn oil yields an artificial rubber widely used in making bottle stoppers, art gum, shoes, rubber specialties, and automobile tire fillers. The value of the oil manufactured from corn was estimated by the Census of Manufacturers to be nearly \$107,000,000 in 1923. But the largest amount, about 75 per cent of the total output, is used for food purposes.

STARCH, as has been pointed out, is the principal product obtained from the kernel. From the Tariff Commission we learn that approximately 93 per cent of our starch comes from corn, about 4 per cent from potatoes, the rest from wheat, rice, and tapioca. In 1925, 86 per cent of our imported starch was potato starch. In 1923 the value of the starch manufactured from corn was nearly \$29,000,000. Starch is used in the textile industry for sizes for stiffening and finishing yarns and fabrics. Confectioners use it in making gum-drops, and as a molding in casting cream centers,

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A herd of Jersey cattle on one of the many dairy farms in Oktibbeha county, Mississippi

The County Cows Built

By SID NOBLE

FEW short years ago Oktibbeha was a typical cotton county in the hills of north Mississippi. Its one-crop farmers, who grew only cotton and bought their supplies with cotton money, were operating very similar to the old share croppers who dumped their wagons at the master's gin, went to the commissary and drew supplies, to the smoke-house and drew meat, and thence back to their meagre acres to grow more cotton to trade for more food and meat.

Today Oktibbeha is known as "the Jersey county of the South." Its annual receipts from dairying are about six times the value of its cotton crop.

It is the location of the first southern milk condensery. Its new doctrine is di-versification and the chief expotrine is the dairy cow.

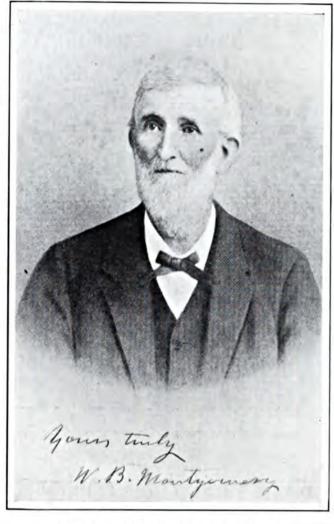
Back of this change is a story of dreams come true-the dreams of a pioneer who was a prophet of better

The pioneering strain has always run like a crimson thread through the fabric of the true American char-



nent of that doc- The milk condensery at Starkville, Mississippi

acter. In pursuance of old ideals and new frontiers the pilgrims boarded the Mayflower and later. feeling the urge, the winners of the West drove their covered wagons toward the setting sun. Thus our forebears pushed boundary lines to the farthest frontiers, spurred stubborn to and relentless effort by the thirst for new horizons, by the belief that through the mist was the rainbow's end —the land



Col. W. B. Montgomery, 1829-1904

flowing with milk and honey.

When the boundaries were established and the country was settled and populated, there began a new pioneering. The farmers came to realize their milk and honey must be wrung from the resisting soil upon which they happened to be; that instead of boarding covered wagons and setting forth once more they must pioneer



Montgomery Hall, the agricultural building of Mississippi A. & M. College

with their own hillsides and gullies and their own rich valley lands.

Col. W. B. Montgom e r y of Starkville, Oktibbeha county, came of this new school of pioneering. This practical farmer, who was born in 1829, was a graduate of Princeton University and a devout Scotch Presbyter i a n. But most of all he was a man of vision. Directly after the Civil War when everywhere swords had been

sheathed and consigned to rust and memories, he settled on his Mhoon Valley plantation, near Starkville, and began to look about for some path that led out of the morass of reconstruction days.

Due to constantly disintegrating lime rock in Oktibbeha soils, the cotton farmers were in a continuous battle to keep grass out of their cotton fields. Grass, to them, was a curse, but Col. Montgomery recognized it as a benediction of nature. Contrary to the general custom of a one-crop system and cotton farming, he began to preach wide diversification and dairy farming. He became owner and editor of The Southern Livestock Journal and built up a strong circulation through the South for this worthy magazine.

Riding about over his plantation and the surrounding country he would always carry the seeds of a variety of good pasture grasses in his saddle bags. As he spread his philosophy of a well balanced farming he would also strew these seed along the roadways, in the fence rows, and through the meadows. Alfalfa, Johnson grass, sweet clover, and lespedeza took to the lime soil as a duck takes to water. From the Isle of Jersey he imported the sires and dams of the herds that fattened on the meadows in Mhoon Valley.

At about this time in the North another pioneer was enjoying his first sweet taste of success. Gail Borden's factory to preserve milk, at Burrville, Connecticut, had done a great service in the Civil War and was receiving nation-wide recognition and its first great stimulus.

W ITH the passing of years the farreaching influences of those two benefactors of the human race have converged in the first southern milk condensery, which has just completed a very successful first year's operation at Starkville. In realization of their dream, the rich milk of Oktibbeha Jerseys goes forth in daily shipments to market in cans flowing with milk



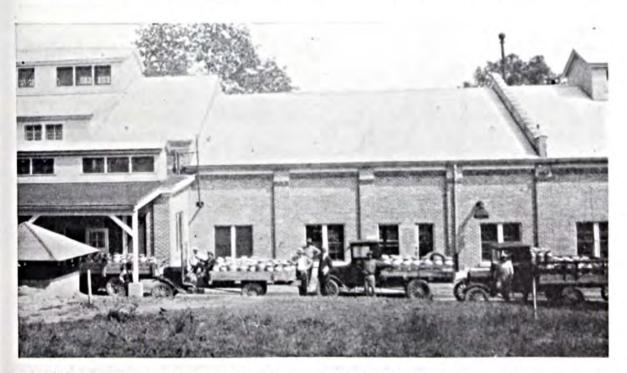
Register of Merit Jerseys

and honey.

Today as cotton farmers are worrying over low prices and wondering how they will meet their notes, Oktibbeha bank deposits are enjoying a steady growth. The bankers are busier than ever before. The streets of Starkville have been paved, and the Chamber of Commerce is figuring on a white way. Oktibbeha farmers are on a steady pay roll now, they receive something like \$150,000 per month for the milk from their Jerseys.

The first year of the first southern milk condensery has been so successful that two other similar plants recently have sprung up in north Mississippi, one in Tupelo, north of Starkville, and another in Macon, south of Starkville. The world has discovered that north Mississippi is an ex-

(Turn to Page 59)



The daily receipt of milk from Oktibbeha Jerseys at the milk condensery. The trucks make regular trips over the county's network of gravel roads to collect the cans from the dairies

Douglas County Oregon Pioneers With New Crops

By GUY A. PETERSON

Madison, Wisconsin

UT in Douglas county, Oregon, a semi-mountainous territory where hardly two farms are alike, there is an Irish county agent who is leading the way to better agricultural incomes for the farmers who look to him for advice. It was my privilege some time ago to sit in E. W. Cooney's office at Roseburg and interview this busy man whose forefathers lived on the Emerald Isle. Our conversation was interspersed with phone calls, conferences, and other interrup-

tions, but I learned enough from my brief stay to assure me that the farmers appreciated the work that is being done in their behalf by this human dynamo and his staff of assistants.

Cooney is one of those rare leaders who is able to get cooperation in his experiments. Whenever he sends out a call for farmers to volunt eer to make tests with new varieties of crops or carry onfertilizer trials on different soil types,

he always has plenty of response. He is now watching a great many fertilizer plots on farms in various parts of his county, trying to find out just what kinds of fertilizer should be recommended under the many conditions that exist.

Among the crops which are receiving a great deal of Cooney's attention is broccoli, or winter cauliflower, rapidly becoming popular among connoisseurs of savory vegetable dishes. Broccoli has been grown within the

county for nearly 20 years but it has been grown on a commercial scale much less time than that. In between phone calls, Cooney was able to tell me something about its culture.

"The crop is very exacting in its requirements of fertilizers and soil types," he said, "but the dominant factor is probably climate. It cannot be grown where the temperature drops to 18 degrees below freezing during January and February



Number one head of broccoli in the field

because the plants do not seem to be able to survive such an ordeal. The Umpqua valley has been found especially adaptable to this vegetable as the warm winds coming up the valley moderate our The climate. acreage has increased from 100 acres 14 years ago to 4,500 acres last year. On the whole it has been prof-

itable and the growers have been satisfied with vields of 200 to 250 crates per acre that netted \$1 to \$1.35 a crate.

have learned many things about this vegetable in the past five years. Possibly the item of greatest importance to the grower is the knowledge that he can get seed of known performance in the field. Originally the seed that we used came from England, France, Denmark, and Belgium and very satisfactory results were obtained. The World War, however, destroyed our foreign sources, and seed stock became a vital issue to every grower. Through plant-

ing unknown seed many farmers began to lose heavily. The climax came in 1924 when a survey of 40 or more fields showed a loss of more than \$150,000 in Douglas county alone,





Above: E. W. Cooney standing in the first flax field ever sown in Douglas county, Oregon. This five-acre plot yielded 18 bushels per acre.

Below: The man in this Douglas county oat field is six feet tall. The soil must be well supplied with potash to make tall oats stand ub.

This discovery led to a pure strain seed campaign and the organization of the Douglas County Broccoli Protective Association."

T is impossible to tell by looking at broccoli seed just what it will produce, because some strains are not adapted to the climate. Some shoot seed stalks and produce nonheading plants. To find out what could be successfully cultivated in Doug-

> las county, the protective association secured 40 strains of seed a n d planted them in two demonstration plots. Two hundred plants of each strain were set out during July and given thorough cultivation. Four of each lots strain of seed were kept in the vaults of a Roseburg bank to be held for checking, because they tested every lot of seed before it was given out to the members. was very much interested in this be-

cause it is not often that one finds seed so valuable that it must be kept under lock and key in safe deposit vaults.

As a result of this work 80 per

cent of the broccoli plantings in the county last fall were from the two best strains of seed as indicated by the trials. What is more, 75 per cent of the entire seed reserves represented by certain of these plots are now in the bank vaults awaiting final check.

Along with the seed testing work Cooney laid out some fertilizer demonstrations in cooperation with Prof. F. E. Price of the Oregon Agricul-

tural College.

Tenth acre plots with nitrate of soda, sulfate of ammonia, sulfate of potash, muriate of potash, acid phosphate, and complete fertilizers are being made. Cooney summarized last year's figures as follows:

THE most outstanding results were secured with acid phosphate and with complete fertilizers carrying high percentages of phosphates. The results were so outstanding in the matter of frost resistance that it was thought best not to hold a field day at the plots until we could definitely determine if the acid phosphate should be given the entire credit."

This does not mean that phosphates alone are recommended for broccoli but that they appear to have an important place in the fertilizing sys-Broccoli takes much the same elements from the soil as does cabbage, and so some county agents advise that the same fertilizer treatment be given for both of these crops. In Josephine county, Oregon, a bulletin issued by the Grant's Pass Chamber of Commerce recommends the use of a complete commercial fertilizer called No. 2 truck fertilizer at the rate of 500 to 1,000 pounds an acre. course the original character of the soil will determine just how much of any plant food will be desirable to apply.

Flax is another new crop which in all probability will find a place in the rotation system of many Douglas county farmers since Cooney has shown its adaptability. Little was known about this crop, but Cooney thought it could be profitably grown, and so he got one of his old standbys, J. H. Parrott, to run some tests on it. Parrott agreed to sow 40 acres in five-acre lots at intervals of one week upon the various types of soil on his farm. The entire planting averaged 13 bushels of seed to the acre which sold for \$3.25 a bushel. The best yield was 18 bushels per acre secured on a field that had been in Canadian field peas two years before. May 10 seemed to be the best date for planting flax on Parrott's farm last

Cooney is not only introducing the idea of growing pedigree Grimm alfalfa seed, but he is studying the pasture and hay problem from other angles as well. In the past few years Ladino clover has been getting considerable attention in the western states because of its perennial characteristics and its fine pasture qualities where winters are not too severe and where plenty of water can be secured. Two years ago, Cooney got enough Ladino seed to plant an eighth of an acre on J. H. Parrott's farm. He said it was hard to believe the results but a two-ton crop of hay was cut from that measured field last year. If further trials show up half as well, Coo-

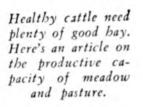
ney is confident that there will be

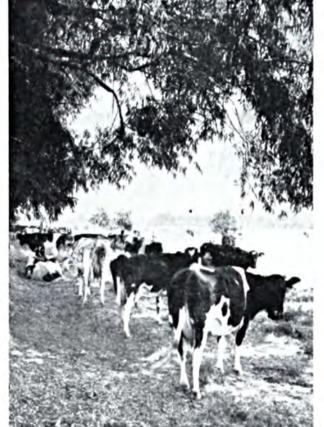
many acres devoted to this crop in the

future.

COONEY has a small farm of his own where he can test some of his ideas and keep in closer contact with his work. He believes that winter pod peas will soon become an important enterprise in his county. Last year on this farm he got two tons of pods per acre that sold at an average price of 9½ cents a pound. These peas were in full bloom by March 25. He planted them in paired rows, the pairs

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Ewing Galloway.

Hay

By Robert Stewart

Dean of Agriculture, University of Nevada

HE typical meadow and pasture region in the United States comprises the northeast portion of the country and includes all of New England, New York, Penn sylvania, portions of West Virginia, Ohio, Michigan, Minnesota, and Wisconsin. The distinctive ag-

riculture of this region has developed a special problem in soil fertility which is of grave concern to the producer, and its successful solution offers much of profit and satisfaction in farming.

From the nature of the soil, climatic conditions and markets, much of the land must be in permanent pasture or meadow, and the short lived legumes do not fill the bill of requirements. It has been hoped by some investigators that alfalfa, the king of forage crops in the West, might be successfully introduced into this region and, in a measure, supplement grass. Facts, however, indicate no such trend on the part of the farmers of this region. In 1919 there were

1,163 acres of alfalfa in Massachusetts; five vears later there were only 1,273 acres of alfalfa, a gain of 110 acres. There are 457,000 acres of hav land in Massachusetts! There is no evidence here that alfalfa is growing in popular-New ity in England.

The farmer

of this region is, therefore, practically limited to the use of a grass hay crop. The crop mostly used is timothy although the "timothy" hay of a large portion of the area is really quack grass. The fact that much of the land is in permanent meadow or pasture, and the further fact that legumes are not used, makes the problem of maintaining the productivity a very difficult one and worthy of careful consideration.

W ITH a few notable exceptions the yield of hay and the carrying capacity of the pastures of this region are very low. The five-year yield of hay from 10 typical states of this region will show this.

Yield	of	Hay-Average	1921	-2	,

State	Yield in short ton
Maine	1.13
New Hampshire	1.15
Vermont	1.38
Massachusetts	1.31
Rhode Island	1.30
Connecticut	1.29
New York	1.32
New Jersey	1.48
Pennsylvania	1.36
Ohio	1.33
Average for Region	1.31

The yield of alfalfa hay in the four states of California, Nevada, Oregon, and Washington in 1925 was as follows:

Yield in short tons
4.20
3.60
3.00
3.00
3.45

The yield of hay in the typical hay region of the northeast quarter of the

United States is distinctly low in comparison with the yields of alfalfa in the natural home of this premier forage plant. alfalfa cannot be grown in the meadow and pasture belt, some effort should be made to increase the yield of such hay crops as can be grown. How can this be done?

The pastures and meadows of Great Britain and Europe are world renowned for their richness and excellence. Every one who visits

the British Isles is surprised at the condition of the meadows and pastures on the farms. Perhaps a consideration of the methods followed by the British farmer will be of value in assisting us to solve our problem of better meadows and pastures in America.

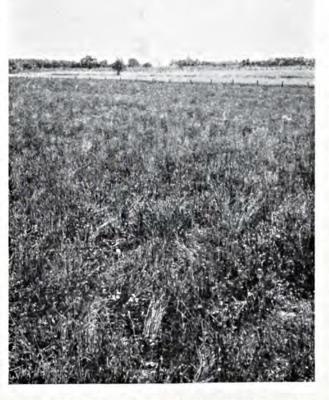
There are two important things the English farmer does which materially assist in maintaining the excellence of his meadows and pastures. He uses a mixture of grasses and he top-dresses his meadow and pasture with fertilizer. The American farmer as a rule does neither.

At the Rothamsted Experiment Station in England there is a park of about seven acres. This park has been in permanent grass as long as there is any record and probably has grown grass continuously for several centuries.

In 1856 experiments were commenced on this park to determine the best method of increasing the yield of

grass. Previous to this date all portions of the park were apparently of equal value. The park was divided in 1856 into a number of different treatment.

The average yield of crop in these plots from 1856 to 1912 shows a very marked difference. The yield of hay varied from 2,090 pounds on the untreated soil to 7,330 pounds on the plot receiving full fer-(Turn to P. 53)



Large field of buckborn which grew from what was supposed to be clover seed on an Indiana farm. Farmers can't be too careful in buying pure seed. The buckborn will be hard to kill,

The N.F.A. Convention

Annual gathering of fertilizer men at White Sulphur Springs proves an outstanding success

By THE Editors

HE most successful fertilizer convention in seven years was held in June at White Sulphur Springs, West Virginia. More than 400 people were in attendance, which is a larger number than last year. There were present executives of fertilizer manufacturing companies from some 30 states, and a score of the world's leading soil scientists from England, Germany, France, Italy, Russia, and other countries. The spirit of the convention was optimistic; it showed faith in the future of both agriculture and the fertilizer industry.

Much credit is due the committee, which organized the convention; and appreciation is also due the speakers who gave of their time and experience for the benefit of all.

The convention was fortunate in being able to prevail on Sir John Russell, Director of the Rothamsted Agricultural Station, England, to give a very instructive and entertaining address on "Eighty-Five Years of Fertilizer Experiments at Rothamsted, 1842-1927." The speaker showed that the chief development in the use of fertilizers, during the last 50 years, has been to stabilize crop production and make it more profitable. A complete report on this address will be found on another page of this magazine. Every man interested in using or selling fertilizers should have heard this address.

In line with the tendency in all industry, special stress was laid on the field of larger markets and better methods of merchandizing. The chief

speakers in this field were C. C. Parlin, who spoke on "Seeking Larger Markets." Mr. E. St. Elmo Lewis gave a very instructive and stimulating talk on "Better Selling, Bigger Markets, Better Profits." This speaker emphasized particularly the importance of sound advertising campaigns and the folly of overproduction. "Foreign Market Possibilities" were discussed by C. C. Concannon who showed plainly that international movements in the fertilizer trade are taking place and must eventually be considered by the National Fertilizer Association. value of surveys in finding fertilizer possibilities was shown by H. R. Smalley in a talk on "Enlarging the Fertilizer Market." The urgent necessity for supporting trade organizations was discussed by W. Bishop.

THAT city prosperity cannot be divorced from a sound agriculture, in fact is quite dependent on it, was shown by Virgil Jordan in an able address on "The Agricultural Problem." This problem, the speaker showed, cannot be solved in any casual manner. It calls for real statesmanship and real thinking.

Last, but by no means least, the well known president of the association, Spencer L. Carter, as always gave a very interesting and profitable annual address. In few words Mr. Carter pointed out the necessity for clear thinking and facing the facts. Farreaching changes are taking place in

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YANCEY SWANSON Practical Farmer

Here's a Georgia farmer who has found the formula to successful crop production

By H. T. MADDUX

ORTY-FIVE bales of cotton on 40 acres!

That is the 1926 record of Yancey Swanson of Campbell county, Georgia. As a result, Mr. Swanson and his sons, Allen and Harry, are recognized as the best farmers in the section.

Down in Campbell county some weeks ago I found every one talking about the Swansons. I asked Mr. Swanson how and why he made better crops than the average farmer of the section.

"I don't use much more fertilizer per acre than they do," he said, "but I am very enthusiastic about potash.

"I use five or six per cent for cotton," he continued. "I wish I could find out how much potash can be used profitably for cotton here. My neighbors have always said this land contains plenty of potash and that we don't need much. I believed it until C. V. Shirley came here as county agent about four years ago.

"Mr. Shirley started me using a lot of potash and as a result I have been making more cotton than I ever did in my life. I used 400 pounds per acre of a mixture running about 10-5-5 last year and made 45 bales on 40 acres. I don't have much trouble making a bale of cotton to the acre. In fact I made that much in 1925 when it was so dry.

"I make big, full-sized bolls clear up to the top of the stalk and it is easy to pick. I don't make any more finger-nail cotton since I started using plenty of potash. In the fall labor often leaves other farms and comes over to me because the picking of cotton is so easy here," continued Mr. Swanson.

The average yield of lint cotton per acre in Campbell county was 177 pounds in 1924, 122 pounds in 1925, and 150 pounds in 1926, according to government estimates. Mr. Swanson averaged 562 pounds per acre in 1926 on his home place.

"Does potash pay with corn?" I asked.

HAVEN'T found a crop that potash doesn't make better on this red and gray land," he said. "I use acid phosphate, nitrate of soda, and plenty of potash under my corn just as I do for cotton, except in smaller amounts per acre, and then top-dress later.

"We farmers are continually advised to grow plenty of food and feed crops. I sell corn every year and my boys have some corn to sell also. I even sold corn in 1925 when it was so dry. I haven't planted any corn this year because I have enough to do me another year.

"Talking about potash reminds me. For the last four years I have noticed that my corn matures better and the ear often grows out of the shuck. This never happened that I know of before I began feeding it plenty of

potash.

"Doesn't potash make sweet potatoes, though! The boys planted a few acres last year and they must have used from 12 to 15 per cent potash under them. I thought they would never get through hauling. We are putting 35 acres in sweet potatoes this year, and 275 acres in cotton. We bought seven tons of muriate of potash and we are out already," concluded Mr. Swanson.

AT this time Allen Swanson arrived.

"Is there any money to be made from farming these days?" I asked Allen.

"Well I guess so," he said. "Last year I bought 50 acres of fairly level land that had been laying out for several years. I didn't know whether I was doing the right thing or not, and so I didn't tell Dad a word about it until I began clearing off the bushes

and small trees. Four acres were planted in watermelons, 16 acres in cotton, and 12 acres in corn. I used 400 pounds per acre of a 10-4-5 fertilizer and made 14 bales of cotton. The place cost me \$450 and I figured that after paying my fertilizer bill I had about \$1,400 worth of crops and money on hand."

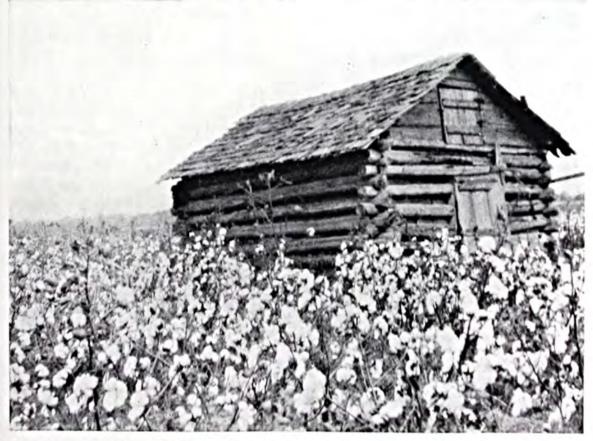
I was preparing to leave when Harry Swanson arrived.

"Harry, tell us about that cotton you planted three years ago when you couldn't get any sweet potato plants," said Mr. Swanson.

This is Harry's story:

"It was about the first of March when I fixed two acres for sweet potatoes, using 300 pounds of acid phosphate, 300 pounds of cottonseed meal, and 300 pounds of muriate of potash per acre. I bedded on this fertilizer, intending to set out my plants about the first of May. But I couldn't get any plants and things rocked along until the last check which I sent out

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The cotton house shown above is an old style structure but the cotton around it was grown by modern methods. Methods of better cotton growing are described in this story which tells how one farmer proved they were successful by producing 45 bales on 40 acres,



Agricultural Building, University of Idaho

I Another of our series.

D

A

H

By E. J. IDDINGS

Dean of Agriculture and Director of the Agricultural Experiment Station.

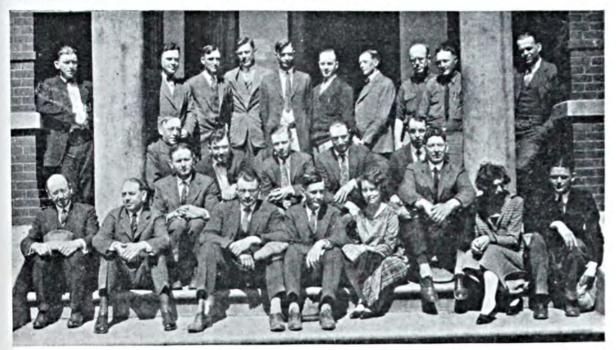
DAHO is a State of great diversity of soil and climatic conditions. The altitude ranges from a little over 600 feet in the Lewiston valley to more than 6,000 feet in the Teton basin. Rainfall in regions where farming is practiced varies from eight to ten inches in the Snake River plain to more than 25 inches in certain of the State's non-irrigated farming regions. Under conditions in this State, it is impossible for a single experimental farm, no matter where located, to render adequate service to farming interests.

To meet the situation, three substations were included in the original organization plan when the Idaho Experiment Station was established in 1892 by action of the board of regents. One of these stations was located near Grangeville in central Idaho; another near Nampa in

southwestern Idaho, and the third near Idaho Falls in southeastern Idaho.

In 1896 the three substations were abandoned. The report of the decision to abandon gives as reasons that their upkeep was too high and too far away from the main station, and that they kept the main station poor





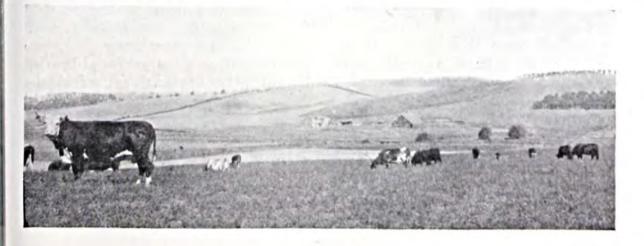
Some members of the experiment station staff. Director Iddings is seated, second from the left, on the front row.

and unable to function properly. However, as the agriculture in the State developed, substations became necessary and were established from time to time. The present plan for Idaho provides five experimental farms and several field stations and points of contact with special experimental problems.

The branch station at Sandpoint serves the cut-over regions. The central farm at Moscow conducts investigations of interest to a large farming region in the north-central part of the State. The irrigated farm at Caldwell is maintained to deal with the peculiar soil problems of southwestern Idaho and to serve as the location for important animal feeding and dairy cattle management studies.

The irrigated crop section, conducted in cooperation with the Federal Office of Crops and Diseases, is located at Aberdeen. The substation to deal with the problems of high altitude, non-irrigated farming is at Felt in the Teton basin at an elevation of over 6,000 feet. The entomological field station at Parma is maintained at this point because of easy access to insect problems of both orchard and field crops.

HE Idaho Experiment Station, therefore, like the stations in other States, is engaged in a comprehensive and carefully organized program of investigation to determine new knowledge for farmers and to interpret



agricultural science into methods and results that can be directly applied to the more important economic problems in farming and home-making. These methods and results are carried to the farmers by the station through its cooperating partner, the extension service, and published reports.

The first bulletin of the station was published in 1892 to acquaint the public with the new organization and plans. It was written by Robert Milliken, professor of agriculture, and first director of the station. first annual report was submitted in 1894 by Charles P. Fox, who succeeded Director Milliken, following the latter's resignation. F. B. Gault, president of the university, became director after Mr. Fox resigned. Joseph B. Blanton, who succeeded Mr. Gault as president in 1899, continued to act as director, and President James A. McLean, who succeeded Mr. Blanton in 1900, was director for two years. In 1902, Hiram T. French, agriculturist, became director. 1910, he was succeeded by W. L. Carlyle, animal husbandman.

Three of the present substations were established under the administrations of French and Carlyle. The Caldwell station was established in 1908; the Aberdeen irrigation section station in 1911; and the Sandpoint substation in north Idaho in 1913.

J. S. Jones, chemist, became director in 1914. The Felt high altitude substation, under his administration, was established in 1917. He was succeeded in 1918 by E. J. Iddings, animal husbandman. Dean Iddings has served since that time. In addition he is dean of the college of agriculture and director of extension.

Idaho has now in progress studies on more than 100 separate projects or distinct lines of work dealing with soils, animal feeding and breeding, insect studies, plant and animal disease investigations, research in bacterial action, study in agricultural economics and marketing, and work in many other phases of farm management, crop production, and animal keeping.

Among some of the interesting and important results of work done on crops may be mentioned the fact that red clover has been found to act as a perennial producing satisfactory yields over a four and five year period. It yields better than alfalfa in the cut-over section of Idaho.

Rustlers white dent corn has been bred up so that it produces satisfactory corn yields in many of the cooler sections of the State. Sunflowers are recommended now as a valuable dairy silage crop. Seeding of peas just as soon as the soil can be prepared in the spring has been found to be the best practice. The same is true of grass and legume seedings. The use of nurse crops has been found to be inadvisable in non-irrigated areas.

HE development of Mosida and Federation wheats, Idamine oats, and Trebi barley have been major contributions of crop experimental workers to Idaho's agriculture. Mosida wheat proved to be the highest yielding variety for the northern cut-over sections. It is a beardless red winter variety, a cross between Fultz Mediterranean and Turkey Red.

Federation wheat, a soft white early maturing variety introduced from Australia, is well adapted to the entire irrigated area and is becoming very popular. Idamine oats, a midearly variety developed from Silvermine oats, is a high yielding variety for the irrigated sections and is well adapted to the entire State.

Trebi barley was introduced by the United States Department of Agriculture. It is a high yielding, spring seeding variety adapted to the entire State.

In Idaho the agricultural experiment station is charged with the responsibility of handling the pure seed work and with the maintaining of

(Turn to Page 46)

Eighty-five Years of Fertilizer Experiments

Address of Sir John Russell, Director of the Rothamsted Experiment Station, Harpenden, England, before the National Fertilizer Association Convention, White Sulphur Springs, W. Va., June 8, 1927

Reported by G. J. CALLISTER

OHN BENNET LAWES, owner of the Rothamsted Estate in England, was the first agricultural scientist who also managed a very successful fertilizer business. In 1840, under the necessity of growing larger yields of fodder crops of turnips, Lawes experimented until he found that rock phosphate treated with sulphuric acid produced an effective fertilizer for increasing his turnip yields. He patented the process, set up a factory in London, and continued to manufacture acid phosphate for many years.

But turnips were only one crop. Wheat was important. Barnyard manure had been used up to that time and gave good results. It was not, however, obtainable in sufficient quantities. John Lawes, therefore, started the now famous experiments on wheat at the Rothamsted Experiment Station.

He proved that artificial fertilizers could be compounded for wheat and used even more successfully than barnyard manure. Realizing the importance of his discoveries he induced a young chemist, J. H. Gilbert, to join him. Together they showed that artificial fertilizers could give great increases in crop yields, but then, as now, the fertilizers were not always effective. Sometimes they acted well, sometimes they did not. Prices of farm produce fell, labor rose, and hard times came upon farmers. It became important, both for agricultural

science and for the fertilizer industry, to know more precisely the conditions under which good effects might be expected and when less favorable results were likely to follow. A disappointed farmer is just as bad for the scientist as for the manufacturer, and it is in the interests of both to gain knowledge so that farmers can be told quite definitely whether fertilizers are likely to help, and, if so, what fertilizers—if not, what else they can do to get better crops.

OF all fertilizers the most uniform in their action are the nitrogenous. In the humid conditions of England, 1 pound of nitrogen gives about 12 to 18 pounds of wheat, barley, or oat grain; 120 pounds potatoes or 120 pounds hay, so that 1 cwt. sulfate of ammonia per acre will commonly add 4 or 5 bushels of wheat, 6 or 7 of barley, 7 or 8 of oats, 20 cwt. potatoes or hay to the crop. The figures vary less from district to district (taking the average of several farms) and from season to season than There may be might be expected. considerable variation in the basal yield, but much less in the increase given by the nitrogenous fertilizer. Similar results are obtained by Lemmermann of Germany.

Phosphates and potassic fertilizers are much less regular in their action; in some seasons they are very good, in others they are apparently useless. In the Rothamsted experiments the phosphates act well in cold, wet seasons when crops are liable to fail and when, therefore, food for animals is scarce and dear. Thus in 1920 there were only 3 tons of Swedes per acre on an unmanured land and 9.3 on land manured well with sulfate of ammonia and potash, but 16.3 tons where the land received phosphates in addition.

Those farmers who had used no phosphate had insufficient food for their animals and so were driven to selling them at a time when buyers were scarce. Those who used the phosphates had sufficient food to keep all their animals and even to buy some that were going cheaply. In bad seasons the difference between a large crop of animal food and a small crop is much greater than the mere figures of tonnage suggest. Therefore, phosphates are regarded as good insurance against bad seasons, and farmers are advised that if the season is good the phosphates may not help; if it is cold and wet the phosphates will probably save the crop.

N like manner potassic fertilizers are very beneficial to potatoes in times of spring drought. One cwt. sulfate of potash per acre has given increased crops varying from nothing up to 58 cwt. per acre, according to to the rain in spring—nothing when there were good rains and good crops—25, 40, 50 or more cwts. when there were drought and liability to failure and therefore a premium on good crops.

At Rothamsted scientists are devoting much time to the study of these seasonal variations. Two methods of investigation are followed: 1, to get all the facts by more accurate field experimental methods; 2, to make complete observations of the climatic conditions and their effect on fertilizer usage.

As a result of this research work a number of correlations between the

fertilizers and the weather have been worked out by the statistical department of Rothamsted.

The main object in doing this work is to put the results into the form of tables of expectancy of crop yields, similar to the tables of expectancy on which life insurance is based. Thus, if a farmer adopted the recognized system of fertilizing, best calculated to stabilize his yield, he could insure his returns at a reasonable premium.

REGARDING the value of barnyard manure as to insurance against bad seasons, the record of experimental work shows that manure is very valuable. It breaks no records but in bad seasons it never fails. A proper combination of barnyard manure and artificial fertilizers gives the best and steadiest results.

The phosphates act well in cold, wet seasons; the potassic fertilizers help in the dry, hot seasons; the barnyard manure is good in dry, cold or dry, hot seasons, while the nitrogenous fertilizers are nearly always good. The fertilizer thus acts as a buffer between the crop and the season, straightening things out and making for constancy of yield. Such steadiness of yield is obviously in the farmer's best interest.

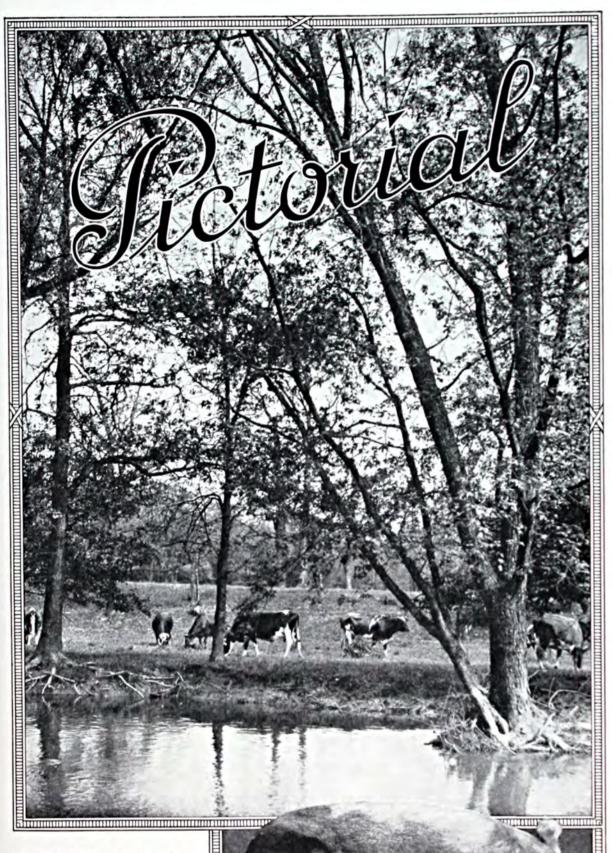
It has been found that the seasonal effects express the varying results of the plant to the fertilizer in varying conditions.

Nitrogenous fertilizers increase the rate of growth of the plant and the size of the leaf. They induce a bulky growth very good for vegetables. The problem is to be able to use enough nitrogen without causing lodging of many crops.

Phosphatic fertilizers improve the root development and tillering of cereals and hasten the development of grain, effects which are very valuable on heavy soils in cold, wet seasons.

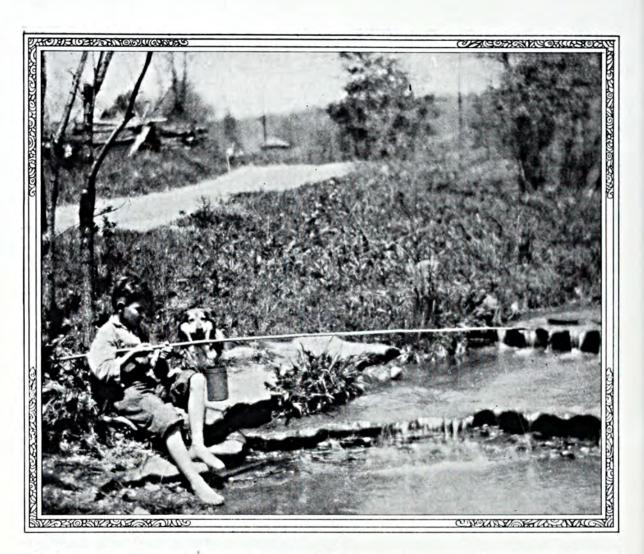
Potassic fertilizers in the Rothamsted experiments have shown two re-

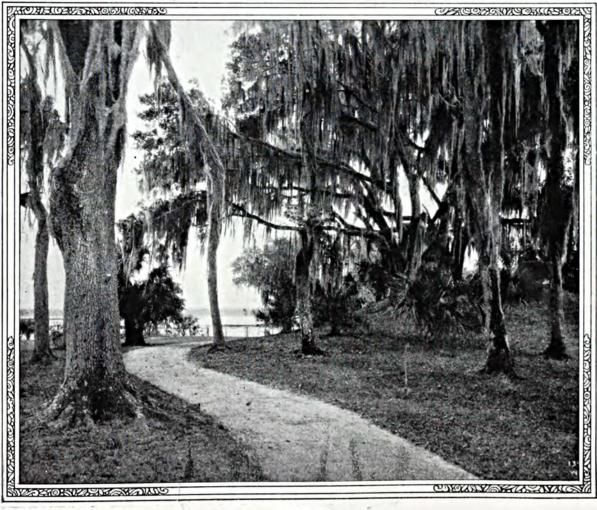
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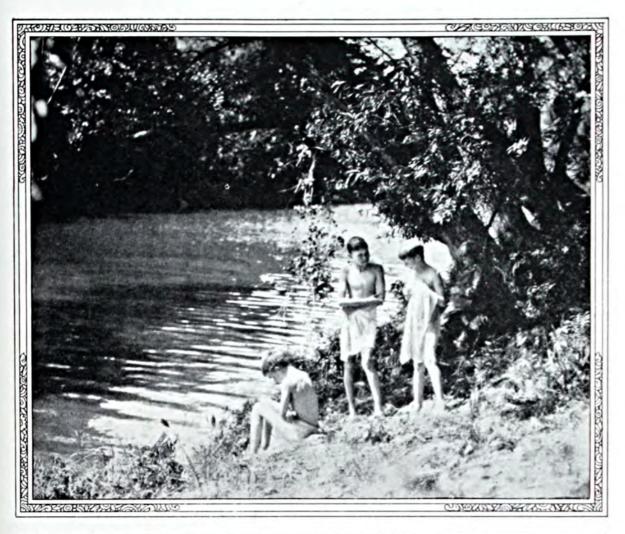


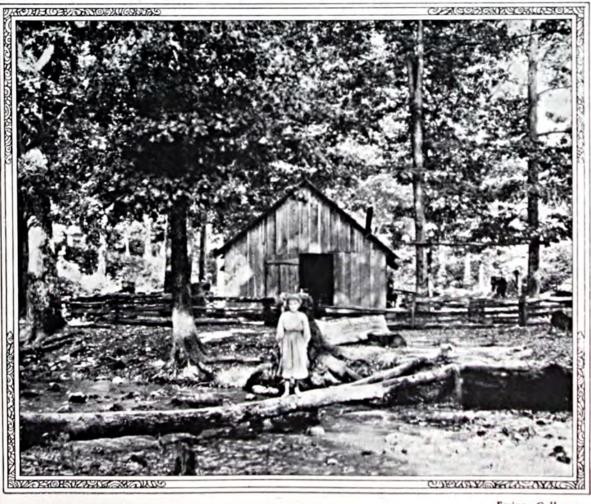
S UMMER heat gives these cows little worry and the pigs below are wholly unconcerned over the fact that thirteen are at the dinner table. Other benefits of farm life in July are pictured on the next two pages.











Ewing Galloway.



One of the most outstanding phases of activity of the U. S. Department of Agriculture is its club work with boys and girls. Shown on this page are two Lowndes county, Mississippi, club members demonstrating a well justified pride in their crops.

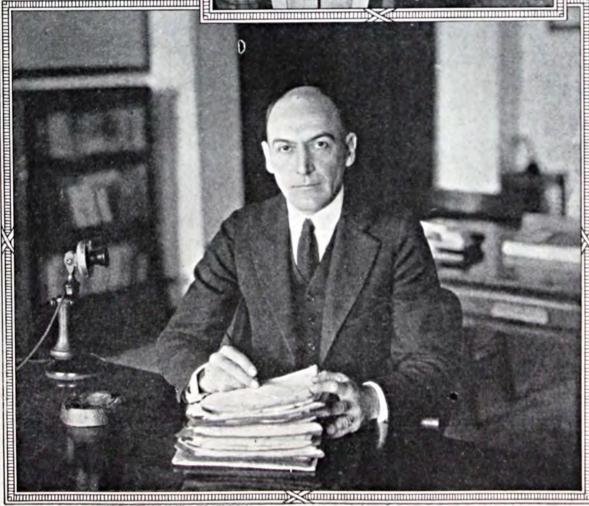
The berries, shown on the obposite page, are a result of other work of the U.S.D. A. Many years ago a Mr. Young of Louisiana developed a new berry by crossing the Mayes dewberry with the phenomenal blackberry. After a time be discarded this hybrid but he had given some plants to a friend in Pennsylvania. Years later this friend sent some of the plants from Pennsylvania to the Bureau of Plant Industry of the U. S. D. A., and discovery was made that this fruit, having most of the characteristics of a dewberry, was better in flavor and appearance than any other dewberry known. Especially suit-



able for the South and Southeastern States, during recent years the Young dewberry has been grown at the Coastal Plain Experiment Station, Willard, N. C., and the berries shown in the picture were shipped from that station to the Washington market.

Below: Reorganization work in the Department of Agriculture has split off the regulatory work from the Bureau of Chemistry and placed it in a separate branch of the Department of Agriculture along with the regulatory work having to do with insecticides and fungicides. The new administration, which went into effect July 1st, is called the Food, Drug and Insecticide Administration and the new chief is Walter G. Campbell who is also Director of all the regulatory work in the department. Mr. Campbell was at one time acting chief of the Bureau of Chemistry and was a part of that organization for a great many years.







W. M. Jardine, Secretary of Agriculture, is shown here with his son, Bill (not William) who will start on his own at the age of 18 to get a job in Kansas City for the summer, and this fall enter the Kansas State Agricultural College in Manhattan, Kansas. Bill hopes to earn enough this summer and at odd times to pay his way through college.



The Clayton county, Iowa, team of club boys and girls who won the International Junior Judging Contest is now in England to participate in the junior judging contest at the Royal Livestock Show held near London this year. Left to right on the front row are: Professor Fordyce Ely and Director C. W. Warburton of Iowa State College; the 4-H judging team composed of Gertrude Kaiser, Kenneth Walter, and Lloyd Kaiser; and Roy Combs, county agent of Clayton county. The others in the picture are officials of the U. S. Department of Agriculture. Miss Kaiser is the first girl who has ever represented this country in international competition in livestock judging.

The Editors Talk

WE all know the life insurance agent. Soon there will be crop insurance agents, at least in Great Britain, if the hopes of Sir John Russell and his colleagues come true. This crop insurance is based on the use of fertilizer.

Briefly it has been found that the proper fertilizers stabilize yields. In other

CROP INSURANCE words, the fertilizer acts as a buffer between the crop and the season, straightening things out and making for constancy of yield. As shown by Sir John

for constancy of yield. As shown by Sir John Russell the yields of potatoes for four years on inadequately fertilized land varied considerably. The range in yield for this period, under the same fertilizer treatment, was 80 per cent. But on properly fertilized land the

yields for the same four years varied only 18 per cent.

Using certain basic figures for the weather conditions over a long period of years and figures for the yields of crops under certain fertilizer treatment, it is hoped to put the results of such correlations into the form of "tables of expectancy of crop yield," in the belief that an insurance business might develop in which farmers who use the right form of fertilizing could insure

their returns at a reasonable premium.

Certinly this is a long step towards taking much of the guess out of farming. It is made possible by long years of work along the same line. It shows that to accomplish anything, especially in agriculture, a great deal of patience and steady well planned work is required as a preliminary undertaking. Profitable short cuts are rare. The house falls down and has to be built all over again. If the guess can be taken out of the fertilization of crops, why not an effort to take some of the guess out of agricultural business that deals with the farmer and his products?

This is a big field, it offers big possibilities; much more work should be done

than is being done.

WELL, it's July. A multitude of boys have finished their four years at agricultural colleges. Each has a degree, and doubtless many of this multitude are wondering just what they are going to do now that they have got it.

To make the most of a scientific agricultural education in these days it takes a great deal more thought than it did years ago. In the

GRADUATES past a limited number of fields were open to the college graduate, his choices were limited. Either he could work on a farm or work for an experiment station, and circumstances usually very

on a farm or work for an experiment station, and circumstances usually very

quickly decided which was the job he would do.

But conditions have changed. The situation is much more complex. The range of jobs is much wider. The student must enlarge his horizon and consider a broader field. Agricultural business in many phases is drawing large numbers of men. Business is becoming receptive to the college-trained man. This is shown in a striking manner in an address of the president of the National Fertilizer Association, Spencer L. Carter, who points out that to obtain good men in the industry men who have had either a good school or college education should be selected. It is not difficult to get such men at present in view of the existing school situation throughout the country.

Mr. Carter goes on to point out that such men properly trained in the office and factory would help to stabilize business, to conduct it on a higher plane, and render better service to the buyer as well as the fertilizer industry.

But will the graduates of our colleges see the opportunity or will they disdain it because it is connected with business? Before the college trained man can render the highest service to agriculture, we need to get rid of a great deal of loose thinking regarding money and business. The college graduate often needs to develop the attitude that business is an important part of the world's work; that good business well done is as high a service to the agriculture of our country as any other form of work. Many graduates will see this and capitalize, for the good of themselves and agriculture, the opportunities that are fast increasing. We wish them every success.

VERY business man knows that if he is to make a success of his business

he must make known the merits of his goods.

Advertising is not anything new. It has been done since man began to produce in excess of his needs. As civilization has advanced with the ever increasing demand for products of the farm and fac-ADVERTISING tory; as competition has become a factor in world

has become imperative.

In big business today, advertising is the fifth wheel of the organization.

commerce, the need for better means of advertising

Large sums are annually spent in conducting this work.

American advertising agencies stand out prominently as leaders in this field. Other countries are looking to us for guidance in the establishment of sound, profit-making practices in advertising to help in the solution of their economic

Everywhere we confront the "Buy From Us" argument. In newspapers, magazines, posterboards, printed matter, window displays, electric signs, novelties, motion pictures, radio, and in public conveyances, we are asked to buy

and try.

That advertising pays is evidenced by the increase in budgets for this purpose over a period of years. Even bankers have changed their attitude of opposition which at one time prevailed. Today many bankers strongly recommend advertising for their clients. Cases are known where bankers acting as receivers increased advertising and thereby quickly emerged from receivership.

What will help big business should likewise help in farming. Farmers as inviduals or as associations have successfully employed advertising. As a national

practice, however, farmers have not adopted it.

Until the American farmer, representing billions of wealth, accepts advertising in the same light as the business man, we shall hear of the down-trodden, discouraged, bankrupt farmer.

Farm relief measures, whatever be their object, cannot overcome the ills of agriculture. We must go deep into the bed rock and build a solid foundation,

based on fundamental facts.

That there is a problem requiring solution cannot be denied. Neither can we deny that a bankrupt agriculture will not ultimately affect other lines of busi-To think that agriculture so essential to our national prosperity can remain on a financial basis below that of other industries without affecting them would be absurd. Farmers must be recompensed equably with other lines of

What is defeat? Wendell Phillips says, "Nothing but education; nothing but

the first step to something better." Phillips is right.

Farm relief legislation was defeated—but possibly it was best that it was so declared. The important fact remains however-the farmer is not defeatedhe has but made another step towards something better.

Education, well balanced, coupled with judicious advertising is a team with which the American farmer will solve his own economic problems, and we heartily recommend that all agencies, law-makers, politicians, bankers and farmers work with this in mind.

THE first International Congress of Soil Science is over. Most of the countries of the world sent some of their people who had studied the soil of their own country. They gathered in Washington and met together in six different groups to study soil mechanics and physics, soil chemistry, soil biology,

soil fertility, and soil classification and mapping. The sixth group studied the application of soil science to

CONGRESS OF land cultivation.

INTERNATIONAL

SOIL SCIENCE The largest delegations came from Russia and Germany. England was represented by members of the

staff of the Rothamsted Station. The state agricultural experiment stations and the United States Department of Agriculure were well represented.

Research on soils now has reached the point where the number of questions involved demands that such a congress be held as a clearing-house for ideas and for defining methods and technique. The soil is one of the commonest things we know in every-day life and yet it is the source of some of the most baffling problems known to the scientist. The first great problem is to classify the soils of the world to know exactly what are the resources for the world as a whole measured in terms of crop production. Therefore, much interest was shown in the systems of soil mapping adopted in different countries.

The leaders who organized the Congress are to be congratulated and the business organization which made possible the meetings and transcontinental

excursion deserve sincere appreciation for their generosity.

It is hoped that the example of this first International Congress of Soil Science will lead to further international meetings that will help to find the solution for many of the problems now confronting us. In the last analysis business prosperity depends on a sound and prosperous agricultural condition. The basis of all prosperity is a fertile soil.

The business man can well afford to support the soil scientist.

ON every side, wherever we go, whatever our business, the password is ORGANIZATION.

Let's see if we know the meaning of this word. Many people believe an organization to be a necessary medium for pooling local social interests, as the

"Needle and Cotton Club," the "Shanghai Sheikers" or possibly the "Riders of the Headless Horse." The average person of intelligence regards organization as a

means of securing prestige in the trade, social, fraternal, or business world. Webster defines organization as "any vitally or systematically organic whole."

Regardless of personal opinions, it is fundamentally sound to say that any organization to be worthy of recognition must be vital to the needs of its constituents, and it must be systematically conducted.

Organizations there are, good or necessary, bad or unnecessary. There seems to be a preponderance of the latter. Good organizations based on a vital need and systematically run for the best interests of all are surprisingly few in number.

Comparing man to other forms of animal life, it appears that man has lost in the race for efficiency.

Take the ant, or the honey-bee, for instance—with either, there exists, we are told, the most highly organized unit in existence. There are department specialists, workers, runners, and all these thoroughly informed as to their duties—all working in perfect harmony.

Truly a more careful study of the efficiency of nature would work wonders

in the realm of man's self-made organizations.

Surely the superior being-Man-will not be content to be less efficient than the ant.

If we are to prosper and be happy in our social, community, state, national, and international relations—to say nothing of our business relations—then let's have Better Organization at every turn.

WHAT is to be the big plank on which hopeful politicians will rest their weight in the next elections, we do not attempt to say. We do feel, however, that the man who does not have one foot squarely on local tax reduction is not going to have the same chance to enjoy his election-return dinner as the man who faces the situation firmly and sincerely.

"FRENZIED STATE SPENDERS"

A great many editorials have appeared within the last few months. People throughout the country are waking up to the fact that economy begins at home.

In our desire to keep the problem alive and before our readers, we quote a good editorial which appeared in a recent issue of the New York Herald:

"The country is looking ahead eagerly to another reduction next winter of Federal taxes. Unfortunately there is no prospect of a similar reduction in state taxes.

"The Federal Department of Commerce has just issued an abstract of state expenditures and receipts for the calendar year ended December 31, 1926, or for the latest fiscal year ending prior thereto—in most cases, June 30, 1926. This shows that the forty-eight states spent \$1,614,537,954. In 1917 they spent only \$517,503,220. There has been an increase of more than 200 per cent in nine years. The total for 1925 was practically the same as that for 1926. But in 1925 \$51,000,000 more was paid out for state soldiers' bonuses—an exceptional obligation. There was an increase of \$51,000,000 in 1926 for other purposes.

"In this period of flush prosperity the states should seize the opportunity to reduce debts and lower taxation, as the Federal government has done. Most of them have not done so. Receipts in 1926 were \$1,655,494,919. The total per capita collection was \$14.29. In 1925 it was \$13.19, and in 1917, \$5.14. Receipts exceeded expenditures, and not since 1919 have the states as a whole had a surplus over all government costs, including capital outlays for permanent improvements. But excess revenue has not been generally applied in the constructive Federal manner to make sweeping cuts in taxation and debt.

"Twenty-three states reduced their debts. The other twenty-five did not. The total funded and fixed debt, less sinking fund assets, mounted by \$78,713,000. It is now \$11.46 per capita, as compared with \$11.09 in 1925 and \$4.39 in 1917. Since the war the states have developed a spending mania. The splendid results of the Federal policy of retrenchment have been offset to the average citizen by the extravagances of state and local governments. One hand wastes what the other hand saves. It is a psychological and pathological problem. What can be done to restrain the enthusiastic spenders in the state capitals, who are rendering futile the relief resulting from a policy of sound and aggressive economy at Washington?"

Scientific agriculturists and extension workers can advise our farmers how to increase crops yields and how to market to advantage. They even go into rural life and work for happier homes and living conditions in the country. Let's not forget to show the farmer how to save money by sending careful spenders to represent him in his local and state governments.



By P. M. FARMER

Good From the Flood

If anything good comes out of the disastrous Mississippi flood, it will probably be the greater appreciation of the extent to which soil erosion is damaging our fundamental national resources and endangering the lives and property of large portions of the population. In recent years scientists in the Department of Agriculture and at some of the State experiment stations have been giving increased attention to this problem. At the recent International Congress of Soil Scientists, Dr. A. F. Woods, Director of Scientific Work of the Department of Agriculture said that erosion has as much to do with the constantly increasing floods as all other factors combined. This problem of controlling erosion of both the slow and rapid types, he said, is the most vital soil problem we have and the one on which we are doing the least work.

Darkness Suits Calves

Sunlight is generally thought to be beneficial to most animals and it has been proved to be of value to many, including human babies. scientists at the Minnesota Experiment Station-T. W. Gullickson and C. H. Eckles-have found that calves did just as well in continued darkness as in light and in fact some of them did better in the darkness than those that were brought up under normal For their experiments conditions. they used four grade Holstein heifer calves and kept two of them in complete darkness, but gave them stalls large enough for plenty of exercise, and let them out in a paddock in the darkest part of the night. At the end of six months there was no difference between the calves that were in the dark, and the two that were allowed to run in the sunlight, all of them having received the same food and care otherwise. They kept these calves under the same conditions until they were about two years old and all the animals grew normally and made good gains, the two calves of the dark doing a little better than the rest.

Self-Feeding Not for Dairy Cow

Self-feeding has become a great factor in fattening cattle and hogs, but Dr. W. B. Nevins of the Illinois College of Agriculture finds that it doesn't work with dairy cows. He says they run up the feed cost and give no more milk. Since the eight cows used were only moderately good milkers, the investigator thinks it possible self-feeding might pay with very high producers. But the point has not been proved.

In carrying on this experiment the cows were kept in individual box stalls, each stall containing a selffeeder with several compartments. The compartments contained grains, milled by-products, hay, and corn silage. Although these cows could eat all they wanted they did not get sick through overeating as cows are supposed to do. They did eat more feed than necessary and put on additional weight. Perhaps, if they had not been accustomed gradually to this new system, they might have injured themselves as cows frequently do when through accident they are able to get all the feed they can eat. Some cows had decided preferences for certain feeds and would eat largely of them for long periods. No two cows seemed to have the same preferences for all feeds.

Late-cut Alfalfa Not Damaged

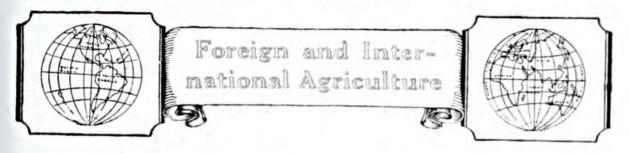
Tests made at a number of experistations including Kansas, Michigan, and Wisconsin, have shown that cutting alfalfa in full bloom, that is about 10 days later than the crop is often cut, gives a little greater yield, saves one cutting and one raking, and sometimes eliminates interterence with other farm work. has also been found in some cases to reduce weed and grass growth. Some agronomists say that injury results sometimes from cutting too soon or too often but not often from failure to cut the crop even for an entire season.

Good Manager-More Money

It is a commonplace that fields on opposite sides of the fence often vary a great deal in productivity and that farms are not all alike even though the soil may have been the same. But it is not so often that we have these differences brought out so exactly and strikingly as was done recently by economists at Ohio State University. They examined the records from 400 Ohio farms. Twelve of these records were those kept by farmers of Henry county in cooperation with the county extension agent and the university. Last year the average labor income of the 12 farms was \$1,861. But the income ranged from \$794 to \$3,368, above expenses and 4 per cent interest on the investment. The conditions were similar on all 12 farms which averaged 148 acres and a capital investment of \$24,728 each. The 5 farms with highest income had about the same acreage as the 5 low farms but the 5 at the top had 87 per cent of the land in crops compared to 73 per cent on the low farms. Cash receipts were \$400 higher on the 5 top farms and the labor income was \$1,000 higher. On the high farms oats averaged 11 bushels higher per acre, wheat nearly 6 bushels higher, and hay a quarter of a pound more. The 5 most profitable farms handled 14 crop acres more per man than the low group. On the high farms the return per dollar's worth of feed fed to livestock was \$2.16 while on the low farms it was only \$1.72. The difference of 44 cents in the return on feed fed on the high farms made a difference of \$500 in the earnings. Summing up the factors that make for the higher income, the economist mentions better crop yields, larger acreage of better paying crops, higher return from feed fed to livestock, and possibly better time and method of marketing. The result is the profit of \$25.10 per acre instead of \$16.90 which were the average returns on the two groups of farms.

Roadside Returns

From now on during the summer and fall is the season of big business for roadside markets. Dr. U. P. Hedrick of the New York State Agricultural Experiment Station has called attention to some of the factors in the success of this method of market-He says that these roadside stands should be a source of steady income to fruit growers but that the low overhead will not automatically bring profits unless attention is given to such details as attractiveness of the stand and unfailing courtesy to the In addition to eliminating the middleman, this method, says the New York horticulturist, has the advantage that all sales are for cash. He also brings out that it is possible to dispose of a much greater variety of products than is possible when shipments are made to distant markets. He recommends that fruit growers produce a much greater variety for this sort of trade and not only more varieties of certain kinds but more kinds.



The Potash Industry

A discussion of recent developments by the Manager of the Scientific Research Department of the German Potash Syndicate, during his recent visit to this country.

By Prof. Dr. Oskar Eckstein

OTASH salts are not simply products of the mines but manufactured products which have undergone a series of processes of purification before they are obtained in a marketable form. The cost of potash salts is dependent not only on the cost of mining but on the cost of labor and material needed in manufacturing. Hence the cost of potash would have been bound to rise proportionately and parallelly with the rise of the cost of other manufactured products, if it had not been possible to counteract this rising tendency by a very fargoing process of rationalization in mining, manufacture, and marketing.

This process of rationalization, which started many years ago with a systematic concentration of potash production to those mines which could be most economically worked and with discontinuing exploitation of potash deposits in Europe showing less favorable possibilities for economic working, has been extended to every other step in the manufacture and distribution of potash.

One such step was the application of the last results of physical and chemical research to the manufacturing process of the potash salts which have brought these processes to an economic and scientific perfection perhaps unequalled in any other branch of chemical manufacture.

The handling of potash salts has been rationalized and thus made cheaper by the erection of very extensive warehouses and terminals for potash in European harbors, particularly in Hamburg, Antwerp, and Bremen which made possible the equalization of production of potash at the mines throughout the year and the taking advantage of every facility for transportation. Thus, seasonal fluctuations in demand for potash have ceased to be as important a factor in the price fixation of potash as they used to be and the bulk of some ten millions of tons of potash salts handled annually is moved with greater facility and regularity.

NOTHER step in the rationalization of the potash industry has been encouraging the consumer in Europe to use those grades of potash fertilizer which are less fit for exportation, and reserving for export a larger proportion of high grade potash salts, the price of which is not increased as much per unit K₂O through the cost of transportation.

But all these measures would have been insufficient to enable the Ger-

man and French manufacturers to keep potash at as low a price level as exists today-a level which is not above the pre-war price-if these methods of technical rationalization had not been supplemented by a rationalization in the methods of marketing and publicity.

Up to less than half a year ago, a vast duplication in costly effort was made in potash industry through separate marketing of the products of the German and French mines. pensive separate organizations were kept up by the two industries in the United States as well as in all other countries to which potash was exported. That such a method of marketing was wasteful and would have meant in the end increased prices to every consumer is evident. Long ago this fact was patent to both the German and French manufacturers, but it took years of patient negotiationwhich sometimes were particularly difficult owing to the fact that Germany and France had just emerged from one of the most bitter conflicts in history—before a working basis of agreement was brought about which made possible the creation of common selling organizations for German and French potash in different parts of the world.

HIS agreement is the logical outcome of the tendency towards rationalization of industries which in Europe is dictated by sheer necessity because industries could not afford any longer to keep up separate organizations for selling and marketing whenever there existed a possibility of more economic system of common handling. Incidentally, the German-French Potash agreement, having been concluded between nations which were the bitterest enemies in the World War, signifies a step forward towards world peace, a step which certainly will be welcomed by everybody who believes that continuation of strife between European nations is disastrous for the

progress of civilization of the white race.

The agreement between the German and French potash industries rests on a firm basis and it will work out for the benefit of consumers and producers alike.

As far as the United States are concerned, one of the most important features in the European German-French agreement has been the substitution of a greater common agricultural and scientific bureau for potash, for the separate bureaus for German and French potash existing here-The new bureau will have the task to help spread, in cooperation with the agricultural stations of the United States Government, the State universities and county agents, knowledge of the right use of balanced fertilizers. One of its tasks will be systematic investigation of the pathological symptoms of potash starvation in agricultural crops.

This work will be undertaken on a far larger scale than was the case heretofore and will be directed by the scientific directors of the two former potash organizations. The counts upon the friendly and active cooperation of the fertilizer industry with which it has a common interest, to supplant all haphazard use of varying quantities and formulas of fertilizers with fertilization based on actual crops needs as ascertained by

scientific methods.

Frozen Potash

MANY analyses show that the supply of potash in the soil is ample, but analyses do not tell the whole story. Let us remember that during the last few years some banks closed their doors because of "frozen assets." Potash in the soil may be frozen just as tight; that is, the chemist may find it there, but it is not available for the use of crops.-The California Cultivator.

PIMA, the Prodigal

By L. R. ENDER

U. S. Department of Agriculture

NTERNATIONAL exchange of valuable varieties of plants is now active in every part of the world. It would be a remarkable result of this exchange if Pima cotton, developed by the United States Department of Agriculture in Arizona from an introduction of seed of Egyptian cotton from the land of the Nile, should eventually become an important agricultural product in the home of its ancestors.

Seasonal conditions in 1926 were very favorable for Pima cotton in Arizona. The average yield of 329 pounds of lint per acre was the highest recorded in the 10 years of commercial production, the next highest yield having been 303 pounds, in 1923. There were 24,500 acres planted in 1926, which was about 35 per cent less than that in the preceding year, when 38,000 acres were grown. But, owing to the much higher yield per acre in 1926, the total production of 16,133 bales was only 17 per cent less than in 1925 when 19,471 bales were produced. The 1926 crop of Pima was marketed at an average price of 31 cents per pound, f.o.b. Phoenix, which was considerably more than double the average price of Upland. This fact, together with the excellent vields obtained, has revived the interest of Arizona cotton growers in this variety.

The Pima variety belongs to the Egyptian type. It was developed by selection of a superior individual plant found in a fleld of the Yuma variety, which itself had resulted from selection in a stock originally introduced by the United States Department of Agriculture from Egypt.

Several years ago the Royal Society of Agriculture of Egypt obtained Pima seed from Arizona, and from this stock Dr. Victor M. Mosseri, technical adviser of the society, has developed, by selection, a strain to which he has given the name Maarad. In a paper read before the Congress of the International Federation of Master Cotton Spinners and Manufacturers at Cairo last January, Doctor Mosseri described the results obtained with Maarad cotton in comparison with Sakel, which is the most valuable of the varieties now grown in Egypt and is the most important, commercially, of the extra-long-staple cottons of the world.

THE following statements are translated from the French of Doctor Mosseri's paper:

"The new Maarad cotton has so far given, in the field, a yield appreciably higher than that of Sakel, except in 1924 when the conditions were unfavorable for it, and when, nevertheless, its yield was equal to that of Sakel. In 1921, 1922, and 1923 it produced from 20 to 40 per cent more per acre than Sakel, and, moreover, had the advantage over the latter of giving a higher lint percentage, of being several days earlier in maturing, and being appreciably less wasty. . . . As to the commercial value, it may be said that America and France regard this new cotton as equal, if not superior, to Sakel. In England, although opinions do not agree on all points, the spinners consulted have declared themselves ready to adopt it, provided that the price is not higher than that of Sakel. The higher yield in the field and at the gin will make it possible to satisfy this condition. The Royal Society of Agriculture proposes, furthermore, now that Maarad is sufficiently well known to take the necessary measures for propagating pure lines with continuous renewal of the seed."

A somewhat similar recognition of Pima cotton was published in April by Dr. L. Trabut, of Algeria. Part of his report is translated as follows:

"In the domain of l'Habra the Botanical Service has pursued since 1896 the experimental culture of Egyptian cottons. In 1916 this Service re-

ceived from Mr. Kearney, of the Department of Agriculture at Washington, his first selections in the Mit Afifi of Egypt cultivated in Arizona. Two varieties sent have become the Yuma and the Pima. From the outset these cottons showed themselves superior to the mixture derived from the first introductions from Egypt. In Algeria, also, Pima has become acclimatized since 1916 and has given, as in Egypt, well adapted forms. will, however, keep for them the name Pima, followed by a number indicating the particular selection. At present, Pima 1423 would seem to have as much merit for Algeria as Maarad for

A Floating Fertilizer Factory

DEVELOPMENT of an innovation in fishing equipment in the shape of a vessel which manufactures fish products at sea, is described by Lewis Redcliffe, Deputy Commissioner of Fisheries in the U. S. Department of Commerce, in *The Science News Letter*, issue of March 26, 1927. One of the purposes of the factory is the conversion of fish and fish waste into fertilizer. An extract from Mr. Redcliffe's article follows:

"The most novel development in floating fish factories is that of the 'Calgary,' a French vessel of over This vessel is being pro-2,600 tons. vided with powerful refrigeration equipment and three large cold storage compartments with a capacity of 800 There are six retorts on tons of fish. board. One will be used for cooking lobsters and crayfish; another for making gelatin; two, capable of handling 40 tons of fish and fish waste per 24 hours for conversion into oil and fertilizer; and two others with a capacity of five tons each for the steam extraction of oil from the livers of sharks and rays. There are two oil storage tanks, one of 26,000 gallon

capacity for storing fish oil and one of nearly 400 gallons for liver oil. Although it is proposed to operate the vessel off the west coast of Africa it has been suggested that the vessel may visit Iceland, Greenland, and even North Atlantic fishing banks adjacent to our own coasts."

Beaver Appetite

HE beaver has long been known for his strong teeth and his engineering feats but little was known regarding his capacity for food. cently a town in the Northwest hired a man to haul green aspen to the lake in front of the post-office where the city kept two to five of these animals. During the fall these beavers carried 800 pounds of wood into the lake in a single night. It was found that 2,000 pounds of green aspen was about right to supply the year's diet for one beaver, but this is thought to be more than he would eat if he were living in the wilds and had to go and get it.



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

The Oregon Agricultural Experiment Station, in its circular 78, "Commercial Fertilizers," has published in thoroughly understandable form information for the chase of soil fertility builders. pamphlet which is well written by R. H. Robinson is primarily advice to farmers on such matters as the Oregon fertilizer control law, trade terms, the manner in which plant foods are combined in commercial fertilizers, high grade fertilizers, and the commercial value of the various brands produced by manufacturers.

"Effect of Certain Nutrient Conditions on Activity of Oxidase and Catalase," Agricultural Experiment Station, East Lansing, Mich., Tech. Bul. 78, May 1927, Boyce D. Ezell and John W. Crist.

"Fertilizer Statistics for Texas," Agricultural Experiment Station, College Station, Texas, Bul. 350, Apr. 1927, G. S. Fraps.

Crops

In addition to the fertilizer bulletins mentioned in the section above, more interesting information on the use of commercial fertilizers is found in Press Bul. 396 of the Florida Experiment Station on blackberries and dewberries. The author of this bulletin, Harold Mowry, states that while "no comprehensive fertilizer experiments have been carried out under Florida conditions for blackberries and dewberries, commercial fertilizers of widely varying formulae are being used. One analyzing 4 or 5 per cent ammonia, 6 to 8 per cent phosphoric acid, and 5 to 8 per cent potash, with ammonia and phosphoric acid content

derived from both organic and inorganic sources applied in early spring at the rate of 500 to 1,000 pounds per acre should give satisfactory results."

New England is especially interested in improving its hay and pasture crops.

The Thirty-ninth Annual Report of the Director Burt L. Hartwell of the Rhode Island Agricultural Experiment Station includes an excellent discussion on the efficiency of fertilizers and Among the results which manures. will undoubtedly be incorporated upon many farms are those from the topdressing experiments. The fertilizer top-dressing which was most economical was equivalent to a half ton of a 4-6-8 ratio and reduction in the amount of any of the three ingredients resulted in a decreased yield. A reduction of potash also seriously decreased the proportion of clover.

Other crop bulletins of the month include:

"Essentials to Successful Fruit Culture in

Arizona," Agr. Exp. Sta., Tucson, Ariz., Bul. 117, Nov. 1, 1926, F. J. Crider.
"Pruning decidnous Fruit Trees in the Southwest," Agr. Exp. Sta., Tucson, Ariz., Bul. 118, Dec. 1, 1926, F. J. Crider.

"Propagation of Date Palms from Off-shoots," Agr. Exp. Sta., Tucson, Ariz., Bul. 119, Dec., 15, 1926, D. W. Albert.

"Apple Growing in California," Agr. Esh. Sta., Berkeley, Cal., Bul. 425, May 1927. F. W Allen.

"Asparagus as a Truck Crop in Florida." Agr. Exp. Sta., Gainesville, Fla., Press Bul. 397, May 1927, M. R. Ensign.

"Ten Year Program," Ext. Ser., Amberst, Mass., Ext. Leaflet 114, May 1927, R. A. Vanmeter.

"Field Experiments with Seed Corn Treatments and Crop Stimulants," Exp. Sta., Lincoln, Neb., Bul. 218, May 1927, T. A. Kiesselbach.

"Pasture Studies," Agr. Exp. Sta., Ithaca,

N. Y. Memoir 104, Nov. 1926, R. G. Wig-

"Twelfth Annual Report," Agr. Ext. Ser.,

Raleigh, N. C.

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Obio, Vol. XII, No. 3, May-June 1927, Whole No. 126.

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American Potato Journal, Washington, D. C., Vol. IV, No. 5, May 1927.

"Farm and Factory must Prosper To-gether," Col. of Agr., Madison, Wis., Cir. 211, Mch. 1927, K. L. Hatch and H. L. Rus-

"Pastures for Pigs," Col. of Agr., Madison, Wis., Cir. 213, Apr. 1927, F. B. Morrison, J. M. Fargo, and H. J. Brant.

Economics

"Farm Taxes and Assessments in Massachusetts," Bul. 235 of the Massachusetts Experiment Station treats well this ever important worry of the The bulletin concerns itself farmer. primarily with the question of an equable distribution of the tax burden.

"Cost of Producing Almonds in California," Agr. Exp. Sta., Berkeley, Cal., Bul. 422, Apr.

1927, R. L. Adams.

"Virginia Farm Statistics 1926," Div. of Agr. Statistics, Virginia Dept. of Agr., Richmond, Va., Bul. 4, Apr. 1927, Henry M. Taylor.

Diseases

"Grapes," Mass. Agricultural College, Amberst, Mass., Ext. Leaflet 100A, Rev. Apr. 1927, Brooks D. Drain and O. C. Roberts. "Peaches," 100B,

"Sour Cherries," 100C,

"Apples," 100D, "Plums," 100E, "Pears," 100F.

"Classification of Plant Viruses," Agr. Exp. Sta., Madison, Wis., Res. Bul. 76, Feb. 1927,

James Johnson.

"Effect of Spraying with Fungicides on the Keeping Quality of Florida Citrus Fruits," U. S. D. A., Washington, D. C., Dept. Cir. 409, Apr. 1927, Harry R. Fulton and John I. Bowman.

Insects

"The Pine Tipmoth in the Nebraska National Forest," Agr. Exp. Sta., Lincoln, Neb., Res. Bul. 40, Apr. 1927, M. H. Swenk.

Early to table and late to arise makes a man "hefty" and hastens demise.-Farm Club News.

Yancey Swanson

(From Page 23)

came back on May 28 with no plants.

"Dad suggested that I plant the land in cotton but we all agreed that there was a mighty slim chance for a crop. I planted cotton in early June on poor, white sandy land. It grew a little over knee high but it was surely loaded down. I got two bales at one picking, and I made about three bales in all from the two acres."

"Wait a minute," I said, "surely you didn't use 300 pounds of muriate of potash on one acre of cotton. That gave you about 17 per cent potash in the mixture, besides the potash in the

cottonseed meal."

"I never had stopped to figure it all out," Harry replied. "I know I used a lot of potash and I made a lot of cotton, where I didn't expect to make more than one-third of a crop."

Idaho

(From Page 26)

seed laboratories. Seed establishments located in approximately 27 counties are visited by inspectors each spring for the purpose of checking seed lots held for sale.

All dealers and farmers selling clover and alfalfa seed for seeding purposes are required to have the seeds graded to meet the Idaho seed law requirements. The State has an enviable reputation as a producer of good seed, and the seed laboratories maintained by the experiment station have widely recognized records for accuracy of analyses and for helpful service to seed growers and to the seed trade.

That the experiment station has proven its worth is shown in a constantly growing indication of greater dependence upon both the experiment station and the extension service and a more widespread appreciation of the economic importance of the statewide work of these two publicly supported educational agencies.

CORN SUCKERING

Removing suckers reduces food manufacturing capacity of the plant

N a great many of the corn yield contests some of the contestants have followed the plan of suckering the corn in the hope that they might thereby increase the yield. Even in the production of sweet corn it is a quite common practice, especially where the fields are rather small. County agents, Smith-Hughes instructors, and extension field men know that there is a common opinion that suckering the corn increases the yield,

produces more uniformly large ears, and hastens maturity.

Will suckering corn bring about any of these results? And if it does, will it pay? Evidently there still must be some difference of opinion for the practice still exists.

It was during the early part of the summer of 1926 that I observed a very fine field of Golden Bantam sweet corn, the property of Geo. W. Hughes of Cedar Falls, Iowa, that had been carefully suckered after the suckers made their appearance. I determined to watch the result. Those who live in the corn belt states will recall that we had a hot, dry summer. What happened? When the corn was well in tassel and about the time that the ears were beginning to shoot, it was noticed that the lower leaves of some

 B_{γ} A. A. BURGER Cedar Falls, Iowa



Chas. P. Bley standing in acre of contest corn yielding 86 bushels. Suckering here, induced firing and reduced the yield

of the stalks were beginning to fire, or dry up. Soon thereafter the forming ears ceased growth.

I asked Mr. Hughes what he thought about the practice, and he replied that he had a second field of corn, about the same size as the first, from which he did not remove the suckers. "While from the suckered patch I secured nothing," he said, "from the sec-ond I sold \$125 worth of corn."

In the acre corn vield contest that was conducted in

Black Hawk county, Iowa, in 1914, and in which there were 571 separate acre entries, some of the suckered fields produced disappointing results. One of the outstanding fields of corn in the contest, that of Chas. P. Blevcorn that stood over 12 feet high with a perfect stand of three per hill,-produced but 86 bushels per acre. It fired after the suckers were removed.

THE same result was produced on an acre entry of A. G. Larson. The acre of carefully treated suckered corn was abandoned to an adjoining acre not suckered and which produced a higher yield. This land had been treated in the spring with an application of acid phosphate and potash. The yield of the unsuckered acre was 94.7 bushels air dry corn on the acre basis. Little was known, at that time, of the effect of removing suckers, but it was apparent that the fertilizer had produced some very appreciable results,—enough, at least, so that this acre was ranking second and bidding hard for first honors in the largest acre yield contest ever conducted in any county prior to that time, and possibly since.

But such isolated, incomplete tests as these are not sufficient on which to base reliable conclusions as to the

result of suckering.

In 1922 the Nassau County, New York, Farm Bureau made five cooperative tests with sweet corn, — Long Island Beauty and Kromer's Special White—four of which showed in favor of suckering and the fifth against. All were made the same year and were run in duplicate only. These results, therefore, are not clearly significant.

The same year Hepler gave the results of an experiment at the New Hampshire station with two varieties, Early Crosby and Golden Bantam, four rows of each variety, 250 feet long. With Early Crosby the unsuckered rows produced 5.8 per cent larger yield but the suckered rows averaged one-third of an ounce heavier yield. Suckering with Golden Bantam increased the yield of 2.6 per cent but made no difference in the size of the ears.

DeBaum (1916) reported the result of three cooperative tests in Bergen county, New Jersey, conducted in 1915, in which 10 rows of 10 hills each were selected. Duplicate tests Average yields of dry were made. corn per row were as follows: (1) check, not suckered, 17.1 pounds; (2) suckered when plants were one foot high, 14.2 pounds; (3) same as (2) with second suckering later, 13.5 pounds; (4) suckered when plants were two feet high, 13.8 pounds; and (5) suckered when tassels began to show, 12.4 pounds.

Commenting on these results he

said: "During favorable growing seasons the yield of sweet corn is reduced in proportion to the lateness of suckering. Corn not suckered gives the heaviest yield. Sweet corn suckered early in its growth will be ready for market two to four days earlier than that suckered late or not at all."

But what will be the effect on field corn? The results here are much more conclusive. Montgomery (1916) summarized the results obtained with field corn in experiments conducted at the Nebraska Station covering a period of five years. In every case the yield was reduced by removing the suckers, (tillers).

Lyon (1905-23) reported two years' results of removing suckers from field corn in the same State which also showed a marked decrease in the yield due to suckering. The yields were 64 bushels against 81 bushels, a difference of 17 bushels, or more than 25 per cent, in favor of the unsuckered corn.

Ricks (1915) gave the results of experiments carried on with field corn in Mississippi for two years. Corn suckered when four feet high aver-

aged 34 bushels per acre; and when six feet high, 33 bushels; unsuckered corn averaged 39.2 bushels per acre.

But the most complete results which have been reported were those published in 1926 by H. C. Thompson of Ithaca, New York, with Stowell's Evergreen and Golden Bantam sweet corn covering a period of five years' work. The soil was of moderate fertility. Rye was plowed under and manure added at the rate of 15 tons per acre—both treatments each year with the exception of the first. Fertilizer applications consisted of 800 pounds of approximately a 2-8-4 in 1920 and 1921, and a 4-8-4 mixture in the other years, broadcast in the spring after the land was plowed. The mixture consisted of nitrate of soda, tankage, acid phos-

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Soybeans

• There's more valuable information on the legume discussed last month

By G. P. WALKER

Soil Specialist, Purdue University

OYBEANS, a comparatively new crop in the Middle West, have assumed a definite and important place in the agriculture of this region. Heralded by enthusiasts as the logical crop to supplant oats in corn belt rotations and lauded by livestock men as a valuable home grown protein supplement, this crop has enjoyed a healthy growth in popularity in spite of two rather serious handicaps, namely the labor competition with corn and the difficulty of getting the seed crop threshed in communities where it is not yet widely grown.

The acreage in Indiana, which may be taken as typical of the corn belt states, has increased from less than 5,000 in 1920 to over 350,000 in 1926. This includes both the hay and grain acreage. According to county agent reports an additional 100,000 acres were grown in corn during the past year.

A few years ago the idea was rather general that the oil mill would soon be receiving the bulk of the soybean crop and high oil content was considered an important item. Very few mills are in operation at the present time simply because they cannot get

enough beans to operate at the price they can afford to pay. Out of the 200,000 acres grown in Indiana for seed but a few hundred bushels actually go to the mills.

OUTSIDE of the seed requirements for producing new seed the great bulk of the grain crop is fed to livestock directly, seeded to produce legume hay, and planted with corn for pasturing off or as a soil improvement crop. The discovery of the value of cheap minerals in supplementing soybean rations

has been a great boon to the hog man and has greatly increased the use of

beans for this purpose.

However, this method of feeding is not fool proof and threats of dire consequences to regions producing too much soft pork are being heard. Soft pork is the oily flabby type produced by rations too rich in beans of high oil content. The livestock men are now wanting low oil, high protein beans for direct feeding to hogs and other livestock.

Perhaps too much has been expected of the soybean from the fertility standpoint because it is a legume. Complaints of low yields of other crops following beans are rather frequent. A typical case is the experience of one farmer in the prairie section of Illinois. Soybeans for three consecutive years on one field of this fertile prairie soil produced yields of 19, 24, and 30 bushels respectively. He sold them at an average price of two dollars per bushel or a total average return per acre of \$50 for each crop. The next year he put this field in corn. Imagine his disappointment in husking a very poor crop of 30 bushels per acre-by far the worst corn on the place. Now he has no use for soybeans.

The three soybean crops took from the soil about 75 pounds of available phosphoric acid and 150 pounds of potash per acre-more than twice as much potash and almost one-fourth more phosphoric acid than three 50bushel crops of ear corn would have taken. Soybeans and corn are both rather shallow rooted crops and compete with each other for the available mineral plant food in the surface soil. Only a limited amount of the minerals become soluble so plants can use them each year, and when this supply gets too low, as the result of heavy feeding grain crops for several years in succession, the crops following are bound to suffer.

This man would not have been disappointed with a poor fourth corn crop if he had planted corn on that same field for four straight years; in fact, he would have expected it. Had it averaged 50 bushels per acre the corn would have given a yearly return of about \$25, just about one-half the returns realized from the soybeans.

Five dollars worth of a phosphate and potash fertilizer and the return to the land of the soybean straw would have put back into the soil a large share of the available mineral plant food removed and left it in far better condition for succeeding crops. In field experiments at the Indiana Experiment Station, wheat after soybeans has averaged for 10 years seven bushels more per acre than wheat after corn with similar fertilization.

Disease Control

HE effect of potash in increasing the disease resistance of potatoes is strikingly illustrated by figures obtained last year at the Kirton agricultural institute's experimental farm in England. In one series of plots the percentage of healthy plants rose from 42.7 where no potash was applied, to 51.1 where two hundredweights per acre of sulfate of potash were used. The duplicate series showed an even more marked difference, the health percentage rising from 28.5 to 58.8. The lower grade potash salts were found to be much less efficient in this respect than the sulfate or muriate. "It is necessary to emphasize the fact," said the experimenters in their report, "that potash is the determining factor in promoting the disease resistance of plants, in so far as this resistance can be affected by manuring. Nitrogen and phosphates, the former in particular, are liable to exercise an adverse effect when used in excessive amounts. These facts must be kept in view when drawing up any scheme of manuring, or devising formulas for compound manures, -- The California Cultivator,

Corn—Peaches—Cotton

Interesting items picked up here and there

W. S. HUNT, of Moultrie, Georgia, produced 717 bushels of corn on five acres last year, or 143.4 bushels per acre, and won first prize in the state five-acre corn contest.

In addition to eight two-horse loads of lot manure per acre, Mr. Hunt used 400 pounds of kainit, 400 pounds of acid phosphate, 200 pounds of nitrate of soda, and 200 pounds of 9-3-5. Part of the fertilizer was broadcast and part applied in the row.

Taking all the fertilizers together, Mr. Hunt used the equivalent of 1,200 pounds of a 7-3-5 per acre, worth about \$18. This seems an exceptionally large amount of fertilizer to apply to one acre of corn but the fact remains that his gross returns per acre were \$143.40, and therefore, this amount of fertilizer paid big dividends. The average corn yield for Georgia was 14.5 bushels per acre.

Corn is essentially a starch plant and potash plays a big part in the formation of starch in all plants. Potash produces a sturdy plant that stands up well against windstorms. In dry weather plants receiving plenty of potash remain green for a longer period of time than those receiving small amounts of potash. Potash thus increases yields by permitting the plant to perform its normal functions. Potash gives large, plump grains and ears that fill well toward the tip.

W. H. Robitzch, a club boy of Fitzgerald, Georgia, under the direction of County Agent C. T. Owens, conducted a two-acre potash test with corn in 1926. Each acre received two tons of lot manure and 400 pounds of a 9-3-3 fertilizer. To one acre he applied 100 pounds of muriate of potash as a side-dressing at the second plowing. The high-potash

acre produced 82 bushels of corn and the other acre 67 bushels.

The side-dressing of 100 pounds of muriate of potash, worth \$2.30, gave an increase of 15 bushels of corn.

Recent tests in Indiana, Rhode Island and other states, show that corn requires relatively large amounts of potash for maximum production.

* * *

Ro H. HOLMES, a large peach grower of Culloden, Georgia, reported that peaches on a Cecil clay loam failed to color properly in 1925. The following year he applied about three times as much potash as formerly, and the fruit was perfectly colored.

John Woolfork, of Fort Valley, Georgia, bought an orchard several years ago on which the fruit was always poor in color and quality, and did not ship well. He increased the amount of potash in his fertilizer for this orchard and has never failed to get excellent quality fruit.

In spite of the fact that Montgomery County, Texas, farmers will cut down their cotton acreage by planting more corn and feed crops, twenty-five per cent more fertilizer will be used this year than last," asserts J. F. Combs. This is due to the cotton contest last year, he thinks. It was clearly demonstrated that better methods of fertilizing and cultivating pay. Those making a bale or more to the acre, tell him that they are not disturbed about the low price paid for cotton.

The Uses of Corn

(From Page 12)

marshmallows, and bonbons. The cook thickens her puddings, sauces, pies, and custards with cornstarch. Then cornstarch serves as a filler, finishing or sizing material for paper, fabrics, cosmetics, and pastes. It also finds application in the manufacture of a high explosive, and large quantities are used for making baking powder.

Dextrines are made by roasting the starch, the various varieties depending upon the time and heat applied. Dextrines are used in the textile industry in sizes for strengthening the fabric and finishing the product. They enter into the manufacture of color for printing calico, into gums, glue, inks, mucilages, in polising rice and coffee, and in fireworks called sparklers.

In addition to cornstarch and corn oil large quantities of corn sirup are manufactured each year. The sirup enters into the manufacture of candy, it is used in making jams, jelly, ice cream, and for mixing with cane sirup and molasses in the preparation of mixed sirups. It enters also into the manufacture of shoe polish and in silvering glass for mirrors. It even has a place in tanning.

OW add to these products mentioned perhaps 100 more which may be derived from the kernel and we have hardly made an impression on the enormous corn crop which is produced in the United States each year. The Government has estimated that about one bushel in every fifty is used in the manufacture of starch and glucose and about three per cent of the crop is ground into corn-meal. One naturally asks, "What then happens to the bulk of the crop?"

Although corn marketings comprise but a small proportion of the entire crop, the amount of corn raised is so very large, varying roughly from 2,300,000,000 bushels to 3,000,000,000,000 bushels each year, that the supply available for manufacturing purposes is always a large one. The hog is the largest consumer of corn; about 40 per cent of the entire crop is fed on the farm to these animals. The corn thus fed is marketed to the American people in the form of pork and lard. About 45 per cent of the crop is consumed by cattle, mules, poultry, and other animals. Only a small proportion is exported; the past two years there has been less than one per cent of the crop to leave our shores each year.

Corn is the greatest American cereal. The production of corn in 1925 was over a million bushels more than the combined production of wheat, rye, barley, oats, flaxseed, rice, buckwheat, and sorghums. Little wonder that corn is called a king of plants. Mr. E. V. Wilcox published an article several years ago on corn products in which he wrote:

"Corn gives us pork, mutton, fried chicken, eggs, milk, butter, cheese, Johnny-cake, hominy, flapjacks, hasty pudding, hot tamales, corn pone, and scores of other good things to eat. We have found that corn sweetens our candy and cakes, yields shortening for our bread and biscuits, gives filling for our pies and puddings, stiffens our collars, stains and varnishes our wood furnishings, helps to make ink and paper, sticks the stamps on our letters, holds briquettes together, sputters in fireworks, booms in explosives, dyes our calico, protects our battleships, softens our face powder, stops up bottles, rubs out our mistakes with art gum, and gives us salad oils, soaps, mattresses, pipes, and music disks.

"Thus the corn plant feeds us, sings to us, washes us clean, hands us a pipe of peace, gives us abounding energy, and at the close of day provides us with a bed."

Corn Suckering

(From page 48)

phate, and muriate of potash. Bantam planted 2 x 2 feet, and Evergreen 3 x 3, both thinned to three stalks per hill. Six replications, or seven rows, treated as follows:

A. Check, suckers allowed to

grow.

B. Suckers removed once when plants were 12 to 18 inches high.

C. Same as B. but suckers re-

moved as they appeared later.

D. Suckers removed when plants began to tassel.

W ITHOUT details, here is the conclusion:

The writer is of the opinion that under most conditions the practice of suckering is not justified and is more likely to result in loss than in gain. The later the suckering, the greater is the chance for loss. He observed that there was no increase in: the total yield of marketable ears; the yield of grade 1 ears; earliness; and size of ears; and, further, that suckering decreased the amount of forage materially, and materially increased the cost per acre. At 40 cents per hour, the cost of one suckering is figured at \$3 per acre; twice, at \$4.50; and three times, not less than \$6.

The common opinion concerning the advantages of suckering corn is based upon the false assumption that the removal of the suckers allows the plant food to go directly to the ears. The raw materials taken into the plant from the soil do not go directly to the ears, but must first pass to the leaves and the other green parts of the stalk where they may be acted upon by the sunlight, digested, as it were, before they may be transformed into the complex starches and sugars which are ready to form the fruit, or the grain of the plant.

Suckers are a part of the leaf sur-

face of the plant. Removing them reduces the food manufacturing capacity of the plant. They seem to act in much the same way as the leaves of the parent stalk itself.

All of us have noticed the effect of the removal by hail of the leaves of a field of corn before it was fully mature. Under some conditions the removal of some of the foliage through the removal of the suckers might prove advantageous, but just when that should be done it is difficult to tell in advance. At any rate, the evidence so far is wholly against the practice, especially so when the cost of the operation is taken into consideration. More often we may expect a loss.

Hay

(From Page 20)

tilizer treatment.

Some of the yields obtained are recorded below:

Yield of bay at Rothamsted-Average of

Plot No.	Treatment Yiel	d as pound
13	Unmanured	2,090
17	Nitrate of soda	. 3,370
7	Complete mineral manure	4,090
14	Complete mineral manu-	re
	and nitrate of soda	5,690
11-2	Complete mineral manu	re
	and ammonium salts	7,330

These results show the marked effect of soil treatment in increasing the yield of hay. This is not the whole story. The method of fertilizing greatly influences the character of the herbage. The unmanured portion had an excessive proportion of weeds of low nutritive value. Of late years the weeds on the untreated soil amounted to as much as 50 per cent.

The use of nitrogenous fertilizer alone without potash and phosphates has had a decided influence on the character of the herbage. The large amounts of nitrogen have so stimulated the growth of the grasses that both weeds and legumes have been largely crowded out. Where nitrogen has been used freely, the weeds were

barely perceptible in some plots to a trifle over 4 per cent in others.

Where ammonium salts as a source of nitrogen were used, the dominant grasses are False Oat Grass, Bent Grass, Sweet Vernal, and Sheep Fiscue. Meadow Foxtail, Cocksfoot, Yorkshire Fog, and Smooth-stalked Meadow Grass are the principal other grasses

Where nitrate of soda is the source of nitrogen the vegetation is more varied. Legumes are not entirely absent, Meadow Vetchling and White Clover being found.

Soil treated with mineral manures containing potash has encouraged the growth of legumes such as clovers. In the beginning the grasses constituted 80 per cent of the herbage and weeds the remainder with no perceptible amount of legumes. potash has been used, legumes now constitute 30 per cent of the herbage.

The results of the experimental work at Rothamsted show the marked influence of fertilizer on the growth and production of grass land. practice of using fertilizer of some sort on meadows and pastures in England is now a very common practice and contributes in a very material way to their superior carrying capacity.

N America, on the other hand, no systematic attempt is made to fertilize either the pasture or meadow. The pasture usually receives only the residues left over from the fertilization of the grain crops in the rota-Some experimental work has been carried on in several states which shows the marked influence of fertilization on the production of hay and

Cornell University has recently reported the results of some fertilizer tests on timothy meadows. these records it is possible to make direct comparisons of the results of the use of fertilizers with those obtained from the same type of soil without the use of fertilizers.

Varying amounts of sodium nitrate were used in 1912, 1913, and 1914. The average amount used during the three-year period was 96 pounds per acre. Muriate of potash was used at the rate of 56 pounds per acre per year and acid phosphate at the rate of 128 pounds per acre per year.

The cost of the nitrate of soda used in the above experimental work was \$2.52, the cost of the acid phosphate was \$1.02, while the potash cost \$1.19; or a total annual fertilizer cost of \$4.73 per acre.

The average yield of hay on the unfertilized land was 2.77 tons while the fertilized section yield was 3.32 tons per acre. The fertilizer increased

the yield of hay by .55 tons.

The average price of timothy hay received by the producer in New York State during the years 1921-25 was \$15.48 per ton. Fertilizing the meadow at a total annual cost of \$4.73 produced an increase of .55 tons of hay worth \$15.48 per ton or hay having an actual value of \$8.51. This amounts to a nice profit of \$3.78 per acre for the use of commercial fertilizer on the meadow, and results in a material reduction in the cost of producing hay. An annual return of \$3.78 on the original investment of \$4.73 is 80 per cent return on the investment which is certainly very good The treatment of a 200 interest. acre meadow with fertilizer in this manner would cost the operator \$946. At the end of the season he would get his money back and make a profit of \$756 besides.

These yields were obtained on unusually good hay soil. The unfertilized yield was 2.77 tons. The average yield of hay in New York State for 1925 was only one ton per acre. The results for the use of fertilizer on the majority of the hay lands of the hay region in these states would probably be much better.

The carrying capacity of untreated pastures in this region is also very low. In Virginia a two and one-half acre untreated pasture produced a gain in weight of pastured livestock of 723 pounds, while during the same period of time a similar field of fertilized pasture produced a gain of 1,350 pounds. This amounts to an increase in the carrying capacity of the pasture of 90 per cent due to the fertilizer treatment.

A PPROXIMATELY 36 per cent of the farm land in the United States is devoted to crops, while 33 per cent is devoted to pasture; that is, there are 91.5 acres of pasture to every 100 acres crops. More than half of the feed consumed by livestock in the United States is produced by pasture. The cost of pasturage is only onehalf as great as harvested forage. The importance of carefully considering methods of increasing the carrying capacity is quite evident.

The uniformly marked increased yields on hay and pasture having fertilizer applied either as manure or mineral fertilizer indicate the great benefit from its use and warrant the most careful consideration by the

Barnyard manure, if available, will give good results if used up to as high as 10 tons per acre. Sodium nitrate can be used with profit as a topdressing at the rate of 100 to 200 pounds per acre, acid phosphate at the rate of 100 to 150 pounds per acre, and muriate of potash at the rate of 50 to 100 pounds per acre.

It is also more than probable that the use of limestone materials will also prove of value in many meadows and pastures. Such limestone material will have little value if simply applied as a top-dressing; it must be harrowed in for the best results. Lime controls in a large measure the nature of the herbage in meadow and pasture. The presence of lime promotes the growth of legumes, bluegrass, and timothy while its absence favors the growth of redtop, bent, quackgrass, and sorrel.

Eighty-five Years of Fertilizer Experiments

(From Page 28)

markable effects. They impart vigor to the crop in adverse conditions and they improve the quality. This makes them of special value to growers of potatoes, sugar beets, good quality fruit and vegetables.

The problem of how much fertilizer a farmer should use, and when he should apply it, is being thoroughly investigated at Rothamsted. Another problem is fitting the fertilizer to the soil reaction, that is, to acid or alkaline soil.

Fertilzer problems thus have widened and link up closely with modern physiological work on plant nutrition. In the early days it was necessary to demonstrate to farmers that fertilizers would profitably increase their crops. In old, settled countries the best farmers now know this, but there is much extension work to be done for newcomers and in new countries or where the system of husbandry is changing.

RESENT-DAY problems are concerned more with the fine adjustment of the fertilizer scheme to the farmer's conditions, making it fit his economic situation, soil moisture, soil reaction, and above all his climate, so as to disappointments. The great fertilizer organizations should, before long, and when further information is avaliable, seriously study the question of insurance of crop increase where recognized fertilizer treatment adopted.

The changes induced by fertilizers in the crop are of growing importance. Advantages may be taken of changes in habit of growth for completing the adaptation of the crop to the farm conditions, while improvements in feeding value of fodder crops and in quality of crops intended for human consumption may be of very special value. As prosperity increases and people have more leisure they acquire a greater appreciation of the meaning of quality. A population struggling for food is concerned only with quantity; as its taste becomes educated and refined, it demands quality. Scientific workers and fertilizer manufacturers are equally interested in finding solutions of these important problems.

The N.F.A. Convention

(From Page 21)

the fertilizer industry. The farmer now tends to buy goods the day he He does not store for needs them. use in advance as he used to do. change in habit is forcing the fertilizer industry as well as other industries to adopt new methods of merchandizing. During the depressed condition of agriculture, President Carter believes, it is going to take all the intelligence possible to conduct affairs on a sound, business-like basis; and along this line he also emphasized the need for a few high type salesmen rather than many mediocre salesmen.

"Everybody who deals with the farmer is interested in seeing something done for the farmer which will give him his proper share of the national income, which he is not getting," declared Charles J. Brand, executive secretary of the association. Each of the broad divisions of the fertilizer industry and the difficulties that are to be met in each were ably discussed by the speaker. The address showed that Mr. Brand had given a great deal of thought and study to the problems of the fertilizer manufacturer.

Another speaker of the staff of the association was J. C. Pridmore, who gave a very instructive and hopeful talk on "The Fertilizer Outlook in the South." The speaker showed briefly

that the aim should be for cheaper production and the production of more food crops grown at home. He emphasized that progress was being made in these two directions and as the cotton price was trending upwards, the outlook for the southeastern states, where most of the fertilizer for cotton is used, was quite hopeful.

SPECIAL thanks are to be given to the staff of the association in attendance at the convention for two things: the zeal and initiative shown in getting out a daily morning paper with associated press news items, as well as news of the day's doings at the convention, and the songs with which each morning's session was started. It is much more stimulating to spend a morning after singing such a song as Dixie or America than it is to start merely by sitting down.

John I. Tierney gave a report on the joint office with the Manufacturing Chemists' Association. Thomas W. Howard gave a very instructive address on "What Uniform Cost Accounting Has Done for Other Industries." This is a very important matter and merits the support of all the W. B. members of the association. McCloskey has been appointed cost accountant of the association. He gave a very interesting talk on "The Comparison of Cost Figures." Horace Bowker showed the necessity for soil fertility research work, and indicated the direction such work should take.

As one of the speakers pointed out, how could an individual company contend with the problems it has to meet unless such companies were banded together in an association? Such an organization is essential beyond any doubt. If it is essential it merits the support of the whole industry. Most certainly the last convention was a striking object lesson in what can be done to define mutual problems and to stimulate a courageous spirit in meeting them.

Douglas County Oregon Pioneers with New Crops

(From page 18)

being one foot apart and four feet between each pair. This made it easier to cultivate them as well as to gather them. They were planted just before Thanksgiving and picking started on April 20. Most of the peas from the Umpqua valley were shipped in burlap sacks last year, but the farmers potash and 100 pounds nitrate of soda per acre. The fertilized berries were 10 days earlier on the market and returned 100 per cent more money than the unfertilized.

The following table brings out the results. It will be seen that a \$20.50 investment resulted in an increase of

Treatment	Yield in Crates	Price per Crate		Cost of Fertilizer (including
200 lbs. sulfate of potash and	1			labor)
100 lbs. nitrate of soda		\$4.60	\$662.40	\$20.50
None	120	\$2.50	\$300.00	4 marks

will ship them in hampers this year as that makes a much more attractive pack which naturally results in better prices.

THE Umpqua valley peas are the earliest in the country with the exception of those produced in the Imperial valley of California. Proximity to the Eugene, Seattle, Marshfield, and Portland markets should make pod pea growing a profitable side line. Another point in their favor is that one can get a second crop each year from the same land.

Cooney believes that the results of some fertilizer trials on strawberries, showing that potash hastens strawberry maturity, will change the practice of strawberry growers in the county. He said, "This fruit, while grown for a great many years in the county, has never reached the commercial scale it has in many districts, chiefly because we have had no variety that will ripen early and stand up under express shipments. Last year we secured four cooperators to make some fertilizer trials, but the most outstanding results were secured by J. A. Crawford of Myrtle Creek with an application of 200 pounds sulfate of \$362.40 in returns for this particular trial.

The berries from the fertilized plot stood shipment so much better than did those from the untreated plot that even though they had not matured at an earlier date they would have been worth more money. The increase in yield, although it was 24 quarts, was negligible in comparison with the increases of \$2.10 in price for all the crates produced.

MARK N. TISDALE is one of the farmers who has profited much from his association with Cooney. He is a banker but he knows something about farming too, because he is making a 10 per cent return from pears on land that is valued at \$1,500 an acre. He started out fertilizing with nitrogen in the form of sulfate of ammonia alone, but he got too much leaf growth. He is now putting a part of this element into the soil by means of cover crops and legumes. He used a carload of lime last spring to help the vetches and rye grass come along and is now causing a 6-7-8 fertilizer to supply the plant food that is taken out of the soil each year by the heavy crop of pears.

An Orchard for Cowboys

(From Page 9)

"My business grew and prosperity rushed into the door on every West Texas wind that blew. Wilson began to feel proud of himself and his dear spouse who partnered with him nobly through the early lean years.

"Last year, as I was walking down the old orchard, I noted that the bark of the trees showed age, and the branches had begun to die back toward the trunk. A new acreage must be set if prosperity was to continue.

"On the upper side of the orchard where the young trees were set, the soil was depleted. The potash and lime had leached out. In the valley below, I assumed that the dirt was good enough and I let nature take care of itself. But I found that nature couldn't do what I could do for myself. The trees that were fertilized made more than three feet of growth by the first summer, but the stock that was set in the native soil didn't put out branches any longer than my hand by the middle of June.

AM thoroughly convinced that fertilizer is absolutely necessary in an orchard if the trees are to make a rapid growth and fruit early. I note, too, that the trees that were fed have a root system of greater spread. Since then I've read a great deal on fertilizers, and doubtless had I fertilized my old trees, their life would have been extended and the fruit would have been of a better quality. I am convinced, too, that had I made an application of potash and lime when the trees were shedding, there would have been less of the immature, wind-blown fruit. Another year I am going to fertilize those old trees that appear to be dying; from

observation, I am convinced that it will invigorate them and start up new life.

"The orchardist who hasn't learned the value of fertilizer among his trees needs to be informed.

RECENTLY a Government man was out at my house making a study of the pioneer orchard of this section of the West. I asked him what he thought of fertilizer for fruit trees. Here's what he said:

"'Fertilizers will grow strong trees and the vigorous growth helps to repel diseases and injurious insects. Fertilizers will hasten the maturity of the fruit, make it firmer, give it a rosier color, and lessen the tendency for the fruit stem to yield to the wind. Fertilizers will increase the size of the product and in many instances double the market value of the yield. The margin between the sale of the unfertilized crop and the returns from the harvest from fertilized trees is where the profits lie.'

"If I could go over the days when I fed the cowpunchers their first West Texas fruit, I'd fertilize and today I'd own double the acreage of my present farm."

Then Mr. Wilson turned to the writer and said, "Come on, let's go eat a watermelon."

Wheeled Schools

(From Page 7)

is forgotten, and remarkable cures effected, for the time being, at least.

The advent of the Mexican boll weevil into the cotton fields of the South brought the full possibilities of the school-on-wheels idea to the attention of the U. S. Department of Agriculture. Some means had to be found for teaching every farmer in the cotton belt how to fight the in-



A group of negro farmers learning how to dust cotton to beat the boll weevil

sect menace. This meant reaching the negroes as well as the whites, for whether as tenants or owners, they furnish the bulk of the labor in cotton cultivation. From this came the widespread introduction of schools on wheels under the auspices of the Federal Government.

As a nucleus, the government took over the wheeled-school equipment of the Tuskegee Institute. In cooperation with the states, it sent traveling schools into various sections of the South. The program of training was enlarged. Greater educational value was given the system by establishing headquarters at various negro schools and colleges. The plan has been highly successful.

In Alabama, where the work started, the rural life of the negro has been influenced to a marked degree. More than 2,000 individuals now receive instruction each month from the wagons. The success here has attracted visitors from many parts of the country, even from abroad, to study the methods.

Wherever possible the wagons go out with negro demonstrators. They have been found to get excellent results when working under the direction of white men and women. It was difficult at first to find good negro agents. But soon it was found that good ones could be developed from among the graduates of the negro schools, such as Hampton and Tuskegee. And it is from these that most of the people now engaged in the work come.

The County Cows Built

(From Page 15)

cellent section for dairy farming. Col. Montgomery knew this 50 years ago.

Constantly working for a progressive agriculture, he was one of the leaders in getting a state agricultural college for Mississippi in 1878. He was influential in locating the college at Starkville and was the first member of its first board of trustees, serving until his death in 1904.

Professor J. S. Moore, present head of the dairy department of the college, was graduated in 1894. As a student Professor Moore demonstrated an unusual interest in dairying and was, therefore, attracted by Col. Montgomery. They became staunch friends and largely through their efforts the college dairy department was established in 1900.

The first herd consisted of 65 grade cows, valued at \$1,300. Thirty-five of these cows were sold, and one registered Jersey bull and two purebred heifers were bought with the money. With this humble start the present college herd of 250 purebreds has been built up. This herd has paid its own way without financial assistance and today is valued at more that \$50,000, not considering improvements to land, buildings, and equipment.

T is almost hard to believe that in Oktibbeha, Jersey county of the South, back in the memory of some of the older settlers, it was impossible to find a nearby market for Jersey butter because it was so yellow that the people thought it was painted. By and by it was found that the world market demanded yellow butter and that the Jersey cow could beat the chemist and actually extract a yellow stain from the green grass.

After failing to find a market for the farmers' home butter because of

lack of standard quality, in 1912, eight years after Col. Montgomery's death, Professor Moore asked the college authorities for permission to use part of the dairy building for Mississippi's first cooperative creamery. The creamery was started with 19 patrons, owning 240 cows. During its first year it took in 14,503 pounds of butterfat for which it paid \$5,193. Demonstrating its steady growth is the fact that in 1926 it received 645,456 pounds of butterfat for which it paid \$301,105.

This healthy growth attracted the Borden Company when it sent out inspectors to spend two years in a careful survey of the South to find a location for the first southern milk condensery. In 1924 an investigation within a radius of 12 miles of Starkville revealed that 7,000 cows were being milked and 6,000 heifers were coming on. Late in the year the company asked for a carload of milk for shipment to an Illinois plant to be processed and examined. The car was ready with 500 gallons in excess at shipping time, this at one milking.

After the milk was tested at the plant, this telegram was sent to Starkville: "Milk received in excellent condition; per cent of acidity, .17; per cent of butter fat, 5.9; if this milk is an average sample of Mississippi milk, Mississippi babies should weigh a ton at 21."

The half million dollar plant of the Southern Borden Company was completed early in 1926. During its first month's operation, in April of that year, it received 1,082,563 pounds of milk from 506 dairies, for which it paid \$25,515. During April, 1927,

> the plant received 3,859,985 pounds of milk from 1,120 dairies for which it paid \$108,-985. In the same month the college creamery paid its pa-\$39,092 trons for butterfat.

> farmers The are paid an average price of about 25 cents per gallon



The prize-winning float in the parade which was a part of the celebration at the opening of the condensery.

for whole milk by the condensery. They are paid on the 15th of each month for the milk delivered the previous month. It is interesting to note that the college creamery has continued its healthy growth since the opening of the condensery. It is estimated that there are now 1,500 dairies in the county milking 15,000 cows. The number is steadily increasing.

In 1926 the condensery had a high day of 87,000 pounds of milk. In 1927, its high day has been 158,000 pounds; and in 1928 it expects to go to 225,000 pounds per day. Its present capacity is 160,000 pounds per day. To meet next year's increase the plant will either have to enlarge its equipment or work in double shifts.

Thus dairying is developing a county, but dairying had been given an added impetus in Oktibbeha. Looking backward it seems almost foolhardy to bring the Champion of America Jersey bull and dams from the Isle of Jersey to a section that was afraid of Jersey butter, or among stockmen who looked upon the cattle as small and "cat-hammed." There was also the dread Texas fever to contend with. But Col. Montgomery was a man of courage. It was his nature to be true to his vision.

Today his philosophy is bearing fruit, all Oktibbeha is green with his grasses, and the milk of Oktibbeha cows is in the market-place of the world. His people have found the land flowing with milk and honey.

Recreation

(From Page 4)

and rock-bound coast preferred to fight and starve rather than indulge in reckless betting and unseemly antics when life was so short and money so scarce. They insisted upon the blue laws because sport had been corrupted in their native land.

I looked at a picture of one of my blue law ancestors yesterday and wondered what he would say, or rather just how impossible it would be for him to express himself freely, were I to show him a pink sport sheet wrapped around a sample copy of our yellow journalism. Yet he was something of a noble old Roman, after all, for he took his sport ducking witches at Salem.

This Calvinistic forebear of mine would doubtless frown and fade away at mention of Gene Tunney or Gertrude Ederle, but I wager he would be too good an American not to grudge a sickly grin if I named Slim Lindbergh!

DARING, perfect poise, skill, and speed are ours to admire and derive refreshment from in the realms of sport. We can't all wield the racket or the bat, run bases or steal home, but we can all warm benches, hold tally pencils, and throw pop bottles.

"There's the rub" as the trainer said.

"There's the rub" as the trainer said. We mostly take our sport by proxy and the press. When you and I were kids we played ball regardless of our prestige as experts, only for the love of the game and each other's untamed

company.

The encroachment of the commercial age has blotted out the sand lots where we used to play one-old-cat with the alley gang. The juggernaut of commerce has forced many of us to rear a generation that takes its sport in second-hand doses and finds the teams that play on diamonds, courts, and gridirons commercialized, too!

But sport has played its part in human re-creation constructively as well. We can all remember when the only published pictures of the human form divine were in medical magazines, the naked zodiac man in the almanac, and that vividly pink periodical we used to read with sly relish in the barber shops.

We admit they were rather too morbid and foreboding. The zodiac man was partly dissected and completely surrounded by a menagerie that must have been the envy of P. T. Barnum. This familiar cadaver is still doing duty among us, but nobody notices him any more. The medical magazines were hard to get and hard to read, while the barber's pink sheet aforementioned was available only once in two months or so when our hair got beyond the collar limits.

MODERN sport has re-created our attitude as a nation toward the human anatomy. Knees and thighs are now as common as elbows and knuckle joints used to be. We have found out that fresh air, ultra-violet rays, vitamins, freedom of movement, exercise, and frequent bathing do more to purify the body for a clean soul's habitation than prudishness and half-truths ever did in days bygone.

Your daughters and sisters are growing up unashamed of their legs—unless said legs are unable to carry them through a fierce tennis game or a twenty-mile hike before breakfast.

They have learned to cover them—with the glory of achievement, if little else. Why not? A plain object lesson in health and normality beats a concealed weakness; and this much at least the craze for athletic sport has done for us.

Physical education has supplanted the dunce-cap system of dealing with animal spirits in school. Sports which are organized and intelligently directed are making over the hodge-podge of restraint and misunderstanding. Pedagogues of yesterday either seemed like books of etiquette and memories of lavendar, rose water, pink tea, and old lace; or else terrible catamounts of fury, armed with the birch rod, and daring the big boys to fight or figure, to wrestle or write.

Swings, trapeze, giant strides, merry-go-rounds and horizontal bars are seen in most progressive school grounds. The best thing that sport has done is to relieve the terrible tension of adolescence—and if this isn't vital re-creation, name a better.

How about the man who is neither

a sportsman nor a fan? What would you recommend for him in the recreation line?

If he has children maybe he can give them a vacation joy ride, and be refreshed through their enjoyment. But visions of overburdened Dads in picnic-laden flivvers sort of take the kick out of that prescription for me.

Change of work is the best recipe for him, and it usually isn't costly.

Too many railroad men take their resting spells hanging around the train master's shanty in the yards. There are too many clerks who wander back in vacation time to gloat over the fellows on duty. But that isn't the worst of it. The habit of carrying mental business ledgers off on the vacation trip and perhaps indulging in worry over what happens in your absence is the worst fault of modern, high-pressure Americans.

Vacation, of course, comes from the verb, to vacate. It should mean more than vacating the premises where you toil and scheme for yourself or the firm. The man who really gets a restful interlude vacates his job in earnest and leaves the harness hanging up on a peg—which is no more disgraceful and far more constructive than if he had exhausted his energy to the limit and died in that old harness!

KNOW a stately justice of the state supreme court who is a poor idler in vacation spells, but a good hand at proving that a change of work and environment equals indulgence in sports.

He owns a farm and goes out at grain harvest to live and work with the tenant and hired men. He finds himself too tired at night to bother with the contents of his brief case—even if he takes it along, which he doesn't. Incidentally, he has had the same tenant for fifteen years, and although he is a masterful lawyer, there exists no hidebound lease between them.

Doing nothing in vacation time is the hardest mode of recreation, and many of us with no skill in sport or chance to change jobs would find it irksome and conducive to the worry we should always avoid at such times. The best way to accomplish this feat is to attempt something impossible of accomplishment by yourself, and then keep at it, which is after all a sort of compromise between restless energy and recreation.

I have worked this stunt to perfection. I spent two weeks writing the score and libretto of an opera, although I cannot read a note. As it never became audible nobody suffered, and I certainly fulfilled my desire of doing nothing at all without the stagnancy and ennui of idleness.

Select the job you wish you had nerve to tackle in your youth and try this mode of doing nothing. It is relaxing and restoring, providing you do not aspire to be a structural iron worker or drive a racing airplane.

HE other more purposeful way to do nothing in vacation is to ride your favorite hobby. It may be birds, butterflies, postage stamps, ancient ruins, or photography. The more absorbing the better for you, your family, and your job. The man with a sideline hobby is usually least in need of summer recreation, and it is this lasting virtue in hobbies that makes me envy the man who nurses one. Carried too far, however, it may be a pest instead of a pastime.

Sunshine, mental and moral, is what we truly seek most in vacation time if we be sane and reasonable, desirous of tuning up for honest service and all-round health.

Were it only a matter of physical trim, we could get that in a hospital or buy it at the drug store perhaps. Unless we proceed to store up our mental and moral storage batteries with the radiance of inward sanitation during the vacation season, it would seem that the best part of it is lost.

Earthly enjoyment is consistent

with fine principles and religion. Pascal, we are told, would not permit himself to be conscious of the relish of food and spices; he wore a girdle armed with iron spikes which he drove into his gaunt ribs as often as he thought himself in need of admonition. He rebuked a mother who kissed and fondled her children, and he assumed an artificial harshness toward his relations for the express purpose of making himself and others miserable. Pascal and the host of other men who have mortified and crucified the flesh in the name of principle lost sight of the connection between a normal life and moral sunshine.

"Mirth is God's medicine," says a wise writer, "everybody ought to bathe in it. Grim care, moroseness, anxiety, all the rust of life, ought to be scored off by the oil of mirth." It is better than emery for grinding out the grooves and rough spots left in a year of constant labor.

A depressed mind prevents the free action of the diaphragm and the expansion of the chest. It stops the secretions of the body, interferes with the free circulation of the blood, and deranges the entire functions of the body. How can you or I ward off mental and physical ailments to better advantage than by setting aside a certain portion of the year for mirth and play?

Then, when the first vitalizing physical flush of vigor derived in the outdoors is worn away upon our return to duty, we have the memories, the trinkets, and the photos gathered in that resting spell to give us the mental stimulus that we shall require before another July comes around again.

New acquaintances are made, new adjustments secured, broader conceptions realized. Good vacations aid content and spur ambition. They are worth the time and effort. Might as well forget the nominal cost of one, for you'll pay for it whether you take it or not.

Cashing out beats cashing in!



WHAT'S IN A NAME?

A woman who was living in a hotel in San Francisco hired a Chinese boy. She said: "What's your name?" "Fu You Tsin Mei," said he.

"Your name is too long. "I'll call you John."

"What's your name, please?" said

"Your name too long. I call you Charlie."—Wall Street Journal.

THE RIGHT SPIRIT

An old farmer made a trip to the city and decided to startle the wife by appearing in brand new raiment. To save wear on the new suit he placed it in the back of the wagon. A few miles from home he took off his old clothes and tossed them off a bridge into the river.

He was surprised to see that the new clothes had dropped out of the wagon.

"Giddap, Maude," yelled the old man, pulling down his shirttail as he realized his plight. "We'll surprise her anyhow!"—Rice Owl.

NO GATE TENDER

An engineer, surveying the right of way for the proposed railroad, was talking to a farmer.

"Yes," he said, "the line will run

right through your barnyard."

"Well," answered the farmer, "ye can do it, if ye want, but I'll be jiggered if I'll git up in the night just to open the gate every time a train comes through."

A NAUGHTY CAT

"Look here," exclaimed little Jean, stamping her foot, when she saw Tabby carrying a little kitten by the back of its neck. "You ain't fit to be a mother cat! No, you ain't even fit to be a father."—O. P., Wisconsin.

Hubby — I miss the old cuspidor since it's gone.

Wifey—You missed it before that's why it's gone.—Pathfinder.

Women who refuse to have birthdays ought to give them to small boys, who can enjoy them.

"Chickens, suh," said the old Negro sage, "is the usefulest animal dere is. You can eat dem before dey is born and after dey is dade."

'RAY FOR ST. PATRICK

A homesick Irishman had got a job as crossing guard for a railroad. The foreman handed him a red flag and a green flag, and told him, "Whenever you see a train coming, get out and wave this red flag."

"Git away wid ye job!" exclaimed Pat; "Me wave a red flag when Oi got a grane one handy. I'll starve first."

Professor (after hour's dissertation on Egyptian archeology)—"Does anyone care to ask any questions?"

Voice in back of room—"Just one question, professor. In your opinion, what is clam digging—fishing or agriculture?"

Winter Wheat

HEAT needs fertile, well-prepared, and well-drained soil to carry it through winter.

Liberal application of high analysis, well-balanced fertilizer, containing ample potash, will help prevent winter injury, increase yields and test weights, improve quality and grade, and produce a healthy plant and firm full grain.

Send us your name and address and we will mail you your copies of: "Better Grains and Hays" and "Fertilizing Wheat and Clover".

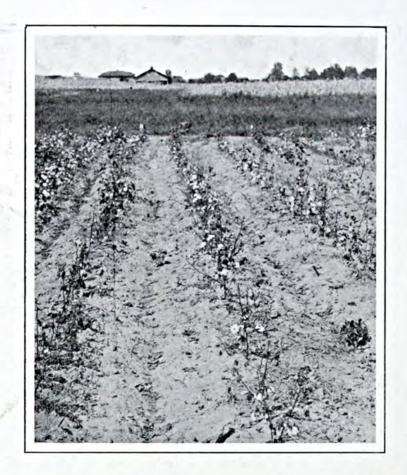
Potash produces plump, sound grain, and stiff straw that does not lodge. When potash is lacking, the grains ripen too early and lack quality; the stems and leaves die while the grain is still immature. Potash is cheap. Use it liberally.

Agricultural and Scientific Bureau

N. V. POTASH EXPORT My. of Amsterdam, Holland
NEW YORK OFFICES: 19 West 44th Street

NEW YORK BALTIMORE ATLANTA JACKSON

CHICAGO SAN JOSE



\$2.25 per acre would have made this healthy cotton

HIS cotton is suffering from rust. The plants are small and unhealthy, with but few bolls. They were practically defoliated by the middle of August. Cotton rust is potash hunger.

Liberal fertilization prevents the above condition. However, phosphoric acid and nitrogen alone will not prevent rust. \$2.25 worth of potash per acre, added to the other elements would have made this cotton healthy without a trace of rust.

Farmers who grow cotton like that shown above save a potash investment of \$2.25 per acre, but they lose from 10% to 50% of their cotton crop.

Agricultural and Scientific Bureau

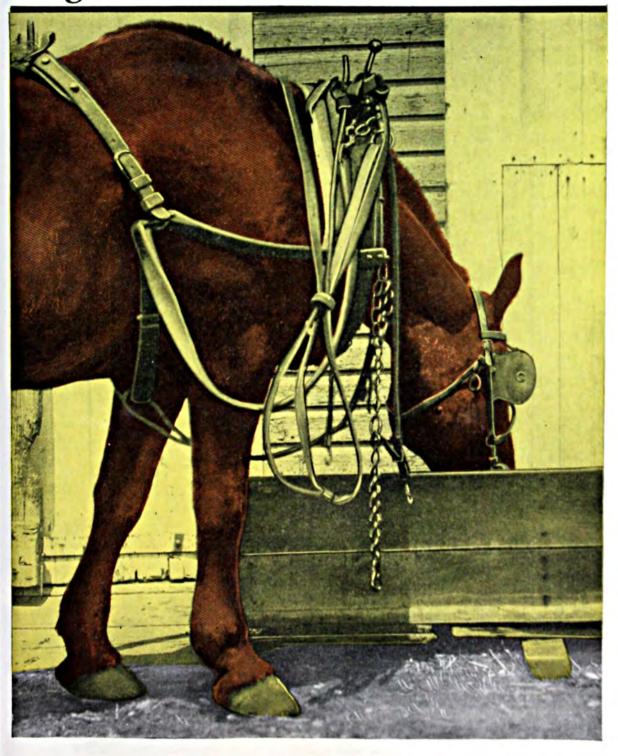
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CHICAGO SAN JOSE

Better Crops PLANT FOD

August 1927

10 Cents



The Pocket Book of Agriculture

About Ourselves

BETTER CROPS WITH PLANT FOOD is a monthly magazine edited primarily for those who act in an advisory capacity to the farmer.

PUBLISHED by the Better Crops Publishing Corporation, 19 West 44th St., New York City.

SUBSCRIPTION PRICE — \$1 per year. Single copies 10c each.

CHANGE IN ADDRESS — Readers should always give old as well as new address and allow at least three weeks for the change.

MANUSCRIPTS should be brief and preferably typewritten. They will be returned only when proper postage is enclosed. Payment is made on publication.

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BETTER CROPS PUBLISHING CORP.

19 West 44th Street

New York

Better Crops PLANT FOD

The Whole Truth—Not Selected Tru

R. H. STINCHFIELD, Managing Editor SID Noble, Editor

Editorial Offices: 19 West 44th Street, New York.

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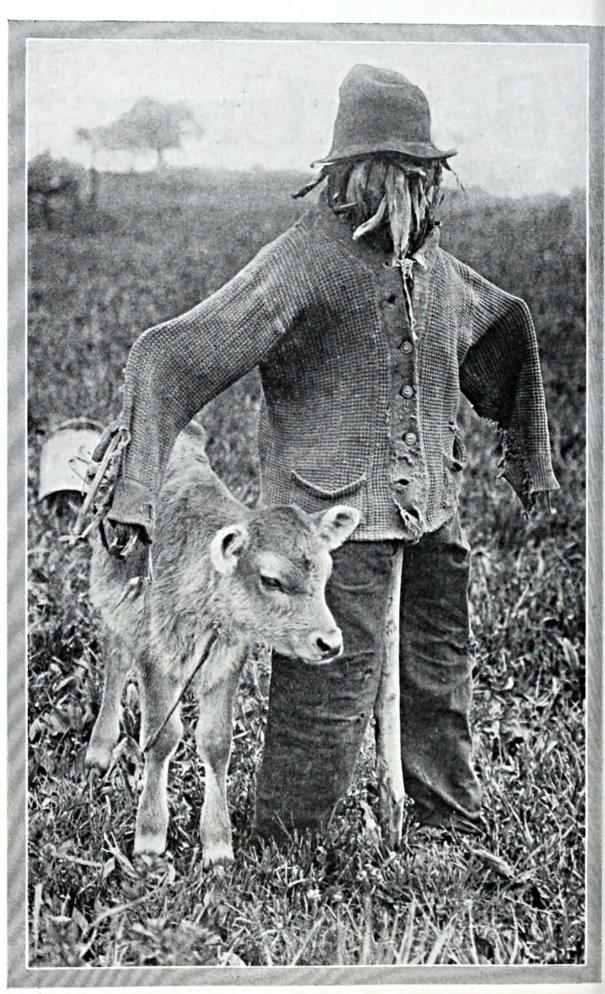
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Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY.

Directors: J. N. HARPER G. J. CALLISTER

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His Master's Clothes.



Published Monthly by the Better Crops Publishing Corporation, 19 West 44th Street, New York. Subscription, \$1.00 Per Year; 10c per Copy. Copyright, 1927, by the Better Crops Publishing Corporation, New York.

VOL. IX

NEW YORK, AUGUST, 1927

No. 3

Jeff M Dermid the genial philosopher writes on

LOOKS

ANY of us openly applaud the old wheezes, "Handsome is as handsome does," and "Beauty is only skin deep" while we secretly wish for the pulchritude that nature has denied us.

Hypocrisy never gets us far in any thesis, so we might as well dispose of the error at the outset by a frank admission that we could use a mirror to better advantage and with more personal satisfaction were things otherwise ordained.

The aforesaid consoling and admonshing maxims belonged to the era of Calvinistic faith, along with log cabins, prairie schooners, hoop skirts and side whiskers.

Folks were so busy making empires and fighting Indians that the ornamental side of human architecture was of less immediate concern than the stability and resistant qualities of it.

Nobody can tell whether Daniel Boone or Kit Carson had romantic eyes or classic profiles, but everybody conjectures that they carried plenty of war paint in their saddle bags. The only kind of "make-up" they hankered for was an occasional treaty with the savages.

So we may well conclude that those mottoes of the vanished era relative to looks have become obsolete. Men no longer consider it a waste of time or a sin to have a face that won't stop the clock.

AVING admitted that we take a good look at good looks whenever found, and that we all yearn for our share of it in some form, we can proceed to a further enlargement of the fascinating subject.

Good looks and looking "good" (well) are not always synonymous.

There are two kinds of good looks —physical beauty and whole appearance.

To be physically beautiful in the purest degree calls for the proper attractions of feature plus a wholesome glow of radiant health and cleanliness.

One cannot be truly beautiful with-

out being wholesome; but one can be wholesome and yet lack regularity and charm of facial beauty.

Therefore, the key to desirable appearance lies in being wholesome. It is the main ingredient of the ideal beauty prescription.

This probably explains why the white explorers mostly sought in vain for the lush Indian beauties that lived in such exotic numbers in the pages of fiction. The smoky tepee, the squalor of savagery and the absence of sanitation robbed the red girl of her charms even before she learned to chew tobacco and rub her cheeks with bears' grease.

Personally, I have always suspected that Capt. John Smith loved Pocahontas less for her looks than because she had a stand-in with the big chief.

But why after all should we abjure the shy daughters of the forest for lacking the wholesomeness to be called divine? They did not camp long enough in one spot to collect sufficient meat scraps to boil a mess of soft soap. Besides, after their husbands and lovers had gone on the war path there wasn't enough paint left to daub over their own deficiencies.

On the other hand, do we not find that the modern nymph has for her artful slogan the famous words of commerce: "Save the surface and you save all!"

Any reputable painter will tell you that there are two requisites to a durable and pleasing job; viz, a thoroughly clean surface and pigments that are not too glaring and incongruous. If Milady would get those essentials taught to every apprentice, there would be more satisfaction alike to be-dauber and beholder.

Yet in this age of so much purchased pulchritude I get a crumb of comfort out of the thought that the drug clerk says there are more cosmetics sold than patent medicines. It is far better to see a parade of gorgeous Grandmas with vermillion cheeks than

to see them drinking Lydia Pinkhams or hear them swapping hospital experiences. I can stand eye-strain better than heartache.

But artifice and disguise, as such, do not well belong to a discussion of looks. Some day when the subject of shams is in order, perhaps the mask can be torn off through these columns in quite ruthless fashion.

ET me ponder now upon looks in their natural state, keeping foremost in mind the wholsesome side of good appearance.

Emerson rightly says, "If eyes were made for seeing, then beauty is its own

excuse for being."

The romantic poet, Keats, is often partly quoted in the phrase, "A thing of beauty is a joy forever." I only get the "skin deep" significance until I read further, and then I see again that wholesomeness is the prize he praises most. Get the rest of his statement, little known and very seldom quoted in full:

"Its loveliness increases, it will never pass into nothingness, but still will keep a bower quiet for us and a sleep full of sweet dreams and health, and

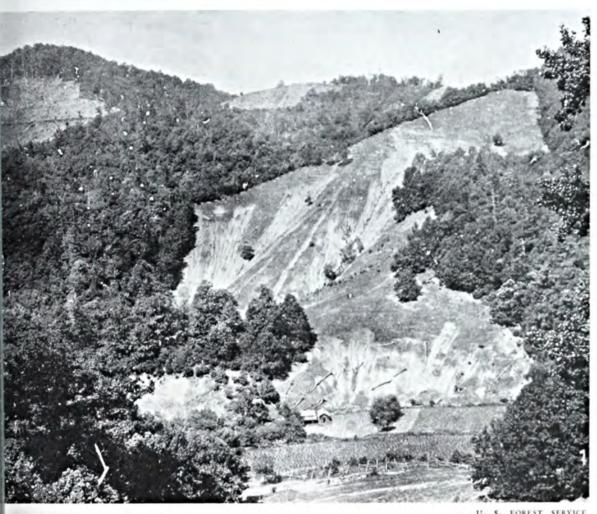
quiet breathing."

Thus no poet who valued his reputation ever raved about good looks without going to the soul of it, which is wholesomeness.

Looks also depend upon the beholder's own standards and mental outlook. Two quotations illustrate this in short order: First, the Indian who said he was thankful that all men did not see alike, or they would all want his squaw. Second, Pope remarks: "All is infected that infected spy, as all looks jaundiced through the jaundiced eye."

Translated into our own tongue, when you say that a dame is a "good looker," you merely mean that you yourself are a good looker. Your male neighbor may be looking in the op-

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A clearing in the Blue Ridge Mountains where cultivation was immediately followed by lisastrous erosion. These steep mountain slopes are ideal forest lands. To clear them for rops is nothing less than criminal trespassing upon nature; for the soil soon goes, leaving behind gullied areas having little value even for trees.

The SOIL Robber

By Hugh Hammond Bennett

U. S. Department of Agriculture

OIL erosion takes from the farmers' pockets an annual toll of at least \$200,000,000. This a modest estimate based on nalysis of widely distributed soils, nd it does not take into account he expensive cumulative effect of he increasing difficulty of cultiation occasioned by removal of the nellow topsoil and the need for more nd more fertilizer material to enrich he exposed raw subsoil material; nor oes it count the taxes paid on land abandoned by reason of soil poverty brought about by this master thief.

Every rain that falls upon sloping areas takes away part of the soil, and that from the surface layer, the richest of the fields. Even the gentle rains of springtime that fall like music upon budding foliage do not neglect the mission of water, that is, to level down the face of the earth.

Next time you find yourself in the rural districts after a downpour, if you look, you will see water speeding away



Showing the efficient work of a terrace in checking rain water rushing down a slope. The embankment leads the water off gradually and thus reduces its soil-stripping effectiveness.

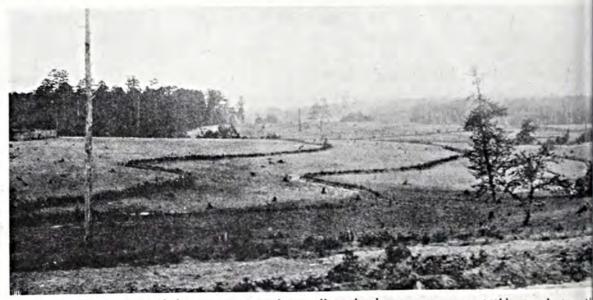
to the rivers and oceans, not crystalclear, but muddied to dun, yellow or red, according to the color of the soil of the locality. This color will represent soil washed out of cultivated fields. Little of it comes from woodlands.

A Difficult Problem

ROSION is the most difficult problem of soil management on most of the rolling lands of the nation. The National Industrial Conference Board recently stated that our

farmers suffer an annual net loss of 5,900,000,000 pounds of plant food removed in crops taken off. This loss is serious enough, but it is small compared with that caused by erosion The eminent geologist, T. C. Chamberlin, said that 1,000,000 tons or more "of richest soil-matter" is carried into the sea every year. Not less than twice this amount is taken out of the fields and left stranded on slopes and distributed over stream bottoms or deposited in channelways where it is not needed. Certainly 20 times as much plant food is wasted by the relentless washing of rainwater than is taken out of the soil by crops, and since the whole soil, not merely the plant nutrients, is removed, the actual loss by this force is again multiplied. minimum estimate of the loss exceeds 126,000,000,000 pounds of plant food annually.

Much of this waste takes place so gradually, by a process known as sheet erosion, that the farmer scarcely notices it while it is going on. Ever when soil has been planed down to infertile raw clay, with frequent spots of bedrock showing through fields, he usually ascribes his reduced yields to "soil exhaustion," abandons field after field, and often decides he has lost the touch for farming and moves away to town or to another community to exhaust another farm.



A Piedmont slope saved by terracing. These rolling lands are very susceptible to destructive washing; but most of them can be preserved indefinitely by proper and timely terracing

The Missouri Agricultural Experiment Station measured the rate of erosional soil loss from fields undergoing a variety of cultural treatment, by catching the material at the foot of the slope and weighing it. It was found that seven inches of topsoil was being washed off every 24 years from corn land given ordinary cultivation. From bluegrass sod, however, the rate of land wearage was seven inches in 3,547 years. Reporting on the results of their investigations the scientists of this station said:

"Most of the wornout lands of the world are in their present condition because much of the surface has washed away, and not because they have been worn out by cropping. Productive soils can be maintained through centuries of farming if serious erosion is prevented. The soils of Missouri have become gradually less fertile during the last 100 years due in large measure to excessive cultivation of rolling fields. Many of the most fertile soils in the rolling prairies and timber lands of this state have been kept in corn until the "clay spots" are evident on nearly every hillside. So much soil has been lost from even the more gently rolling parts of the fields that yields are far below those obtained by our grandfathers who brought the land into cultiva-



Gullies often have their beginning in the middles of crop rows run up-and-down slopes. On all slopes the rows should follow the contours, but not cross them.

tion. The erosion of cultivated fields is taking place at such a rate that it is calling for a decided change in our system of soil management. If we are to maintain our acre-yields at a point where crops can be produced at a profit we must make every reasonable effort to reduce the amount of soil fertility that is carried off during heavy rains."

This process of land depreciation goes steadily on in nearly every agricultural county of the United



This one-time productive field has been permanently destroyed by erosion. More than 10,000,000 acres in the United States have been ruined by this untiring agency of soil wastage.

States. It is worse in rolling regions than on flat plains to be sure, and in some localities of peculiarly vulnerable soil conditions it despoils the land like an unharnessed demon.

Monuments to Wastage

N a single county of the Piedmont region 90,000 acres, as measured by an actual survey of the Department of Agriculture, were classed as rough gullied land. This was formerly cultivated; it is now utterly ruined, save for a few unimportant islands and peninsulas between hideous gullies. Bedrock is exposed in thousands of places. Centuries will be counted before arable soil again develops on most of this area.

Not far from this locality another county is the possessor of more than 60,000 acres of formerly rich land, which has been ruined in similar manner. Some of this has been so gullied that pine trees will not grow on it. At one place where a school house stood 40 years ago, one can look out over hundreds of acres hideously dissected with gullies, some of which are more than 200 feet deep.

The human tragedies these devastated areas could tell will be remembered only by the monuments of gullies and ravines left to mar the landscape.

Hundreds of counties in many parts of the country from the northernmost states to the Gulf of Mexico include small, large, and enormous areas of land made unfit or seriously impaired for farm use by this demoniacal Not less than 10,000,000 acres of formerly cultivated land have been permanently destroyed in this country by erosion. Several additional millions of acres of rich bottom land have been buried with inert sand and gravel or converted into overflow swamp by choking of stream channels with soil debris washed out of upland fields. Along one creek where observations were carefully made, rich alluvium has been buried during the past 15 years to a depth of 20 feet

with valueless sand assorted and deposited by rushing currents from soil material derived from tilled upland. In the lower Mississippi Valley some towns at which freight and passenger boats formerly called have not seen a boat for more than a generation, because the rivers have been choked with excessive sediments washed down following the clearing of timber from all kinds of uplands.

The Scourge of the Fields

Dut this more spectacular form of land despoiliation is the lesser evil. The real scourge of the land is that type of erosion which proceeds gradually and quietly but none the less destructively. Here is the spigot through which thousands of tons of fertility flow out as irreclaimable waste, lost forever to the fields whence it comes.

With our vast land resources, we have given little thought to soil con-We have been too busy servation. with other things. Of course, several millions of farmers have been thinking about it for many years. To them erosion has been a nightmare; a relentless enemy difficult to combat. With the overproduction of some agricultural products in recent years and the constantly recurring admonitions to eat more meat and to wear more and longer dresses of cotton, many will be inclined to feel perfectly at ease about the problem of soil wast-This point of view is preage. cisely like that held a few years ago by those who said our forests were inexhaustible. They were exceedingly wrong. At this time a shortage of lumber is not a matter of the future but is already with us. Our lumbermen are entering the forests of British Columbia and even Nicaragua, and wood supplies are coming to our ports from abroad.

The foresters of the country, however, are performing a very great service in their efforts to preserve timber on the watersheds of streams and to restore forests to waste areas. Re-

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The Country's Needs

Address of W. M. Jardine, Secretary of Agriculture, to the Country Life Conference

EDITOR'S NOTE—In an address made August 1 at East Lansing, Mich., before the Country Life Conference, Secretary of Agriculture Jardine talked understandingly of some of the broad changes that are occurring in rural life and told of some of the things that are needed to put rural districts culturally and economically on a level with urban communities. The following excerpts will show the trend of his thought.

N recent years not only has the per cent of rural population decreased, but the number of people actually living on farms fell from 32,000,000 in 1910 to fewer than 28,000,000 in 1927.

A certain part of this movement is due to the natural long-time adjustment which will always go on between industrial and agricultural activities and methods of earning a livelihood. It is a healthy movement. It need not operate to the disadvantage of agriculture.

So long as we have adequate production, our main interest is not in reducing numerically the movement from farms to cities. Rather, our problem is to keep on the farm those men and women who know rural life, who love it, and who can contribute substantially to its development.

Economic Reward

THE economic aspects of farming have been so thoroughly and sincerely studied that from all our efforts must come some sound solution to the problem of making the economic reward of rural endeavor as great as that

of city endeavor. Indeed, progress is being made. We have come a long way since the worse depression of 1921. Essentially related to this improved economic situation is the growing tendency of farmers to handle their business in a cooperative way. Last year more than one-fifth of all agricultural products were marketed cooperatively. This, in itself, is a genuine sign of progress in rural life, for what the farmers accomplish through cooperation is a permanent contribution to better farm conditions. In order that cooperative action may gain in volume and effect, it is necessary that we train our rural population in its fundamental principles. Happily, this is being done to a large extent in our colleges and secondary I believe the instruction should be extended to our elementary schools. All this education and development will lead to a more stable and equitable farm income and at the same time will, by reason of its opportunities for leadership and service, stimulate men of ability and vision to remain in the country.

Obviously, however, many of those who leave the farms—and not a few of them are highly competent—are moving to town to give their children and themselves the benefits of the city's standard of living. What happens when a fairly well-to-do farmer moves to the city? He either sells his farm or places a tenant in charge. If the latter occurs, the farm must then support two families. The new man, as a general rule, has his fortune to make out of the soil. The prosperous farmer takes to the city with him his

years of experience and education in business-like farming, his wealth which was produced on the land, and his desire to live a more comfortable life. The rural neighborhood, school, club, church, and local government lose a substantial supporter. Even if he retains ownership of the farm, his income from the land is usually spent in the city. Should he sell the farm outright, that wealth goes to build up the city and its business. By remaining on the farm, the fairly well-to-do man could do much to raise the standard of living in his community. In moving to the city, he enters an entirely new environment with a good chance of being a misfit in the new surroundings.

Happiness at Home

ONLY a month ago I visited several farms in Kansas. For thirty years Mr. Taylor and his family have lived on a 160-acre piece of land in the central part of the State. Taylor himself has retired; but he continues to live on the farm; his sons are in

charge of the actual operation. farm home has a small, but good library. There are a fireplace, a radio, and a piano. Shrubs and trees shade and beautify the home. The house, pump house, and barn are equipped with electricity. There is running water in the house. Mr. Taylor has even laid out a nine-hole golf course on a hilly section of his land; that particular piece of land is grazed by sheep. All that Mr. Taylor and his family have was made from the land. That wealth has been invested right at home. His family is benefited. entire community is benefited.

Just across the road is another farm. Its soil is as rich and as productive as Mr. Taylor's farm. Ten years ago its owner felt that he had sufficient money to move to town. He placed a tenant in charge. Today the foundation on that farm is rotting. There are few trees and no shrubs. The land produces bountifully, but the income seeps to the city. Ten years ago the farm offered better living conditions (Turn to Page 54)

Good country churches can contribute greatly to a wholesome rural community life and thus make farm life more attractive. This is the Stidham Memorial Church at Taylor Station, Tippecanoe county, Indiana.

Storing for Profit

Here's a discussion of the pros and cons of the problem of holding crops for better prices

By ARTHUR P. CHEW

U. S. Department of Agriculture

CIENCE blows up many fallacies, but occasionally it con-firms some dearly cherished popular belief. Economists are now confirming the belief held by many farmers that there is money to be made in storing crops for better prices. Surplus commodities, when injudiciously flung into the market, force down prices lower than is necessary, and the opposite policy of wise storing has in it possibilities of profit. That is declared today by certain very competent economists, including men high in the councils of the United States Department of Agriculture.

Usually, however, a popular idea that gets the stamp of scientific approval undergoes some refinement and modification first. This question of storage and its economic consequences Farmers commonly is no exception. think they would be able to beat the grain market or the cotton market if only they did not have to sell their crops just when everybody is selling. Their idea is that prices are always lower at harvest time than they ought to be, because speculators take advantage of the farmer's need for cash to pay his bills. In that view there is a grain of truth and a bushel of error.

Collective Storage

WHEN the modern economist advises storing crops as a means of preventing price declines, he is not thinking of storage on individual farms or storage by individual producers. It is collective storage that he has in mind.

Moreover, he makes it plain that if

the storers are to get the benefit of their work, rather than nonstorers, or the general consuming public, the conditions of a complicated and exacting technique must be observed. Individual farmers storing their own crops, or even quite large groups storing products collectively, are more apt to lose than to gain, because outsiders take advantage of the temporary scarcity thus created and rush their supplies to market. When the storers want to sell their holdings, they find the demand satisfied and the price falling.

Mordecai Ezekiel, an economist in the Department of Agriculture, puts the matter this way: Storing surplus supplies will give increased returns to farmers under certain conditions; but all the gains of the storing operation will go to farmers who take no part in it unless the cost of storing is spread over a very large proportion of the producers.

That is a little different, is it not, from the notion that there is a sure profit to be made by any farmer who holds his crop until the bulk of the supply has passed into consumption? Many a farmer who thinks he is making a profit by holding back his crop ought to check his optimism by close figuring on interest charges, insurance, storage costs, and shrinkage. It is a mistake to suppose that there is always a substantial rise of prices after

If storing supplies is to raise prices, it must be done on a scale big enough to lessen materially the movement of supplies to market. More-

the marketing season is over.

over, the nonstorer, who takes the cream off a market as soon as it rises, must be dealt with. Otherwise, storing surpluses brings only disappointment and heart-burning. Storing for the benefit of those who neither fish nor cut bait is neither ethics, economics, nor good sense.

Mr. Ezekiel has worked out the results that might be expected from limited collective storing operations in the case of cotton. They show, with overwhelming logic, that all the gains would go to nonstorers and all the losses—and they would be heavy—to the storers.

How It Pans Out

HERE is about how it would pan out. You can estimate the probable effect of withdrawing a certain amount of cotton from the market from the relation that has existed previously between cotton supplies and cotton prices. There is a possible margin of error, because you cannot exactly foretell how a market will react to the knowledge that a certain amount of stored products is being deliberately withheld. But in a general way the storing of, say, 4,000,000 bales of cotton would probably have temporarily about the same effect on the price of cotton as if the total supply had been that much smaller.

Let us assume then, with Mr. Ezekiel, that a small group of farmers store 4,000,000 bales of the 1926 cotton crop. Let us assume further that the 1927 crop amounts to only 12,000,000 bales. The combination of circumstances, through its effect on prices, would make the two crops worth about \$200,000,000 more than they would otherwise be worth.

Hooray, you say! But stop a minute. Who is going to pocket the extra \$200,000,000? The fellows who make it available by withholding 4,000,000 bales from the market? Not at all. It would go entirely to the cotton growers who sold at the peak of the market, and they would be the nonstorers because the storers would be busy holding back their supplies so as to keep prices up.

The Storers' Loss

THAT would the storers get? Profit? No. They would pocket a thumping loss, estimated by Mr. Ezekiel at about \$20,000,000. This would be incurred from the fact that the extra 4,000,000 bales in the carryover at the end of the 1926-27 season would make cotton worth considerably less in 1927-28 than in 1926-27. Obviously, the depressing effect of the carry-over on the price for the 1927 crop would fall with disproportionate weight on the storers, because the non-storers would have disposed of all their 1926 production at the favorable price established for that crop at the storer's cost.

It is perfectly true that the storing operation would show a big profit for the cotton growers as a group. But the distribution of the profit would be inequitable. It would be necessary, says Mr. Ezekiel, for the storers to control at least 30 per cent of the crop, just to break even. They would not lose any money with 30 per cent of the crop in their control. But neither would they make any money. They would simply put about \$200,000,000 in the jeans of the non-storers.

If a group of farmers controlled half the crop, and stored 4,000,000 bales of it, its members would profit to the extent of \$70,000,000. But non-storers would profit to the extent of \$168,000,000. Storers could earn an extra profit of \$155,000,000 by storing 4,000,000 bales if they controlled three-quarters of the crop. Even then, however, they would be making a present of \$83,000,000 to non-storers.

As to the moral, you can take your pick of several. It may occur to you that storing in any case is not worth the trouble, since even a 100 per cent line-up of American cotton growers

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'An abundance of plant food makes plenty of wheat shocks and good returns for the grower.

WHEAT PROFITS

A discussion of what the present and future seasons promise in profit from winter wheat

By C. A. LECLAIR

St. Louis, Missouri

wheat that brings a dollar or less per bushel at the farm? This is what every intelligent winter wheat grower is asking himself right now and in the next breath he queries what are the chances of better prices prevailing in the years ahead. Or, shall he plan to continue growing his usual acreage of wheat or go more largely into raising other crops?

Perhaps winter wheat has been his major money crop for years. His father before him most likely depended upon it as an important source of income. To abandon or even curtail the culture of such an important crop requires more than snap judgment. It is advisable, therefore, to take the long view, weighing the history of wheat culture through years, and, so far as the signs reveal, conclude what the future holds.

Wheat, the staff of life, has been a crop of major importance ever since the dawn of civilization. It was one of the first crops introduced in America in colonial days and has held a place of major importance ever since. Because it is largely utilized for human consumption it has always been a cash crop. In frontier days the relative value of wheat as compared to any other crop of an equivalent bulk that could be grown and its constant demand made it the main contributing aid to a permanent settlement. Even today wheat is still one of the most important crops of the frontier settlers of our western plains area.

Pioneer Wheat Growers

THERE were good farmers and inefficient ones in colonial days just as at present. A consideration of the problems of the best wheat growers in those times will be perhaps the most enlightening. It happens that George Washington was one of early America's great agriculturists. His contributions to increasing efficiency in agriculture, although not generally heralded, rank relatively with his accomplishments as a patriot and statesman. Up to the birth of this country, the early colonists sowed and harvested their grain crops not very differently than in the time of Abel. However, on the extensive lands of the father of this country the beginnings of the science of agriculture began to be applied. It is related that George Washington, who grew in some years as many as 700 acres of wheat, had to learn by costly experience that early sowing of winter wheat was disastrous because of the ravishes of the Hessian fly which even at that time was a serious pest.

Likewise in those days there was little information available to direct the grower in the selection of varieties or strains of wheat which would yield best under his conditions. It was practically up to each individual farmer to make trials and tests of his own.

Again, contrary to what might be assumed, the maintenance of yields was a task for our earliest farmers from the outset. They were obliged

to combat erosion; and the fact that rotation of crops and the return of plant food to the soil by manuring was insufficient to the securing of continued big yields soon became apparent. It was in large measure the lack of means such as we have today to increase productiveness of the soil that contributed to the migration of the farmers beyond the coast to the central virgin prairies of the Missis-To be sure Benjamin Franklin had noted benefits from application of land plaster to grass lands and the notes of George Washington reveal that he made a special trip to Pennsylvania to observe results with this fertilizer but in general only a very few individuals even attempted conservation of the land's resources. Yields of wheat in colonial days averaged about the same as today, namely about 15 bushels to the acre. From 20 to 25 bushels to the acre of wheat was considered very good in those times.

Did farmers in those days make money growing wheat? Undoubtedly some did and others didn't. The cost of production per bushel in labor was tremendously greater than it is at present. Most of the wheat in Washington's time was sown by hand although there were in use then some very crude seeding machines. One of the first seeders was a sort of revolving cylinder or barrel with holes burned into it to permit the grain to drop out as it revolved behind the plow. A brush harrow following served to cover the seed.

Likewise the labor toll of harvesting and threshing wheat was vastly greater than today. The wheat was cut with a scythe or cradle and the bundles bound by hand. The threshing was usually done with a flail. An idea of the human labor put into the threshing of wheat in the late eighteenth century can be gained by considering that on one of George Washington's farms he planned and erected a structure with a threshing floor capable of affording room for 30



UNDERWOOD AND UNDERWOOD

A giant combine harvester drawn by a team of 27 mules and horses harvesting wheat.

hands to work conveniently. Some progress had been begun as early as 1780 in the invention of crude threshing machines but no machine of this kind was as yet really practical. Washington is said to have tried out one of these machines but its production was all out of proportion to the repairs required to operate the equipment.

Practically all of the wheat grown by the early colonists was consumed locally. The value, therefore, of the crop was not dependent upon the world production as is the case now.

A century later when Missouri, Iowa, and Illinois were being developed wheat culture occupied an even more prominent place in agriculture. As early as 1870 about 20 per cent of the crop was exported and the farm price that year was about 94 cents per bushel, with average yields about 13 bushels to the acre. The reaper and rather crude threshing machinery had begun to materially reduce the labor expenditure of producing the crop and farmers generally seemed to be doing well. However, the majority of them

were in debt by reason of the purchase and improvement of additional acreages to their holdings.

The Big Problem

HIS brings us to the present generation's experience in wheat growing and the story particularly of the last decade is fresh in our minds. Where do we go from here is the question of the moment. That with modern equipment farmers of the United States are capable of producing more than enough wheat for home consumption has been repeatedly demonstrated in late years. How much better than has been done in the way of production if the need arose and it paid to grow more wheat has as yet not been determined. We do know, however, that because of the nature of farming radical adjustments are rather difficult of abrupt accomplishment. However, an increase of 40 per cent in the production of wheat was accomplished in 1919 under special price and patriotic stimulus. It is reasonable to believe, therefore, that the feat could be repeated if it paid.

Since 1920 as everybody knows we have had a number of years when production of wheat has been somewhat in excess of domestic and foreign requirements. Such surplus crops depressed the price received by the producer in inverse ratio to the volume of the surplus. Under these conditions wheat growers particularly of the north and central west states have experienced some very lean years. They are consequently the ones most concerned about what the next and future crops will mean for them. Agricultural economists are not agreed as to how soon the requirements of our own and the world's growing population will take up the slack which naturally occurs in favorable growing seasons. However, the present annual increase in population of the United States is a not to be overlooked factor solving our surplus production problems. There has been an increase of consuming population of 13,000,-000 since 1920. This approximates about 2,000,000 more people each year that must be clothed and In other words we are needing about 8 per cent more wheat each year to take care of the constantly growing domestic requirements. crops are as subject as wheat to weather conditions and it is thus a physical impossibility to adjust acreage to anticipated production with any degree of accuracy. In fact the present average acreage of wheat now sown is likely at any time to produce a seriously short crop. There is nothing on the horizon to indicate that new empires may be discovered where wheat can be more economically grown than in the present producing areas. Neither are there indications that the acreage in states and nations now growing wheat will be materially enlarged prior to the time that increased consumption demands encouragement of this step. It appears, therefore, that American wheat growers have seen conditions as bad as they are likely to be and since there is a way to make dollar wheat growing pay, the

methods of those who are accomplishing this feat can well be more generally practiced.

Putting Profit in Wheat

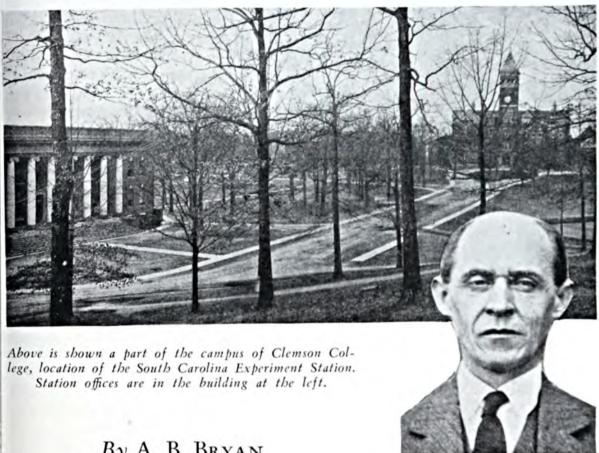
PROFIT in any business is determined by the difference between cost of production and the sale price of the commodity. To the extent, therefore, that production costs are reduced in growing wheat, is profit to the grower amplified. In what ways can wheat be produced more economically? Let us consider some of the major items of expense in its culture.

It is not likely that land rents or land taxes will ever be less than they are today in a growing country like ours, so no saving is likely here. By the use of better and more power machinery some reduction in the cost of preparing land for planting and harvesting is possible, but these possible reductions will be most likely offset by the need of larger investments in fertilizer and manure in the future. However, the relatively small increased acre cost of applying fertilizer more generously will be insignificant in contrast to the tremendous returns from the expenditure.

In bigger yields per acre and larger gross crops per farmer, which it is possible to obtain, primarily rest the immediate and future possibility for bigger profits in winter wheat grow-That this is so has already been proven. Farmers of the State of Ohio for example have increased the average yield of wheat from 12.2 bushels per acre which was the 10-year average yield for the decade ending in 1860 to an average of 17 bushels to the acre for the decade ending in 1920. To a wider use of commercial plant foods is this accomplishment largely credited by Professor C. G. Williams of the state agricultural experiment The same authority states that even greater returns will be secured by farmers of the Buckeye State

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SOUTH CAROLINA



By A. B. BRYAN

Editor, South Carolina Experiment Station

UCH water has gone under the bridge during the 40 years since the General Assembly of South Carolina, in December, 1886, passed "an act to establish the South Carolina Agricultural Farms and Stations" which provided for the establishment of two experimental farms to be known as "the South Carolina Experimental Stations, the object of which shall be to determine the capacity of new plants for acclimation, the manurial value of fertilizers and compost, testing the purity and vitality of seeds, examining weeds, grasses and other plants, investigating the growth, requirements and comparative value of different crops, studying the economical production of milk and butter, and conducting such other tests, investigations, and experiments as may bear upon questions con-

Director H. W. Barre.

nected with either the science or the practice of agriculture."

In July, 1887, the state board of education established, as required by the Act, one station in the Piedmont at Spartanburg, and one in the "lower tier of counties" at Darlington, and set aside \$10,000 from the privilege tax on fertilizers for the support of these farms.

That same year, 1887, the funds of the Hatch Act, for the support of experiment stations, became available from the United States Government and the General Assembly accepted the terms of the Hatch Act and vested its administration in the trustees of the University of South Carolina, with authority to establish an agricultural experiment station under the terms of the Hatch Act. The result was an organized research staff at the Univer-



Measuring twigs on a fertilizer experiment with peach trees.

sity of South Carolina in Columbia, and three farms, one each at Spartanburg, Darlington, and Columbia; the whole, supported by \$15,000 annually from the Hatch fund, plus \$5,000 from the State Department of Agriculture.

Birth of Agricultural College

M EANWHILE, Thomas G. Clemson, adopted son of South Carolina and son-in-law great South Carolina statesman, John C. Calhoun, had a dream. Mr. Clemson was for years a member, as Calhoun before him had been, of the Pendleton Farmers' Society, which lays good claim to being the oldest living farmers' society in the United States. Some of the leaders in the society, including Mr. Clemson, had discussed the need of a farmers' college, and when Mr. Clemson died in 1888 he willed to South Carolina, the Calhoun estate (previously purchased by him at public sale) to establish an agricultural and mechanical college. It is worthy of special note, in passing, that Clemson was the first man

to hold the office of "Superintendent of Agricultural Affairs" in the Federal Patent Office and that in urging in his report the creation of a separate bureau for agriculture he might properly be called the father of the U. S. Department of Agriculture.

Accepting the Clemson bequest in December, 1889, the South Carolina Legislature established Clemson Agricultural and Mechanical College and specified that the South Carolina Experiment Station supported by the Hatch fund be established at Fort Hill (now Clemson College) as a part of the new college to be built under the Clemson bequest.

After its establishment as a branch of Clemson Agricultural College, the South Carolina Experiment Station was supported entirely by the Hatch fund until 1920, when the state legislature granted a request for \$25,000 annually, which was increased in 1921 to \$50,000, and to which was added in 1923, \$25,00 for boll weevil control work. Of course, the Adams Act funds have been available from the Federal Government since 1906, and now further federal funds are available from the Purnell Act of 1926. The final result is sufficient funds to make possible a rather broad scope of research work for the benefit of South Carolina farmers.

Four Stations Serve State

Station is organized in accordance with the provisions of the General Assembly of the state and in line with the stations of other states. It is an integral department of the Clemson Agricultural College, its units being subject-matter divisions cooperating with one another, and the whole is in charge of a director of research,

who is responsible to the president and the board of trustees of the college. The division chiefs are of course specialists in their lines and are responsible to the director.

The work is conducted at four stations located on four important soil types of the state. The headquarters station is at Clemson College in the northwestern area and serves the Piedmont territory of hilly clay lands. The Pee Dee station, at Florence, is located on typical coastal plain loam soils of the eastern counties. The Coast station, at Summerville, is on flat cutover land representative of the tier of counties along the Atlantic coast. The Sand Hills station, near Columbia, is on a light sandy soil found in a strip of counties running through the middle of the state near the "fall line" that separates Piedmont from coastal plains territory. The Pee Dee station was established in 1912-13. The Coast station was established in 1907, though some experimental work had been conducted on temporarily available land at Charleston since 1901. The Sand Hills station was established in 1927, jointly with the U. S. Department of Agriculture, and will therefore probably become one of the largest and most important research points in the Southeast.

The Pee Dee station has been since its establishment in charge of R. E. Currin as superintendent; the Coast station is now in charge of E. D. Kyzer; and the Sand Hills station is in charge of J. A. Riley,—all well trained



A grape experiment.



Cotton breeding test.

and widely experienced agricultural workers.

Through the work at these four stations and through cooperative experiments on farms in various parts of the state, every important soil type and variety of climatic conditions is studied for the benefit of farmers and therefore the general public.

Directing Heads

HILE the Station was a unit of the University in Columbia, the president of the university, Dr. J. M. McBryde, was officially the director, with Milton Whitney as vice-director in active charge. For some years following its removal in 1891 to Clemson College, the president of the college was designated as director while the active responsibility was vested in Prof. J. F. Duggar, a vice-director. now of the Alabama station, was acting director in 1891. Then came that grand old man of Southern agriculture, Col. J. S. Newman, who was in charge from 1892 to 1894 and again from 1898 to 1905. From 1894 to 1897 W. L. McGee was agriculturist in charge, and in 1897 W. J. Quick was vice-director. From 1905 1916 inclusive J. N. Harper was Since April, 1917, Prof. director. H. W. Barre, who since 1907 has been chief of the division of botany and bacteriology, has been the director.

Much good work of a fundamental character was begun and forwarded under Col. Newman and Prof. Harper; but greatest progress and most valu-

able scientific and practical results have been accomplished in the last 10 years under the careful planning and able management of Director Barre. A South Carolinian, trained at Clemson College and the University of Nebraska, Prof. Barre has to his credit 20 years of fine service to his native state and to the cause of scientific agriculture and is now a recognized authority and power for progressive farming. Quiet persistence, rigid thoroughness, and a rare good judgment and common sense are qualities that have helped him to use his technical training and his administrative position to telling effect.

The scope of this story prevents going into detailed history of the accomplishments of the South Carolina Experiment Station towards solving with science the problems of the art of farming, but below are given a few outstanding results and a brief statement of important problems solved or being solved through the patient and unsung labors of the staff of station workers.

Finding Fertilizer Facts

oU saved me \$500 on fertilizers this year," said one farmer recently to Director Barre. The correct use of recommended formulas and materials explains this saving, and the case is illustrative of one of the most valuable lines of research conducted, for South Carolina farmers spend \$25,000,000 or more for fertilizers each year. Ten or more important soil types and a great variety of crops each requiring its own fertilizer diet make the matter of kinds, amounts and methods of application of plant food a very important one.

Cotton has been King in Carolina for many decades, but even before Billy Boll Weevil, "the billion dollar bandit," appeared on the scene 10 years ago, there were other enemies that dealt King Cotton some severe blows; and these enemies the research army of the Experiment Station was constantly and successfully attack-

ing.

A dozen years ago anthracnose, or boll rot, was a source of great loss in cotton fields of South Carolina,-millions of dollars annually, some fields suffering 40 to 50 per cent. Professor Barre, then chief of the division of botany and plant pathology, attacked this enemy from various angles, found that the fungus is transmitted in the seed, and worked out methods whereby through seed selection, fall plowing, rotation, and seed treatment the disease practically disappeared. farmers of South Carolina and of other states were saved from immense annual losses.

Likewise with angular leaf spot, a widespread and wasteful bacterial disease, prevention and control measures were worked out by Rolfs and Faulwetter; and with cotton wilt, a destructive cotton disease, the remedy in this case being a new variety—Dixie Triumph (developed in cooperation with the Bureau of Plant Industry, by L. O. Watson) the wilt-resistant power of which makes it possible to grow cotton on thousands of acres of excellent loam lands otherwise lost to cotton production.

Whipping the Weevil

BY 1921-1922 cotton farmers of the Southeast were worried sick over the boll weevil, which took such heavy toll from cotton fields that farmers were playing a losing game. Attempts to fight the weevil directly by poisons had not been sufficient to bring back profits, and under leadership of Director Barre and President W. M. Riggs a legislative appropriation was secured and in cooperation with the U. S. Department of Agriculture the Boll Weevil Control Laboratory was organized as a separate unit to serve not only South Carolina but the southeastern states, as the Delta Boll Weevil Laboratory serves the Gulf states.

"Cotton production under boll weevil conditions" was the basis of (Turn to Page 56)



City Farmers

Walter J. Toussaint and some of his boy pupils at work in the fine school garden at a New York Public School where children are taught practically everything there is to learn about growing flowers, garden truck, and field crops. It is all done in little patches. But one stalk of corn is enough to demonstrate to a youngster how corn grows.

These city school boys are not growing up to be truck gardeners. Some of them may be farmers. Some may be bank presidents, railroad executives, etc., with country estates where they can use their knowledge of plant life and soil.

The course also serves to teach botany in a very practical way. Toussaint has been in charge of the garden and the gardening classes for the last twelve years. He is an enthusiast, and his enthusiasm, plus unusual personal popularity, counts for much in the success of his work.

PHOTOS BY EWING GALLOWAY





The three rows of cabbage on the left received an application of 4-8-6 fertilizer at the rate of 500 pounds per acre. The balance of the field had previous heavy applications of manure.

Productive Swamps

By G. E. LANGDON

Wisconsin College of Agriculture

EGLECTED swampy acres can be made as productive as upland soil, in most cases, if the farmer treats them with potash after supplying the proper drainage. The choice of the best crops for such land should be carefully considered.

"While part of our marsh land should not be developed under present conditions, there are, nevertheless, hundreds of thousands of acres which can easily be made into productive land," declared A. R. Albert, soil expert at the Wisconsin College of Agriculture. "This is true especially in the case of marshes forming a part of farms, the upland of which is already developed. In thousands of cases the development of the marshes will greatly improve the farm as a whole."

Where marsh soils are favorably located, they are well adapted to truck farming either as the main business or as a side line, but the farmer must study his crops and be prepared to invest in potash to succeed well.

Where wet acres form a part of upland farms, crops will be found which will supplement those grown on the upland part of the farm. The crops on the marsh for the most part should be produced by the help of commercial fertilizers, and manure should be used on the uplands.

What Crops?

W HAT can be grown on reclaimed marsh land is a question that the farmer must consider with care. Soil experts at Wisconsin have found that well drained marsh-border soils, mucks, and well drained and fairly well decomposed peats are adapted to a large variety of crops, although when marsh land is first placed under cultivation the number of crops that can be grown successfully is limited, especially if the soil is tough peat.

Soybeans, buckwheat, flax, timothy and alsike clover are commonly the best first crops, although on mucks and well decomposed peats in southern Wisconsin, corn is very frequently

planted as the first crop.

Corn and soybeans can be grown together for silage purposes, thus increasing the value of the feed. A light application of manure combined with a liberal dressing of phosphorus and potash fertilizers should be used to grow the best possible crop of corn on peat soils.

Rve will also do well and is frequently used as a nurse crop for grass and clover seeding.

In experimental work with rye, oats, clover, and corn at the Coddington, Wisconsin, marsh, it was found that 150 pounds of muriate of potash applied once in four years give about the same gross yields as are secured on plots receiving eight tons of manure. The addition of rock phosphate to the potash treatment has so far produced little increase. The total amount of phosphorus in this soil, however, is low, and it is only a question of time before phosphates will be needed as well as potash. When upland soils as well as peat are included in the farm, manure should be used on them

and potash purchased for the peat, which does not need the nitrogen furnished by the ma-

In this experimental work the rate of application of potash was undoubtedly too small permit maximum vields, since the amount applied did not equal the amount of potash removed by the crops grown. Taking the increases in the yields of these crops above those on plots not receiving treatment, and estimating costs, the increases due to 150 pounds of muriate of potash costing \$3.75 would be

worth \$27.69. This makes the use of potash fertilizer on such soils very profitable.

Truck crops such as cabbage, onions and celery as well as potatoes and sugar beets may often be grown successfully on salvaged marsh soil.

Potash for Peat

ARGE applications of potash to A peat soils planted in potatoes produced striking results at Coddington, Wisconsin, during 1926. Four hundred pounds of muriate of potash produced 312 bushels of Early Ohio potatoes per acre when half of the fertilizer was broadcast and half used in the rows. Before this time the average production was 150 bushels per acre for three years. When all of the fertilizer was broadcast, 400 pounds of muriate of potash produced a yield of 250 bushels per acre.

Potatoes need potash, according to C. J. Chapman of the Soils department, because the root system of potatoes is not very extensive and in order to make a vigorous growth there must be an abundance of plant food within the root feeding radius. The soil, of course, must be kept loose and friable,



A marked improvement in the third crop of rye on peat soil was still apparent from using 150 pounds of potash and 400 pounds of acid phosphate per acre, at Coddington, Wisconsin.

which necessitates thorough cultivation. Potatoes are heavy feeders on potash. A poor vine growth is frequently due to lack of nitrogen, other conditions being favorable, although the lack of potash manifests itself in a dark and rather crinkled condition of the foliage, and in later stages of growth, a bronzing of the leaves. Plenty of available potash results in a light-colored, thrifty, luxuriant growth.

Cabbage "heads" better if it has plenty of potash, although it also needs nitrogen. Unusually heavy yields of this crop have been secured in marsh land in Dane county, Wisconsin.

Onions can be successfully grown on muck soils providing the plant food content of the soil is maintained through the use of proper fertilizer and also that insect and disease pests are controlled. The advantage of using commercial fertilizer for onions is at once apparent since it is weed-free and easily distributed.

Soils experts at Wisconsin say that the kind and amount of fertilizer to use for onions will depend on the state

of fertility of the land which is being used. In general the black sands and mucks are quite deficient in Furtherpotash. more, onions, as well as other bulb and root crops, are naturally heavy feeders on potash, and for this reason fertilizer mixtures should contain relatively large amounts of potash. For peats and mucks the fertilizer should contain phosphoric acid and potash in a ratio of 1 to 1, or even 1 to 2, such as 0-12-12 or



Muriate of potash helped make this excellent crop of sweet clover on a marsh.

0-10-20. It may be advisable to use a small amount of nitrogen as well.

Sugar beets have been grown successfully on thoroughly drained mucks and on the well decomposed peats of southwestern Wisconsin.

"Where the sugar beet crop is grown on the muck or peat soils, it is necessary, of course, to use a fertilizer very high in its content of potash," explains A. R. Whitson of the Soils department. The ratio of phosphoric acid and potash should be 1 to 1 or 1 to 2, such as 0-12-12 or 0-10-20. It will be necessary to use larger amounts of commercial fertilizer, from 400 to 800 pounds of mixtures mentioned, on the peat or muck soils unless the soil has been manured or fertilized heavily for previous crops and is still high in its residual content of plant food. Where large amounts of fertilizer are applied on peat or muck soils, it should be applied broadcast and worked in deeply previous to seeding. In addition to the broadcast application, a small application of fertilizer containing some nitrogen applied with the fertilizer beet drill will be found desirable, since it will start the beets with

> a vigorous growth and will get the crop ahead of the weeds.

Marsh soils in general are not very well adapted to alfalfa unless they are well drained. Experiments indicate that alfalfa can be on well grown drained marshes, where the free water in the soil seldom gets higher than two feet below the surface. To insure best results under favorable drainage condition thorough fertilization and (Turn to Page 50)

"A Broad Agricultural Field is Open to Chemists"—Dr. BROWNE



Dr. C. A. Browne, Acting Chief of the Bureau of Chemistry and Soils.

GRICULTURE depends on the chemist for solution of some of its most difficult Many of these problems problems. were pointed out and discussed by Dr. C. A. Browne, recently appointed Acting Chief of the Bureau of Chemistry and Soils of the U.S. Department of Agriculture, in a talk to students of Columbia University. He said that the utilization of unmarketable and surplus products for new industrial uses is one of the most important of these problems and added that chemical utilization of plant and animal products is only in its infancy. At the same time he called attention to many new products and processes developed in recent years.

He spoke of present-day chemical utilization of the corn crop in the

manufacture of starch, dextrin, glucose, sirup, dextrose, gluten, oil and many other things. One of the greatest accomplishments of the chemist in this field, he said, was the utilization of cottonseed oil as human food and in industrial processes. Dr. Browne believes that the results with these two crops are an indication of what we may expect in the handling of other crops in the future.

Products Demand Attention

MONG the products whose manufacture demands much attention from the chemist are sugar, sirup, vinegar, butter, cheese, dried fruits, tobacco, leather, vegetables, oil, turpentine and many others.

(Turn to Page 50)



The crowd that came to study the plots in 1927.

Making Poor Land Pay

Solving problems of soil reclamation and fertility by experiments and demonstrations

By A. A. BURGER

Cedar Falls, Iowa

TRAWBER-RY shortcake with plenty of good cream - all you want to eat! That in itself should be attractive enough to bring out any group of people. But this was only a halting point, so to speak, a part of a program for setting up a milestone at the end

of the year; taking stock, as it were, of what had been accomplished; celebrating over the results.

On June 10th, more than 350 people—commercial club members and farmers—were called together to enjoy this repast, which was held at Cedar Falls in Black Hawk county, Iowa. These people met to celebrate an event—a soils demonstration of far greater influence and magnitude than those who started it a few years ago ever dreamed it might become. It was put on by the commercial club in cooperation with the farm bureau and the people. Dealing, as it did,



A fertilizer plot.

with the problem of an abandoned soil, it was basic, touching the very fountain of prosperity for both the country and the town over a large area. This at once explains the interest in it.

The most important part of the celebration and field day was spent in the study

of an experimental demonstration. In addition to this field day thousands of visits to these experimental plots have been made during every season of the year except winter by farmers, city men, high school students, extension workers, county agricultural agents, and college students, many of whom drove in from miles around.

The importance of the results of this experiment is increasing with the years. In themselves the results are not new. But the plan of the demonstration well could be followed by those whose leaderships have taken them into the field of agricultural education. The experimental data should be of interest to those concerned with financial and social conditions, the results of crop and soils treatments, or, in general, the problems of soil reclamation and fertility.

Abandoned Land

MMEDIATELY following the world war, the attention of the people of this particular territory in Iowa was focused upon a strip of some 2,000 acres of abandoned land-land once productive. Improper farming had robbed and impoverished the soil and the people on it. What could be grown profitably there, nobody knew; but to find this out, money was appropriated, the free use of 10 acres of land was secured, and 15 or 20 different crops were put in. This soil was gravel and sand, underlain with gravel. Those who are familiar with soils know its peculiar limitations. Likely it was at one time the old channel of the Cedar River. Forty years ago it raised good crops of clover, corn, and wheat.

What happened here in the short space of one generation is what is happening in a good many localities —everything was sold off the land, nothing was put back. The inevitable result was that the unprofitable day of farming, the zero point, had come. A soils project to start here must start with zero. The problem was first, to find out what would grow; second, what would grow profitably, third. what treatments were necessary and finally the fourth, and most important, whether the necessary work and expense of soil treatment would produce final results that would be profitable enough to make farming profit-The experimenters were like mariners lost at sea without chart or compass. Time alone was with them.

On June 10, 1924, the work was launched. Business men were skeptical, farmers made fun of it, some folks thought it foolishly visionary. The first year things looked rather gloomy, but the committee in charge held. Some accounting to show cause for expenditure of funds was necessary, and so a public meeting was called for the last of July. The visitors saw that the vine crops-melons, cucumbers, etc.-were drying up. None of the regular crops of the section was succeeding, yet they were the regular crops that had always been depended on. Dalea, the new poor



An outstanding plot of the demonstration which finally convinced doubting neighbors.

land crop, was a fizzle. Cane and sudan did fairly well, responding best where manure or commercial fertilizer—a 3-12-4—was applied. Navy beans, soybeans and cowpeas did only fairly well, showing a pronounced effect when inoculated and responding to manure and commercial fertilizer.

But manure was the one product in which this entire section was lacking; there was no livestock, and manure had to be bought and hauled in for several miles. All this was a failure. It was very fine demonstration stuff for the Smith-Hughes students of the entire region, and for the agricultural students of the State Teachers college at Cedar Falls. It was a good lesson in the effects of land robbery.

Farmers from outside came in. Those near-by—well, nobody ever saw them in the plots. Strange, but they resented the state-wide advertising which their land got. They kicked, and knocked, but stayed conspicuously away. Others were attempting to show them how to farm! Yes, all of this business was a waste of time and money, high collared farming! These neighbors said so!

The second spring came. A part of the plots had been seeded to alfalfa, 15 to 18 pounds per acre, varieties of Turkestan or common western, Dakota No. 12, Cossack, and Grimm, seeded in strips four rods wide running east and west. Across these variety tests, running north and south, were

the different soil treatments, in strips two rods wide. Thus the plots, two rods by four, contained eight square rods, one-twentieth of an acre. Two and one-half feet alleys were left between the plots. Suggestions for the different treatments were received from Warner, Churchill, Hauser, and Hughes of Ames.

Good Results

I QUOTE from the notes in the record:

"Common western, winterkilled; Dakota No. 12, good; Cossack, better; Grimm, best—the best stand, seems most hardy."

Since the notes were made, similar tests throughout the country have given similar results and have increased the demand for the hardy strains of alfalfa.

"Plot (1), manure 8 tons, without limestone; plot (5), 400 pounds of acid phosphate, no limestone; plot (9), no treatment — all three plots complete failures. Lime is a basic essential. Plot (2), three tons lime, first cutting 2,300 pounds of alfalfa per acre; plot (3), lime 6 tons, 2,370 pounds; plot (4), 6 tons lime plus 8 tons manure, 2,560 pounds. Manure is beneficial.

"Plots 6, 7, and 8 each received 6 tons of limestone per acre. No. 6, with 400 pounds of acid phosphate, yielded 3,250 pounds; No. 7, with 8

(Turn to Page 53)



This fine field of corn followed alfalfa. Note the new barn in the background. This picture was made in 1927.



Specially designed potato digger equipped with an auxiliary engine, at work in the delta. This shows the digger without the sacking device.

Producing a Record Crop

By GUY A. PETERSON

Madison, Wisconsin

HEN the world's record crop of potatoes was harvested on Zuckerman Brothers' farm in the Sacramento valley of California last fall, it marked a new epoch in potato culture because most of the work connected with the production of this yield of 62,293 pounds of fine quality spuds from a single acre had been done by power machinery. This yield in terms of bushels is 1,038.2 or almost 10 times as much as was harvested from the average acre devoted to the production of potatoes in the United States.

The potatoes were grown on the famous Henning tract in the Stockton Delta. It is the second world's record to be shattered in this region, for in 1924 F. H. Rindge, operating a delta tract not far from the Zuckerman ranch, grew 57,752 pounds or 962 bushels from one acre.

That the Zuckerman record is not a mere stroke of fortune is demonstrated by the fact that 6,624.5 sacks weighing 798,443 pounds were dug from a measured tract of 13.7 acres. This is an average of 972 bushels an acre or 10 bushels more than Rindge's world's record of three years ago. J. E. Curry, state potato inspector of California, superintended the digging and certified the accuracy of the figures.

No one can tell to what lengths man will go in the task of producing the world's food, but certain it is that proponents of the Malthusian theory will have to admit that the possible day when the population will overtake the food supply must lie in a remote future when such yields can be secured by scientific application of the principles of soil fertility.

Record Increases

N 1916 the zenith of production was thought to have been reached when a Nevada grower dug 692 bushels of potatoes from an acre. A Maine gardener a few years later added more than five tons to this record yield by producing 866 bushels. He in turn was eclipsed by an English potato fancier who succeeded in cajoling 887

bushels from an equal area of land.

The three Zuckerman brothers Roscoe, Maurice, and Herbert are only getting started, for they feel certain that they will better their record as they learn more about the fertilizer characteristics of their soil and as new high producing strains of potatoes are developed. The average production for their 1,700 acres in potatoes last year was nearly 600 bushels an acre, making a grand total of more than a million bushels, nearly all of which were classified as U. S. No. 1 or better. Many of them went to feed the boys in our navy for the Zuckermans have a contract with Uncle Sam that calls for more high quality potatoes than many individual counties in this country produce.

Zuckerman Brothers own and operate 2,700 acres in this single tract. They had 1,000 acres in onions, beans, alfalfa, and sweet corn last year. More than 300 cars of onions alone were harvested.

Fertilizer Tests

Agriculture of the University of California, a series of fertilizer experiments are being made which, when completed, should be of great value to potato growers on muck and peat soils. We asked Herbert Zuckerman to give us the results of the study to date but he does not think it advisable to have these results published until more definite figures can be secured.

In general, fertilizers carrying high potash and phosphate percentages are proving most profitable as these peat soils contain large quantities of nitrogen but are exceptionally low in potash

F. H. Rindge used a ton of 0-21-21 fertilizer on his acre when he made the 962 bushel record in 1924 and the Zuckermans used a correspondingly large amount. The 13.7 acre plot that included their record acre was all in the experiment, so various amounts of different kinds of fertilizer were applied. The record acre received an application of one ton of an 0-23-24 mixture. It may be several years before the Zuckermans are sure enough of their findings to make the results of these trials public.

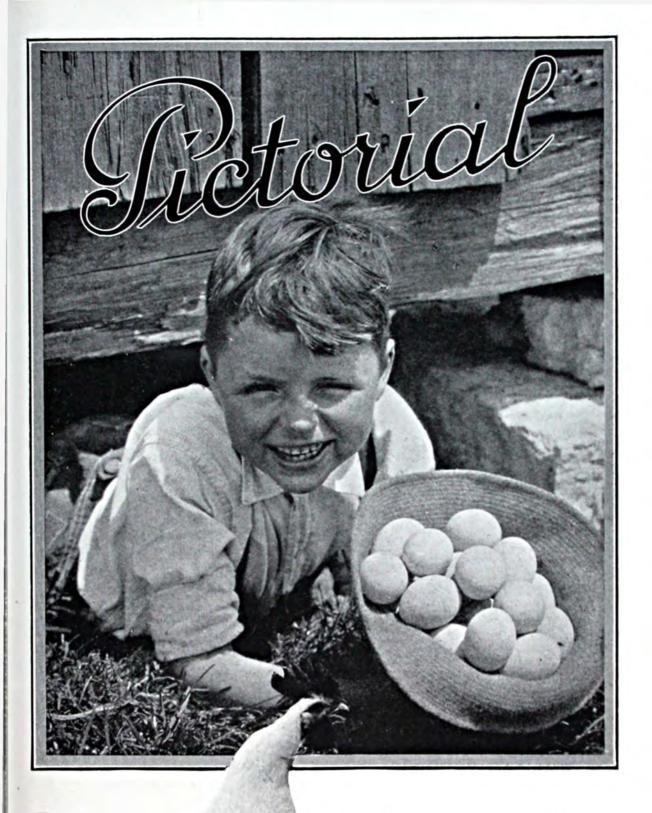
Herbert Zuckerman told us that they will spare no expense to find the most economical fertilizer practices for their type of soil, but he confesses to the gigantic task that lies ahead of them before this problem is solved. He criticizes the chemical approach to the science of soils fertility that is now used by many soil specialists on the grounds that it is inadequate. To quote him verbatim:

"Until we know what is going on in the plant and learn the place bacteria and catalytic agents play in the soil we cannot hope to solve the fertilizer problem from the purely business standpoint of getting the most economical returns from an applica-

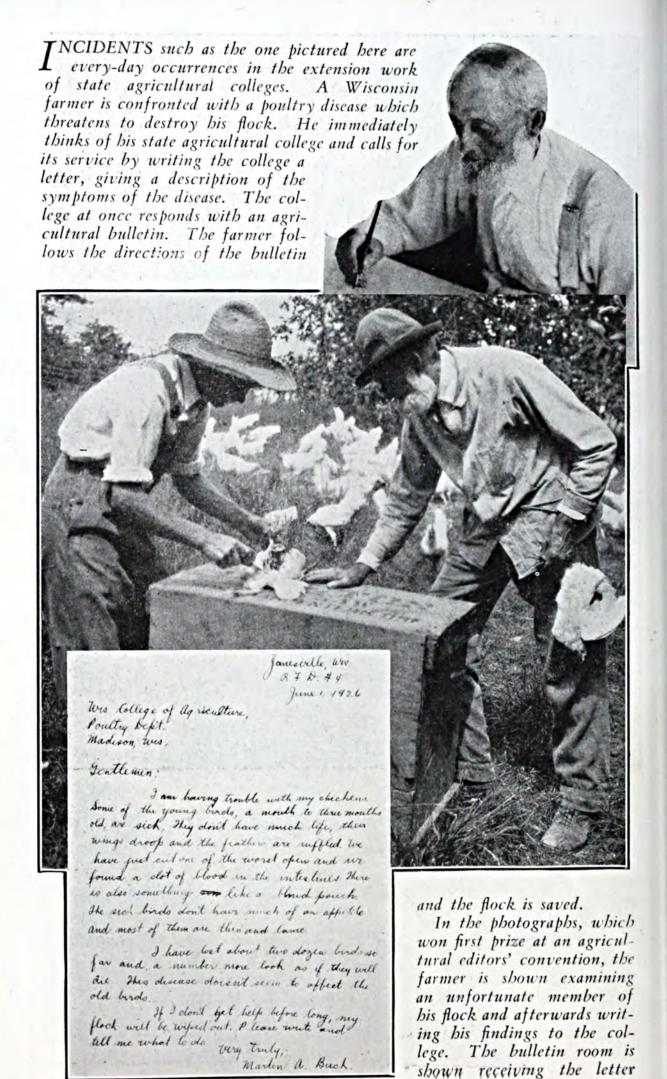
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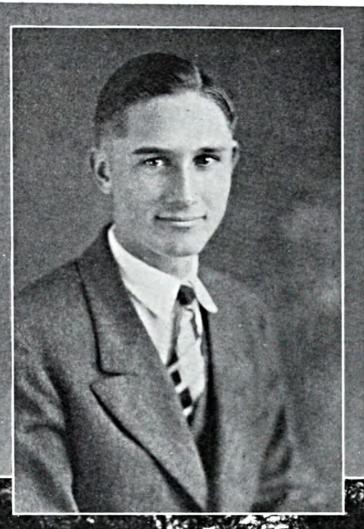
World's champion yield of potatoes sacked and ready for the washing machines,



THIS youngster's broad smile and the contents of his hat give the rooster plenty to crow about. However, egg production is withal a serious business. Some of the things back of a hat full of eggs, a boy's smile and a rooster's crow are shown on the following two pages.

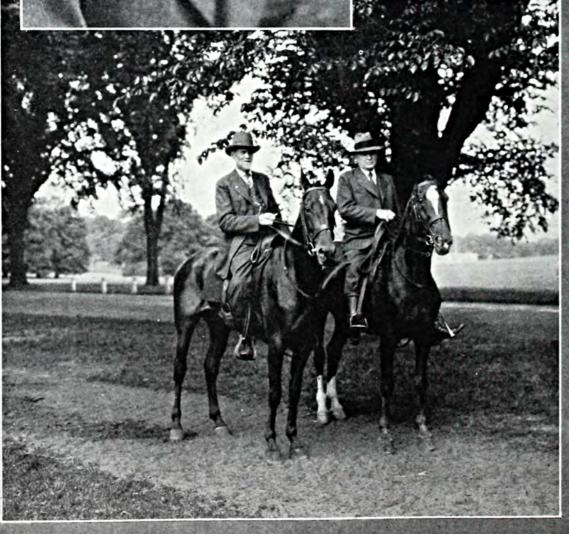






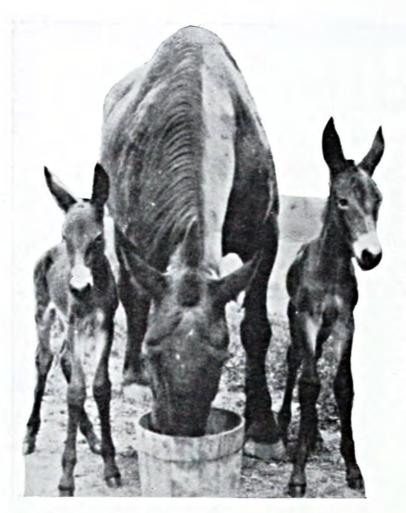
Left: Olin Butler, president of the Oakland 4H Club Federation, selected as one of the nine boys and girls to represent the state at the National Club Camp at Washington, D. C. He was president of the club that won the state championship in 1925-26.

Below: R. W. Dunlap, Assistant Secretary of Agriculture, and his father, a large landowner and farmer of Ohio. The elder although 84, is still very active and a good horseman. The photo was made near the Department of Agriculture in Washington.





Right: An Indiana farm boy and bis pet.



Introducing one of the few and possibly the only pair of twin mules in the United States, owned by Clarence Campbell, a farmer residing near Washington Court House, Obio. Twin mules are as rare as the proverbial "blue moon" and the owner has about decided to name one of them "Blue" and the other "Moon." The frisky little bybrids are normal, although one is much smaller than the other. They are pictured with their proud mother.



A scene in the sunny South of Spain where the most hygienic and efficient method of selling milk seems to be direct from goat to customer. Each goat knows its list of customers and it stops in front of their houses while the buyer comes out and takes its daily quantity of milk.

The Editors Talk

A Tribute to Science

ARE sadly deficient in accurate scientific knowledge and this paper is a plea for an awakening in this respect. Fortunately for our own little circle of activity, we have evolved a method of production which is phenomenal in comparison with others in the same district and also when compared with the average of individual results in other parts of the United States or the world. But we have seen enough of the possibilities of the future to make us think that our present best performance without scientific measurement will be considered very poor when true science comes to aid us."

This statement by R. C. and H. G. Zuckerman, Stockton, California, before a recent meeting of the Potato Association of America opens a whole new field of speculation as to just what science can do for agriculture. Accorded fame as growers of the world's record yield of potatoes, 1,038 bushels on one acre of land, these two farmers still maintain that they are sadly in

need of scientific knowledge.

What an argument for the county agent who is looking for a renewal of his contract! What good reasoning to present to a

county board contemplating hiring an agricultural agent!

In this issue we are running a story about the farming activities of the Zuckerman Brothers, extraordinary farmers because they constantly carry with them a vision of what might be achieved in the way of crop production once science unlocks more of the

secrets of plant growth.

These two men not only use all of the present available scientific knowledge practicable to their conditions, but they, themselves, are thinkers. They attended the recent International Congress of Soil Science held in Washington and intelligently discussed, with the leading soil scientists of the world, scientific problems of mutual interest. The scientists listened to these men who see possibilities of increasing in almost unbelievable measure the present average production of some of the staple crops, and also increasing profit in the marketing of these crops.

This tribute to science by men who, because of their achievement, have every right to a feeling of self reliance and independent endeavor, merits the attention of the whole agricultural industry. We need more expressions of this kind to stimulate and encourage the tedious and often criticized work of the agri-

cultural research worker.

Better Agricultural Fairs

HERE is a justifiable pride in accomplishment. Whether that pride reaps the attention of onlookers depends largely upon the way in which the doer makes known his achievement. Little sympathy is accorded the man who ballyhoos his

accomplishment. The world is full of "show-mes."

With this in mind the editors wish to endorse the efforts of fair managers, county agents, enterprising farmers, and others who are constantly working for more interesting county and state fairs—the "show-yous" of better agriculture and better rural living. We want to doff our hats to the executives who are excluding from their expositions the fakirs and cheap amusements which detract from an appreciation of work well done. Especially do we want to commend the managers of county and district fairs in a mid-western state who recently met in an exposition clinic to learn what, if anything, is wrong with the present day agricultural fair. They diagnosed its ills, actual or imagined, and then went back home to put into practice some of their findings.

This particular state's leadership in agricultural fairs, both county and district, is by no means an accident. Believing that these expositions serve a big purpose in developing the agriculture of the commonwealth, the legislative body of this state annually furnishes around \$300,000 as state aid to the county-

wide demonstrations and displays.

A leader in the movement for improvement of the classification of agricultural displays in that state firmly believes that the county fair should furnish common ground on which leaders of agriculture, industry, commerce, and education may meet for the purpose of doing those things that will result in better farms, better business — in short a better county.

He is convinced that from the view-point of the visitor, such fairs have a distinct function in that they should educate, inspire, entertain, and amuse. Each year a county fair should register a

clearly defined milestone in county projects.

"In its colorful presentation and exhibit, demonstration and wholesome amusement, the county fair has made a distinct contribution to the cause of better farming," said another fair commissioner. "Its future will depend largely on whether or not the fair secretary definitely plans that his institution shall be a leader in the progress of his community."

A great many of our readers are already actively planning their exhibits for local or state fair this fall. More should become interested. There is a justifiable pride in accomplishment. Put a show case on some of the splendid work which you are doing.

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It will sell your efforts and better agriculture as well as any other one thing.

Give Russia Credit

CCORDING to the authority of Dr. C. F. Marbut of the United States Department of Agriculture, Russian scientists have developed "the first and only comprehensive theory of soil genesis, aside from that of the genesis of soil material, that has yet been worked out." Thus has Russia contributed to the solution of some of the problems pertaining to the soil.

There are two chief reasons for this:

1st — The tremendous geographic extent of Russia which stretches over a large part of the greatest continuous land area of the globe, and

2nd — The presence in that country of the great belt of strikingly characteristic black soils.

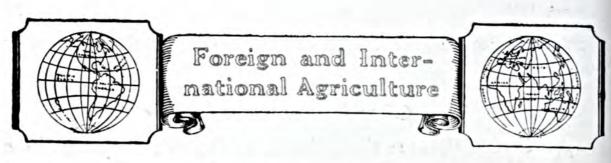
The Russians are able to study the characteristics of soils within their own country in regions of widely different climatic, geologic, topographic, and biologic conditions. The opportunity provided by these widely varying natural conditions has been a great stimulus to soil investigations in that country.

Only in the United States is this natural variety of conditions duplicated to anything like the same extent.

Therefore, as pointed out by Dr. Marbut, the fact that the soils of our country are so much like those found in Russia makes the results of Russian soil investigation particularly interesting to American investigators.

The land area of the greatest interest to Russians is the belt of black soils, or in Russian, "Tschernosem." This interest has been aroused because of the great agricultural importance of this black soil, its large area and the conditions under which it occurs. All sorts of travelers and scientific people have endeavored at various times to answer questions regarding the origin of this typical black soil, why it is confined to a particular region, and how the great amount of organic matter in the soil originated.

Therefore, while we have always looked to Germany, England, and France for new ideas and a stimulus of thought regarding soils, we must now add to our list the contributions of the soil scientists of Russia, and particularly should we follow the work of the Dean of all Russian soil scientists, Professor Dr. K. D. Glinka, Director of the Agricultural Institute, Leningrad.





Branches that bore the previous year are pruned leaving only one branch which is cut short.

The Cultivation of Grapes in Champagne, France

RAPE culture is followed in some sections of France with a diligent care that is akin to love, especially is this true in the western part of the province of Champagne. The work is often done by peasant proprietors who have a proud attachment to their vineyards that lasts from father to son, sometimes for centuries. While the eastern part of the province is very dry and poor and grows hardly enough grass to raise a few sheep, the western part is one of the richest sections of France. It is constituted by the lower valley of the river Marne. To the north and the south of the river are gentle slopes. The crests of

the hills are covered with woods while the properly exposed slopes are planted in vines

The centers of the vine-growing sections and of the Champagne wine industry are the towns of Rheims and Epernay. The value of the land planted in vines is very high, probably higher than any other agricultural land in France. Last year, the average value of an acre of vines near Epernay was about Frs. 40,000, or nearly \$2,000 at the present rate of exchange, representing \$8,000 at the pre-war value of the franc. The cost of cultivating an acre of vines is about Frs. 6,000 or \$250 at the present value of



Pruning is followed by digging in; each vine plant is buried, only the shortened branch left by the pruner is allowed to emerge from the soil.

the franc, (\$1,200 at the pre-war value of the franc).

The amount of labor invested in the cultivation of an acre of vines in that section is very high, only it is more than mere work, it is a labor of love. The slightest change in the cultural

methods would alter the quality of the wine and the growers, anxious to live up to the reputation of the wine they produce, will do anything and go to any expense to maintain quality.

A few years are required to prepare the ground, plant the vines and bring



After digging in comes the placing of wooden props which serve as supports for the new shoots. The shoots are tied to the props with straw.



When grapes are ready to be picked men, women, and children join in the harvest.

these vines to the point where they will yield crops of the high quality necessary to make Champagne wine. If properly taken care of, the vines will live and bear for many years. It may be remarked that Champagne is one of the few sections of France where vines can be grafted on native stocks, giving a better quality of wine. In most sections, they have to be grafted on American stocks on account of phylloxera.

The work begins each winter with pruning the old wood to prepare the plant for new sprouts. Formerly, this work was done entirely by men, but since the war, pruning is very often taken care of by women laborers. Most of the branches that bore grapes the previous year are cut, one only is left and it is cut to three or four buds. Pruning is very important, because Champagne is at the northern limit of the region where grape production is possible, and in order to obtain grapes rich enough in sugar to be suitable for the manufacture of wine, only a very small number can be left on each vine. In spite of this precaution, there is hardly more than one crop in four or five years considered by the wine

growers as of very good quality.

The vines are heavily fertilized and given an unusually large dressing of potash. Pruning is followed by digging in; each vine plant is buried, only the shortened branch, which has been left by the pruner, being allowed to emerge from the soil. After digging in comes the placing of wooden props, which had been removed at the beginning of winter, and which serve as supports for the new shoots. As the vine grows, the surface of the soil is hoed over slightly, and the shoots are tied to the props with straw. Finally the shoots are cut to a height of about three feet.

Harvesting the crop is very hard work and requires much skill on the part of the harvesters, because only properly matured grapes can be picked. The grapes from one vine will be harvested in five, six, seven or eight times. Only the grapes are picked, because if the stems and wood of the bunch were pressed with the grapes, it would produce a very inferior quality wine.

The care devoted by the vine growers to their work and their financial expenses have been recognized by the

(Turn to Page 50)

By P. M. FARMER

Forest Soil Science

The recent Mississippi Valley flood, the worst in the history of the Father of Waters, has stimulated renewed interest in soil and forestry problems. Now comes Dr. Raphael Zon, head of the Lake States Forest Experiment Station at St. Paul, Minnesota, with the suggestion that we need a science of forest soils as a division of general soil science. Dr. Zon says: Our knowledge of both the influence of soils on different types of forest and the influence of different types of forest upon the soil is largely of an empirical nature. It is only by the development of a forest soil science that a truly scientific foundation for forest practice can be developed. conservation of the fertility of the soil is just as fundamentally important to forestry as it is to agriculture; nay, it is even more important in forestry than in agriculture. The agronomist has a great variety of artificial means for increasing the fertility of soils. He mechanically cultivates the soil; he increases its fertility by fertilizers or crop rotation; he protects it from drought by special methods of cultivation. The forester can not, as a general rule, resort to such artificial means of working his soil. For maintaining the soils fertility he is thrown back on the resources which nature provided. The forester must make the forest itself conserve not only the fertility of the soil but even improve it. He does it by maintaining a certain density of stems; by regulating the density of the crop; by creating an undergrowth; by controlling the composition and the form of the forest. The mechanical tilling of the soil he

assigns to the roots of the trees and the fauna of the soil. The fertilizing of the soil is assumed by the trees in the stand. . . . The relation between the forest and the soil is closer and deeper in forestry than in agriculture.

Radio in the Cow Barn

Despite a lot of talk about the beneficial effect of music on the productive capacity of the dairy cow, it has not been proved that musical instruments are necessary modern dairy equipment. But J. F. Couture, a dairyman of Marshall, Minnesota, has approached the problem from a different angle. He has installed a loud speaker in his dairy barn, the object being not contented cows but contented hired men. About milking time in the evening there are usually good programs coming in. Only once has the radio interfered with the business of milking. That was during the Dempsey-Tunney fight and the loud speaker in the barn was not working well. Mr. Couture and all the other milkers adjourned to the house where there was better equipment.

European Grapes in Carolina Sandhills

A successful new crop for the North Carolina sandhills region is European grapes. They have also been found to grow well in the same kind of soils in South Carolina. They are said by the horticultural specialist of North Carolina to do even better than these varieties do in California, which State now has a monopoly of this kind of grape growing in the United States. In this sandhill region the new grapes, both juice and table varieties, are not

only vigorous and productive, but are to a large extent free of disease and insects. Economic advantages here are cheap lands and nearness to big markets in the East and South.

Fitting Crops to Certain Soils

Recently the writer of this department read an editorial in a city newspaper to the effect that soil survey work was useless, that no farmer ever made any practical application of the information, and that very few other people paid any attention to it. Almost immediately thereafter there came to his notice a statement by the chief of the agronomy department of North Carolina State College in which he says that "nearly every agricultural soil type in North Carolina has characteristics or aspects certain which make it better suited to a certain crop or certain kinds of farming than to some other crops or types of farming. There is tobacco for instance, and red clover. We know that best results with tobacco are secured when a crop is grown on cer-Norfolk, Durham, Alamance, tain Granville, and Cecil soils. When the crop is put on other soils the quality is not so good and the tobacco does not grow so well. Red clover does best on the Davidson clay loam soil." This agronomist adds that a sound plan of promoting the growth of special crops may be worked out if such tacts are followed. He says this is especially true of alfalfa, red clover, or tobacco. When such information is available it is obvious that a knowledge of soil types is worth having.

The Smithy's Successor

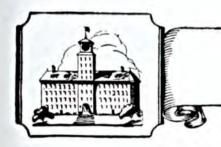
The chestnut tree is disappearing and so, it seems, is the smithy. In many sections farmers now find difficulty in getting their horses shod because the local blacksmith, his trade cut down by the revolution in the means of transportation, has turned his horny hand to other work. With

his automobile the farmer finds it convenient to take his repair work to the city, but distance is a barrier to the horse needing a new set of shoes. One of the best plans to solve the difficulty occasioned by the smithy's disappearance is one now in use in New York State. It consists simply in teaching farmers and their sons to do this important job themselves. Meetings are arranged by the county agents and an expert farrier in the employ of the College of Agriculture gives an illustrated lecture and puts on a demonstration. If there are horseshoers and blacksmiths in the community they are also invited to attend. Attention is given to the anatomy of the foot and leg, preparation of the foot for the shoe, and the actual shoeing.

Cream May Be Fat and Thin

Thick-headed persons will probably persist in the belief that the thickness of cream is an index of the percentage of butterfat it contains, while those with their fat properly placed will accept the conclusions of dairy specialists who now say that thick cream can be produced regardless of the amount of fat it contains. It is announced by the New York State Agricultural Experiment Station that the thickness can be regulated by controlling the clumping of the fat globules. However, the amount of fat, the age and temperature are also factors.

One way to influence the clumping of the globules is to hold the milk at a low temperature for several hours and then separate the cream at higher temperatures, but it is not thought the method will be of any commercial value in producing sweet cream. Pasteurizing, it is said, causes the clusters of fat globules to separate and causes the cream to appear thinner although it is just as rich in fat. Obviously it is not possible to judge the fat content of cream by its appearance.



REVIEWS



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

The Journal of the American Society of Agronomy for June, 1927, gives the papers on potash read before the last annual meeting of the American Society of Agronomy.

The first paper by J. N. Harper on the potash needs of the soil provinces shows in an interesting manner the soil types within the soil provinces that require potash. An interesting correlation of the principal soil types in the order of their needs for potash is given in a table. It is also pointed out that the soils of Eastern United States are poorer each year to the extent of 2,000,000 tons of available potash.

"Relative Crop Response to Potash" was discussed by Burt L. Hartwell. The paper is very interesting. It particularly points out among other things that a committee of New England agronomists has suggested that in fertilizers the proportions of the fertilizer ingredients be represented by certain given numbers, the sum of which shall be about 20 in each fertilizer, and that such an expression be known as a fertilizer ratio. The numbers recommended for potash were: very low, 2; low, 4; medium, 6; high, 8 and very high, 10, the point being that a wide range of percentages of potash should be available. the high potash-response crops cited by the author are tomatoes, mangels, buckwheat, corn, and onions. medium potash-response crops are barley, rutabagas, parsnips, potatoes, and cabbages. The low potash-response crops are oats, rye, wheat, millet, and

carrots.

Certainly a higher percentage and a wider range of potash is required in fertilizer recommendations made in many parts of the country.

A very interesting paper on "The Influence of Liming on the Availability of Soil Potash" by W. H. Mac-Intire, W. M. Shaw and K. B. Sanders should be studied in the Journal.

Professor Schuster discussed "Potash in Relation to Quality of Crop". He points out that potash is an important element in producing quality in potatoes, sugar crops, corn, wheat, tobacco, and sugar beets, but the evidence is not always clear as to just what form of potash produces the most desirable quality in every case. There is, therefore, need of well-defined investigations regarding the form of potash.

Every farmer in Missouri using fertilizers on his wheat or other crops should obtain Bulletin No. 251 published by the College of Agriculture on the fertilizers for soils in Missouri in 1926. We cannot repeat too often that it is always profitable to read carefully these reports and especially the simple instructions given on estimating fertilizer values.

Extension Bulletin No. 112, April, 1927, by the Connecticut Agricultural College Extension Service discusses the phosphorus problem on Connecticut soils. It shows that phosphorus is needed on many of the soils of the state, but that corn, grass, and hay crops when well manured, need only moderate amounts of phosphorus, also that such crops in a dairy sys-

tem have not seriously exhausted the phosphorus supply and that past heavy applications of phosphorus to older tobacco soils have resulted in a great accumulation of both total and available phosphorus. The figures are very striking. For instance, in new land the phosphorus content in pounds per acre is 1,528 lbs.; in land that has been 5 to 20 years in tobacco, 2,655 lbs.; but when 20 or more years in tobacco, the phosphorus content is 3,855 lbs. per acre.

"Potash in Relation to Quality of Crop," Reprinted from the Journal of the American Society of Agronomy, Vol. 19, No. 6, June, 1927, G. L. Schuster.

"Analyses of Commercial Fertilizers and Ground Bone; Analyses of Agricultural Lime, 1926." Agr. Exp. Sta., New Brunswick, N. J., Bul. 444, Dec. 1926.

"Fertilizer Statistics for Texas," Agr. Exp. Sta., College Station, Texas, Bul. 350, Apr.

1927, G. S. Fraps.

"Relation of the Potash Removed by Crops to the Active, Total, Acid-Soluble, and Acid-Insoluble Potash of the Soil," Agr. Exp. Sta., College Station, Texas, Bul. 355, May, 1927, G. S. Fraps.

Soils

"Aluminum Hydroxide in Alakaline Soils and its Effect upon Permeability," Agr. Exp. Station, Tucson, Ariz., Tech. Bul. 12, Dec. 1, 1926, W. T. McGeorge, J. F. Breazeale, and P. S. Burgess.

"Sodium Hydroxide Rather than Sodium Carbonate the Source of Alkalinity in Black Alkali Soils," Agr. Exp. Sta., Tucson, Ariz.. Tech. Bul. 13, Dec. 15, 1926, J. E. Breazeale and W. T. McGeorge.

"A Study of the Toxicity of Salines that Occur in Black Alkali Soils," Agr. Exp. Sta., Tucson, Ariz., Tech. Bul. 14, Feb. 1, 1927, J. F. Breazeale.

"Crotalaria as a Soil Builder," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 398, May, 1927, W. E. Stokes and U. A. Lenkel.

"Soils of Phillips County," Agr. Exp. Sta., Bozeman, Mont., Bul. 199, Dec. 1926, L. F.

Gieseker.

"The Recovery of Soil Nitrogen under Various Conditions as Measured by Lysimeters of Different Depths," Agr. Exp. Sta., Knoxville, Tenn., Bul. 138, June, 1927.

Crops

Fifteen crop bulletins have been received during the month. From California comes an excellent treatise on cauliflower production, Cir. 11, written by H. A. Jones and F. H. Ernst.

Cauliflower is not an easy crop to produce. Yet it is one of the most popular vegetables served in our American restaurants and homes. The bulletin points out that most of the cauliflower grown for shipment is produced in California, New York, Oregon, and Therefore, this well illus-Colorado. trated and well written circular should prove a valued addition to the working library of truck growers in these states.

Sweet potato growing, U. S. D. A. Farmers' Bul. 999, written by Fred E. Miller, is another contribution of the month to growers of quality vegetables. Put up in the characteristic and attractive style of Federal Government publications, this bulletin treats fully every phase of growing this crop, from a general discussion of its importance to problems of grading, marketing, and desirable varieties.

In particular regard to fertilization, the author states that every grower should make a study of his soil requirements and should apply those fertilizers that give the best results. the Northern commercial sections where the sweet potato is grown as a truck crop and has a comparatively brief growing season, the crop must mature in the shortest possible period. In these sections, a heavy application of a high grade fertilizer is practicable. A fertilizer analyzing 2 to 4 per cent of nitrogen, 8 per cent phosphoric acid, and an available 8 to 10 per cent potash should give good results. The author also gives his fertilizer recommendations for growing the crop on the sandy loam soil of the South.

"Poisonous Plants of Colorado," Exp. Sta., Fort Collins, Colo., Bul. 316, Mch. 1927, L. W. Burwell and Geo. H. Glover.

"Growing Annual Flowering Plants," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 399, June, 1927, W. L. Floyd.

"The Relation of Internal Cob Discoloration to Yield in Corn-Five Years' Results," Agr. Exp. Sta., College Park, Md., Bul. 290, Mch. 1927, R. A. Jeble, F. W. Oldenburg, and C. E. Temple.

Quarterly Bulletin, Agr. Exp. Sta., East Lansing, Mich., Vol. 9, No. 4, May, 1927. "Flax-Wheat Mixtures under Irrigation," Agr. Exp. Sta., Bozeman, Mont., Bul. 202,

Feb. 1927, Clyde McKee.

"Mazzard and Mahaleb Rootstocks for Cherries," Agr. Exp. Sta., Geneva, N. Y., Bul. 544, Mch. 1927, G. H. Howe.

"A Report on Investigations of Farm Problems," Agr. Exp. Sta., Stillwater, Okla.

"Legumes for Texas Beekeepers," Agr. Exp.

Sta., College Station, Texas, Cir. 46, May, 1927, H. B. Parks.

"Hybrid Vigor in Sorghum," Agr. Exp. Sta., College Station, Texas, Bul. 359, May, 1927, A. B. Conner and R. E. Karper.

"Maintaining Potato Yields by Hill Selection," Agr. Exp. Sta., Logan, Utah, Bul. 200, May, 1927, George Stewart and D. C. Tingey.

Department of Agriculture Immigration of Virginia, Richmond, Va., Bul. 235, July,

1927.

"Community Production of Acala Cotton in the Coachella Valley of California," U.S. D. A., Washington, D. C., Dept. Bul. 1467, Mch. 1927, H. G. McKeever.

American Potato Journal, Washington, D.

C., Vol. IV, No. 6, June, 1927.

Economics

"Maine Agriculture, A Statistical Presentation," Agr. Exp. Sta., Orono, Me., Bul. 338, Mch. 1927, Charles A. Merchant.

"An Economic Survey of the Apple Industry in Maine," Agr. Exp. Sta., Orono, Me., Bul. 339, Apr. 1927, Charles H. Merchant.

Farm Economics, Col. of Agr., Cornell Univ., Ithaca, N. Y., No. 45, June, 1927.

"Prices of Farm Products Received by Producers," U.S.D.A., Washington, D. C., Statistical Bul. 15, May, 1927, Prepared by Bu-reau of Agricultural Economics.

"Reliability and Adequacy of Farm-Price Data," U.S.D.A., Washington, D. C., Dept.

Bul. 1480, Mch. 1927.

Diseases

An important study on the "Mosaic of Raspberries" has just been published by the New York State Experiment Station, Geneva, N. Y., Bul. 553. W. Howard Rankin, the author, in the abstract of the bulletin states that mosaic is the limiting factor which has caused the general abandonment of red raspberry culture in New York. This is probably true in sections where the red raspberry used to play an important part in the large cash returns from bush fruits. Red raspberries are always in demand upon the market. Therefore, Mr. Rankin's work should be very valuable in throwing light on the situation.

Insects

"Control of Vegetable Pests," Ext. Ser., Storrs, Conn., Ext. Bul. 114, May, 1927, Albert E. Wilkinson.

"Codling Moth in the Grand Valley of Colorado, Exp. Sta., Fort Collins, Colo., Bul. 322, May, 1927, Geo M.. List and Wm. P. Yetter, Jr.

"Preparation of Bordeaux Mixture," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 400,

June, 1927, G. F. Weber.

"The Black Army Cutworm," Agr. Exp. Sta., Orono, Me., Bul. 340, May, 1927, C. R. Phipps.

"Montana Insect Pests for 1925 and 1926," Agr. Exp. Sta., Bozeman, Mont., Bul. 200,

Ja. 1927, R. A. Cooley.

"Physical Properties of Commercial Dusting and Spraying Materials," Agr. Exp. Sta., Geneva, N. Y., Tech. Bul. 125, Apr. 1927, Leon R. Streeter,

"The Peach Cottony Scale," Agr. Exp. Sta., Geneva, N. Y., Bul. 542, Mcb. 1927, S. W.

Harman.

"The Influence of Parentage, Nutrition, Temperature, and Crowding on Wing Production in Aphis Gossypii, Glover," Agr. Exp. Sta., College Station, Texas, Bul. 353, Apr. 1927, H. J. Reinhard.

"Studies on the Biology of the Pecan Nut Case Bearer," Agr. Exp. Sta., College Station, Texas, Bul. 347, Apr. 1927, S. W. Bilsing.

"Control and Spring Emergence of the Cotton Flea Hopper," Agr. Exp. Sta., College Station, Texas, Bul. 356, Apr. 1927, H. J. Reinhard.

"The Beet Leafhopper and Curly-Top Situation in Utah," Agr. Exp. Sta., Logan, Utah, Cir. 65, May, 1927, George F. Knowlton.

Poison Alfalfa Weevil

In several States of the Great Basin the alfalfa weevil has become a great factor in the production of this crop, sometimes getting half the first cutting and most of the second. It has gradually become more destructive since it was first discovered near Salt Lake City about twenty-five years Various control measures have been tried, including quarantines, foreign parasites, and more direct meth-The best method, says the U. S. Department of Agriculture, is to spray with calcium arsenate several days before the feeding of the larvae reaches its height. This requires experience and close watching of the field.

Cooperative Shipping

The Farm Bureau of Columbia County, Washington, helps its members to market livestock

By WAYNE BISHOP

Dayton, Washington

yip-yip of the disappearing cowboy, farmers of Columbia county, Washington, drive their four or five head of cattle up the loading chute to the stock car and then go home to dream of the check they will soon receive with the same margin of profit as if they had shipped a whole carload.

The time has passed in Columbia county when a farmer with a few head of hogs, cattle, or sheep had to drive them to the local butcher and take whatever was offered, or hold them until he could handle them, which was probably after the price had dropped a couple of cents. The time has also passed when one riding through the country could see it stocked with poor and worthless stock, which the local butcher could not handle.

By Telephone

When a farmer has stock to sell now, he telephones to the Farm Bureau secretary and tells him what he has. The secretary has also received similar information from other farmers, and when enough are listed to make up a carload or two, which is about every two weeks or oftener, he ships them out. All the farmer has to do is to bring his stock to the stock-yards at the time which the secretary has set for the shipment, and then come to the office the following week for his check, which has been sent there.

The county which has a popula-

tion of probably 600 farmers has shipped to the Portland market a surplus of 921 hogs, 181 calves, 239 heavy cattle, and 454 sheep, or 22 cars during the last 11 months.

Variety of Tasks

READING thus far, you probably wonder who is behind this work—who does the actual shipping and how is it accomplished? The service is furnished by the Columbia County Farm Bureau, a farmer's organization, whose creed, motto, and aim are SERVICE. The work is done by the Farm Bureau secretary, who, since there is no county agent in Columbia County, has a variety of tasks.

His first task, in getting up a shipment, is to sign up enough stock from the farmers to get up a good carload with good weight, in order to keep the expenses down, since the shipping expenses are prorated on the basis of the weight. At the same time he must be doubly careful not to sign up more than a car will hold, unless, of course he has enough for two. Planning a carload in which sheep, hogs, and cattle are shipped is probably the most difficult part of the job. Of course he must know the approximate weight of the stock sent and then proportion his load accordingly.

On the day he has set to ship, he must be at the stock-yards to receive and brand the stock, in order that the commission company selling the stock may know to whom to make out the checks. Cattle and hogs are usually branded by clipping a brand with mule clippers, a chart of brand-

ing marks being furnished by the commission company. Sheep are usually branded by a special paint which will not damage the wool. As stock is branded it is listed under the owner's name, in order that the identification record may be sent with the car.

Sheep, hogs, calves, and heavy cattle, when sent in the same car must be partitioned off from each other, so partitions of suitable strength must be constructed during the day. The last task is the loading, with which some of the farmers usually help the secretary.

One of the shippers, or some Farm Bureau member usually goes with the stock to Portland, his expenses being paid out of the shipping expenses prorated to members, unless two cars are sent, in which case the railway company furnishes his transportation.

The stock is sold by a commission company to which the car is sent. The company also prorates the expense which consists of selling commission, feed, freight, etc., among the members according to the weight of their stock; subtracts it from their gross sales; and sends the checks to the Farm Bureau. They are made out in the shippers' names and all the secretary has to do is to distribute them.

Several of the direct advantages derived from this cooperative shipping have already been mentioned, although there are indirect ones that are overlooked by many who can plainly see the others. For instance, local butchers are offering several dollars more per hundredweight for stock than they offered before the farmers started shipping. At that time the butchers could take what they wanted when they wanted it. Now they have to bid up to a reasonable price for material for the block, and the farmer can do just as he pleases about selling it at home or in the Portland market.

This changed condition has brought up the standard of livestock in the county in a similar way. Old and undesirable animals that the local butcher could not possibly use, are shipped to Portland where they sell as canners and cutters at fair prices which is just like finding that much money for the shipper. It is surprising to note the amount of this aged and scrubby stock that has been shipped out of the country.

A vast fund of information has been opened for the farmers through this channel. They are taking more interest in the type of stock that brings the highest price in the large markets, and are taking steps to produce that type. The \$35,000 or \$40,000 which cooperative shipping has brought the farmers directly, represents only a fraction of its value.

Wasted Milk

I N speaking before the Minnesota creamery operators and managers association recently, Dr. C. W. Larson, Chief of the Bureau of Dairy Industry of the Department of Agriculture, after commending the state for the great progress made in the manufacture of butter, called attention to the great waste of milk solids in butter producing sections. said, "It is a startling waste to use 25 per cent of the milk solids and disregard the other 75 per cent. the manufacture of butter there are more of the constituents of milk either wasted or not utilized than in the making of any other dairy prod-Of course, there are not now ways of using all of this in a better way than through the feeding of livestock, but before long it will be necessary to use much more of the solids and the skim-milk directly as feed or dispose of them to better advantage such as in the manufacture of greater quantities of skim-milk solids and buttermilk solids.

"A Broad Agricultural Field Is Open to Chemists"

(From Page 25)

"The reduction of enormous losses which occur each year from the spoilage of fruits, vegetables, foods, cattle feed, fabrics, timber and other products," said the Chief Chemist, "can be brought about to a large extent by the scientists assigned to this work."

He said that bacteria, molds, yeasts and fungi, enzymes and insects caused the American farmer a loss of several billions of dollars every year and that the chemist is the main reliance in controlling these loss producers. connection with these enemies of the producer he mentioned souring of milk, molding of bread, spoilage of canned goods, heating of cattle feeds, rotting of fruits, fermenting of sirups, and decay of timber. processes of deterioration, he said, are imperfectly understood and quently furnish a wealth of opportunity for the research man.

Soils and Fertilizers

R. BROWNE called attention to work that has been done in the study of the chemistry of soils and fertilizers and indicated that the population increases and the necessity for more intensive cultivation of the land call for greater attention to the chemistry of soils and fertilizer.

In showing the possibilities for utilizing farm wastes, Dr. Browne said that opportunities in this field are almost unlimited, for much remains to be done in chemical utilization of agricultural residues. Thousands of tons of straw, corn stalks and similar refuse are wastefully burned each year for the purpose of disposal. Destructive distillation of such refuse for the production of gas, carbon, pyroligneous acid, tar and other products opens up vast possibilities. Chemical utilization of the cellulose in agricultural wastes,

such as straw, is already carried out in certain paper mills. Conversion of the pentosans of such materials as corn cobs and oat hulls into the valuable chemical furfural is being performed on a small scale. The important lignin complex in waste wood, straw, corn stalks and similar agricultural refuse probably offers as many methods of utilization for the manufacture of tanning materials, dye-stuffs, and other industrial products as was offered 80 years ago by that other trade wastecoal tar-which through the ingenuity of the chemist has proved to be an almost inexhaustible source of wealth.

Productive Swamps

(From Page 24)

cultivation are necessary. Before seeding, 75 to 100 pounds of muriate of potash and 200 pounds of acid phophate per acre should be applied to furnish available potassium and phosphorus.

The alfalfa crop offers one of the best weapons against Canada thistles. The stand must be thick and liberal applications of potash are important.

The Cultivation of Grapes in Champagne, France

(From Page 42)

French Law; no wine can be called "Champagne" unless it has been made according to certain rules with grapes grown in a section around Rheims and Epernay very strictly outlined by the law. Thus the growers are assured that their pains will be rewarded, the buyers being ready to pay the necessary price when they are sure to find exceptional quality in what they buy.

Producing a Record Crop

(From Page 30)

Thousands of experiments are eing made to illuminate variable facors but such studies as what is hapening in the soil and the nutrition of rowing things get little attention. In ne operation of our 2,700 acre farm e aim to do everything in the most ficient manner. I believe that in the ultivation of our land and in the andling of our products we have eached the highest mechanical effiiency so far attained by any potato rower in this country, but we had to evelop nearly every implement to fit ne work to be done. We stop at nothng and spare no expense if we think

n improvement will make profit in dollars and cents. "We are finding an anwer to our questions relating to mechanics and power, out we are still far from inding an answer to some of our other questions on varieties, diseases, and soil ertility. We put \$100,-00 worth of fertilizers in our place this year. ome of the natural uestions that come up

re: What kind hall we use? How much shall be applied? Can we get as good eturns if we ise less? Should ertilizers be apblied in the fall, pring, or durng the growing eason? How should the application be made? What are the residual effects of a ferilizer? Some of an be answered

in a general way and new things are turning up every day, but when you look for refinements you find them lacking."

A Big Job

WHEN the Zuckermans started farming in 1914 they found many difficulties to be overcome. They had tried to operate their land on the share tenant system, but concluded that they could make it pay better returns by using power machinery and running it themselves. Today there is probably no farm in the United States that produces potatoes so nearly

on a factory scale as this one does. As many as 30 bushels of seed are sometimes planted to the acre. The chief varieties grown are Wisconsin Pride, Burbank, and American Wonder. Seed from northern states is shipped to this farm

by carloads. The seed is first treated for diseases and then cut. It is planted by a machine that puts it

down from 4 to 7 inches deep in rows 26 to 30 inches apart and 10 to 12 inches apart in the row. It does this so accurately that one can rarely find a missed hill in their fields.

After planting, the potatoes are harrowed two or three times with a spike tooth harrow drawn parallelly with the



hese questions Potatoes on the world's record plot just as they fell an be answered from the apron of the digger.

rows. Cultivation starts as soon as the sprouts come up, for in this rich deep soil the weeds would grow with abandon if vigorous methods were not used to combat them. No weeds are allowed to mature on the Zuckerman farm.

It takes four months to mature a potato crop in the delta. Early potatoes are planted in April and May and harvested in July and August. Late ones are planted in June and harvested in October and throughout the fall.

Fourteen tractor-drawn potato diggers, each capable of harvesting 2½ acres a day, are used at digging time. These machines are marvels of mechanical invention as four men can operate one. One tends the tractor, another the digger, a third the sacker, while a fourth keeps the vines out of the way. The sacks are filled to within six inches of the top and are then loaded onto trucks and carried to the levees where they are washed, graded, and sent down to market in boats.

Washing Machines

T HE washing machines cost \$1,500 each. It takes five of them to scrub all the potatoes grown on this farm, but they pay for themselves since clean potatoes bring 15 cents a sack above the regular market price. As the potatoes are hauled in from the fields, they are fed into a deep trough containing a rotating washing cylinder that operates under water. usually come out of this cylinder clean and white, but they are conveyed to a second trough containing pure water for further cleaning. A draper pulls the tubers out of the water, depositing them upon a moving grader belt not unlike those used by the western apple growers. Men stand along this belt to sort out different sizes and qualities and sew up the sacks for shipping.

Zuckerman Brothers believe that every effort expended in marketing their produce in the best condition possible pays.

Another specially designed machine that is getting results is a heavy duty tractor outfit that plows up the dirt much like a lawn mower cuts grass. Similar machines have found favor among the gardeners of Europe. This one takes a strip eight feet wide and will cut any depth down to 16 inches. This pulverizing process seems to be beneficial to the action of soil bacteria as this type of land will stand a great deal of work. It has been found that three plowings and 10 diskings and harrowings have resulted in somewhat larger yields for each operation.

Reclaimed Lands

N concluding this article it may be well to tell something about this delta region where so many thousands of bushels of farm products are grown every season. As it is possible to cultivate this land 12 months in the year, two crops of potatoes are often dug from the same land in a single year. Three-fourths of California's potato crop is raised in the San Joaquin delta region where there are over 200,000 acres of peat lands made up of tule and other march plants. These soils are in varying stages of decomposition from brown peat to black muck filled with river sediment. The lands were reclaimed by throwing up permanent levees along the banks of the river and sloughs to form islands, many of them from 2,000 to 6,000 acres in size. Before the erection of these embankments, the whole delta flooded at high water stages.

The lands are drained by large canals with the drainage water being pumped into the streams by electric pumps. This allows complete control of the moisture conditions of the soil as it seldom rains here and the water can be let into the irrigation ditches by siphons over the levees or by flood gates through the embankments. The same laterals that carry the irrigation water also drain the land as the ditches are dug in such a manner that sub-

irrigation is practiced.

Making Poor Land Pay

(From Page 28)



The first cutting this year.

ons manure and 400 pounds acid hosphate, 3,755; No. 8, with 250 ounds of a 3-12-4 commercial ferilizer, 3,060 pounds. Acid phosphate t \$32 per ton was paid for in the first utting, figuring the hay worth one ent per pound, or \$20 per ton. Comnercial fertilizer showed up better han the manure. And it has kept hat advantage to the present time."

In some of the later tests manure ave slightly better results than the cid phosphate, but when the cost of ecuring it was taken into consideraion it was the more expensive, conidering returns. The combination of cid phosphate and manure proved to roduce the most growth, though maure made the crop somewhat expenive. In some of the later tests a low rade marl was used at the rates of 2, , and 6 tons per acre. It was not s satisfactory as the crushed stone. Burned, slaked lime at the rates of 00, 1,000, 2,000, and 4,000 pounds vas used. Its use proved too expenive and impractical.

One of the very best plots in the whole experiment, in fact it was the utstanding one, received 400 pounds f potash per acre. Here was the best tand and the best yield. Evidently potash is one of the limiting factors

in this sandy soil.

That year with crop failures all around, the experimental tract received very favorable consideration—but not from everybody. The near neighbors still held back.

"Alfalfa could not be grown here," they would say, even when they were standing in the alfalfa so tall that their hands dangled in it. "No use, it would not grow. . . . If it could be raised here there would be an overproduction, and the price would go down." They took their friends past the plots, proving the failures from those plots where there was no alfalfa. For the explanation of this they did not care. Luckily, the great majority of the people were more considerate. They saw possibilities; they expected results.

More Visitors

THE second year more people came to visit the plots. The second annual field day was more of a success even, than the first. The third was still more successful. The results of the different treatments were graphically shown at the National Dairy Cattle Congress, and Belgian Horse Show at Waterloo, and at the Cedar Valley Fair at Cedar Falls. They

attracted much interest. Other counties in the State began to put in plots of a similar nature. The money from the sale of the alfalfa on the plots now made it largely self supporting, and the acreage and number of plots were increased. There are more than 100 plots in the 10 acres of alfalfa, sweet clover, and red clover, all of it doing well where it has been properly treated and properly fertilized.

The neighboring farmers finally were won over. Drawing a circle with a three and one-half mile radius from the plots, one would find that there are now 56 separate pieces of alfalfa, a total of 604 acres, the tracts ranging in size from two to forty acres. New barns, new sheds, and new homes are going up. Dairy cattle, hogs, and chickens are coming into their own. Farmers are taking new hope. Their attitude has changed.

Driving over the country one notes the change. He sees fields of green alfalfa. Corn this year, for the first time, has followed alfalfa and it is the best corn that has been raised for many years. Alfalfa on land joining the experimental plots sold in the field for \$30 per acre. One farmer has been producing five tons of hay per acre, which would cost on the market more than \$20 per ton. But better still would be the stories of the men who have found prosperity, satisfaction, and happiness in a new type of farming.

A Success

THIS reclamation project has been a success because it was based on the e'ement of proper cooperation between every individual and every group that would either offer help or who would receive benefit. Every opportunity of advertising was used. The college and extension department had a part. County agents were asked to take part in the meetings and urged to bring their people. At the last meeting the members of the Greater Waterloo association were invited to attend in a body. Special efforts were made to

take care of students and others seeking information. High school students were invited. The railroads were glad to give assistance. They offered to haul the limestone free of charge and even furnished some of it. Seedsmen were on the ground, fertilizer companies were glad to assist, editors were willing to give publicity. These efforts were appreciated.

The first part of the work was experimental—rather feeling the way. Finding the correct solution, the work became demonstrational, an object lesson of applied science in the practical field of farming. Like many of our soils projects of today that touch the well being of many people, its interested spectators were as unlimited as its opportunity for useful service

The Country's Needs

(Fom Page 10)

than it does to-day.

The perennial loss of surplus wealth is one of the outstanding causes of a barren country life. Amazingly slow of accumulation, surplus wealth car do much when wisely utilized. Surplus wealth in a nation is the mean of culture, civilization.

A national policy of unconcernabout country life, about rural standards of living, about the condition that surround the farm family, many believe, is a move in the direction that has led to the destruction of historic civilizations. Theodore Roosevelt said nearly twenty years ago, "If there is any one lesson taught by books, it is that the permanent greatness of any State must ultimately depend more upon the character of its country population than upon anybody else."

The six and a half million farm families in the United States offer opportunity for such constructive leader ship as will promote not only their happiness but the stability and strength of the entire Nation.

Storing for Profit

(From Page 12)

would not dispose of the foreign nonstorer. Or, you can maintain that pooling should be deferred until an overwhelming proportion of the growers are lined up in cooperative groups. Or you can argue that the solution is not to be found in voluntary grouping, but only in some exercise of Government authority. That view, however, opens up profound questions as to the effect of compulsory pooling on production here and abroad, and on our whole agricultural economy. Moreover, it probably involves too high an expectation of what pooling can accomplish even under the most favorable circumstances.

Difficulty of Price Control

S TORING is, theoretically, a means of causing crops to bring more under certain conditions than they otherwise would. It is an approach to the control of the surplus problem. Eventually, beyond doubt, it will play an important part in agricultural marketing, although the precise method by which its costs and profits can be fairly apportioned among all farmers is not clear. That is encouraging.

But ponder the fate of the New Zealand Dairy Produce Control Board's attempt to influence prices by storing supplies of dairy products. It is an object lesson in the difficulty of

price control.

The New Zealand Dairy Price Control Act of 1923 set up a board and a London agency to control the export and sale of butter and cheese in the interest of producers. Through control of shipments and marketing it was planned to control prices, or at least to influence them favorably. But a strike of British seamen tied up the board's shipping program. Then came the general strike in Great Britain, followed by a prolonged mining tie-up. Poverty-stricken Britain cut down its consumption of dairy products, and stocks of New Zealand butter and cheese mounted portentously, until in March last they totaled 23,327,000 pounds of butter and 28,120,000 pounds of cheese.

With such accumulation of supplies, the price-control dream faded. New Zealand's dairy products are now sold in Europe at competitive prices.

It was originally the policy of the board to hold butter for better prices whenever the market slumped. This policy was backed up in New Zealand by a legal obligation resting on every dairyman to sell his products exclusively through the board. Competition at the selling end was thus abso-

lutely prevented.

Nevertheless, the board recently acknowledged that it can no longer set prices, but must accept whatever the market will pay. It is now eating humble pie, and trying to square itself with the producers. It has discovered. what every selling organization of farmers must eventually discover, that control of supplies is only half the battle in trying to influence prices. Consumption also must be taken into the reckoning.

The theory of influencing prices by storing surplus products may be all right. But the technique of doing it has not yet been worked out.

Save \$5,000,000

N some years the livestock industry suffered a loss as high as \$5,000,000 because of the screw worm. Benzol or benzene, says the Department of Agriculture, is an effective treatment for this pest which results from the eggs laid by the blow fly in an open wound or sore. Many animals "as good as dead" have recovered completely after this treatment.

South Carolina

(From Page 20)

work planned, which includes a study of varieties, spacing, time of planting, fertilizing methods, cultural practices, as well as poisoning. After five years of this work, which is now under Dr. George M. Armstrong, it is evident that the Southeast can produce cotton under boll weevil conditions, and confidence has been re-established even to the extent of overproduction. Carolina is the only state specially organized for the cotton research problem; and the same data and organization is now being used to work out more economical production to meet western competition.

To this end South Carolina is now working with the U. S. Bureau of Agricultural Economics to improve length, strength, and spinning quality of cotton. Spinning qualities of lints from breeding plots are being tested constantly by cotton technologists of the Bureau of Agricultural Economics located at the Clemson College Textile School.

Research with Livestock

THE wonderful world champion Berkshire herd of Clemson College, developed under Prof. L. V. Starkey, chief of the animal husbandry division, under conditions prevailing on average Southern farms, has focused attention on the Palmetto State in the livestock world. This herd, developed from one boar and one sow secured in 1922 and built up through skillful inbreeding, has taken national first rank and has been the admiration of all who have seen it in the show rings for two seasons; and blood from the herd is now beginning to tell in the improvement of Carolina hogs.

Prof. Starkey is now seeking to do with the sheep what he did so well with hogs, and has the foundation of a flock of Hampshire sheep that bids fair to take rank with the Berkshires. He plans also to do similar breeding

work with Hereford cattle.

Incidental to experimental work with animals themselves, much work is being done with feeds and feeding. These include especially (1) the development of soybeans as a forage, enabling pork production as low as 4½ cents per pound; (2) working out a forage crop cycle to make sure pasturage the year round and realize a dollar plus per bushel for corn fed; (3) comprehensive work with protein supplements to corn—especially soybean meal, peanut meal, fish meal, tankage, thus effecting a decided saving in balancing the corn ration.

The dairy division, always seeking to furnish information and new knowledge that will induce farmers to make dairying a worthwhile factor in South Carolina farming, has sought more recently with the increased financial support given it, to put its experimental work on a more strictly scientific basis for determining the best dairying practices for this state and section. To this end special attention is centered on production problems, that is, breeding and feed-

In breeding work important lines of research now well under way and pointing to important results are:

 A long-time project on the best systems of mating, to study the production of offspring linebred against outcrossed.

 A study of the amounts of feed materials necessary to grow a dairy animal from birth to producing age.

 An extensive investigation on changes in body form during growth from birth to maturity, with photographic records.

Heretofore all dairy investigations have been made at the headquarters station at Clemson College, some of them in cooperation with the Federal Bureau of Dairying. Some important work to determine the most suitable

herd size and the best forage and pasturage will be conducted at the new Sand Hills station.

Farm Crop Investigations

MULTIPLICITY of experiments with farm crops has been conducted for many years, these dealing chiefly with problems of best varieties, best fertilizers and best cultural practices in connection with the main crops of cotton, corn, oats, rye, to-bacco, soybeans, and forage crops. Some of these matters are discussed elsewhere in this story. Prof. T. S. Buie is chief of this important division.

The botany division, under direct charge of Prof. Barre, has been of high practical service in studying for public benefit such problems as rusts in small grain, corn root diseases, bacterial diseases of cotton, forestry methods, and in making annually a plant disease survey.

Likewise in the entomology division, besides the big work with the boll weevil already cited, life-history and control studies of the insects of economic importance constitute the main line of endeavor.

A total of 15,000 to 20,000 car-

loads of fruits and vegetables shipped from the state annually makes it important that experimental work with varieties, fertilizers, cultural methods, etc., be conducted by the Experiment Station. Present varieties and fertilizing practices in general use are those proved best by the station tests. Of special practical importance have been (1) tests in recent years on proper fertilizers for peaches, asparagus, Irish potatoes, and lettuce, four crops of increasing importance; (2) studies in source of seed and in certified vs. non-certified potato seeds (3) variety tests with apples, grapes, lettuce, berries, etc. This work is now supervised by A. M. Musser as acting chief.

In recent years the newly added division of agricultural economics, with Ward C. Jensen as chief, has been conducting a series of surveys and studies in farm management, cost of production, production and demand, marketing of cotton, forms of farm credit, taxation problems, livestock in the farming scheme, home economic and rural social problems, etc., all of which are helping to supply the farmers and the public with data that enable them to pitch operations on a more intelligent basis.

Wheat Profits

(From Page 16)

as soon as they further increase the amount of fertilizer per acre applied for wheat.

In the face of the activity they evidence in regard to other far less positive means of attaining their purpose, it is inconceivable how slow farmers have been in appreciating that investments in larger applications of fertilizer is the surest way to make wheat pay best. For instance in the important winter wheat state of Missouri there is used at present only about 40 pounds of commercial fertilizer per acre of wheat grown. Yet the Mis-

souri Agricultural College has consistently demonstrated that the net returns from the right fertilizer properly applied for wheat is 253 per cent for every dollar invested. Again the U. S. Department of Agriculture in a survey of winter wheat production costs finds that a yield of 28 to 30 bushels per acre reduces the per bushel cost of production to one-half of what it costs to grow only 10 to 12 bushels of wheat to the acre. In other words, there is a saving or a direct profit of 72 cents per bushel in the larger yield over the smaller.

Is it possible to produce 30 bushels of wheat in the winter wheat belt consistently? Perhaps not every year on every farm but over a period of years such production could be very nearly approached and at times exceeded. Under perhaps a bit more favorable growing conditions the United Kingdom average yield of wheat is close to 32 bushels to the acre. farmers average nearly 43 bushels to Yields of 45 bushels of the acre. wheat per acre on well fertilized land have many times been secured at the Ohio Agricultural College Farm and yields of 35 bushels to the acre have been harvested on the Missouri Agricultural College plots. In fact yields of wheat as large as 108 bushels to the acre have been reported by farmers in various states during recent years.

In addition to the necessity for a wider and more generous use of commercial fertilizer as an adjunct to lowering production cost there is the further advantage of improved quality of crop and the premium it brings. Every year thousands of farmers take losses by marketing wheat of inferior quality and to a large extent this could be avoided. The test weight of wheat is influenced by its color, moisture content and the proportion of weed seeds it contains. As much as a pound in test weight per bushel can be lost when uncapped or carelessly shocked grain is exposed to a single heavy shower. Similarly to thresh too soon after harvest or after exposure impairs the quality of the grain.

Considerable damage to wheat by poor storage also is common and can in a large measure be avoided. Again prior to the sale if the wheat is infected with weed seeds or dirt it should be cleaned. However, this requires special machinery and it is costly. The better way to insure clean wheat of good quality is to sow good seed on clean ground and rogue any straggling noxious weeds from the field prior to harvest.

Now forgetting about ten yeears hence and considering only the

coming year's outlook, the season 1927-28, intentions to plant reveal that very nearly a normal acreage of wheat will be sown. If an exceptionally good crop is harvested and satisfactory prices prevail, which seems probable in view of no surplus wheat likely entering into the situation, farmers ought to make money. Those who get the biggest yields per acre will profit most no matter what the market price proves to be. This is always the case. A notable example of how profitable production can be accomplished in the face of expensive lands and present day labor costs is the present production of rice in California by efficient methods at a cost which permits the growers to ship the product to China and compete with the domestic product grown with labor worth 15 cents What is being done with rice can be accomplished likewise with wheat. Wheat lends itself admirably to culture and harvest on an extensive scale by improved power machinery. Farmers haven't begun to grow wheat at a minimum production cost in this country. With better tillage, planting the most prolific varieties, fertilizing more generously, and harvesting more efficiently the United States could feed the world with its full requirement of breadstuffs.

Barring unfavorable growing conditions and the production of normal crops both here and abroad, there isn't much chance that the price per bushel farmers will receive next July or at succeeding harvest will be much higher or lower than now prevail. This should not be discouraging when viewed from the means available within in this hypothetical limitation for increasing the returns from this cron. If returns remain constant or even decrease somewhat it is still possible to make handsome profits if production costs are materially cut. Farmers, therefore, in the states where winter wheat finds its natural habitat would be foolhardy to abandon its culture when the crop fits so perfectly into the system of farming.

"KING POTATO" is Crowned

By ALBERT E. WILKINSON

Connecticut Agricultural College

UMANITY paid due homage to King Potato at the big potato field day held last fall on the farm of L. L. Grant, Buckland, Conn. Several hundred men, women and children crowded the field to view the bumper crop being harvested.

To the Hartford County Farm Bureau and its hustling agent, Benjamin G. Southwick, is given the credit for organizing and carrying through the day's program. Potato King, Louis L. Grant, a very close cooperator with the Farm Bureau and the Connecticut Agricultural College, was glad to hold the big demonstration. Up until five years ago Mr. Grant grew nothing but tobacco; then because of marketing difficulties, he changed to potatoes and now he has the enviable reputation of being the largest potato grower in the state.

A measured acre was used for the field meeting. It was anticipated that this acre would produce 500 bushels of potatoes. The potatoes were dug and weighed with the crowd looking on. The most spectacular feature of the meeting was a guessing contest on the yield from the measured acre. No effort was made to select the best acre on the farm but an acre was selected that was convenient to the roads and therefore to those coming to the meeting. The acre yielded 489 bushels of marketable potatoes.

In 1925, Mr. Grant, grew 72 acres of potatoes at Buckland, harvesting 23,000 bushels from this acreage. Last year, in anticipation of heavy planting generally and the possibility of lower prices, he planted but 53 acres. Of 300 bushels of potatoes graded as a test, only three bushels fell below No. 1 grade.

Good seed is a shibboleth on the

Grant farm. Only northern-grown, certified seed is used and as Mr. Grant believes there is as much difference between strains of certified seed as between certified and uncertified seed, he insists on inspecting his seed supply in the field. In September he spent 11 days driving through the potato sections of New York, Vermont and Maine, looking for the best seed obtainable. On this 2,000 mile trip he bought not only his own seed supply for next season but purchased several carloads for growers who rely upon his judgment.

By selling only what the market can readily absorb and distributing the sales over a period from November 1 to April 1, Mr. Grant does his part to hold up the market for local growers.

An old cow barn has been converted into a storage shed without much expense. A tobacco shed has been converted to the same purpose. The tobacco shed was boarded and papered inside, a ceiling put in, a raised floor built and a boiler and hot water pipes were installed. Eventually he expects to build a permanent storage house, using most of the material from the tobacco shed.

Mr. Grant has figures to indicate that he can store potatoes from November to April at a cost of about 10 cents a bushel. The potatoes are sacked in the field, hauled to the shed and stored without grading. As the

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The Soil Robber

(From Page 8)

forestation is a synonym of soil conservation. The wood will be sorely needed, and every acre of sloping ground upon which timber is growing will contribute to the protection of fertile downstream valley lands.

If the farmers of the rolling parts of the country could be brought to see the importance of reorganizing their fields to the point of turning over all lands that can not be protected from ruinous erosion by terraces or sod to wood lots, a very long step would be taken in the direction of land conservation. In some sections this is beginning to be done. Farmers are coming to look upon timber, even in small patches, as a valuable crop. More than ever before they are protecting young trees from fires, and are hesitating about making new clearings.

Some of our pines, as the shortleaf and slash, grow with such remarkable rapidity, even under conditions of adverse soil, that with protection from fire and the foraging of the hog, known as the "piney woods rooter," it is possible to establish almost immediately an excellent growth on land where profitable farming can scarcely be hoped for. This applies to millions of acres over an immense territory.

Returns will begin to come in much sooner than expected. A tree of almost any size nowadays is valuable for pulpwood. Furthermore, good stocks of the young trees will increase in value every year, and where there is a considerable area of young forest, as might readily be established in thousands of localities by concerted action among the owners of land duly encouraged by light taxation upon such enterprises, the growing timber will be sure to come more and more into demand by lumbermen with an eye on the future.

The writer is familiar with numerous localities where second-growth pine has kept farmers going in spite of short crops and low prices. The writer owns land that was destroyed by erosion, insofar as having value for farm crops, 75 years ago. From this one crop of timber has been removed, a second crop is ready to cut, and a good start on the third cut will be left by the axemen.

This land was so gullied that whole houses could have been dumped into the ugly ravines, some of which are still of huge dimensions. But pine trees took to the land, growing everywhere except on exposed rock and the raw clay of the gulley sides. Trees springing up in the bottoms of the gulches finally arrested erosion and turned the process around to soil building, with consequent filling of many gullies. The land should never have been cultivated in the first place, because of its extreme susceptibility to washing. It would have given much better profits in timber.

This applies to millions of areas throughout the nation. In the south-eastern states alone careful appraisal of the region on the basis of the different types of soil shown on Government maps reveals the presence of 64,000,000 acres of land which is better suited to timber than to anything else, and of 90,000,000 acres of unimproved land, much of which could well be used for forestry and grazing while awaiting occupancy.

The Hillside Terrace

A LTHOUGH erosion can not be completely stopped in cultivated fields, it can be reduced to a minimum by the building of terraces along slope contours to check the speed of run-off water. The cutting power of flowing water is enormously enlarged with increase in the rate of flow; conversely, the biting edge is reduced by placing obstacles in its path to check the flow. The hillside terrace effectively does this by turning the water aside to flow away gradually



This field of inert chalk formerly consisted of highly productive prairie land in Central Mississippi. The gullies that could easily have been destroyed in the beginning were not attended to, hence this devastation. These despoiled white areas dot the landscape, not only in the prairies of Alabama and Mississippi, but in many parts of the Texas Black Belt.

along the contours.

In the Piedmont and many parts of the older coastal plain states these terraces have been in use for more than 80 years. While much land has been washed away in these sections, millions of acres that surely would have been destroyed have been saved by terracing, and are today producing about as well as they did before the Civil War.

It is difficult to understand why this efficient system of soil conservation has not spread far beyond the localities referred to. Only recently has terracing come into common usage in Mississippi, and it is just now getting over into Central Texas. Perhaps it was necessary that many farms should be severely impoverished before the necessity of putting a halt to the evil thing was sufficiently impressed upon the owners of farm land.

In the central states, where sheet erosion, and in some localities gulley erosion, is rapidly wasting the fertility of sloping areas, terraces are almost never seen. They are needed very badly in many parts of these states, and it is time that farmers, bankers, merchants, railroads, and county agents were seriously busying them-

selves with doing something about it. There is immediate need for active campaigning against this form of land wastage. It requires more than advice and words to get reforms of this nature started.

Actual demonstrations of the effectiveness of terraces and of restocking wasting slopes with trees and grass are needed all through the areas of more vulnerable land. There is need also for further investigations in perfecting methods of terrace construction, especially in the matter of adjusting different types to varying slopes and soils. More information is needed about the distribution of those soil varieties on which cultivation can not be safely carried on under any condition of slope protection. It seems little less than a crime that with all the research organizations of the hundreds of different kinds in the country, but one single type of soil has its rate of wear under erosion measured.

The problem of erosion is too seriously interwoven with both the present and future welfare of our nation to be laid aside as something that concerns only the farmer. If ever a national problem existed this one is most outstandingly of that kind. We have

been lamentably unmindful of the seriousness of the scourge, and to lessen the evil there should be immediately widespread effort on the part of the nation, the states, counties, and the citizens thereof, in furthering large programs of terrace building and the planting of forests and grass upon steeply sloping lands and those types of soil that are known to be highly susceptible to erosion.

Looks

(From Page 4)

posite direction at the time with a set of standards all his own. job and mine is to get the right standards.

THAT, then, is a good looking man or woman but a reflection of an ideal in our own inner minds? Clothes may enhance appearances here and there, or hide or mar the effect, but the keen eye of the wholesome beholder soon finds the wholesome answer.

Here I find Walt Whitman saying: "The expression of a well made man appears not only in his face; it is in his limbs and joints also, it is in his walk, the carriage of his neck, the flex of his waist and knees. Dress does The strong, sweet not hide him. quality he has, strikes through cotton and broadcloth."

Each of us has some goal of perfection in form and face to seek. I take up Matthew Arnold for a bit of further enlightenment, I note his logic: "The pursuit of perfection is the pursuit of sweetness and light. He who works for sweetness and light works to make reason and the will of God prevail."

Wholesomeness is the first requisite of good looks. Fitness of purpose is the other attribute, but it is illusive It is sometimes beand indefinable. yond the human eye.

Abe Lincoln, our own homelyheroic figure, said that a man's legs ought to be long enough to reach the ground. In that remark he preached a ton of evidence sustaining my contention that fitness of purpose is the second necessity for harmony of appear-

OF course, we agree that a first-rate prize fighter is a fine looking animal, but the only way you and I can tell the result when two such specimens combat is to wait for the gong.

Three fighters who would not measure up to ordinary visual standards come to mind. Alexander of Macedonia was small with a twisted neck. He conquered the world in his time, but the kid in McGuffy's reader asked, "How big was Alexander, Pa, that people called him great?"

Napoleon, who was only five feet six inches tall, chose the human nose for his index of scrapping tendencies. He picked all his generals by the size and shape of their nasal organs. If you wish to know definitely, they had to

be prominent and acquiline.

Paul, the Apostle, formerly Saul of Tarsus, was no mean fighter in his day, both physically and morally. Yet they tell me Paul was undersized, frail, and

had weak eyes.

Gen. Winfield Scott Hancock was defeated for the presidency. He lost, not because of his looks or because of a lack of a war record, but because Charles A. Dana made that mean crack about him, saying, "He is a good

man, weighing 250 pounds!"

The President is usually the most "looked at" man in the country. Presumably, the holders of that office should be chosen for their magnificent and stately appearance. however, that one argument used against woman suffrage was that the ladies would all vote for the best looking candidate. Apparently, this has since been disproven, both to their credit and perhaps to the welfare of the nation.

Who's Who in America does not give data bearing upon our subject. However, a frenzied seeker after zestful journalism in New York is circularizing all the dignitaries whose names appear in the red tome, asking them to give certain physical facts appertaining to the question of the relation of success to good looks. I am afraid not a few of the requests will be unanswered for obvious reasons. I, for one, shall remain forever silent.

From this dubious venture the worthy editors no doubt hope to collect a composite picture of the upstanding, purposeful American—but I fear he will have one gray eye and one that is partly black and blue.

At any rate, this set me to gazing upon the dim features of the Presidents, as they appear in histories and as their physical attributes are described by men of their times. The result has convinced me that looks taken as a gauge of achievement are really a blandishment and a snare.

Y little son, who resembles me perfectly, has his proportionate hope of being President, and the survey I have made lends much encouragement to his faith in the future—much more than his direct inheritance warrants.

Of 30 Presidents we have enjoyed, only four of them were men of more than six feet tall. Lincoln topped the list with six feet and four inches, and the other big ones were Jackson, Jefferson and Washington.

James Madison, known as the Father of the Constitution, was five feet and six inches tall and weighed only one hundred and ten pounds. Alexander Hamilton, who sought the high office, and who was one of the giants of his day in intellect, proved out to be only a small chap in height and avoirdupois.

Taft and Cleveland tipped the scales down the most, while the plum for the handsomest of the Presidents must go to Gen. Arthur and Franklin Pierce.

I have learned by the research done in your benefit that being President does not relieve some folks of the natural desire to be good looking. One would imagine that a fellow who got that high could afford to look like Andy Gump without hurting his conscience.

Martin Van Buren, suave and soggy in appearance, was succeeded by Gen. Harrison. When Mrs. Harrison moved into the White House and started to renovate the rugs, she noticed with chagrin that the spot right in front of the mirror in the President's private room was worn to shreds by the gay and festive Martin Van Buren, who liked to admire his reflection when state duties were not arduous.

I GET from this that the three presidents who were the prettiest men, as well as the one who yearned to be a Beau Brummel, have achieved places among the least of those who occupied the chair.

Looks are therefore no index of actual worth in statecraft, and in the realm of economics they are of chief value in the movies and on the stage. I have purposely omitted their possible economic value before a jury in an alimony case, because with so many women now hovering around for a chance at the jury box their effect is going into an eclipse.

Beauty in a child inspires adoration. In a woman it inspires admiration. In old age it inspires veneration. But adoration, admiration, and veneration are inspired besides and above all else by something within the face and form we gaze upon that transcends all the superficial elements of grace and color.

Character, motives, breeding, culture, refinement, ideals,—all these and much more haunt and hold us as no mere regularity or consistency of features can hope to do.

The making of a wise and gentle face is the work of years and the fruit of victory and sacrifice. Inability to sense this fact deprives us of more pleasure than actual physical blindness.

Let's open our eyes a little wider and see if we cannot observe some of those good looks we have missed.

"King Potato" is Crowned

(From Page 59)

market demands, he grades in storage, sacks the potatoes in two-bushel bags with his name on the bag and sends to market. This plan calls for minimum handling and distributes the labor over a longer period.

Here are a few points taken from Mr. Grant's explanation of his own methods:

He plants only northern-grown, certified seed of good strains, personally inspecting the fields in which the seed is grown. He plants in 3-foot rows, 13 inches apart in the row, allowing about 13,000 hills to the acre. The rows are run as straight as he can make them, making cultivation easier and spraying more effective. He wants the spray on the plants instead of between the rows, and straight rows make this possible. used a ton to the acre of 5-8-7 fertilizer, some ready mixed and some mixed to formula. This year he used at least 2,500 pounds of fertilizer to the acre. He sprayed seven times last year, the last spraying on Sep-

tember 11. He experimented with both spraying and dusting and decided that spraying is cheaper and more effective. He uses a home-made bordeaux mixture, 150 to 200 gallons to the acre at one spraying. At the first spraying he uses 5 pounds, copper sulphate, 5 pounds lime, 50 gallons of water. As the vines grow he increases the chemicals until at the last spraying he is using a 8-8-50 formula. He got control of the potato leaf hopper last year with his spraying but has been unable to control the flea beetle satisfactorily. He uses nicotine sulphate for aphids. He had no blight last year.

Power machinery is used where possible. The latest, most efficient types are preferred. Economy and not expense is the watchword. He has two planters, two power sprayers, a power duster, and two diggers. Tractors or four-horse teams furnish motive power. He sees but little difference in cost or efficiency between the tractors and horses.

Yearbook of Agriculture-1926

T is always a sound business policy in any industry to check up on work done, review the situation, and look into the future possibilities. With this in mind the United States Department of Agriculture since 1894 has published regularly a summary of its present and projected work.

Containing more than 1,300 pages, the Yearbook of Agriculture for 1926, which is just being distributed, is as complete and interesting a volume on American agriculture as can be found. In preparing his report, Secretary Jardine brings out that the Yearbook reaches more persons than any other book on agriculture issued anywhere in the world.

While the bulk of the circulation is among farmers, the book does not deal with elementary facts which every intelligent farmer knows. It does give the farmer the new discoveries and upto-date information from every phase of agriculture.

The information in the book is arranged for ready reference, and many illustrations add interest. The editors, Nelson Antrim Crawford and A. P. Chew, are to be congratulated for their efficiency in the preparation of this volume.



SLIGHTLY NERVOUS

An English barrister, after a particularly trying day, came home with his nerves on edge and at once sought refuge in his own study, well away from the noises of the household machinery.

He sat down by his fire and was gradually getting calmed down when the cat, which had been sitting there, too, got up slowly and walked across the room.

The master turned on her and said indignantly: "Now, what are you stamping around here for?"

And yet we can't help sighing some for the good old days when men were men and women weren't. Frosh—Junior—Young ba Frosh—did. I recursed the Flamingo.

EWING GALLOWAY

Keeping Cool in August

HOLDING HIS OWN

"Whatever you tell a man goes into one ear and out of the other," angrily snapped the wife because her husband had forgotten to mail a letter.

"Yes," he retorted, "and whatever you tell a woman goes in at both ears and comes out of her mouth."—A. K. Montana.

Dumb—"Talking about babies, you know my father weighed only three pounds when he was born."

Dumber: "You don't say. Did he live?"—Rammer Jammer.

Frosh—"Why don't baby talk?"

Junior—"He can't talk yet.

Young babies never do."

Frosh—"Oh, yes, they do. Job did. I read in the Bible how Job cursed the day he was born."—
Flamingo.

Cop—"Who was driving when you hit that car?"

Drunk (triumphantly)—"None of us; we was all on th' back seat." —Virginia Reel.

THE MEANEST MAN

Mitzi: "I heard that the guy you were out with last night is awfully stingy."

Fritzi: "Stingy? Dearie, if he'd 'a bought me a bag of peanuts I'd 'a' got shell shock!"

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Sulphate of Potash90-95% K ₂ SO ₄
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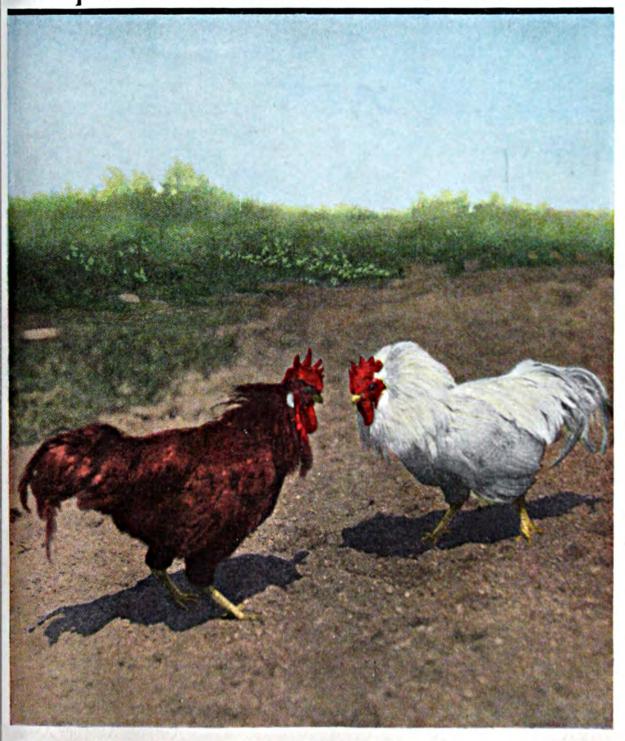
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Better Crops PLANT FOOD

September 1927

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The Pocket Book of Agriculture



Every Useful Magazine Has a Sound Policy



HE policy of Better Crops with Plant Food is definite. It is to stimulate an interest in all factors pertaining to more efficient crop production and to give accurate information on such subjects.

In developing a more efficient agriculture, you believe—as we do—that one of the most important factors is sound research and experimental work. It is our policy, therefore, to actively support all groups and agencies doing such work, especially the State Agricultural Experiment Stations and Colleges and the United States Department of Agriculture.

We believe that such research work is of the greatest value when translated into more efficient production and better living on the farm. Agriculture should be put on a business basis. The farmer is entitled to a larger share of the consumer's dollar. One sure way of getting it is to cut the cost of production. Consequently we are glad to heartily support the work of the agricultural extension forces and the county agricultural agents who are working toward that end.

Especially do you want all the facts, not selected facts. It is, therefore, a very vital part of the policy of BETTER CROPS WITH PLANT FOOD to publish all the facts.

You want these facts presented by authorities in an easy-to-read and attractive form. To combine a soundness of purpose with brightness of treatment is one of our chief aims.

It is the firm resolve of the editors to live up to this policy at all times.

This magazine is your forum. The editors will be glad to hear from you or see you at any time at the editorial offices, 19 West 44th Street, New York City.



Better Crop
Will Will ANT FOR The Whole Truth—Not Selected Truth R. H. STINCHFIELD, Managing Editor SID NOBLE, Editor Editorial Offices: 19 West 44th Street, New York. VOLUME IX NUMBER FOUR Table of Contents, September, 1927 Fairs 3 Jeff McDermid sprinkles his reminiscences with some good practical ideas. The County Agent 5 A tribute to ten years of remarkable progress, by Frank George. Unbending Backs in Farming 8 A timely number of this good series by M. L. Hopkins. Fruits, Nuts, and Fertilizers 12 The success of a California grower related by B. E. Maynard. 13 Nevada Dr. J. E. Church, Jr., conducts us to points of interest. Herediscope Is Invented to Teach 17 Mendelian Theory of Inheritance. Picking Cotton by Horse Power 18

What will it mean to cotton growers? by W. W. Fetrow. Good Farms from Blow Sands 21 A story of abandoned farms by R. H. Stinchfield. The Soil Science Tour 23 G. J. Callister tells us about it. South African Cotton 43 An interesting account of producing cotton in the "dark" country, by H. E. Andries.

Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY. of Amsterdam, Holland

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Directors: J. N. HARPER

G. J. CALLISTER



Home Sweet Home



Published Monthly by the Better Crops Publishing Corporation, 19 West 44th Street, New York. Subscription, \$1.00 Per Year; 10c per Copy. Copyright, 1927, by the Better Crops Publishing Corporation, New York.

VOL. IX.

NEW YORK, SEPTEMBER, 1927

No. 4

¶ This is the season for partaking of red lemonade, bot dogs, and cracker-jack

FAIRS

By Jeff M Dermid

AIRS reflect human traits and as this is the season when our energies are spent upon fair-making and fair-going, methinks it is time well spent to ponder upon them. My earliest cognizance of the word fair had to do with the emporium kept by one Isaac Burnstein on Main Street in a somnolent mid-western village. The fair store was the shopping place of the countryside and had attractions for the boy with a bit of spending money on the Fourth of July or at Christmas. Mother got her jelly glasses there; Father sought it regularly for his bandanna handkerchiefs and red flannels; and its cracked mirror reflected me in my first pair of long pants.

When next I heard of fairs it was in my romantic years when I used to read Vanity Fair or listened to a garrulous Hibernian neighbor repeat the tales of turmoil and cudgeling so common at Donnybrook in the brave days of old.

SINCE my maturity and its attendant close connections with fairs as we really know them here, I have observed that those three kinds of fairs that caught my childish attention contained the main ingredients that make up the modern show festival of our autumn season. Let's note the resemblance.

First, the present-day fair is an exhibit of wares and equipment intended to pry open the family purse—even as the "fair store" aimed to do. It is as much to sell to farmers as to sell agriculture to the public that many of the fairs are operated.

Second, a display of vanity, vainglory, and pride in achievement many losers for every winner—just like the background for Thackeray's classic.

Third, a scrap for position and honor, a tussle for a moment's place in the sun, even at the risk of a little jockeying and rough work, reminiscent in part of the Donnybrook fracas.

FAIRS are almost as old as goodness and meanness, and I suspect that Adam held a fair soon after he got settled following the w. k. eviction—providing the crops turned out well. If Noah missed staging a carnival with his caravan, it was simply because the grounds were too damp.

At any rate, the tomes of history tell us that the Phoenicians had great carnivals and commercial fairs, while the bazaars of the Orient were the precursors of the hootchie-kootchie and the inspiration for the blatant streets of Cairo, both once inseparable from the modern midway. The Russians on the famous fairgrounds at Nishni-Novgorod began a series of community festivals long Christopher Columbus discovered our precious land of pumpkin shows and cracker-jack.

However much the Irish may have contributed to the battle element in fair tradition, it was left for their neighbors, the braw Scot and the bluff Briton, to set the pattern for the truly rural livestock fair as we now see it at its best. The followers of Cruikshank and Cobban set the pace in the eighteenth century for the type of agricultural fair which George Washington encouraged, and upon which so

many of our tawdry carnival troupes have since tried to infringe.

GIVEN a natural Scotch ancestry, our fairs should partake of the characteristic thriftiness that is so often used as a bon mot on the kiltclad stockmen.

But do they live up to it? As a rule the fair boards either raid some public treasury for all it will stand or assess a local commercial club to make up the deficit. The annual fair subsidy created in the name of agriculture, but largely spent upon circus attractions, costly fireworks, and decorations, amounts to a huge sum.

If this goes on for another decade or two, with hamlets in rivalry with cross-roads, county pitted against county, state against state, what limitations are to be placed on the budgets?

Maybe Charles Dawes and the "old briar Hell and Mariar" will have a job cut out for him as finicky and perplexing as the one he tackled at the Ruhr. Perhaps America needs an exposition commissioner in the president's cabinet.

We have regulated transportation, child labor, immigration, and beverages—and we may have to assume full public responsibility for amusements next.

THIS brings us up short against the real question that must first be raised: Are fairs amusements or educational institutions? Perhaps they signify progress administered to the unwilling populace in homeopathic doses of sugar-coated pills.

One person says they must be amusements, for the posters display the pyrotechnic panoramas and grandstand tumblers, with nary a line about the cows and cabbages.

Yet the anxious fair secretary, appearing before the civic club or the senate finance committee, avers with unblushing astuteness that the yeomen

(Turn to Page 61)



William C. Stallings (center) appointed in 1906 as the first county agent in the United States, and W. F. Proctor (right) selected in 1904 as one of the first extension workers in the field, shown here with one of the first organized boy's corn clubs.

The COUNTY Agent

¶ Ten years have worked wonders in agricultural extension work

By Frank George

U. S. Department of Agriculture

HE county agricultural agent system has developed in the past 10 years from a wee thing to the world's greatest agricultural extension agency. No other country has anything that begins to approach in efficiency this organization which is credited with much of the agricultural progress made in the United States.

Although the county agent system as now organized dates back only to

1914 when the Smith-Lever Act was passed, county agents or itinerant agricultural teachers had been appointed in many states prior to that time. The movement originated in the South in 1903, but by 1914 it had spread to other regions, North Dakota in that year having 14 county agricultural agents or more than any other state outside the cotton belt.

J. A. Evans, now assistant chief of

the office of cooperative extension work in the Department of Agriculture, and W. F. Proctor were appointed in 1904 to do farm demonstration work in combating the boll weevil. Subsequently, in 1906, William C. Stallings was the first man to be appointed a county agricultural agent, his territory being Smith county, Texas.

By July 1, 1914, two months after the passage of the Smith-Lever Act, 718 counties in the 15 southern states and 210 in the remaining states in the North and West had agents. Seven states had no county agents and only two had a full quota. On July 1, 1924, there were 2,084 counties with agents. All states had county agents and five states had a full quota.

Three Out of Four

A STATISTICAL measure of the far-reaching influence of the extension service in improving farming practices was developed in a survey recently of 3,954 farms in Iowa, New York, Colorado, and California. The farms constituted 94 per cent of all the farms located in typical areas of seven counties in the four states. It was found that on 74 per cent of the farms, or in the case of practically three farms out of four, extension effort had brought about the adoption of one or more improved practices.

It was freely predicted in 1900 that cotton production in the United States would be completely wiped out unless the boll weevil was checked. Early attempts to control the pest, such as burning the cotton stalks, proved ineffective. It was discovered that the fight on the weevil had to be one of adapting agricultural practices to raising cotton under boll weevil conditions rather than extermination of the The county agricultural agent was developed to carry on such demonstrations. He turned defeat into victory. Cotton is still the basis of southern agriculture.

Western farmers 10 years ago believed that corn could not be adapted to that territory. Experiment station tests proved that corn of certain varieties could be produced there. The result has been that the corn area in 11 western states has been expanded from 793,000 acres in 1914 to 2,637,000 acres in 1923. Introduction of corn made dairying and livestock feeding possible; the whole system of farming was changed.

Increasing Corn Yields

IN 1917 a wet fall and early frost followed by warm weather caught much of the corn immature in the northern and western states. The northern part of the corn belt was practically without corn that could be used for seed. To meet the situation many county agents established special stations for testing corn. Surplus seed of good quality was conserved and made available to farmers who had none.

In the fall of 1917, county agricultural agents in that territory obtained the field selection of seed on 63,813 farms, which provided seed for planting 3,466,986 acres in 1918. Through testing campaigns in the spring of 1918, 547,779 farmers tested seed corn for germination and provided seed for 10,605,894 additional acres. More than 1,000,000 bushels of seed were obtained from other sources for 222,123 farmers. Not only was the situation saved but 500,000 additional acres of corn were planted in the spring of 1918, resulting in an increased production of 12,820,300 bushels.

Varietal standardization of grain has been an important service rendered by county agents that has made agriculture more profitable. Formerly, hundreds of so-called varieties were grown, usually from 10 to 20 in each community. Variety tests of local varieties planted alongside strips of pure seed were made by county agents. As a result of such tests, field demonstrations, and campaigns, and through the establishment of reliable sources of seed, whole communities or regions

have discarded the old mixtures and are growing one approved variety particularly adapted to local conditions.

J. C. Arthur of Purdue University discovered in 1890 the value of formaldehyde treatment in the control of oat smut. More than 25 years passed before farmers in the oat belt were induced to use the practice, and then only through the efforts of county agents. In Benton county, Ind., the county adjoining the experiment station, the first county agent to take up the work could find not a single farmer treating his seed oats. A few years later, more than half the farmers were testing their oats for smut. similar situation existed throughout the oat belt.

New Strains Introduced

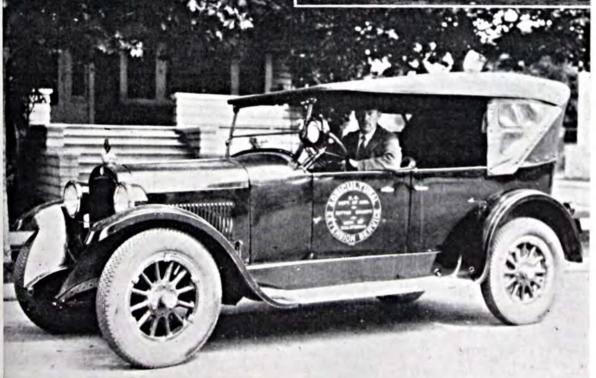
THE Kansas Agricultural Experiment Station in 1914 began the distribution of Kanred, a Crimean

The first county agents travelled about their counties on foot, on horseback, and by horse and buggy. The modern county agents such as the one below use a much faster method. Good roads and automobiles greatly facilitated the work of the agents.

variety of wheat which had been developed by years of careful head selection and breeding. A survey in 1918 showed that 80 per cent of the total acreage of Kanred was being grown in the 42 counties having extension agents In 1924, some 4,000,000 acres were grown in Kansas, or nearly half the total winter wheat acreage. To the introduction of Kanred by the extension agents is attributed the upward trend in the yield per acre in more than half the counties of the State.

(Turn to Page 56)





CORN CUTTING is taken out of the class of back-breaking labor

Number vIII in our series

Unbending

BRING sickles to reap, or blades to strike.

Before they have lost
In the sun and frost
The nourishing juices the cattle like,
Sucker and stalk must be cut from the hill
Surround them, and bend them, then hit with a will!

Left standing too long,

They grow woody and strong;
The corn in the stook will ripen still.

O wrote the poet before the coming of the miracle of modern corn harvesting machinery. Were he writing today he might, instead, be inspired to sing the paeans of

praise to the mechanical marvel which at the same time cuts, bundles, and binds the corn ready for shock or silo.

Because of the saving of time and labor made possible by its use, a corn binder is practicably indispensable on every farm producing substantial acreages of the King of American field crops. It has been estimated that while one man is cutting from an acre to an acre and one-half of

corn by hand, one man with a binder will cut and bind five to seven acres.

Corn was the earliest, as it is often the most important, cultivated crop on the American farm. When the first Colonists settled, they found the Indians producing corn from which they made various kinds of food.

The first corn grown by white men was produced in the Virginia Colony, at Jamestown, in 1608. It is not unlikely that the Indians taught the settlers how to plant and cultivate the crop. Almost the sole food supply of the colony for that first winter of hardships was obtained from the corn

harvest

It is not probable that it took long to discover that just as the ear was good for grain the leaves and stalk were fine fodder. So as a stock food, both the ears and the stalk of the corn plant have been used from the earliest times.

Topping or stripping the leaves was one of the first known methods of harvesting corn. The farmer, with a sharp knife, walked along the



Corn cutting was back tiring work even with a sharp blade and strong right arm.

Madison, Wisconsin

Backs in FARMING

rows of corn, cutting off the tops just above the ears. He also stripped the leaves from that part of the stalk left standing.

The tops and the leaves thus cut off were laid in small piles to dry, after which they were tied into bundles. These bundles were then set up in small shocks and left until the fodder was sufficiently cured, when they

were hauled a way and stacked near the feeding place. This corn, considered very valuable, was used for feeding the horses and the oxen in the spring before the grass came.

Because the corn plant dried before the ears were mature, the leaves were stripped while still green. This procedure neces-

The unsatisfactory results which followed corn topping and stripping led the search for a better method of securing the fodder. Cutting the stalk close to the ground at a time when no damage is done to the ripening corn answered the needs. It is not entirely surprising that the hoe was the first implement used for corn cutting nor are we startled that it proved to be

too crude, heavy, and awkward.

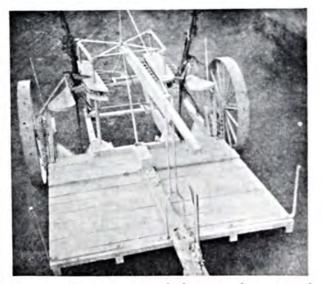
Scythe Replaces Hoe

SHARPENED blades, some of which were scythes, soon replaced the hoe, for with these it was possible to cut three times as much corn, and with less back-breaking. One type of corn cutting knife was fast-

ened to the shoe. This was then pushed with considerable force against the stalks. But despite the elimination of the tiresome stooping over with the shoe cutter type, the process was a laborious one.

Besides being back - breaking, cutting by hand of necessity delayed harvesting

at a season when many other duties demanded attention. Moreover, it was found that corn cut by hand was hard to handle, because it was next to impossible to pitch the stalks with a fork. About the only way loose cornstalks can be handled is in armfuls, which adds to the labor of handling. Furthermore, it is necessary to have small loads, for it is out of the question to throw an armful



Long corn rows seemed shorter when viewed from a moving platform equipped with blades to do the cutting.



The corn binder may prove an ally in the struggle to conquer the corn borer.

of unbound stalks onto a high load.

For years we have had machines which successfully harvest, thresh, and clean the small grains, so that every part of the plant may serve some useful purpose. The machinery for the care of the corn crop, however, has seemingly been much more difficult to develop than any other line of farm implements.

Gradual Development

BEGINNING with the corn knife, an instrument in common use on small farms today, corn harvesting machinery has developed through the single row sled cutter, two-row corn cutter mounted on wheels, the corn harvester, the binder, and the machine that cuts the stalks in the field ready for the silo.

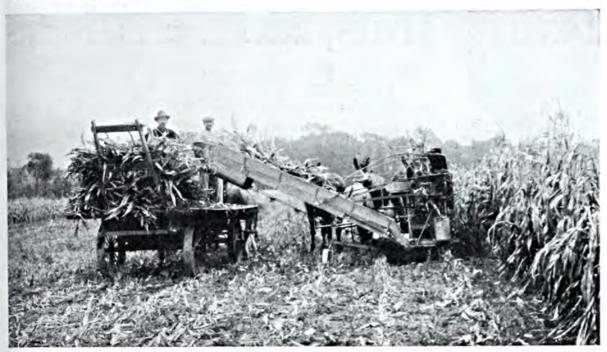
As early as 1820 attempts were made to construct a mehanical corn harvester. From that time until 1892 apparently all of the inventions were failures, for although the machines were patterned after the mower and the reaper, they either would not cut at all or they broke under the heavy strain.

In the meantime the sled harvester, a home-made device, was being improved from time to time. With most of the early sled harvesters, the driver rode on the platform, where it was necessary for him to gather the stalks in his arms in advance of the cutting edge, so as to prevent them from falling in all directions. The process proved to be a back-breaking one.

By mounting the harvester sled on wheels a decided improvement was effected. This type cut two rows at a time. Two men sat upon the platform, each one guiding the corn on his side against the cutting edge with one hand and with the other hand placing the corn into position to form a shock. When enough corn had been collected to make up a shock, the stalks were tied together and the side platform so tilted to deposit it on the ground in an upright position.

Back-breaking Exercise

THE corn harvesters were rather useless when the corn was tangled and lodged, because the machines work most effectively when the corn stands straight and the horse walks rapidly. It is needless to state that the process of gathering the corn after the sled harvester preparatory to



Power and machinery now cut, bind, and elevate the corn to silage wagons.

shocking it gave the farmers considerable back-breaking exercise.

The cutter sleds, and machines of similar construction, were gradually substituted by harvesters and binders which cut the corn and deposited it in bundles, tied or loose, or even delivered the stalks to the loading wagon.

The credit of inventing corn-harvesting machinery belongs to Edmund W. Quincy of Illinois, as he obtained the first patent on a corn-harvesting machine in October, 1850.

The principle in corn harvesters and binders which was destined to prevail was invented by A. S. Peck, of Geneva, Illinois, and patented January 5, 1892. The principle consisted of a machine with two dividers passing on each side of a row of corn. The dividers consist of two diverging jaws opening at the front of the machine. Attached to each jaw are two or three traveling chains, which bring the stalks to an unright position and carry them back to the binding deck.

It is being claimed, today, that the first truly successful binders, placed on the market in 1895, were Deering and McCormick machines.

Thousands of farmers during

the last few years have increased the profit from their corn crop by harvesting the whole plant—stalks, leaves, and all. Properly harvested corn fodder is a nutritious summer succulence, yet there are countless farmers who still snap or husk their corn in the field, letting the stalks and blades go to waste.

Despite the fact that corn harvesting machines are not, as yet, complete, the labor-saving devices are so well developed that corn may be cut, husked, and shredded with less hand labor than the cutting, alone, formerly required.

With the continued development in improved types of corn binders, corn of any size can be cut and tied or dropped in loose bundles as desired. Bundle carriers on the binders are so constructed that they collect several bundles, then drop them in windrows. The bundles can be conveniently shocked in rows or they can be hauled directly to the silo from the windrows.

The latest improvements on the corn binders eliminate chance of breakage caused by clogging. For instance, the manufacturers of the John Deere claim for their machine that it has a shaft that drives the apron, on

(Turn to Page 57)

Fruits, Nuts, and Fertilizers

By B. E. Maynard

San Jose, California

E. WALKER, who resides a few miles out of San Jose, has been engaged in fruit growing in the Santa Clara valley for nearly 40 years. Almost as many years ago, he began using commercial fertilizers in orchard work, and many interesting facts concerning their use have come under his observation during that time.

Mr. Walker not only is a practical and successful fruit grower, but a close observer and student of horticultural matters, always delving carefully into such matters as cover crops, cultivation, pruning, spraying, fertilization, irrigation, and any other treatment that may have a bearing on the welfare of his trees. His experiences with the use of fertilizers in orchard practice are of more than passing in-

Early in his work he became convinced that the best paying returns were to be obtained only by the use of a well balanced complete fertilizer—that is, one containing all three of the essential ingredients, nitrogen, phosphoric acid, and potash. Thirty years later this is still his unshakable belief, fully upheld by his experiences during recent years.

The story of the beneficial results he has obtained from the use of commercial fertilizers as he related it in his quiet, unassuming way, certainly carried conviction with it, and clearly demonstrated why he has such unshakable faith in their value when properly used. Mr. Walker does not confine himself to the use of commercial fertilizers only, but uses barnyard manures to a considerable extent and regularly turns under a legume cover crop of some sort. However, he has proved to his own satisfaction that cover crops and barnyard manures do

not meet the full plant food requirements of his place, but that it pays him well to supplement them with fertilizers well supplied with phosphoric acid and potash, also containing a moderate amount of nitrogen.

Prunes and Peaches

HEN he first started fertilizing, Walker used a formula containing 3 per cent nitrogen, 10 per cent phosphoric acid, and 10 per cent potash. Thirty years later he still finds that this formula meets the general conditions of his place better than anything he has applied. This formula contains enough nitrogen to give all the renewal necessary, plenty of phosphoric acid to insure proper setting and ripening of the fruit, and potash in sufficient supply to fill the fruit with sugar, plump it out, maintain quality, and promote health and hardiness in his trees.

However, on his prune trees where wood growth was excessive, the fruit of poor quality, shrinking heavily in drying, and the flesh of the dried product of a dull blackish color, he omitted the nitrogen entirely, using a fertilizer containing 10 per cent available phosphoric acid and 10 per cent potash at the rate of 10 pounds per tree. This treatment proved most successful, greatly increasing production. The sugar content of the fruit was increased, which meant lower shrinkage in drying, with the flesh of the finished product of a clear, rich, golden hue free from the undesirable blackish color formerly produced and still produced in near-by orchards. Thus as far as his prunes were concerned, potash and phosphoric acid met every food requirement.

On his Tuscan cling peaches, how-(Turn to Page 55)



The Mt. Rose Observatory at the crest of the mountain (elevation 10,800 feet).

Nevada

EDITOR'S NOTE: Nevada, the sixteenth state visited in our journalistic tour of state agricultural experiment stations, offers information on a comparatively new project that is being recognized as of vast importance to irrigated farming in a number of states of the Union and in the provinces of Canada. This work, in connection with the snow survey measurements of water in the mountains, which serves as storage material for irrigation water during the summer, is described to us in the following article by Dr. J. E. Church, Jr., who has charge of this unusual research.

has been primarily a stock-raising state. Sheep and cattle from ranch and range have constituted the leading agricultural output of the State. Nevada's agriculture has, therefore, presented special problems, and for many years past most of the station work has centered around the problem of animal disease, poisonous range plants, and kindred problems of the livestock industry.

There are many interesting agronomic and soils problems to be studied in Nevada and with the development of small farming in place of large scale ranching, studies of the more conventional types will be undertaken.

Founded in 1887

THE Nevada Agricultural Experiment Station was founded in the year 1887. Until the year 1912, the following named presidents of the



The timber line on Mt. Rose (10,000 feet elevation). The snow is as deep as the sampler is long. Compare the length of the sampler with the height of the observer.

University of Nevada served also as directors of the Experiment Station: Leroy D. Brown, Stephen A. Jones, and Joseph Edward Stubbs.

The separation of the presidency and directorship was brought about in the year 1912 when Gordon H. True, professor of animal husbandry, was made director of the Station. In 1913 S. B. Doten succeeded Director True and has acted as director up to the present time.

A recent interesting development at the Nevada Station is the study of the economics of reclamation of the desert by irrigation. This is a study of markets, crops, and the cost of production of products which may be shipped to outside markets.

A great interest to prospective as well as present farmers of this irrigated land is the Nevada cooperative snow surveys which now have been 10 years under state direction and support, during which time maturity and service have been attained.

Twenty years ago the Mt. Rose Observatory was conceived. A few years later the study of the effect of forests on the conservation of snow led to the forecasting of stream flow, now recognized as the foundation of crop planting in the irrigated west.

The early years of slowly forming ideas were under the tutelage of the Nevada Academy of Sciences and the Nevada Agricultural Experiment Station which had just acquired the Adams Fund for research.

Basins Organized

THROUGH the cooperation of Nevada, California, City of Los Angeles, Utah Agricultural Experiment Station and various power companies, and irrigation districts, the snow survey has gradually been extended over the Sierra Nevada, and the Great Basin. On the eastern slope of the Sierra Nevada, the Tahoe Truckee, Carson, Walker, Mono, and Owens Basins have now been fully organized, except for small details connected with refinement of method.

On the western slope, the South Yuba is as yet the only basin fully organized. However, the Mokelumne Basin only awaits the improvement of reservoir sites downstream to supplement its crest stations by stations at low levels, while some form of snow surveying has now begun on the Middle Yuba and the Klamath.

In the Great Basin, plans are still in the formative stage. A partial snow survey system has long been in use in the Humbolt Basin, but owing to lack of funds for adequate observations, the results have been very unsatisfactory, particularly because of the low elevation of much of the watershed.

A complete system of snow surveying has been prepared for the Colorado Basin, the development of whose resources is now awaiting early realization. A similar system has also been devised for the entire Columbia River Basin, whose development lies in the more distant future.

The Nevada System

IN addition to the close cooperation in Nevada, California, and Utah, the Nevada System has been adopted by the Washington Water Power Company (Spokane), the Shawinigan Power Company (Montreal, Canada), and in part by the Black River Control District (Watertown, New York). Apparatus for surveying has been purchased by the Canadian Meteorological Service for use in the Bow Basin, the U. S. Reclamation Service at American Falls (Idaho) for the Upper Snake Basin, and by the Stavanger Power Company in Norway

and the Zurich Glacier Commission for glacier study in the Alps.

The basic principle of snow surveying is the determining of the relative water content of the snow cover at the beginning of the spring run-off. This can be done with certainty only by ascertaining the water content of the snow rather than its depth or the seasonal precipitation measured storm by storm.

The snow sampler, which records the water content of the snow directly on a dial by weighing, can be driven to a depth of 20 feet or more, and has penetrated the deepest snow yet found in the snow study of the Sierra. A specially adapted toothed cutter makes it possible to cut through thin crusts of ice and penetrate the upper layers of congealed snow on glaciers.

Since the snow falls more or less uniformly over wide areas, it is necessary only to maintain a few snow courses in each basin or group of closely situated basins. These courses consist of 20 to 40 measurements usually 50 feet apart, maintained un-



Driving the sampler in deep snow at Ward creek (elevation 7,000 feet) at the eastern crest of the Sierra Nevadas.

changed in the same place from year to year. The average water content of several annual measurements is made the mean from which to estimate the seasonal percentage for the current year.

Zones Laid Out

TO check variation in precipitation with altitude or distance from the crest of the range, crest as well as outpost stations are maintained. Because of loss of snow through premature melting on the lower edges of the basin, the basins have more recently been laid out in zones based on elevation, and the percentage of snow cover for each zone is weighed according to relative area of the zone.

For purposes of forecasting, the seasonal percentage of the snow cover in the basin April 1 is considered as representing the seasonal percentage of the succeeding run-off during April-July, at the end of which period the snow cover practically disappears as a dominant factor in the run-off and summer precipitation takes its place.

The accuracy of the snow survey is based on two fundamental facts: (1) As already stated, the approximate uniformity of the snow cover over wide areas, and (2) the intimate relationship in the Sierra Nevada between winter snowfall and springsummer flow. The only two disturbing factors of major importance are: (1) the premature melting of the snow cover at lower levels, and (2) deficiency in normal precipitation during April-July. The former can be determined and measured by means of low level courses at the time of the annual snow survey March 1 or April 1. The probability of the latter and its results can usually be determined by May 1 or at latest by May 15.

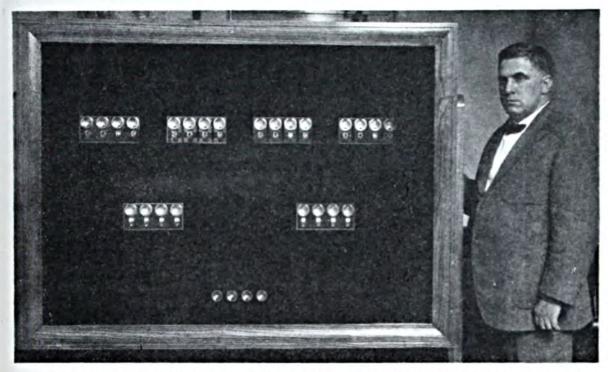
Six Basins

S IX basins, those longest organized, are included in the test series and are situated on both sides of the range. One of these, Lake Tahoe, is greatly affected by precipitation upon its surface. Another, the (Turn to Page 47)



Refuge but and snow survey beadquarters at Contact Pass (elevation 9,000 feet). This cabin, made of sandbags, has since been replaced by a better but of sheet metal.

Herediscope is Invented to Teach Mendelian Theory of Inheritance



R. R. Graves, in charge of dairy cattle breeding investigations, Bureau of Dairy Industry, U. S. Department of Agriculture, with the "berediscope" which he has invented to illustrate the manner in which hereditary characters are transmitted from parent to offspring.

EREDISCOPE" is the name given to a device invented by R. R. Graves of the Bureau of Dairy Industry, U. S. Department of Agriculture, to demonstrate the Mendelian theory of inheritance. He built the contrivance to assist in teaching the principles of inheritance in dairy cattle and hopes that it will be useful to county agents, lecturers, and others engaged in spreading knowledge of better breeding methods.

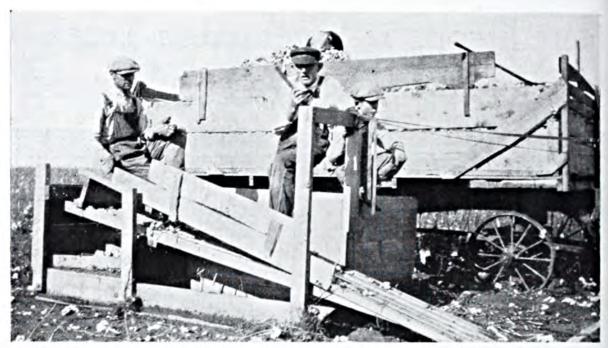
The machine is made up of a number of groups of aluminum cups, each group representing an individual animal. These groups of cups are arranged in the form of a pedigree representing three generations, although machines including more generations could, of course, be constructed. Many small colored balls, each representing any given hereditary character, are placed at random in the cups

of the starting generation which in the machine illustrated in the picture would be the grandparents.

Colors Represent Factors

NE of the colors might represent the factor for high production of butterfat, or it might represent coat color, or any other factor. It might be the factor for low production of butterfat just as well as the factor for high production of butterfat. The marbles representing the various characters are put in the cups in the first generation, and when a trigger is pulled, half of the character symbols from each parent cup are sent on to the cups representing the next generation, the selection of the characters in the change from one group of cups to the other being merely chance as in the case of actual matings.

By repeating this process several (Turn to Page 54)



This is a detail view of a side-draft sled showing how it operates.

Picking COTTON

¶ A simple sled may be the first bint of a revolution in the production of cotton

S NAPPING cotton by a mechanical means known as "sledding" was widely practised in southwest Oklahoma and the Texas Panhandle last year, in spite of the objections which were advanced. Economic conditions caused the resort to mechanical means of harvesting in an effort to reduce costs and make up for labor shortage. It was another case where necessity was the mother of invention.

Much of the cotton in the Southwest has been hand snapped for a number of years. At first the practice was severely condemned and objections are still raised to it.

However, unfavorable weather last year, a labor supply both expensive and hard to get, together with a low price for their crop, led farmers to try the still more severely criticized method of sledding.

Although machine labor has replaced man labor in a number of farm operations, the method of gathering cotton, with exceptions here mentioned, is not materially different from what it was in colonial days. Getting cotton out of the fields is very expensive in man labor and is the limiting factor in the acreage of cotton which one man can handle.

Sleds Are Simple

THE sleds which were used to gather the cotton were very simple in construction. They consisted of a box on runners for holding the cotton as it was snapped. Many farmers used old wagon boxes for this



The cotton is collected in a box at the side of the platform where it is easily handled.

by Horse Power

By W. W. Fetrow

Department of Agricultural Economics, Oklahoma A. & M. College

purpose. In front of this box there were either one, three, or five grooves made usually out of two by fours, pointed at the end and set at an angle. These grooves were about three-fourths of an inch wide and from two to six feet long, depending on the type of sled. The cotton bolls were caught in these grooves, pulled from the stalk, and raked into the box as the sled passed down the row.

There were many different kinds of sleds due to the fact that most of them were made by the farmers, but they all operated on the same principle. Most of the sleds were pulled by two horses, the team straddling the row of cotton to be snapped. However, in some sections they used what they called a "side draft" sled which gathered the cotton from the

row at the side of the team. These sleds were easily operated by a man to care for the cotton as it passed through the grooves and a boy to drive the team.

Three Methods

THERE were three methods of gathering cotton used in the Southwest last year, viz., picking, hand snapping, and sledding. It should probably be stated here that these farmers prefer to pick their cotton when they can. Talk to these farmers as you come to them and most of them will say they would rather pick their cotton than snap it. But labor was scarce in this section last year, as it has been during the past four years. Most of the laborers refused to pick cotton but were will-

ing to snap it. Rains delayed picking for those who had the laborers and made the cotton so hard to pick that most farmers had no choice but to snap it or leave it in the field. While they were delayed in gathering the crop the price of cotton was declining. The price was soon so low as compared to the cost of hand snapping that this method was not profitable. The sled was the only means by which the farmer could gather his cotton and have anything left when it was sold.

A sled could be bought or made on the farm for about \$20. amount saved on one bale would al-

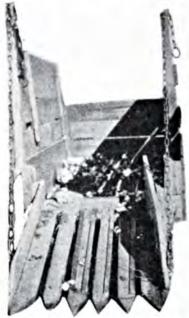
most pay for the sled.

A few figures will help to explain the situation of the farmer in the Southwest last year. If a farmer owned his land and picked his cotton, he would have left about \$25 or \$30 out of each bale after paying for his picking and ginning. If this farmer was renting his land and giving one-fourth of the crop as rent, he would have left about \$12 or \$16 out of each bale. If the farmer was renting on halves and picked his cot-

ton, he would do well to break even picking ginning to say nothing of his labor and expenses in growing the crop.

Objections

HERE are two principal objections to the sleds. One of these is the fact that much cotton often is left in the field.



Most sleds bave several grooves.

The amount of cotton left in the field varies a great deal, depending conditions. upon some cases very little is left in the field, and in others from 25 to 30 per cent. This depends mostly on the type of seed used and the size of the cotton stalk.

The other objection to the sled is the amount of leaves and stems gathered with the cotton. The amount of trash gathered also will vary a great deal. It is often impossible, however, to distinguish sledded cot-

ton from hand snapped cotton. fact the best sledded cotton is far superior to the poorest hand snapped cotton. In handling the sledded cotton, as many of the stems and sticks as

possible are picked out.

The principal advantages of the sled are that it provides a faster method of gathering cotton, takes less labor and costs less, no cotton is picked from the ground, and the sled can be used when the ground is too wet for hand snapping. For the sled to work best, the cotton should be small or of medium size, have few branches, and be free from leaves and

This is a type of single groove sled.

No one knows what the future development mechanical cotton pickers will Probably the greatest improvements will come in gin machinery for cleaning the cotton. If cotton can be gathered by machines and cleaned with no loss to the grade or staple, cotton production will be revolutionized.

¶ Weeds once refused to grow on the abandoned land reclaimed by a county agent in this story on

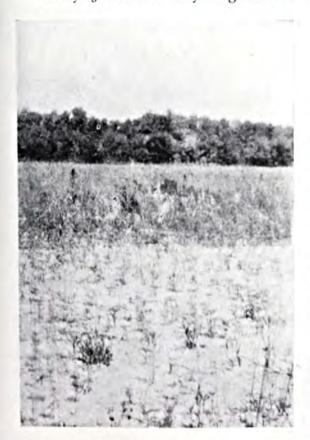
Good Farms from Blow Sands

By R. H. Stinchfield

To find a man living in all contentment where three years ago he declared that he would not live if the place were given to him, is a situation that arouses interest. But to find that man thoroughly enthusiastic about his place, precludes any idea that circumstances force him to make the best of the situation and arouses wonder.

And it is with wonder that one visits Harley Jacklin on his 40-acre farm in Portage county, Wisconsin, and learns that three years ago the fields, which now rank in crop production with any in the Badger State, were nothing but stretches of blow sand which scarcely grew weeds.

Harley Jacklin is a young farmer





Blow sand before and after a treatment of lime, commercial fertilizer analyzing 2-16-28, and alfalfa. (And County Agent Noble is a tall man.)

with a rosy faith in better times for agriculture. Even so when he first drove past this abandoned farm, he told County Agent H. R. Noble that he wouldn't live on that place if it were given to him. But he hadn't counted on a vision in Noble's mind—a vision of bringing back into a prosperous and healthy community that whole section which had been mined of its fertility and abandoned by farmers during the great depression after the war.

How He Did It

J UST how Noble did it is a piece of work which has attracted not only attention throughout Wisconsin, but in neighboring states where similar worn-out soils problems exist. A hustler in every sense of the word, Noble had already demonstrated that excellent and profitable crops could be grown on the marsh lands of the county by supplying the elements of plant food—chiefly potash—which were lacking in the well drained peat. And now he was worrying about all that abandoned blow sand.

The solution to the problem is an interesting tale of a business man's faith in a county agent and the agriculture of his community. H. D. Boston is a furniture dealer and undertaker located in Stevens Point, a city surrounded by the sand country. About 10 years ago Boston acquired two of the abandoned farms south of the city and became a soybean booster. However, the growing of this crop without applying lime or fertilizer and removing the crop from the field were not good practices from the standpoint of building up the soil. They were rather soil-robbing practices, and later when the price of soybean seed Boston discontinued dropped, growing of this crop.

Four years ago, supported by County Agent Noble's advice, Boston turned to lime, potash, and alfalfa as the chief factors needed for rebuilding the sick land. He put in his first small piece of alfalfa on what is now the Jacklin farm. Jim Isherwood, an outstanding farmer of the community, did the work for him.

The results were astonishing and led to interesting Boston in planting more and more alfalfa. He hired all of the work done by near-by farmers who were glad to find extra work to boost along the income from their own places.

The adventure proved a profitable one. Alfalfa thrived, and it wasn't long before Boston was ready to dispose of some of these farms carpeted with seedings of this rich legume which would satisfy the envy of any dairy farmer.

It is one of Boston's farms that Jacklin bought. The son of a pure-bred Guernsey breeder in an adjoining county, the young man saw in the alfalfa the possibility of maintaining a good herd of cows. Furthermore, he could purchase this land at a very reasonable figure.

A Show Place

FORTY acres is all that he bought, but that forty after three years is a show place of the community. One 4-acre field of sweet (Turn to page 58)



Signs like this were erected to stimulate interest.



The international group of soil scientists who made the tour.

The

¶ Delegates to the First International Congress study chief crop regions of North America

Soil Science Tour

By G. J. Callister

Co-Director, Agricultural and Scientific Bureau, N. V. Potash Export My.

ANY years ago, Mr. Pullman evolved sleeping cars. He probably little expected that one day more than 240 people, representing 30 nationalities and 25 languages, would be crowded into some dozen of his cars for 30 days and 30 nights to travel amiably for 10,000 miles. Yet this was done and not only done, but accomplished with marked success.

The occasion was a tour by soil scientists from all over the world. It was a complimentary transcontinental tour of the United States and Canada to the foreign delegates of the First International Congress of Soil Science, which was held in Washington. The trip was conducted under the auspices of the American Organizing Committee, formed of soil scientists from different parts of the United States. Dr. A. G. McCall was the executive secre-

tary of the committee, Dr. O. Schreiner the chairman and official tour guide, and Dr. C. F. Marbut a member of the committee and official tour guide. The tour started on Wednesday, June 22, from Washington, D. C., and ended at the same city on July 22. The map on page 28 shows the route taken. As explained by Dr. McCall, the purpose of the tour was to give the foreign delegates to the Soil Congress an opportunity to study the great soil regions of America, the crop zones, and some of the principal agricultural industries.

For the outstanding success of the tour a generous vote of thanks must be accorded particularly to Dr. J. G. Lipman, who was the first president of the Society of Soil Science, to the Organizing Committee, and also to many other groups and individual people, as well as many travel agencies and agri-



"Now of the wise man's words I learn the sense; How all things live."—Goethe

cultural industries who so kindly entertained the members of the party.

No Room for Dignity

THAT Pullman cars are designed, making it possible for some 240 people to live and travel for 30 days in one train, is an economy not to be overlooked. The fewer the cars, the cheaper the cost, which is a consideration to scientific people, even in these days of urban prosperity. And then, too, the Pullman design—30 men in a car for 30 days—compels a respectful degree of intimacy that no mere bar-

There was room for everything; for bags of soil more precious than gold; for a bewildering variety of botanical specimens; for mountains of baggage; for maps, photographs, books, guides, the typewriter, daily paper, and a carload of cameras; but there was no room for an excess of dignity. That was one thing that had to be thrown overboard about the second day. It was largely a khaki shirt and coatless party. Mr. Pullman looked far ahead when he designed his cars. He compelled people to know each other,

rier of 25 languages could break down.

which was good for the people.

Ladies Were Grateful

IN addition to the standard sleeping-cars, the train was thoroughly equipped with compartment and observation cars, two dining-cars and a baggage car, as well as sight-seeing cars as the occasion demanded. The ladies (for about 20 ladies accompanied the tour) were grateful for the compartment and observation cars, and the



Members of the party in a trench. Notice one man with a bottle of acid testing for carbonates.



One of the profiles studied in the arid section of the Southwest.

gentlemen, in turn, were grateful for the charming presence of the ladies.

Unfortunately, owing to other duties which took him abroad, Dr. J. G. Lipman was unable to accompany the tour. Every one wished he were there. The leaders of the tour were Doctors Marbut, Schreiner, and McCall, and a vast amount of appreciation should be accorded to these gentlemen who so patiently explained a multitude of things that need explaining when people from all over the world come together. Many members of the staffs of the state experi-

ment stations were also present throughout tour, which was a great help to the foreign delegates. Associated with the leaders as their right-hand man in arranging their daily routine was the genial and capable E. N. Thorn, Assistant General Passenger Agent of the Baltimore and Ohio Railroad—a diplomat of the railway service-who was in charge of transportation arrangements throughout the journey. Much of the success of the trip was due to Mr. Thorn and the personnel of the 12 railroads over which the tour passed.

Another vote of appreciation must be given the delegates themselves for their excellent good humor, their sportsmanship, their ability to adapt themselves to new methods and modes of life; to engineers that start and stop decisively; to the American summer heat; to the American water supply; to overalls, whether khaki or blue; to baths in quick rotation or en masse, as the occasion or Mr. Thorn demanded; to country stores that



In the Piedmont section of the South; one of the first profiles examined on the tour,



American farm machinery was a source of great interest to many visitors. Its use was studied throughout the tour; the manufacture particularly at Moline and Chicago, Ill. The picture shows the party inspecting a combine typical of western agriculture.

kept everything but the right foreign photographic film; and to automobile drivers that could drive up mountain peaks with one hand and explain the scenery with the other—a feat which never failed to thrill the passengers peering into the dizzy depths below.

Whole-hearted Hospitality

L AST, but certainly not least, must appreciation be extended to the many groups of public - spirited citizens in our

Doctor Curtis
F. Marbut,
Chief of the Soil
Survey Division,
Bureau of Soils,
United States
Department of
A griculture;
one of the Official guides of
the tour and
author of the
book which described the soils
over which the
tour passed.

state agricultural colleges and experiment stations and in our towns and cities who entertained the members of the excursion—one wide circle of cordial welcome and whole-hearted hospitality. As the paper printed on the train very properly said:

"The excursion would not have been a success without the help of the local committees. We, therefore, take great pleasure in expressing our most sincere appreciation to the people at Greensboro, Knoxville, Athens, Atlanta, Memphis, Carthage, Aurora, Sheldon, Kansas City, Hays, Rocky Ford, Canon City, Salt Lake City, Riverside, Los Angeles, Trona, Fresno, Corvallis, Portland, Vancouver, Edmonton, Saskatoon, Berkeley, Indian Head, Winnipeg, Fargo, St. Paul, Minneapolis, Ames, Des Moines, Moline, Chicago, and Lafayette."

Many were the good friends in all these places that fed, bathed, and entertained the party, all in a spirit of the truest and most cordial hospitality, which was appreciated to its fullest extent by all the travelers.

While the primary purpose of the tour was to study the soil regions of the United States, this original purpose was far outshone by a much greater achievement, namely, a closer affinity of understanding and mutual regard between the representatives of the different countries of the world.



Throughout the long trail of 10,000 miles, a spirit of understanding that will never be forgotten developed. The tour was an object lesson of the fact, so sorely needed, that a mutuality of purpose can bring a mutuality of understanding. It was the chief theme of many addresses given by delegates while on the tour, and a topic of discussion in the paper published on the train.

International Good Will

TYPICAL of many such addresses were those following the banquet given at the Mission Inn, Riverside, California, on July 5. Among the speakers were Professor F. Schucht of Germany, Professor A. A. J. De'Sigmond of Hungary, Professor K. D. Glinka of Russia, Professor T. Imaseki of Japan, Sir E. John Russell of England, and others. The theme of all their addresses was international good will—the value and accomplishment of a better understanding by having lived, worked, and played together.

The comments of Professor F. Schucht—in German—were particularly happy in contributing to this achievement of the tour—a mutual understanding. Professor A. A. J.

Professor Doctor K. D. Glinka, Leningrad, Russia,

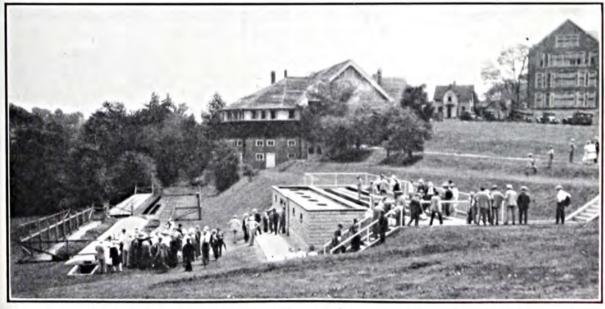
who was elected President of the International Society of Soil Science at the close of the First International Congress of Soil Science at Washington.

De'Sigmond on the same occasion used the soil profile as a happy simile, remarking that a study of the surface was not sufficient.

As Sir E.
John Russell,
Director of
Rothamsted
Experiment



Station, pointed out, to avoid international clashes the great problem at present is to bring the spiritual values into our civilization—the material alone is not sufficient. If we can continue to develop friendship between



Many agricultural experiment stations along the route kindly entertained the visitors. Among such stations were: Knoxville, Athens, Hays, Tribune, Riverside, Corvallis, Vancouver, Edmonton, Saskatoon, Indian Head, Brandon, Winnipeg, Fargo, St. Paul, Ames, and Lafayette. This typical photograph was taken while studying the lysimeters at the University of Tennessee, Knoxville, Tenn.



The group of ladies who accompanied the party on the tour.

the people of different nations, then these spiritual values will grow. The tour had accomplished that to a significant degree.

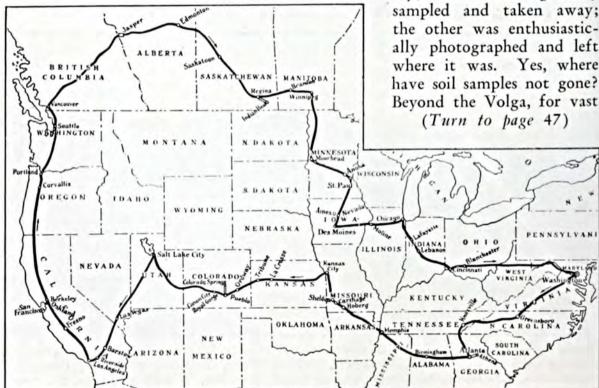
Similar thoughts were expressed in various ways in their own words and in their own languages by the other speakers. We were also particularly glad to hear from Frank Miller of Riverside, California, a well-known worker in the cause of better international relations. Again quoting from the paper-published on the trainissue No. 27:

"Representatives of more than 30 nations have proved to the world what differences can be settled by mutual understanding. Without knowing one another's language we can come together on a common basis and discuss the problems of common interest. Science and art are the universal languages which are finally bound to unite us all as one people -the people of the world."

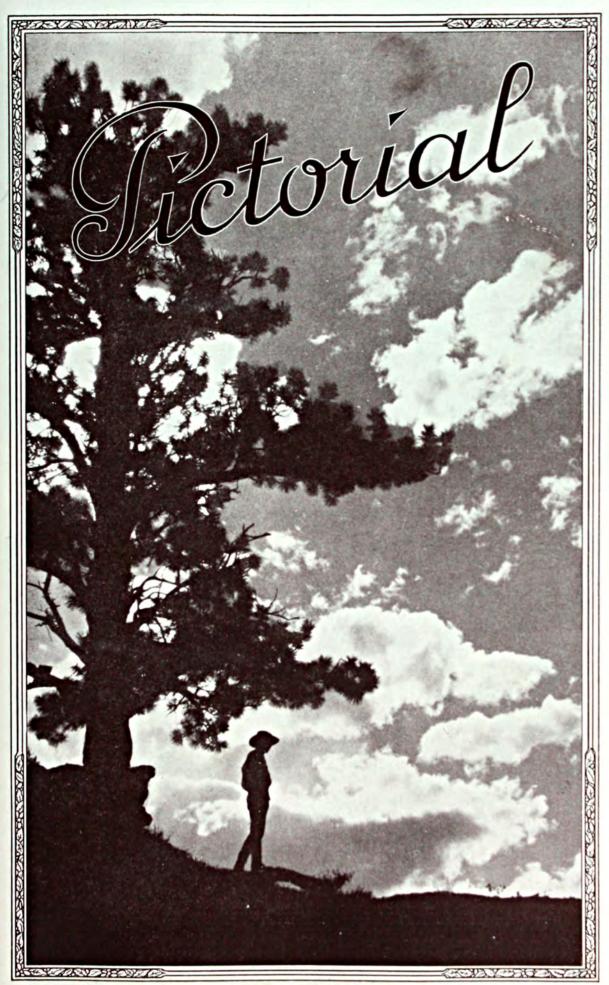
Soils and Scenery

PECIFICALLY the members of the excursion were chiefly concerned in two things: soils and scen-

> ery; the one was vigorously sampled and taken away; the other was enthusiastically photographed and left where it was. Yes, where have soil samples not gone? Beyond the Volga, for vast (Turn to page 47)

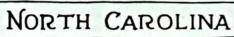


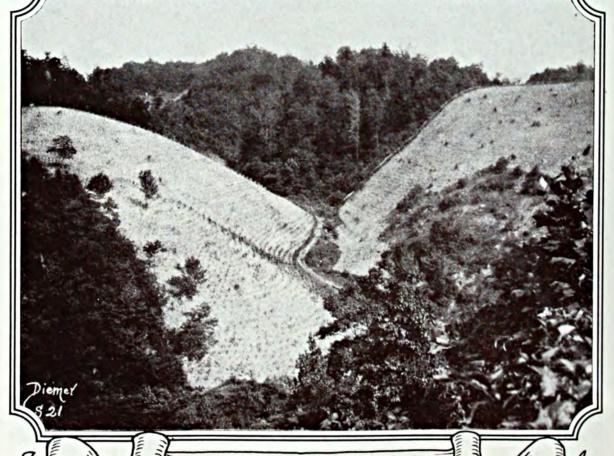
The route of the tour from Washington to Los Angeles, returning through Canada.



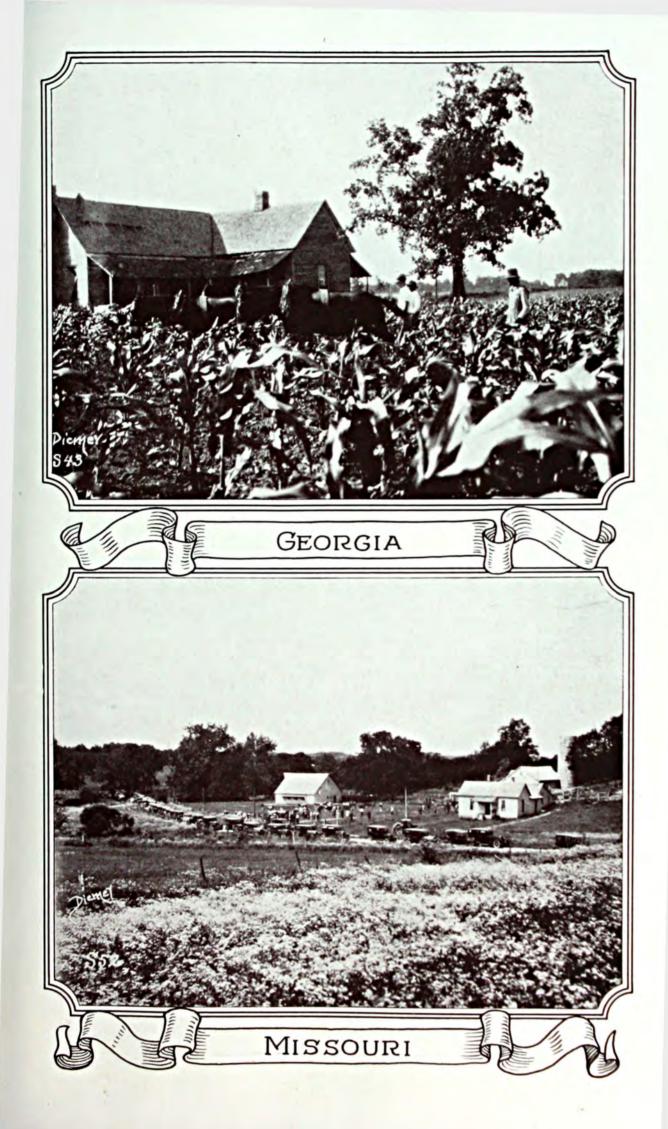
A Pictorial Resume of the Tour of the Soil Scientists

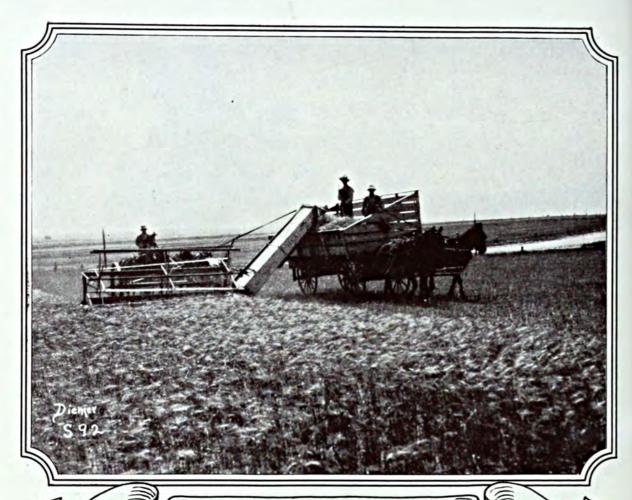






TENNESSEE

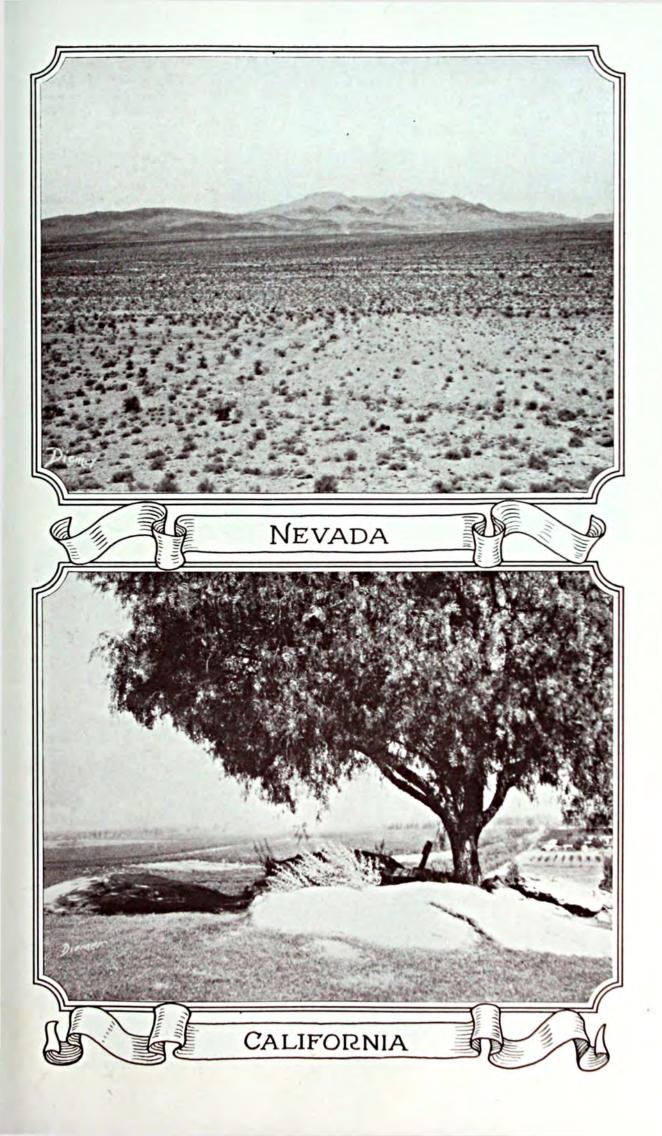


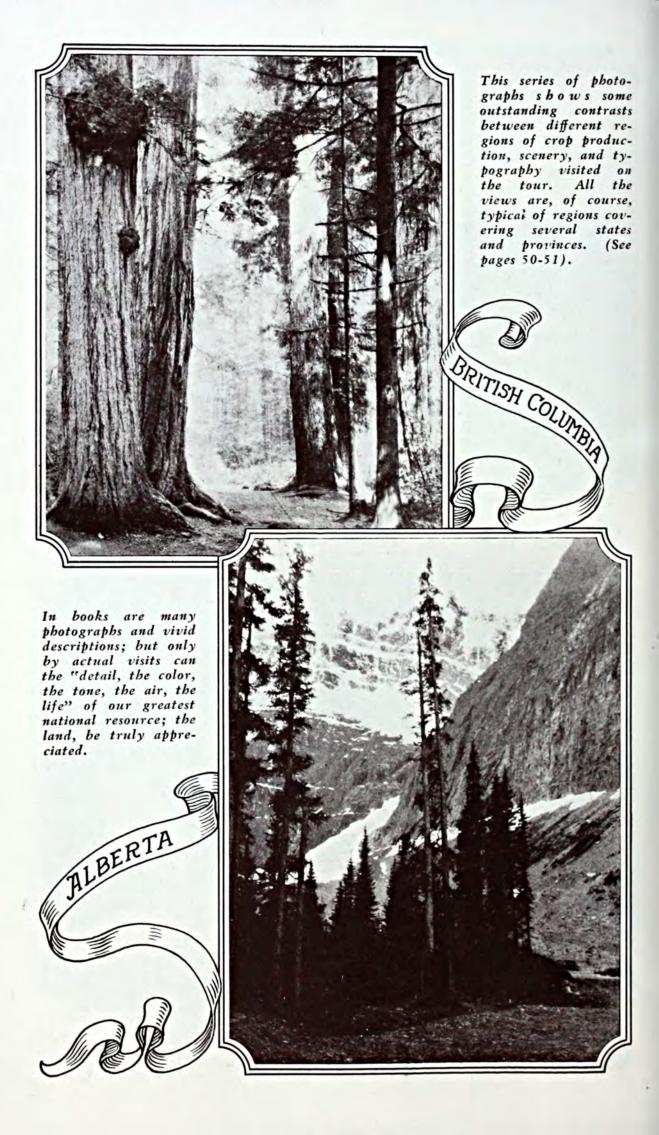


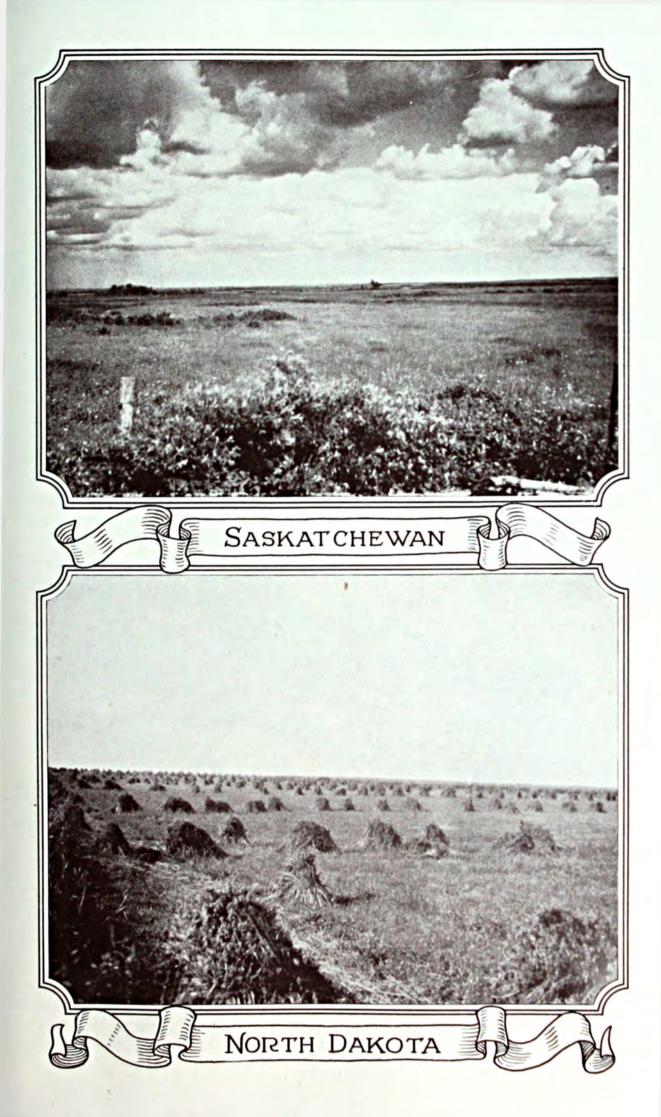


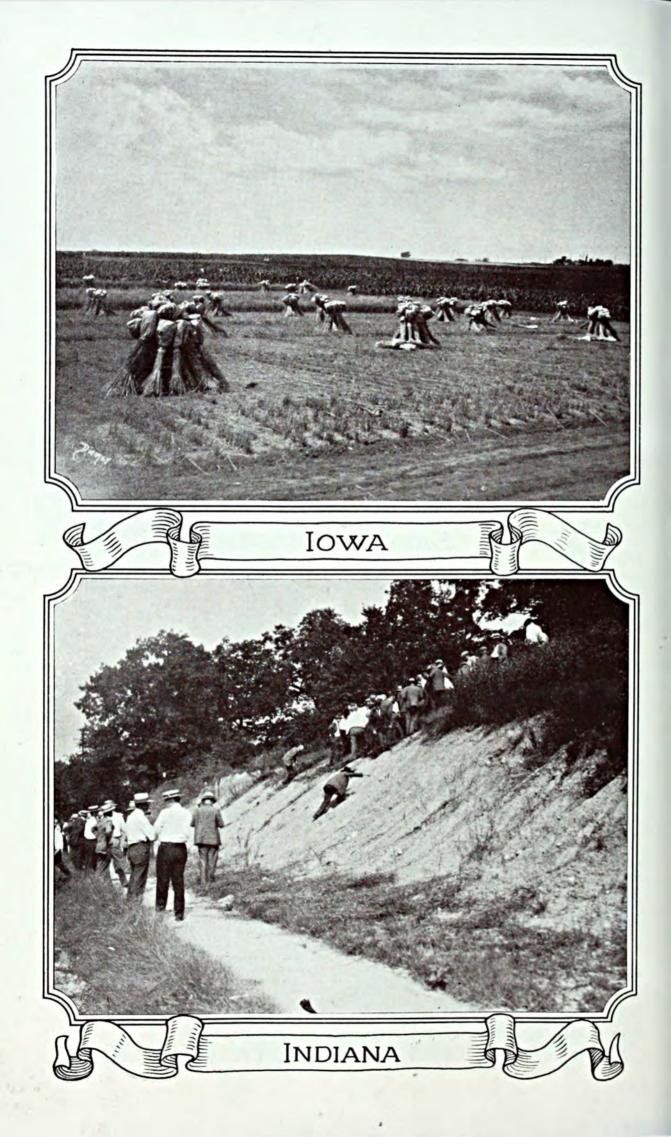


COLORADO











Diversified Fertilizing

The total fertilizer tonnage sold in the United States each year since the war has fluctuated widely. During the 12 years, 1914-1925, the total fertilizer tonnage did not increase over the pre-war period, 1900-1914,

and the fluctuations were much larger than in the previous period. There were, for instance, decreases of 1,800,000 tons in 1915 and 2,400,000 tons in 1921.

These fluctuations are caused chiefly by changes in values per acre of farm crops, that is, changes in crop prices and average yields. Therefore, increases or decreases in crop values cause changes in the fertilizer sold. the present time, the values per acre of cotton and tobacco make up more than 60 per cent of the factors affecting variation in the total tonnage of fertilizers sold in the United States.

While no doubt there must always be some fluctuation, if a greater degree of stabilization is ever to be accomplished, this dependence on cotton and tobacco values must be reduced and fertilizers used in large amounts on many other crops. There is an urgent need for a more careful follow-up of the fertilizer requirements of corn, grain crops, legumes, and small specialized crops. In fact, no crop should be considered unimportant from the fertilizer viewpoint. The tendency at present is to pay too much attention to a few high cash crops, and not enough possibilities are seen in the lower value general crops.

Crop diversification is a good thing for the farmer. Diversification in the fertilizer sold is also a good thing for the industry, as well as the farmer.

> Nature fits all her children with something to do. -A FABLE FOR CRITICS.

the Fittest

Survival of Last year more than half a million people left farms to seek more remunerative employment in the city. This fall, with another harvest tallying up successes and failures, a similar trek will start.

Alarmists already are voicing their predictions-downtrodden agriculture, famine, high cost of living. These men seem to have forgotten completely one of nature's inexorable laws-The Survival of the Fittest.

We have no sympathy whatever with the alarmists. Rather do we wish to endorse the opinions of two men who see in the exodus from the farms a brighter future for agriculture.

One of these men, Secretary of Agriculture Jardine, speaks from a vision of the nation's agriculture such as few men in the United States are privileged to acquire. In citing the fact that the number of people actually living on farms fell from 32,000,000 in 1910 to less than 28,000,000 in 1927, he points out that a certain part of this movement is due to the natural long-time adjustment which will always go on between industrial and agricultural activities and methods of earning a livelihood.

He believes that it is a healthy movement and need not operate to the disadvantage of agriculture.

The other man is a farmer, C. J. Hayward of Colorado. In a letter to the editor of Farm Life, Hayward says:

> "What would we farmers do now if 71 per cent of our population (as in 1880) were rural? We farmers progress as do other manufacturers. By the use of machinery one man can now do what 10 men used to do. Every year more and more labor-saving machinery is coming into use. Every piece of machinery put in use on the farm has released men from the farm and put men to work in the city, making more machinery. What would be more natural than for men to move from the farms to

> "The rural population will continue to move to the city until the balance is such that the employed men of the city will make the demand for farm products equal or exceeding what the rural population can produce with the use of labor-saving machinery. Until that time the farmer's lot (as a whole) will not be all rose blossoms. Helping the man in the city to find profitable employment so he can buy more is better horse-sense than

to worry about keeping him on the farm.

"Some government legislation may help the farmers a little, but the main help will have to come from within. Wheat is now worth \$1.25, local elevator. If I can produce it for \$1.20, I can get ahead. If it costs \$1.30 for me to produce it, sooner or later I will have to move to the city, and still there is only 10c. difference bewteen \$1.20 and \$1.30. Right there is where some of us farmers lose out. It isn't the big things, but the little leaks that make the difference between \$1.20 and \$1.30 cost. I believe the government can help us by not developing more land. Let the demand catch up with the supply. Do not encourage settlers on new dry lands until the price of farm commodities has risen so the new settlers can make a profit and succeed."

The other side of the picture, as Secretary Jardine stresses, is the need of keeping competent farmers on the farms, men and women who know rural life, who love it, and who can contribute substantially to its development. The development of a rural community life on a plane comparable to surroundings in the towns and cities will accomplish much toward that end, he believes.

But we maintain that the sound conditions of a happy and healthy rural community are closely tied up with sound economic conditions.

> The best investment is in the tools of one's own trade. -BENJAMIN FRANKLIN.

sourcefulness

Tar Heel Re- The people who appreciate water the most are those who live in deserts.

> The farmers that appreciate fertilizers the most are those that live on poor soils.

Thus, curious as it may seem, agricultural communities in the poorer soil regions are often the most prosperous for the simple reason that they use all the resources available to build up the soil, while the people on the better soils are more inclined to merely accept what nature gave them and let it go at that.

As an instance, North Carolina is one of the most productive agricultural states in the Union, yet the state as a whole possesses soils of only moderate to poor fertility. No state in the Union uses as much fertilizer as North Carolina, The state is thus poor in soil, but rich in the resourcefulness of its people in making the most of what science and the business man have made available for a more prosperous agriculture.

The following from the Drovers Telegram on FERTILIZER PROFITS tells the

story better than we can:

"NORTH CAROLINA was cursed or blessed, it is difficult to determine which, with naturally poor soil—nearly as poor as the soils of Georgia, Alabama and South Carolina, and decidedly more so than any of the states to the west and north of those named. Yet North Carolina has become one of the most productive agricultural states of the union. The Tar Heel people have literally become rich by buying plant food and speculating on it.

"That is, the North Carolina people have bought vast quantities of commercial fertilizers, applied them to cotton, tobacco, truck crops, peanuts, and corn, and grown rich on the profits after paying for the fertilizer. No other state has used nearly so much fertilizer to the acre, and only two or three irrigated states have made as much cotton to the acre as has the Tar Heel State. No other southern state makes as much tobacco of as high quality. That section is not regarded as very productive of corn, but North Carolina makes a better average yield than any other cotton state except Texas, and ties with that state."

The farming population on many other soil areas could profit by this lesson of North Carolina.

Business ideals are the sign-posts of business conduct.

—FARM MARKET SAYINGS.

Business Ethics

That business as a profession with definite ethical standards is growing is shown by the fact that at least five books on business ethics were published last year. It is significant that each writer is impressed

with the "growing ethical importance of the trade association movement as a force in the direction of higher ethical standards."

Dr. Edgar L. Heermance, in his book THE ETHICS OF BUSINESS, particularly discusses the trade association for his group unit for three important reasons: trade associations are made up of a considerable number of units, which means a diversity of opinion; they are of recent growth so that the process of developing group consciousness lies within the memory of men still actively engaged in business; and trade associations usually make early efforts to define their activities in the form of codes.

These books have been ably reviewed by W. B. Donham, in the HAR-VARD BUSINESS REVIEW. As he properly points out, trade codes too often have little relation to hard reality and, therefore, unhappily point in one direction while the practical affairs of business head very definitely in another. To reconcile trade practices and codes is one of the chief problems of modern business.

The difficulty, in the opinion of W. B. Donham, is the lack of recorded cases. He concludes that much research work must be done before a satisfactory study of practices can be made and standards evolved in the way that legal principles have evolved, that is, as generalized from specific cases. In other words, what is needed is "hard-boiled concreteness as a basis." At the

present time, we are too much in the position of hopefully sitting on ethical committees forming codes without the fundamental aid of carefully recorded specific situations.

The evolution of ethical principles and their acceptance by modern business are excellent in theory. Doubtless we all accept them—at least for the other fellow. But we believe that there is a lot of hard practical sense in what Mr. Donham says. Before trade associations and ethical codes will effectively help to stabilize business, many specific cases of where the code and practice do not fit will have to be studied patiently.

This requires confidence in the association on the part of all its members—that their mutual good is best served by an association—that a code is essential. It also requires time and patience and diligence by some one in every association who is willing to work eternally hard and be satisfied with but small thanks from his own generation.

But some one will do the job. The profession of modern business demands it.

Louis A. Fuertes

With profound regret we record the death of Louis Agas-

siz Fuertes, artist, naturalist, and lecturer of ornithology at Cornell University. By the untimely close of this life, the world of science and art suffers and irreparable loss.

Louis A. Fuertes' work won for him great distinction, not only in this country, but abroad. Perhaps the work by which he will be best remembered is a series on habitat bird groups in the American Museum of Natural History, New York City. His untimely death will leave his book on the Abyssinian expedition of the Field Museum

of Natural History only half completed.



As Alexander Pope said, "All Nature is but Art unknown to thee." We have seen, in the unique personality of Louis A. Fuertes nature revealed in art by the rare combination of scientist, naturalist, and artist. He brought together Nature and Art, scientist and layman in one common love and devoion to that field in which he was so ardent and so inspirational a worker.

Bacon, speaking of the forces of Life, says: "Fame is of that force as here is scarcely any great action wherein it has not a great part." May we not trust that by the untimely death of Louis A. Fuertes his work may not cease, but in his Fame be carried on in memorial by those who shared his labors and those who received the rich benefits of his devotion to the world of Nature and Art.



By P. M. FARMER

Potash Holds Leaves on Cotton Plants

Cotton on experimental fields on which potash had not been used shed practically all leaves by the first of August, according to a statement by E. B. Ferris of the Mississippi Agricultural Experiment Station. Other fields, similarly fertilized but with potash added, retained the leaves until frost and produced a better yield of better grade cotton that was more easily picked. In the cotton work at that station it was also found that proper fertilization aided greatly in the battle against weeds. The fertilized cotton started off quickly and soon shaded the ground and drove out the foreign plants. On the unfertilized fields the weeds and grass remained strong competitors throughout most of the season. It is apparent that fertilizer should be given credit for reduced labor in caring for the crop.

Soft Corn Coming

It looks as if there will be a lot of soft corn again this fall, and states in the corn belt are warning the farmers to make preparations to handle it in such manner as to reduce losses to a minimum. The University of Illinois says that soft corn cannot be husked safely as early as mature corn. The ears will dry faster on the stalks than in the crib. Also, late in the season when the weather is cool, there is not so much danger of spoilage in the crib. Soft corn should be husked clean as husks, silks, and shelled corn fill up the space around the ears and interfere with the circulation of air. Throw-

ing out the sappy, rotted ears also is desirable. The crib for soft corn should not be more than six or seven feet wide and should have slatted sides and bottom. Ventilators should be installed to facilitate the escape of moisture from the corn. Special apparatus for the utilization of artificial heat should be used in many cases.

Health in Country and City

The city is best for the children and the country best for the elders, according to an investigation carried on by Prof. Howard Woolston of the University of Washington. In the country, he says, there is less success in checking communicable diseases. Degenerative processes are speeded up in the cities and age breaks under the pressure. In the country the diseases causing the highest mortality rates are typhoid, tuberculosis of the lungs, scarlet fever, nephritis, whooping cough, puerperal, diphtheria, and diarrhea in the order listed. His study showed the highest rates in the city to be caused by influenza, cancer, measles, diabetes, violence, heart disease, tuberculosis (various), and cerebral hemorrhage.

Insects Migrate From Apples to Potatoes

The small greenish insects known as leafhoppers which cause burning of potato vines in August are the same ones that were found on young apple trees earlier in the season, according to the New York State Agricultural Experiment Station. Soon after the potato plants appear above ground these

insects leave the apple trees and begin feeding and laying eggs on the potato vines and can be found in all stages of development on these plants for the rest of the season. The effect they produce, which used to be called tipburn and is now called hopperburn, was once thought to be caused by dry weather. These insects can be held in check by 3 or 4 applications of a spray made of 5 pounds of copper sulphate, 10 pounds of lime, 21/2 pounds of powdered lead arsenate, and 50 gallons of water. The spraying must be done from the undersides of the leaves as that is where the insects congregate.

Strawberry Fertilization

That a properly balanced fertilizer for strawberries will pay good returns was shown by a demonstration in Duplin county, North Carolina. In this demonstration, conducted by E. B. Morrow, Extension Horticulturist, and County Agent L. L. McLendon, a 9-3-8 fertilizer was used in comparison with the fertilizers formerly used by the growers. Plots of 1/20 of an acre with check plots were used. The average yield of the plots getting the 9-3-8 fertilizer was 140.1 quarts compared with 98.4 quarts from the others. This was an increase of 26 crates per acre in favor of the recommended fertilizer.

Airplane to Fight Sugar Cane Insect

Experiments to test the effectiveness of dusting sugar cane against the sugar cane moth borer were begun in Illinois August 1 under the direction of the U. S. Department of Agriculture and in cooperation with the American Sugar Cane League, planters, manufacturers and bankers. Fifty thousand dollars it to be expended in this work. At the present time the effective control of the borer consists in submerging seed cane in water for 72 hours before planting. It is hoped that airplane dusting with sodium fluosilicate will prove equally effective

and more economical. One dusting was given about August 1, another September 1, and a third one will be given October 1.

Sweet Clover Accused

Sweet clover, long praised for having brought itself up from the position of roadside bum into the society of respectable money crops, is now accused by the plant criminologists of being responsible for the deaths of The experiment stations of Minnesota, and Ohio have found that sweet clover hay when fed continuously and in large amounts causes internal hemorrhages and death. Young cattle seem to be the most susceptible. The North Dakota station says that only spoiled sweet clover hay will cause the trouble, and gives blood transfusion as the best cure. Both the Ohio and Minnesota investigators believe that any sweet clover hay, good or bad, will cause the poisoning if fed to young stock in large quantities. Bacteria in the hay are thought to cause the hemorrhages.

In Ohio it is thought farmers will have no trouble with this valuable feed if they use it as pasture, or mix the hay with other kinds and feed it lightly.

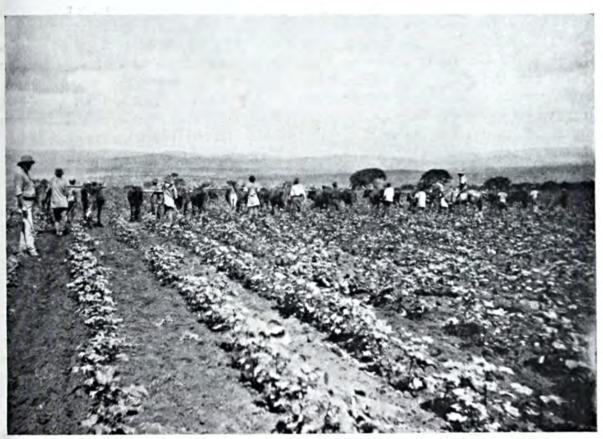
Spray or Dust

In a recent Minnesota test of the relative merits of spraying and dusting for potatoes the spray gave its dust to the dust. The spray seemed to have a decided advantage in reducing the losses from insect pests. All the plots, which were planted to Bliss Triumph and Green Mountain, were sprayed or dusted four times and there were check plots on which neither spray nor dust was used. The average increase over the check plots was 57 bushels for the sprayed plots and 20 bushels for the dusted plots the first year. The next year the advantage in favor of the sprayed plots was 19 bushels and for the dusted ones 61/2 bushels.



Foreign and Intermational Agriculture





A gang of cultivators operating in a South African cotton field. Note the fine soil tilth, the even stand, and the strong development of fruiting branches. This crop was thinned at the right time and yielded heavily. Note the oxen and type of labor.

South African COTTON

By H. E. Andries

Umbogintwini, Natal, South Africa

¶ How the other side of the world grows cotton

THE Union of South Africa, it must be made clear at the outset, is a comparatively small producer among the world's suppliers of cotton. Within the country itself, cotton growing is still an infant industry. Of the 90,000 farmers and

companies actively engaged in farming in the Union, not more than 5,000 are growing cotton on a commercial scale, that is on upwards of 30 acres, whilst the largest area under one control at present is 20,000 acres. Yields vary all the way from 250 pounds of

seed-cotton per acre to as high as 1,500 pounds per acre with an average yield around 350 pounds of seed cot-

ton per acre.

The high yield recorded above was grown during the 1924-25 season on a 200-acre block, and represented a phenomenally good crop. The grower secured 14.50 pence (29 cents) per pound for his lint and 4 pence (8 cents) per pound for the greater part of his seed for planting purposes. Less than 200 miles away in other parts of the cotton belt, however, planters suffered the loss of their entire crops as a result of excessive rains at the commencement of the picking season. No less than 40 inches fell during March, 1925, in these districts just when the crop was in the first flush.

The crop has been grown seriously during the last six years only, and it is natural that farming methods are still in the process of evolution.

The approximate acreage planted during the 1924-25 season was 64,000 acres, and during the 1925-26 season 90,000 acres, whereas the estimated potential cotton acreage is over 4,000,000 acres. It is considered that the achievable wealth of the future

cotton fields of South Africa will far exceed that of the gold mines of the Rand.

The difficulties that have hampered in the past the development of the industry have been:

(1) Impure seed, from which was produced a staple lacking in uniformity and consequently in poor demand;

(2) Lack of reliable information on the growing of the crop, due in a large measure to lack of organization

within the industry;

(3) Transport difficulties (the best cotton-growing territories have been badly served by railways and roads. Many of these territories have been malarious and practically uninhabited).

(4) Grading, ginning, and marketing facilities have been inadequate, and prior to 1918 were practically non-

existent.

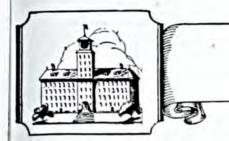
In 1918, however, the Union Government inaugurated a specialized Cotton Division of the Department of Agriculture to take over all previous and existing work on cotton, and to conduct intensive research on the growing of the crop. This Division is today able to teach farmers along

sound lines, based on those methods that have been found most reliable on its experimental stations. In addition its field staff organizes cooperative experimental investigations on representations on representations of the presentations of

The Empire
Cotton Growing
Corporation (a
body with the development of cotton growing
within the British Empire as its
(Turn to P. 46)



Cultivating South African cotton with an ox-drawn spring tooth barrow. The work is done across the rows which gives fine tilth and does no permanent, if any, damage to the cotton crop.



REVIEWS



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Analysis 2-12-2 and analysis 0-12-2 developed more primary and secondary roots on corn plants than did acid phosphate used alone. This is one of the outstanding results among others obtained as the result of experimental work to determine "Some Effects of Method of Application of Fertilizers on Corn and Soils" by Frederick B. Smith, Agricultural Experiment Station, Iowa. The results of the work were published in Research Bulletin No. 104.

As the author points out, the amount of root growth is of vital importance to the corn crop. He states that early growth, early maturity, increased yields, and quality are correlated with the root growth. The fertilizers, therefore, that produce the biggest root growth are of vital importance. Of equal importance is the method of applying the fertilizers. Experiments were conducted in a greenhouse and field with fertilizers in various amounts, from 100 to 300 pounds per acre, applied in contact with the seed, at the sides of the seed, below the seed, and in the hill mixed with the soil. All these methods were compared with corn grown on check plots. The author states that it seems we have to conclude from these studies . . . that the best effect of fertilizers are obtained when the fertilizers are applied in the hill properly mixed with the soil. By this method the greatest development of both the primary and secondary roots was ob-

In greenhouse experiments the fer-

tilizers used in the hill mixed with the soil decreased the production of nitrate and lowered the nitrifying power of the soil for two weeks after the fertilizers were applied. With the present corn crop only 60 per cent of normal and the use of fertilizers increasing on corn, this research work contributes valuable and practical information on both the effect of fertilizers and, particularly, the method of application which would tend to act as an insurance against poor stands of corn.

Soils

"Properties of the Colloidal Soil Material," U. S. D. A., Washington, D. C., Dept. Bul. 1452, Nov. 1926, M. S. Anderson and Sante Mattson.

Crops

New and interesting information can be found on almost every one of the major crops in the large assortment of bulletins which have appeared this month. Arkansas has two new bulletins on corn; Texas has two on cotton; the grain crops are well represented, and there are two new bulletins on strawberry culture.

"Corn Varieties in Arkansas," Agr. Exp. Sta., Fayetteville, Ark., Bul. 217, June, 1927, C. K. McClelland.

"Strawberry Production and Marketing in Arkansas," Agr. Exp. Sta., Fayetteville, Ark., Bul. 218, June, 1927, C. O. Brannen and J. A. Dickey.

"Cultivation Experiments with Corn," Agr. Exp. Sta., Fayetteville, Ark., Bul. 219, June, 1927, Martin Nelson and C. K. McClelland.

"Apricots," Agr. Exp. Sta., Berkeley, Cal., Bul. 423, May, 1927, H. R. Wellman.

"Growing Flax in Kansas," Agr. Exp. Sta., Manhattan, Kans., Cir. 133, Apr., 1927, H. H. Laude and W. E. Grimes.

"Blackbull Wheat in Kansas," Agr. Exp. Sta., Manhattan, Kans., Bul. 241, June, 1927,

S. C. Salmon, C. O. Swanson and H. H. Laude.

Thirty-fourth Annual Report, July 1, 1925 to June 30, 1926, Agr. Exp. Sta., St. Paul,

Minn., W. C. Coffey.

"Results of Seed and Legume Inoculant Inspection for 1926," Agr. Exp. Sta., New Brunswick, N. J., Bul. 447, Feb., 1927, Jessie G. Fiske.

"Sugar Beet Investigations," Agr. Exp. Sta., State College, N. M., Bul. 162, June, 1927,

J. C. Overpeck.

"Protein Survey of the N. D. Wheat Crops of 1925 and 1926," Agr. Exp. Sta., Fargo, N. D., Bul. 208, Mch., 1927, C. E. Mangels, T. E. Stoa and Wm. Guy.

"Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XII, No. 4, July-August, 1927,

Whole No. 127.

"Apple Pollination Studies in Ohio," Agr. Exp. Sta., Wooster, Ohio, Bul. 404, Apr., 1927, Freeman S. Howlett.

"Varieties of Cotton for the Gulf Coastal Plains of Texas," Agr. Exp. Sta., College Station, Tex., Bul. 354, May, 1927, D. T. Killough and V. E. Hafner.

"The Effect of Spacing and Time of Thinning on the Yield, Growth, and Fruiting Characteristics of the Cotton Plant in 1925," Agr. Exp. Sta., College Station, Tex., Bul.

360, June, 1927, R. H. Stansel.

"Seeds and Plants Imported by the Office of Foreign Plant Introduction, Bureau of Plant Industry, During the Period from Jan. 1 to March 31, 1925," U. S. D. A., Washington, D. C., Inventory No. 82, June, 1927.

"Everbearing Strawberries," U. S. D. A., Washington, D. C., Farmers' Bul. 901, June

1927, Geo. M. Darrow.

"The Life History of Timothy," U. S. D. A., Washington, D. C., Dept. Bul. 1450, Mch., 1927, Morgan W. Evans.

"Experiments with Fall-Sown Oats in the South," U. S. D. A., Washington, D. C., Dept. Bul. 1481, May, 1927, T. R. Stanton.

"Soy Beans," U. S. D. A., Washington, D. C., Farmers' Bul. 1520, Apr., 1927, W. J. Morse.

American Potato Journal, Washington, D. C., Vol. IV, No. 7, July, 1927, Karl H. Fernow.

Economics

"Income to Iowa Agriculture 1920 to 1926," Agr. Exp. Sta., Ames, Iowa, Cir. 104, June, 1927, Knute Bjorka.

Diseases

"Raspberry Diseases in Iowa," Agr. Exp. Sta., Ames, Iowa, Cir. 105, June, 1927, J. E. Melhus and O. H. Elmer.

"Why a Cull Apple is a Cull," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 160, Feb. 1927, H. P. Gaston.

"Some Observations on Winter Injury in Utah Peach Orchards," Agr. Exp. Sta., Logan, Utah, Bul. 202, June, 1927, T. H. Abell.

South African Cotton

(From Page 44)

purpose) maintains five experimental stations and a seed-breeding station, each in charge of a highly-trained expert whose help and counsel is at the disposal of the growers in the neighborhood.

Enterprising commercial concerns, particularly ginners and manufacturers of fertilizers and insecticides, are giving valuable assistance to the cotton industry through their service departments. At least one such firm operates an up-to-date experimental farm.

Meanwhile several commercial and farmers' cooperative ginneries have been erected, and between them they are able to cope with the entire output of the country efficiently and rapidly. The building of new railways and roads has opened up important fresh cotton areas, and various land-settlement campaigns both in the Union and overseas, have populated them.

Government cotton graders and seed-cotton classifiers are now stationed at the principal ginning and selling areas; and at Durban (Port Natal) there is a well-established cotton market—the only one of its kind in the world—at which ginners, acting on behalf of their clients, sell on sample by public auction. These sales are well attended by English, continental, and oriental buyers; whilst facilities for the export of lint to Liverpool markets complete the needs of the industry which now holds great promise for the future.

The writer of this article recently had occasion to investigate the cultural methods adopted as standard by the biggest estate in the country (to which reference was made in the first paragraph of this review) and a brief summary of their practices will be given in next month's article.

(Continued next month)

Nevada

(From Page 16)

Carson, has large diversions above its point of gaging. A third, the Mokelumne, possesses only crest snow survey stations and depends for its low level estimates upon measurements in the South Yuba Basin, which is separated from it by the wide American Basin.

Yet out of 60 forecasts in the past 17 years for the entire six basins, 33 forecasts were within 10 per cent of the actual April-July run-off, while 16 were within 20 per cent. In the remaining 11, the maximum divergence between snow cover and run-off was 30.4 per cent.

In 1925-26, a year of heavy premature melting and run-off, still greater accuracy was attained by means of weighted estimates for high and low levels. For out of six forecasts, four (the West Walker, Carson, Tahoe, and Truckee) were within five per cent, while that for the South Yuba was 10.3 per cent, and for the Mokelumne within 18.5 per cent. The East Walker, greatly affected by large meadows above point of storage, deviated only seven per cent from the forecast.

Under the varying conditions of weather, accuracy within 10 per cent is considered highly satisfactory. However, low-level courses have now been organized to maintain this accuracy, or if possible, further to increase it.

The Soil Science Tour

(From Page 28)

quantities of American and Canadian soils have gone to many parts of Russia, carried there by Russia's diligent 19 delegates; a lot more has gone to Switzerland, to Germany, England, Holland, Hungary, Roumania, Poland, the Far East, and many

other places, all to be stored until winter, when the great investigation

of American soils can begin.

It is to be no superficial examination, for the soil scientists dug deep for their samples. Trenches were dug showing profiles and horizons (see photographs). Each of the soil horizons, A, B, and C, were all carefully measured, samples of each were taken, noted, wrapped, and labeled from the



Showing the productive effects of irrigation in the Arkansas Valley, Colorado.

surface of North American Mother Earth to several feet down. Yes, the soil scientists of the world are going to get to the bottom of the great American land problem.

Why all this interest? What does it accomplish? logical and natural questions. The reason is, briefly,

in order to make any practical or scientific progress, thought and things must be classified. This is a classifying and classified age. The principle is used by all of us even when speaking of things in common use. Without classification, thought would be wild confusion.

Science is the great classifier. In line with this thought during the history of the ages, various attempts have been made to classify soils. It is not a new subject. Cato classified soils.

The Newer Concept

NTEREST has recently been intensified in the genesis and classification of soils because the world of soil science has received the vigorous stimulus and challenge of a comprehensive and newer concept. The chief interest of the tour was, therefore, in this newer concept discussed in the following paragraphs. To what extent did it interpret and meet the soil conditions of all countries? the scientists agree with its principles? Thus were provided the basis of sharp clashes of opinion—"the collision of mind with mind and knowledge with knowledge-" all of which shows that soil science at least is in a healthy, growing condition.

Broadly speaking, the older systems of soil classification had a distinctly geological basis. Soils were regarded "simply as the end products of rock weathering; in other words, geologic material, the ground, dirt, silt, loam, sand, clay, etc." But this idea provided no vital explanation of the relation between different great soil bodies; neither did the idea provide any basis for a comprehensive and natural scheme of soil classification

or fundamental principles on which to found a separate soil science.

Contrasted with this older idea—the newer¹ concept is that soils are "natural dynamic bodies," not merely end products; dynamic bodies, the product of powerful soil forming forces which forces are constantly tending to produce mature soil bodies.

According to this concept, the chief forces are the "climatic and biotic forces." The development of this concept has led to one of the fundamental laws of soil genesis and classification "the law of the development of soil types on the earth's surface under the influence of climate."

As component parts of climate, rainfall and temperature are, of course, the chief factors. While in this concept, climate, and especially moisture, has been raised to a plane of fundamental importance in formulating the basis of a scientific concept of soil genesis and classification, all the other factors, as the land relief, vegetation, soil material, geological processes, soil and ground water, age, and the effects of human labor are also included as influences.

¹ For an exposition of this concept, see, "The Great Soil Groups of the World and Their Development" by Professor Doctor K. D. Glinka, Director of the Agricultural Institute, Leningrad. Translated from the German by C. F. Marbut, U. S. Department of Agriculture, 235 mimeographed pages. Edwards Brothers, Ann Arbor, Michigan, 1927.



Nearing Salt Lake City, Utah. Old lake levels.

A Proposed Basis

WHEN these forces act unhindered, particularly moisture and temperature, mature soil bodies are developed. Many soils are "young or immature"—others have been developed beyond the mature stage "postmature."

Using moisture as a basis, the exponents of this newer concept suggest that the classification of soils can be related to moisture, specifically: (1) optimum, (2) average, (3) moderate, (4) in-

sufficient, (5) excessive, and (6) temporarily excessive moisture conditions. While this is a proposed basis and a phase of the newer concept, it is not necessarily accepted in every country. From an international view-point, soil genesis and classification are in a state of evolution, which varies considerably according to the contributions and the factors affecting the work in each country.2 Hence the value of the Congress and the tour.

The regions of moisture variation already noted exist, of course, in the United States. The tour passed over many of the soil bodies developed under the major variations of these factors. Typical developments of such

soils were examined.

Several groups and types of soils formed under "average" or humid moisture conditions were examined

broad groups. (See soil surveys and reports.)



After leaving Corvallis, and on the way to Seattle.

during the eastern part of the tour, soils generally light The Sassafras color. of the Coastal Plain, the Chester loam of the Piedmont, the Hagerstown and the Cecil soils further south are the best known.

The prairie soils were studied in many places in the Middle West States and Canada.

Soils still under a grass cover but formed under less rainfall than the prairies were examined particularly in central

western Kansas. Still under a short grass cover, but formed under less rainfall than the last group, are the high plains soils still farther West.3

The Profile is Used

CINALLY the desert soils in many parts of the Southwest were examined. The Pacific Coast region is, of course, an epitome of nearly all soil-forming forces and types. Peat and muck soils, the class formed under "excessive" moisture conditions, were studied particularly at the Coon Creek Sand and Peat Experimental Fields in Minnesota. Of soils developed under moderate moisture conditions, the greatest interest was aroused by the search for a typical mature development of the black soils-Tschernosem (A Russian word meaning black soils of typical character. These soils are abundant in eastern Europe). The best developments of these black soils were found near Brandon and

² Regarding the United States, Dr. W. W. Weir, U. S. Bureau of Soils, in the Handbook of the First International Congress of Soil Science, states as follows: "The new concept of soils has changed the basis of soil classification of the Bureau of Soils. According to the old idea, the United States was distincted abscious children in the concept and According to the old idea, the United States was divided physiographically into seven provinces and six regions, designating 13 major classes into which the soils of the States might be grouped. But this scheme of classification, having a geological basis, was found wanting when the genetic concept of soils was accepted by the Soil Survey." He points out that the next classifications suggested were on the basis of color, and finally, it has been suggested that the soils of the United States may be classed into 7 broad groups. (See soil surveys and reports.)

³ Certain essential differences exist between soils in eastern Europe and North America; in Russoils in eastern Europe and North America; in Russia, for instance, changes in temperature and rainfall are in parallel lines; on the other hand, in North America the rainfall decreases from the East to the West, and the temperature increases from the North to the South. This difference in climatic conditions tends to produce a greater variety of soils in North America.

Saskatoon, Canada, and in the North Central States.

As the basis of soil study in the field the profile was used. A profile is "everything presented to the eye in a vertical cut through the soil exposing its various horizons." This soil picture requires special care in its As one scientist said, examination. "A day to each profile." The reason is that the various soil substances may have been tansferred from one horizon to another "partly due to chemical and partly due to mechanical action." These substances consist chiefly of salts, colloids, humus, iron, water; and especially are carbonates looked for. In one of the photographs of a trench, a man will be observed with an acid bottle, testing the profile for carbonates.4

To sum up, soil science with its modern content, the investigation of natural forces in their relationship to natural dynamic bodies, as such bodies are developed over the face of all the earth, reflects and vitalizes the philosophical concept, how all things, "live, and work, and ever blending, weave one vast whole."

Whether the newer concept is fully accepted or not, the tour provided a much needed opportunity to discuss the principles involved and to make essential field observations. It provided happy opportunities for soil sampling and a magnificent stimulus to a world embracing view-point.

Of What Value?

F what value are such studies? Briefly, to rationalize agriculture. By a study of the soil profile, sounder knowledge is obtained of the changes occurring in the soil, in the iron, organic matter, carbonates, col-

loids, etc. This knowledge serves as a sounder basis for soil management and for interpreting fertilizer experiments and plant nutrition work. From a national view-point, such a knowledge rationalizes agriculture in economic land utilization and crop production and from an international view-point, it enables the research work of one country to be better understood and applied in another.

However, soil profiles were not the only things studied. Soil utilization, crop production, and agricultural industries came in for a large share of interest. Major subjects in this field were the results of fertilizer experiments on cotton in the South, citrus in California, and corn in the North. Methods of irrigation were a source of much interest, especially in the Askansas Valley, Colorado, and at Riverside, California. The methods of treating alkali soils to make them productive were particularly observed at Fresno, California. The use of lysimeters and results obtained were studied at Knoxville, Tennessee. Results of plant breeding, especially on the small grains, were studied throughout the West and Canada. Farm machinery was observed in Kansas, Colorado, and other places in the West. agricultural industries of interest to smaller groups were visited.

Also much interest was taken in the forest laboratories and nurseries at Saskatoon, Canada, and Madison, Wisconsin. The latter place was visited on a side trip by those interested in forestry.

The pictorial resume in this issue shows some of these things. All the photographs are, of course, typical of regions covering several states or provinces. For instance, the North Carolina and Tennessee views are typical of the Piedmont and mountain sections of the route through Virginia and Georgia; the Georgia farm scene, of farms in Alabama and Mississippi; the Missouri picture of parts of the Middle West.

The Nevada scene is a typical view

⁴In countries of wide ranges of climatic variation as in Russia and the United States, in addition to laboratory methods, the morphological characteristics of the soil profile assume a high degree of importance in field examinations. In countries of narrow climatic range, where the temperature and rainfall do not vary greatly, there is a tendency to regard the morphological characteristics as of less importance and to stress laboratory methods of examining samples of the profile.

of some of the arid parts of the Southwest, much of which is irrigated in Nevada, Utah, and California, making fertile and valuable fruit and general farms. For instance, the citrus groves in the background of the California picture are irrigated. Fine irrigated farms were also visited near Las Vegas, Nevada.

The mountain views typify the magnificent scenery of much of the Pacific Coast, particularly of the northern part in Oregon, Washington, and western Canada. A small picture in the text gives a view of one of the charming and fertile valleys, typical of Oregon and Washington.

The North Dakota, Iowa, and Kansas scenes typify the great plains and prairies. The last photograph, Indiana, shows the party making one of the

last soil examinations of the tour.

In Rome

THE "real story of the First International Congress of Soil Science and the tour that followed starts more than three years ago, on a hot day in May, 1924, in the ancient city of Rome. A group of distinguished scientists, representing more than one half of the nations of the world, listened to a report of the Committee on the Organization of the International Society of Soil Science." It was then recommended that the first Congress be held in Washington, U. S. A.

In November, 1925, the members of the American Organizing Committee were appointed in Chicago. On June 9, 1927, the first of the groups of delegates arrived in the United

States.

Dr. Asher Hobson and a group of officials representing 12 European countries accompanied the tour. Dr. Hobson is the permanent United States delegate to the International Institute of Agriculture at Rome. The party afterwards participated in the Country Life Conference at East Lansing, Michigan, August 1 to 6.

Two enterprising county agricultural agents also accompanied the excursion over a very large part of the way. These two agents were A. W. Klemme of Lawrence county and Ira Drymon, Jackson county, Missouri. Their foresight and energy made it possible for them to obtain a broader vision of the agriculture of this country and a better knowledge of how things are done abroad.

In retrospect, the outstanding characteristics of the tour were the fine accord and mutual good feeling, one to the other, to the good people that entertained the party and to the discussions on the variety of interpretations that scientific investigations are

so apt to develop.

The Daily Paper

S OMETHING of this spirit and accord is shown by a few selections taken from the paper "Boden Bull," published daily by the members of the excursion while on the train. Different delegations or groups took charge of such duties each day. A typical complete title was:

BODEN BULL

Published on Board the S. S. Pedologia
"The Truth As We Economise It"

though the truth was idealized daily, according to the taste of the groups

editing it.

Speaking of soil profiles the following was published in BODEN BULL No. 7 on July 1, while somewhere in Kansas:

"CHANSON

To C. F. Marbut in homage.

Sing a song of profiles, sing with heart and soul,

Four and twenty Russians crowded in a hole, Trowels, bags, and acid bottles, filling every chink,

Stremme, Treitz, and Marbut, dancing on the brink."

Again in BODEN BULL No. 19, July 13; Alberta, Canada:

"The truth at last," by 4 Englishmen "Today's Profiles

We are now able to give an authoritative description of the Edmonton profiles, to wit, a tshernosiomoid rendzina with a strongly podsolized 'Glei' horizon, lateritised by infiltration from the

Foreign Delegates

MR. A. B. FAGUNDES

Canada

PROF. H. M. NAGANT MR. F. A. WYATT

MR. A. MATTHEI

Cuba

MR. A. BONAZZI MR. C. N. AGETON

Czechoslovakia

PROF. and MRS. VACLAY NOVAK DR. LADISLAV SMOLIK

DR. H. STREMME

Denmark

Dr. J. H. BLOM Mr. S. T. JENSEN MR. V. C. MADSEN PROF. FR. WEIS

Germany

DR. E. SCHUSTER PROF. R. ALBERT Prof. R. GANSSEN Prof. G. Krauss Prof. O. LEMMERMANN PROF. and MRS. H. NIKLAS PROF. A. PENCK PROF. F. SCHUCHT Dr. M. C. Trenel Prof. W. Wolff

Great Britain

PROF. N. M. COMBER DR. E. M. CROWTHER Mr. James Hendrick SIR E. JOHN RUSSELL Dr. B. A. KEEN Dr. W. G. Ogg Mr. G. W. ROBINSON

Holland

MR. J. G. BYL Dr. F. C. GERRETSEN Dr. D. J. HISSINK

Dr. and Mrs. Louis Kreybig PROF. A. A. J. DE'SIGMOND MR. P. TREITZ

MR. P. G. KRISHNA

PROF. G. PERONI

Japan

PROF. T. IMASEKI PROF. A. ITANO PROF. H. MISU

Mexico

MR. M. MESA

New Zealand MR. T. RIGG

Norway

PROF. K. O. BJORLYKKE

Palestine

DR. F. MENCHIKOVSKY Dr. A. Reifenberg DR. M. WINNIK

Poland

PROF. M. GORSKI DR. S. MIKLASZEWSKI PROF. F. TERLIKOWSKI MME. DR. JADWIGA ZIEMIZCKA

PROF. N. FLOROV PROF. T. SAIDEL

Mr. T. AFANASSIEFF Mr. K. D. GLINKA Mr. W. GEMMERLING PROF. A. T. KAIGORODOV MR. S. KRAVKOV Mr. A. F. LEBEDEFF Mr. S. NEUSTRUEV DR. B. POLYNOV MR. L. PRASSOLOV PROF. A. SCHMUCK MR. A. SHOORIGIN MR. A. SOKOLOVSKY Mr. A. TARILOV MR. J. TJURIN MR. N. M. TULAIKOV MR. P. TURIN PROF. D. VILENSKY PROF. E. E. USPENSKY

MR. A. ASLANDER MR. H. HESSELMAN DR. E. MELIN MR. H. OSVALD

PROF. S. A. ZAHAROV

Switzerland

DR. H. GESSNER MR. O. J. GIRSBERGER MR. E. NAEF DR. H. SCHILDKNECHT PROF. GEO. WIEGNER

Union of South Africa PROF. T. D. HALL

calcium carbonate horizon.

Any inaccuracies in this description are due to the fact that the trench was only large enough to accommodate the Dutch delegation."

BODEN BULL No. 8, was called the German Lunch Counter Evening Edition. From that is noted:

"The pen of the most famous editor wouldn't be able to describe the longing of the German heart for a glass of Munich beer. Nevertheless, some people became already accustomed to Coca Cola.

"Mr. R. Krauss and others didn't feel very comfortable going down by automobile, for the driver talked with the crowd, not minding the dangerous curves—after all, we are satisfied with a day of rest without soil science and discussions, for Life is not science alone."

All of which shows that soil scientists are thoroughly human.

Another item:

During the excursion the reporter noticed that there were some disagreements about soil types, but the antagonism was later on leached out in the swimming pool.

The same Pullman car porters traveled the whole journey. An item is taken from BODEN BULL No. 13:

"Bob Elliot of Car 5 was asked if he was in command of a freight train or just an ordinary baggage car.

"'No, Siree, this car am a shoe fac-

tory."

From BODEN BULL No. 18, July 12, while on the Pacific Coast, the following is noted:

OVERHEARD IN A RAILWAY STATION

Traveller to gateman at railway station, "What is all this fuss about?"

Gateman, "Oh, a bunch of seasiders from the North and a bunch of dirt diggers from the South."

Such is one railroad man's opinion of soil scientists. In any case the scientists published it about themselves, the purpose of this remark being of course, to show that soil scientists do have a sense of humor.

Finally, in BODEN BULL No. 26, on July 21 was printed:

"With the end of this unique excursion close at hand, all the foreign delegates and visitors are most anxious to tell their American friends how much they have enjoyed this tour. It has been an unforgettable experience and it would be impossible to select any one side of it as the best. Suffice it to say that in the breadth of vision and the warm hearted welcome of the American Organizing Committee and of all the people of the United States and Canada, who went out of their way to entertain us, they have set a characteristically high standard for future conferences. The friendships formed in Rome, Groningen, Hungary, and elsewhere have been renewed, and friends, through the columns of Boden Bull, we all say from the bottom of our hearts-Thank you."

The following day the tour returned safely to Washington at noon.

Thus was brought to a close a gathering of unique significance. Congress and tour will be a milestone in the history of soil science. But, as is true always, as such studies and meetings enlarge the sphere of our knowledge, so they enlarge the sphere of our ignorance. Individually we become aware of further fields of knowledge of which we know but little. After such field travels there creeps into our minds something of the questioning spirit as in Obermann, "But now the old is out of date, the new is not yet born."

Thus, such a tour to delve into the why and wherefore of natural dynambodies and natural forces and classify them for man's use is only an enrichment, as we bring the proper mental and temperamental interpretation to bear upon their manifold meanings and phases. It was something of this essential spirit, as much as exact knowledge, that was the significant accomplishment. The natural sciences yield much to questioning, but they demand much over long years of time if any progress is to be made in knowing and understanding them, for are not the words of the Astronomer-poet of Persia, of true significance:

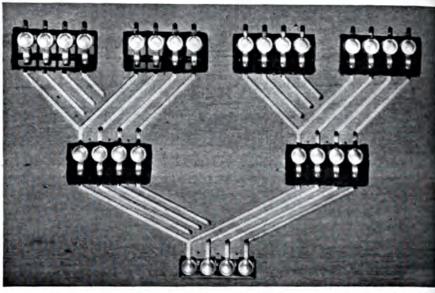
"And the first Morning of Creation wrote,

What the Last Dawn of Reckoning shall read."

Herediscope

(From Page 17)

times, it is possible to see how certain characters may be transmitted from generation to generation, or how they may be lost entirely, or how they may be covered up by dominant characters, and how they may reappear when the dominant characters are missing.



This view of the "berediscope" shows the connecting mechanism or channels by which the colored balls travel from one cup to the other. The apparently incomplete channels make their connection with the cups toward which they are headed by means of channel-bridges back of the channels they cross.

The Proved Sire

THE machine, as at present constructed, illustrates the transmission and recombinations of four separate characters, or it will illustrate the transmission of four multiple factors, in such types of inheritance as milk yield, egg yield, or stature.

Mr. Graves thinks that the average dairyman does not realize the importance of the proved sire, but he believes that an illustrated lesson with the herediscope would make him see why the proved sire is the most certain and speediest means of developing high production in dairy cattle.

He says that inheritance is such a complex study that the average person needs some easy and convincing demonstration. Another reason given for using a machine, such as the herediscope, is that it is extremely difficult for those versed in heredity to write or lecture on it so that it will be understood by the layman.

So far there is only one of these machines in existence. Some of the mechanical features were designed by K. E. Parks and it was built by G. F.

Betts. Mr. Graves thinks it may be possible to simplify the mechanism so that herediscopes can be produced without excessive cost and small enough to permit their use in places where county agents or extension workers often find it necessary to give talks on inheritance.

Cows Fool Farmers

COW testing associations have proved to thousands of farmers that they are often poor guessers of the producing capacity of cows, but it is not often that this sort of failure can be demonstrated in a wholesale manner. At a meeting of the Tulsa (Oklahoma) Milk Producers Cooperative Association, 700 persons were asked to pick the better producer of two cows. Eighty per cent of them selected a cow with a record of 255 pounds of butterfat a year as the better one. The other cow had a record of 452 pounds of butterfat.

Fruits, Nuts, and Fertilizers

(From Page 12)

ever, this formula was not so successful, although where used the crop was good, fruit large, high colored, and very sweet. At the same time the peaches were unusually firm and lacked juiciness, making it difficult to remove the pit when being prepared for canning. But with the addition of three per cent nitrogen to the fertilizer, this deficiency in juice was overcome and the removal of the pit easily accomplished. Walker also has found by using fertilizers high in phosphoric acid and potash on his cling peaches that the fruit produced was decidedly higher colored and much plumper than that from trees where these two ingredients had been omitted.

Apples and Walnuts

ONE Delicious apple tree, reserved for home use, had been well supplied with manure, had had sufficient water, and otherwise was well cared for in every respect. Yet the tree was unthrifty, the fruit off in color, being a light greenish yellow, and affected with an internal browning which developed before the fruit was ready to pick. The apples were bitter in flavor and so worthless that Walker had about decided to dig the tree out. However, as a last resort, he gave this tree an application of twelve pounds of his favorite 3-10-10.

The improvement following this treatment was marked the first year in both tree and fruit, the tree becoming healthy and vigorous; the fruit growing to unusually large sizes, entirely free from internal browning, sweet, and delicious in flavor as well as in name. The fruit, instead of being a pale yellow as in the past, was a rich golden color with dark red cheeks characteristic of the Delicious apple when at its best. An examination of this tree showed it to be in a perfectly

healthy and thrifty condition, and judging from the abundance of sturdy fruit spurs and plump bloom buds, this tree will carry another heavy crop of fine fruit this year.

Where Walker had used this 3-10-10 fertilizer, at the rate of not less than 15 pounds per tree, on 15-year-old Franquette walnuts, he noted a decided improvement in the foliage and general appearance of the trees. The nuts grew very large and were well filled out with particularly fine flavored white meats, and particularly free from discolored meats known to the trade as ambers. These nuts, when graded, ran to large and jumbo sizes. Nuts from the unfertilized trees ran to smaller sizes with many shrunken kernels. These, owing to the poor color of the meats, were classed by the trade as ambers, which meant a considerable reduction in price.

Mr. Walker, in the light of his own experience, scoffs at the prevalent idea that walnuts will not respond to the use of fertilizers. In connection with this, he spoke of the large well filled nuts his trees produced when they first came into bearing as compared with the smaller sizes with many shrunken and discolored meats produced by the trees as they grew older. But when these older trees were fertilized with his favorite 3-10-10 fertilizer, the size and quality of the nuts immediately began to improve, becoming as good, if not better, than any the trees had produced in the past.

"Old men," reads a scolding editorial, "are too frisky these days. Too many of the doddering fools consider themselves romantic figures." Why not? After all, a man's only old once.

It all depends on the point of view. Doubtless, parrots marvel at the way humans imitate their speech.

The County Agent

(From Page 7)

Sweet Clover 10 years ago was commonly considered a wayside weed and a nuisance in most localities. Its only recognized economic importance was as a bee pasture. In a few localities. principally in the hill countries of northern Kentucky and the lime belt of Alabama and Mississippi, sweet clover was grown to a limited extent as a hay crop and for pasture. County were induced to try crop, many of the tests were successful; the information was passed from one another; the number of demonstrations increased, and the attitude of farmers toward the plant changed. Sweet clover now is a standard forage crop.

Valuable work has been done by the county agents in combating rodent pests, by organizing poison campaigns against prairie dogs, ground squirrels, and other rodents. In 1924 alone 833 tons of poison grain were distributed, in addition to 100,000 pounds of carbon bisulfide and 175,000 pounds of calcium cyanide used for fumigating burrows. Estimated savings in that year amounted to \$4,000,000 as a result of the campaigns.

Stopping Soil Losses

TERRACING has been used for Centuries in China, Japan and other countries where every foot of land must be utilized to its fullest But only within recent years has terracing been practiced for agricultural purposes in the United States. It is the result of attempts to stop or decrease the large soil loss on the single crop humus depleted lands of the South. In almost every county in the southern states terracing has been a standard county agent project during the past 10 years. The work has spread recently into Ohio, Indiana, Illinois, Missouri, and other states.

Other projects in which county agents have played an important part include tick eradication, the fight against hog cholera, the control of tuberculosis and blackleg, and herd improvement. When the Federal Government organized tick eradication work, the era infested with the parasites was 741,515 square miles, and it was estimated that the tick was effecting a loss of \$40,000,000 annually to southern farmers. Since 1915 more than 12,000 dipping vats have been built, largely through the efforts of county agents. When the tick eradication work was undertaken in 1916, some 975 counties were included in the quarantined territory, of which 693 had been released in 1923.

Hog auction sales in California are said to afford an excellent example of the relations of agents to marketing enterprises. The sales were started in 1916 by G. C. Kreutzer, county agricultural agent in Kern county, modeled on a plan that he had seen successfully worked out in Australia. The plan was to select a small town in a county where market facilities were available, procure enough hogs from producers of the district, set the date for the sale far enough in advance so that the packing concerns could be notified, have buyers on hand, obtain an auctioneer, and then advertise the sale to each farmer in the county. The plan proved so successful that other counties in the valley adopted it.

Summing Up

WILLIAM A. LLOYD, in charge of county agent work in the western states, office of cooperative extension work, sums up the achievements of county agricultural agent work as follows:

"It has saved a great industry in the Southern States and brought to agriculture in that region a measure of stabilization and diversification. "It has brought new crops and new livestock enterprises to various regions of the country adapted to them.

"It has aided in mitigating the losses due to livestock and plant disease and to insect and rodent pests.

"It has helped to conserve soil fertility and to prevent soil wasting.

"It has brought about a standardzation of breeds of livestock and varieties of crops.

"It has in a thousand ways modified farm practices to the individual bene-

fit of the farmer.

"It has aided farmers in solving their marketing problems and in bettering their economic conditions.

"In a great national emergency it was the effective agency in organizing American farmers to make their best and largest contribution to the

cause of human liberty.

"Important as are these accomplishments, it has done something else. It has lifted the farmer out of his isolation and brought him into working relation with his fellow farmers and his agricultural institutions—the state college of agriculture and the United States Department of Agriculture—

without destroying his individualism, which is his tower of strength.

"It has left him still independent, still self-reliant, but more tolerant and with more community consciousness. It has developed a new leadership in country affairs. Through common counsel and mutual helpfulness among fellow farmers in connection with the simple problems of his workaday life, it has developed cooperativeness of spirit which is fundamental to the more complex, more difficult association in business. It is placing at the farmer's disposal a better organization of facts by means of which he is doing more accurate thinking, reaching safer conclusions, and living a more satisfactory life. It is not paternalism nor philanthropy but organized self help."

The Anti-Proverb League pridefully points out that Lindbergh couldn't possibly have had any success had he paid any attention to the familiar saw about the wisdom of keeping one's feet on the ground.

Unbending Backs in Farming

(From Page 11)

the carrier which is so fitted with a safety slip clutch that the movement of the apron is stopped in case it becomes clogged.

Saving of Labor

THE corn binder eliminates the back-bending process of hand-cutting. Having the corn bound in bundles of convenient size, also, helps to save time in the shocking and in the loading onto the wagon at silo filling time.

In some neighborhoods, the few farmers who do not have binders find it necessary to employ from four to eight men to cut the corn. As many as eight men may be seen in a field with corn knives the day before the silo is filled. The high cost of employing so large a number of men is not the only disadvantage of the plan, for when cut, untied in bundles, the loose stalks are hard to pick up from the ground, hard to load and unload from the wagon, and hard to get into the cutter.

Usually before silo filling, the corn binder is started a day ahead of filling. The contrast of a binder with one man and four horses against four to eight men cutting by hand, leaving the horses idling in the barn, speaks for

itself.

Just as there is a proper time to plant and harvest all farm crops, there comes a time in the fall when corn can most advantageously be harvested, that time varying with the needs—namely the silo, shredded corn, ear corn, etc. The binder makes it more possible to harvest effectively large areas of corn when the weather conditions are right.

To make improvement and to advance defines progress. For a farmer,

progress means the use of any machine which can be profitably used to increase crops with a saving of time and energy. When farmers progress, they are striving for better methods of working, better ways of living, and the attainment of improvements which will help them to live, rather than merely to exist.

Good Farms from Blow Sands

(From Page 22)



An exciting moment at H. D. Boston's alfalfa auction.

clover pastured 13 head of as fine Guernsey cattle as can be found in the State from spring until the middle of July, when Jacklin turned them into an alfalfa cutting to allow the sweet clover to get its second breath. His corn was more than knee-high by the Fourth, which is unusual considering the long, cold, wet spring they had in Wisconsin this year. His alfalfa averaged two tons to the acre at first cutting and his barns were full. The second cutting went into stacks. fact Jacklin is "alfalfa poor." He was considering plowing up the choicest kind of a three-year-old alfalfa field to put into corn for silage.

Across the road from the Jacklin place, a fine new farm residence is being built by a man who abandoned his farm several years ago to take up more remunerative employment in

Chicago. Since he has seen what alfalfa is doing for Portage county, he has come back to his farm, has 10 acres of fine alfalfa seeding, and is on his way to rival his neighbor in making "milk flow where alfalfa grows."

South of the Jacklin place on the Jim Isherwood farm there now are about 40 acres of alfalfa growing on limed and fertilized soil. Mr. Isherwood has been one of the progressive alfalfa growers in this great soil-rebuilding project.

Down the road a bit there are 75 acres of a new alfalfa seeding put in by Boston this year. In July the little plants had their heads a good five inches above the white sand. The whole 75 acres were put in in a week's time, disking, dragging, rolling, seeding, and rolling. It was fertilized with

250 pounds to an acre of a commercial fertilizer analyzing 2-16-28.

Another field of 45 acres consisting of 8 acres of three-year-old, 15 two-year-old, and the rest oneyear-old seedings had just been divided into five-acre strips so that each strip contained some of each seeding. These five-acre strips were auctioned off by Boston to the highest bidder. Farmers from 15 miles around came to see the alfalfa and observe this novel way of disposing of a hay crop. The bids ran from \$13 to \$14 an acre for the best lots and \$8 to \$9 for the poorest. Boston averaged \$10.70 per acre on his hay without having to concern himself with any of the labor of making it.

County Agent Noble in talking about his alfalfa work, disclosed that in Portage county five years ago there were only 112 acres of the legume grown. Now some townships list more than 400 acres of the legume, and the total acreage for the county would run well over 4,500. Four carloads of muriate of potash were or-

dered for the county this

spring.

"The fertilizer work on alfalfa in Portage county was started about four years ago, using a ready mixed commercial fertilizer containing only six per cent potash," Noble said. "Since that time we have been increasing the amount of potash used, and today the average recommendations are to apply from 125 to 200 pounds of muriate of potash per acre in addition to 75 to 125 pounds of treble super acid phosphate. Whether or not a small percentage of ammonium sulphate does any good when applied before seeding alfalfa, remains to be seen, and some of the mixtures contain two per cent.

Potash for the Blow Sands

FEW years ago, potash as a fertilizer on sand soils was practically unknown, but it had been used on the marsh south of Plover for the past 8 or 10 years. Three or four years ago the first applications of potash were made on real sand soils and due to the results obtained, the use of potash has increased so that this past season there were four carloads distributed to farmers in this county, and I would say that practically three-fourths of it were used on the lighter soil and the other part on the muck soil.

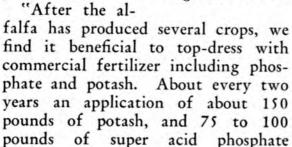
"We feel that in the lighter soil areas, where farmers are short of cattle due to the difficulty of producing sufficient hay crops, the use of com-

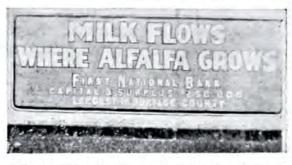
mercial fertilizer should be encouraged," Noble continued. "Generally on this type of a farm there is hardly enough barnyard manure available to properly fertilize the corn and potatoes, and rather than use barnvard manure to get 5 or 10 acres of alfalfa started, it is better to use potash and phosphate on the alfalfa and to use the barnvard manure, the complete fertilizer, on such other crops as corn and potatoes. An aver-



A first cutting of two-ton per acre alfalfa on Harley Jacklin's sand farm.

age application of the commercial fertilizer, which most of the farmers mix at home. costs them from \$6 to \$9 per acre, which isn't any more than an application of barnyard manure.





That the banks are solidly behind County Agent Noble is evidenced by this large billboard on a federal bighway.

has given good results, although some farmers use the potash alone. These fertilizers are being distributed either after the first or second cutting or late in the fall, although some have been applied

very early in the spring."

Mr. Noble in cooperation with the State Soils department has conducted some experiments to find the most profitable fertilizer to use for growing alfalfa on these sandy soils. Tests were conducted on four different farms.

The test on Farm 1 showed that when 150 pounds of potash were used alone, there was a profit above the cost of the fertilizer of \$6.75. When 200 pounds of phosphate, 45 per cent, were used alone the profit was 60c. When the two materials were combined, there was still a profit, though somewhat less than when potash alone was used. The following are Mr. Noble's figures:

FARM No. 1 (two cuttings)

	Control Which I among Value of Inches					
Treatment	Cost of fertilizer	Weight of hay	Increase over blank	Value of Increase above cost of fertilizer		
			H	lay \$15.00 per ton		
Blank	3.0101	4765	***	*****		
150 lb. potash		6165	1400	\$6.75		
300 lb. potash		6230	1465	\$3.50		
200 lb. 45% phosphate	\$5.60	5590	825	\$.60		
200 lb. 45% phosphate						
and 150 lb. potash	\$9.35	6230	1465	\$1.65		

The test on Farm 2 showed that 150 pounds of potash used alone produced a profit, that there was no profit from phosphate used alone, and that the phosphate and potash used together also resulted in a loss.

FARM No. 2 (two cuttings)

Treatment	Cost of fertilizer	Weight of hay	Increase over blank	Value of Increase above cost of fertilizer
			I	Hay \$15.00 per ton
Blank		6000	24.64	*****
150 lb. potash		7100	1100	\$4.45
300 lb. potash		7730	1730	\$5.50
200 lb. 45% phosphate 200 lb. 45% phosphate	\$5.60	6650	650	 \$.72
and 150 lb. potash		7200	1200	—\$.35

The test on Farm 3 showed the same thing, namely, that the potash produced

a profit. The phosphate alone was used at a loss. Figures are given below:

FARM No. 3 (two cuttings) Value of Increase Weight Treatment Cost of Increase above cost of fertilizer of hav over fertilizer blank Hay \$15.00 per ton Check 5090 \$8.00 1410 100 lb. potash..... \$2.50 6500 150 lb. phosphate... \$4.13 5300 210 -\$2.48150 lb. phosphate and 100 lb. potash.... \$6.63 7565 2475 \$11.93

On Farm 4, again 100 pounds of potash produced a profit, and in this test the phosphate also produced nearly as good a profit. The results will be found in the next table:

	FARM N	o. 4 (one cutt	ing).		
Treatment	Cost of fertilizer	Weight of hay	Increase over blank	Value of Increase above cost of fertilizer	
			H	lay \$15.00 per ton	
Check	1111111	2800	40.000		
100 lb. potash	\$2.50	3500	700	\$2.75	
150 lb. 45% phosphate		3650	850	\$2.25	
150 lb. 45% phosphate and 100 lb. potash		4000	1200	\$2.27	

The above four tests show that potash is essential and profitable on these sands for maintaining the most profitable yield of alfalfa. Phosphates are also necessary. Too much phosphate, however, should not be used or the cost of the phosphate will reduce the profit on the fertilizer. Phosphates and potash can, of course, be procured in mixed fertilizers of a suitable analysis, that is, phosphates and potash alone with the potash equal to or more than the phosphates.

Fairs

(From Page 4)

of the soil depend entirely upon the Bingville Racing and Agricultural Society for their annual uplift.

One western state grudgingly doles out its biennial university budget of less than two million dollars and disposes of eighty per cent of the annual premiums paid at sixty county fairs with loud applause-and the latter amounts to half a million smackers a year. One-fourth as much for five weeks of county fairs as for two years of higher learning! Send the bull to the fair and the boy to the university, and see which wins!

THE United States supports some four thousand fairs and expositions in each and every blessed season, regardless of feast or famine. Canada holds many hundreds of them all year round. The list does not include the pageants and divertissements which self-conscious mushroom communities of the Sinclair Lewis type feel called upon to launch to commemorate some anniversary or dedication.

I have heard divers surmises as to the reason why the Sesqui-Centennial at Philadelphia in 1926 failed to draw the expected throngs. This is not so

hard to answer.

Back in the days when our grandmothers dusted off their black alpaca gowns and packed the haircloth trunks to attend the great Centennial of 1876 at Fairmont park, the wide-flung reaches of the unwashed west had not succumbed to the expo ego. People had to seek far for the chance to become sophisticated. In those days Mahommed went to the mountain, but now the mountain, aided by the wireless, comes to Mahommed.

AVE we then an overproduction of expos and a surplus of festivals beyond the needs of the appetite or the power of comfortable consumption?

This question is the same as the one so often and so irritatingly put to county agents and fertilizer men relative to the production of field crops.

My answer must be identical and based on the same line of logic as theirs. America demands quality fairs and quality foods. "Digestion waits on appetite and health on both," as Shakespeare remarked. Poor food and rotten fairs discourage consumption and limit production to a dead level of mediocrity.

America wants more better fairs, but would not be any wiser or happier with any increase of them based on selfish commercialism alone.

If this objective is not kept in mind it will take more than a surplus control act to salvage the ruins left in the wake of shattered buildings and bankrupt premium lists.

The gamble and hazard elements are always present in fair management. It is a race between Jupiter Pluvius and the casualty company.

Whether the word "fair" means "fair weather" or "fair treatment" is hard to settle sometimes. The average disappointed secretary whose grounds have been deluged declares it doesn't mean the former; while the tight-fisted exhibitor is equally emphatic that it cannot mean the latter—unless he chooses the judges.

might form the title to a large chapter on recent fair history. Having indicated that fairs have experienced the need for thrift and protection from hazard and mishap, we have left another human element to consider—sanitation.

Dickens and Hogarth both picture for us in different mediums how the mountebank, the fakir, and the strolling entertainer usurped the places of vantage at the early English festivals. Dickens with kindly humor plays up Jarley's wax works with its van of horrors standing beside English hedgerows. Hogarth in rugged lines has left for us the cruel side of the picture in the Rake's Progress and similar sketches. In modified form we have had our clutter of arrant blacklegs to deal with at modern fairs, and probably shall for many moons.

At a state dairy show last fall I remember seeing a man with a rattle-snake on each arm selling pocket knives at the rate of five a minute. The said toad-stabbers wouldn't cut a cheese sandwich and were brittle and useless, but the crowd was true to Mr. Barnum's platitude.

And just two hundred yards away from that spot, the great lesson of vitamins for vigor was scarcely noticed, and the county agents' stock of bulletins—also "free for nothing"—was playing second fiddle.

DISPLAYS of equine and bovine type and form once suffered from the proximity of the Devilish Dancers or the Swimming Susans, but it seems of late that the normal, everyday sight of feminine underpinning we get has sort of checkmated the distracting influence of those old time leg shows.

No innocent Punch and Judy or strength testing machines ever hurt our agricultural fairs, but the public has pretty well got the number of the trashy aggregations that once led gypsy-like lives upon every fair park in rural America. Now comes in a hopeful note in the outlook for putting on home talent, livestock and agricultural pageants and spectacles that will create more interest because the actors are known to the people, while the scenes they portray are not weak imitations of Roman pomp, but pictures of how Silas Smith built his log cabin on Cedar Creek and "fit" the Injuns to a standstill.

FAIRS have standardized their customs and premium lists, which but reflects the mania for regularity and uniformity pervading human effort. The livestock and field crops lists in particular have been overhauled by zealous college authorities, not without much lasting benefit in most cases.

It was not always thus. I recall as a lad driving a brindle cow of unknown antecedents to the county fair, followed by a red calf that could boast of being a native like myself, if nothing else. We had been importuned by the officious factorum of the fair to bring in "that nice fat old cow," and promised a prize ribbon and our names in the paper for our pains. I slept beside those unworthy creatures for five hot nights at the fair; but, unluckily, the judge was of the newer order, and old bossie and her humble offspring went home as innocent of fame as they came.

That was the beginning of the end for the farmer who imagined that he owned a good cow regardless of the herd-book. It removed many poor bovines from the ring, but it likewise robbed the fair of much of its ancient warmth and neighborly competition. We have gained much and lost much in the movement for standards.

The pumpkin alone has managed to survive the onslaught of the standardizers. In the pumpkin class size and the hint of aromatic New England kitchens survive to win, sans pedigree, sans records, classifications, or variety nomenclature. But pumpkin growers, beware; the vegetable im-

provers will yet hedge you roundabout with reservations and recommendations, and then the last entry list will be closed against the freefor-all in the annual harvest competition.

YOUTH at our fairs working under the emblem of the four-leaf clover marks the apex of worthy attractions rapidly being taken on by the expositions. If fairs were as faulty as could be and had no other redeeming features, the presence of Youth with a willing heart and an eager hand—brought there by the invitation of the exhibit board—would prove the salvation of them and the justification for our patronage.

You and I remember that when we found a four-leaf clover it meant a vague, haphazard piece of good luck, maybe never realized although hoped for with all the superstition of childhood.

Today the club leaders of America have transformed the four-leaf clover into a living sign. It imparts the finest traits of citizenship, and holds high the universal appeal of home, heart, hands, and health. Our fairs recognize this human tie that unites mankind in its love for youth, and youth attends the fairs to follow the trail to achievement in tasks that are both needful and noble.

With the bands of demonstrators and exhibitors representing Youth and Ambition clustered at our fairs, we need spend no time in fretting about the future of that phase of the expo business. It provides something we never had as boys and gives the elders plenty of room to inspect their own lives and achievements by contrast. It flatly gives the lie to the treasonable talk about decadent juveniles, and builds for us a coming generation of broad-minded farmers.

Be fair to the fairs. They must suit the public taste or fail. Let's see to it that we, the public, help set a higher standard—not for more fairs, but for more better fairs.



NEW ENGLAND SPEAKS

The latest Coolidge yarn to reach us is attributed to J. Allen Wallis, president of the Iowa Dairy Association. According to Allen, two lads were sitting on an old stone fence whittling. The late autumn sky was overcast and threatening. All was silent for a long time. Then one of the boys called to the other "Cal."

No response.

There was another whittling silence; then another call:

"Cal."

Still no response.

Then finally:

"Cal, I say, do you think it's going to rain or clear up?"

Once again the strange New England silence.

At last the boy addressed moved; slowly he turned toward his questioner.

"What are you trying to do?" he queried. "Pin me down?"-Exchange.

ONE ON PA

Father-When Abe Lincoln was your age he was making his own living.

Son-Yes, and when he was your age he was President.

This is Apple Week. Hurrah! An apple a day keeps the doctor awayunless you get the seeds in your appendix .- Iowa State Green Gander.

"Where's the electrical Flapper: department?"

Hardware Clerk (who was bow-

legged): "Just walk this way, miss." Flapper: "You fresh young thing! I'd die first."-Catapult.

COOPERATE

Ay tink Ay vill cooperate Und help my neighbor out. Ay can't get anyvere alone: Dat's so vidout a doubt.

He needs my help, Ay needs hes, too, Ve pull yust like a team— Ven he kvits quarreling vid me Und Ay kvits fighting heem.

Ve neighbors act yust like beeg fools Ven ve each odder fight Und say each odder von is wrong Ven neider von is right.

Ve pull our loads dat easy No vun will veel de weight-Ven me und heem togeder vork Und boat cooperate.

-Exchange.

Jack-That's a fine looking horse; but what's the idea of the two sad-

Betty-That's the rumble seat .-Judge.

"Sweetheart, do you believe marriages are made in heaven?"

"Probably. Heaven only knows why some are made."-Western Reserve Red Cat.

"Do you know the pawnshop song?"

"No. What is it?"

"Ve Lentcha."—Oregon Owl.

When a mule runs away he stops and looks back as soon as he thinks he is out of danger. A horse runs until something smashes.

CAVEMAN STUFF

Mother sent little Harry to take his smaller sister safely to the kindergarten. He was back sooner than she expected.

"Well, dear," she said, "did you treat Mary like a little lady, as I asked

you to?"

"Naw," replied the youngster disgustedly, "we canned that lady-andgentleman stuff, an' I chased her most of the way."

New York-to-Paris-If Most of Us Tried It:

"I had to come down for gas. Is this near Paris?"

"No, you're about a mile and a half from Bloomfield, Indiana."-Life.

"Triplets," announced the nurse to the proud father.

"Really?" he said. "I can hardly believe my own census."—Dartmouth Jack-o'-Lantern.

SHE MISUNDERSTOOD

A stout woman drove up to a filling station.

'I want two quarts of oil," she said. "What kind, heavy?" asked the at-

"Say, young man, don't get fresh with me," was the indignant response.

"Now, don't be unkind, Johnny! Forgive your little sister-why, she may die in the night, and then how would you feel?"

"All right, I forgive her. But if she's still alive tomorrow morning,

she'll get it!"-Ex.

We know of instances where dads are working their son's way through college.—Sickle and Sheaf.

"What's become of the tattooed

beauty?"

"She had her face lifted and it threw all her pictures out of focus." -Vassar Vagabond.

Potash Salts

Muriate of Potash	80-85% KCl
Sulphate of Potash	90-95% K2SO4
Sulphate of Potash-Magnesia	48-53%K2SO4
Manure Salts	30% K ₂ O
Manure Salts	20% K ₂ O
Kainit	14% K ₂ O
Kainit	12.4% K ₂ O

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DOTASH gives excellent body to tobacco leaf, making it smooth, free from blemishes, and bright in color.

POTASH improves the yield and shipping quality of peaches, apples, grapes, celery, lettuce, cabbage, tomatoes, asparagus, strawberries, and melons. It makes fruits firm and gives them color and flavor.

POTASH produces plump heavy seed of corn, oats, and wheat. It helps oats and wheat to resist lodging and to withstand frosts.

DOTASH increases the yield and the sugar content of sugar cane, sugar beets, sorghum, and fruits.

POTASH greatly increases the yield of cotton, prevents cotton rust, and lengthens and strengthens cotton fiber.

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VOLUME IX

NUMBER FIVE

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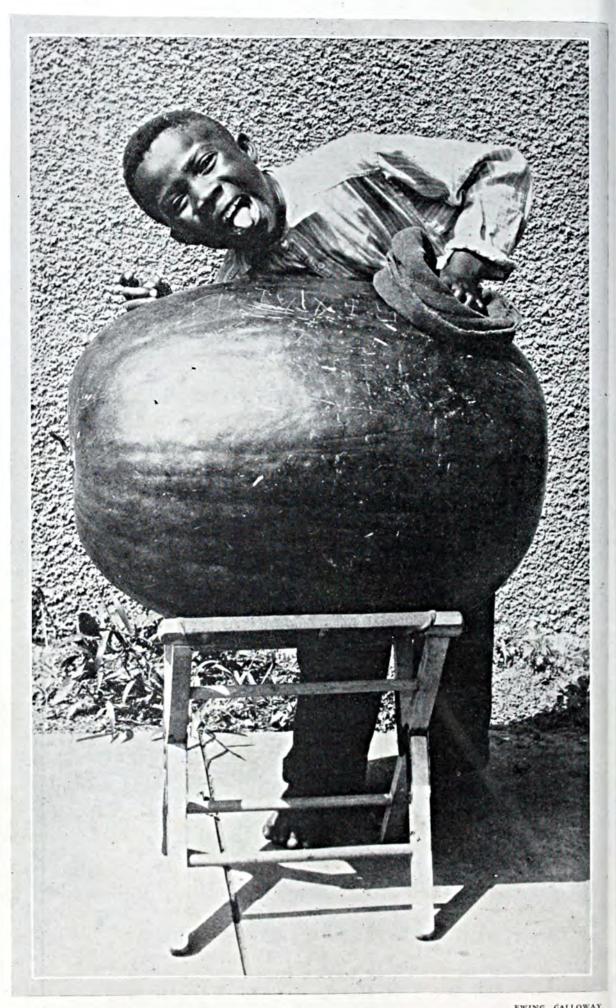
Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY.

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of Amsterdam, Holland Directors: J. N. HARPER

G. J. CALLISTER



"Uatermelon? Passuh Boss, you sho' said a mouth full."



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VOL. IX.

NEW YORK, OCTOBER, 1927

No. 5

JEFF says that we should all be good

Neighbors By Jeffm Dermid

HAVE lived with neighbors who were only five inches of lath and plaster distant from me; and I have had to ride a cayuse for an hour in order to reach my nearest neighbor. Some of my neighbors have been too mean to lend me a spoonful of stock salt, while others have been as flush with the milk of kindness as Segis Pietertje Prospect.

What are neighbors, and why? How far off must a person be to cease being neighborly? What are the limits of range in being a neighbor or in having one, and how do we measure it?

Last night I listened to the phonographic voice of a chap who used to be counted as my neighbor, but who has since passed beyond the portals. An hour later I heard a church choir composed of former old neighbors singing hymns in a city eight hundred miles away. Then I asked the man who shares my apartment house to endorse my note and he couldn't hear me.

That's the way it goes. It must have something to do with Einstein's "relativity" or some other equally abstruse proposition. Yet I shall not fail in my effort to get this thing out of my system, for we all have neighbors whether we want them or not.

Noah Webster is one of my unfailing indices. I can always get a fresh viewpoint by consulting his definitions and illustrations. Words that may perhaps seem commonplace have a bigger meaning after I have laid down my pipe to dip into his hefty book. Although the old woman found his stories "mighty disconnected," she doubtless profited by her faithful perusal of his compendium.

He says that neighbor is derived from the Anglo Saxon word "neahgebur." Translated, it means nighdweller. Then he amplifies a bit by explaining that it also signifies one who is near to another by confidence or sympathy.

THIS brings me to the nub of a certain text I learned from the book of Luke one somnolent Sunday long ago. Mrs. Main, the patient lady teacher of the old Tenth Ward gang, pounded it into my head somehow, where it has stuck by some freak of memory that is no special credit to me

Luke, the physician, was perhaps pretty well fed up on alleged neighborly feeling, and maybe some of his neighbors owed him a fee, so he was qualified to grab the world by the ears in this text.

Here it has stood for centuries in the story of the Good Samaritan, thrusting at us always the challenge of whether distance or acquaintance really determines neighborly feeling and neighborly responses after all.

After telling about the first two travelers who passed by the unfortunate man on the Jericho highway, he shows how the Samaritan rescued him from under the overturned tonneau of his Damascus twin six and rushed him to the waiting hostelry.

"Which now of these three, thinkest thou, was neighbor of him who fell among thieves?"

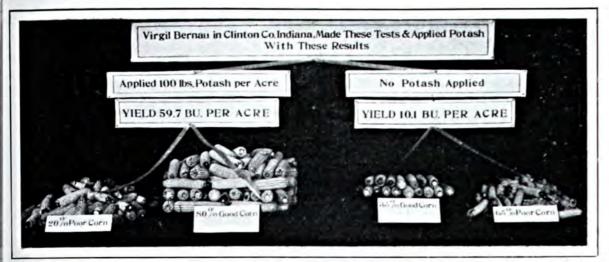
The Tenth Ward gang always had the right answer. It was very obvious and we couldn't see any puzzle to it, like the other one about the much-married gentleman coming from St. Ives. Of course, the Good Samaritan was the hero of the parable. But he was cast in this role for readers of a simpler age of social control. We Tenth Warders lived before the community chest and the budget system of relief came into vogue. That is, we pitched in and helped our neighbors wash their dirty linen sometimes because we didn't quite know when blue Monday might come to us.

Stop and ask yourself if the course followed by the Good Samaritan in Dr. Luke's story would carry the same consequences today? Maybe the Good Samaritan would be jollied a lot for doing such a stunt when the Associated Charities could be summoned from the nearest farm house by tele-Furthermore, modern innkeeper accept such a disheveled pair of tourists without calling up the police department, the Chamber of Commerce, or the Y. M. C. A. for advice? Would not the extremists in the radical press berate him as an influential citizen who had done nothing to make the Jericho highway wider and safer for the motorist?

It simply suggests that we dispense our neighborly feeling in the mass, by proxy and by virtue of red tape instead of in the old personal way. Mr. Kindheart is apt to be dubbed Mr. Buttinsky by a populace that has not lost its love for humanity in general, but fails too often to show its love for humanity in particular.

OW the one who really loses is not the poor gaffer out-at-elbows, or the poor orphan, or the bedridden widow. They get the royal relief all right, but the dole comes as a professional flourish at the hands of those to whom the job of bringing good cheer carries no thrill or heartwarming opportunity. When I give my dollar to the subscription campaign I lose the human touch, although I have been "touched" in quite a different, perfunctory way.

(Turn to Page 62)



A farm test showing the value of potash fertilization in overcoming corn root rot.

Cause and Control of Corn Root Rot

By C. T. Gregory

Purdue Agricultural Experiment Station

ROOT rot of corn is one of the most insidious diseases known. It may kill the corn plant early in its life. It may let the plant drag along through the season but cut short its career long before the ear has filled and matured. On the other hand diseased plants may live till frost kills them in the fall but still the ears are far from mature. It is odd that the same disease should kill some plants quickly and apparently prolong the lives of others.

In the early studies of this disease, it was thought that the trouble was due solely to the attacks of fungi on the roots. The roots were rotted and stalks were rotted and the same fungi could be found in both places. However, it is apparent now that other factors are the cause of the trouble, and root rot is the final result. The cause of many cases of root rot lies

within the joint tissues of the corn plant, in the sap tubes. Two substances, iron and aluminum, accumulate in the sap tubes, plugging them up and preventing the passage of foods in the plant. What is the result? Naturally when the food supply to the roots is reduced, starvation and weakening occur. The weak roots cannot throw off the attacks of the rotting fungi or bacteria. Certainly, the rotting is caused by these organisms, but it is the plugging of the sap tubes that starts the trouble. Another complicating factor is found in the genetics of the corn plant; some plants are more resistant to the trouble than others.

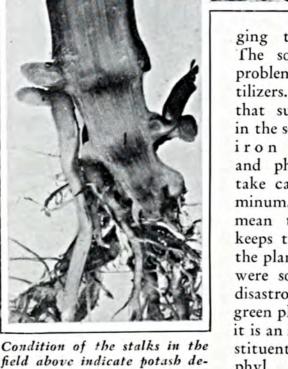
When we know these facts concerning the true nature of root rot, the peculiar actions of the disease can be explained. The premature death of the plants is merely an



aggravated case of iron accumulation in the sap, so severe that the entire plant literally starves to death. Of course the roots are also rotted. The plants that die in midsummer, those plants that many farmers think are early maturing strains, are usually filled with iron or aluminum. The plants that linger along till frost cuts short their career are merely less aggravated cases of sap tube pluzging. The plant cannot furnish sufficient food to mature the ear as it should and as a result

the ear is sappy and immature. In the same way we can explain the unfilled nubbins and the chaffy ears.

Since this root rot disease is the result of these accumulations, the control must be some measures to prevent iron and aluminum from plug-



Condition of the stalks in the field above indicate potash deficiency. Iron accumulations in the joint cause the dark discolorations of the tissues as shown in the lower photograph.

ging the sap tubes. The solution of the problem lies in fertilizers. It is known that sufficient potash in the soil will prevent iron accumulations and phosphate will take care of the aluminum. This does not mean that potash keeps the iron out of the plant, because if it were so, it would be disastrous. Every green plant needs iron; it is an important constituent of the chlorophyl. Potash seems to act more like a traffic cop, forcing the iron to move along where it is needed in-

stead of stopping in the sap tubes of the joints.

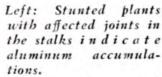
This is a good theory, but how can the farmer tell whether potash or phosphate is needed? Here again the answer is ready; we let the corn plant diagnose its own needs. The evidences of potash hunger are the firing of the edges of the leaves, the nubbin ears, and the rotting of the internal tissues of the stalk with consequent bending or breaking of the stalk. In some cases the leaves will develop yellow streaks, and in extreme cases the plants will be greatly stunted. This occurs most commonly on soils that are neutral or alkaline in their reaction.

The most certain evidence of potash deficiency is obtained by the new stalk test developed by Dr. G. N. Hoffer at Purdue working in cooperation with the Cereal Office of the U. S. Department of Agriculture. This test is for iron accumulations in the stalk, since heavy deposits of this substance in the joints are a certain indication that potash is deficient.

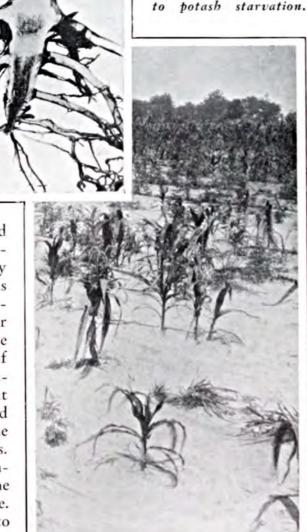
Phosphate deficiency is revealed in several ways. Stunted plants on an acid soil are almost certain evidence that phosphate is lacking. Too much emphasis cannot be placed on the need of the soil test in connection with the stunted plants, because, as

has been indicated above, stunted plants on sweet soils may be due to potash deficiency. Phosphate deficiency will act in any kind of soil, but it is more liable to occur in sour soils. Another indication is the darkening or rotting of the joint tissues in which the iron test is negative. The darkening of the tissues is due to aluminum accu-Another indication that mulations. is rather tricky and cannot be relied upon too fully is the purpling of the leaves, particularly along the margins. It must be remembered that smut infested stalks, particularly when the ears are destroyed, will become purple. Certain strains of corn are also apt to produce this red color. This purpling of the leaves in young plants due to phosphate deficiency is more pronounced when excessive amounts of nitrate are present. In general we may say that phosphate deficiency is indicated by stunted plants on acid soils.

Nitrate deficiency is indicated by a yellowish color in the leaves. Dr. Hoffer has a test solution which produces a blue color in the



Below: This field shows symptoms of phosphate starvation when the soil is acid. If the soil is alkaline the trouble may be due to potash starvation.



EFFECT OF POTASH ON CORN YIELDS, CASS COUNTY

	Soil	No fertilizer		Fertilizer			
Name of farmer		Iron test	Nitrate test		Nitrate test	Fertilizer applied	Increased yield
Ed. Lybrook	Clay	++	_	Normal	+	Potash	5.2 bu.
Claude Pavey	Black sand	+++	++	Normal	++	Potash	20.0 bu.
J. L. Ledgard	Clay	+++	+	+	+	Ac. Phos. Potash	7.7 bu.
Elmer Elliott	Light clay	+++	_	+	_	Ac. Phos. Potash	9.0 bu.
R. V. Lybrook	Heavy clay	++	+	Normal	++	Potash	6.6 bu.
Frank Tyner	Muck	++++	++	+	++	Potash	9.0 bu.
Geo. Banta	Muck	+++	++	+	++	Potash	9.0 bu.
E. J. Zeck	Black loam	_	++	_	++	Potash	.7 bu.
Carl Miller	Dark loam	+	++	4	++	Potash	1.9 bu.

sap when applied to the cut surface of the stalk if there are excess nitrates in the tissues. A negative test accompanying yellow leaves is a good indication of nitrate deficiency.

So much for the theory and the nature of the tests, but the question is does it work? Will potash and phosphate fertilizers overcome root rot when applied under farm conditions?

In Clinton county, Indiana, Virgil Bernau used 100 pounds of potash on his potash deficient black sand. Where he used the fertilizer he raised 59.7 bushels of good quality corn per acre. Where no fertilizer was used he obtained 10.1 bushels per acre of poor quality corn.

In LaPorte county, Ray Gourley used 125 pounds of 0-14-14 on his black loam soil. On the fertilized plot there were no down stalks and the corn matured in good shape, while in the unfertilized part many of the stalks were down and corn was much more chaffy.

In Jackson county, George Miller applied 100 pounds of potash per acre. His yields were 33 bushels of immature, chaffy corn on the unfertilized plot and 43.8 bushels of high quality corn where the potash was applied.

In Newton county, W. F. Mashino used several combinations of fertilizer.

With 100 pounds of potash his yield was 67.3 bushels per acre, with potash plus 0-10-10 the yield was 75.8 bushels, with 0-10-10 alone be obtained 56.8 bushels, and without phosphate or potash his yield was 15 bushels per acre. This was a case where both potash and phosphate were needed to overcome the root rot. Tests were made on his corn stalks and showed that the iron accumulations in the joints were most pronounced where no fertilizer was applied.

In the same county Ray Souder had about the same results. Potash plus 0-10-10 produced 69 bushels, 0-10-10 alone gave 53 bushels and no fertilizer gave 20 bushels per acre—another proof that this soil needs potash and phosphate.

Perhaps the most striking case occurred in Cass county. The results are given in the accompanying table.

It will be noted that good results were obtained in every case except the last two which would seem to show that potash is not always beneficial. However, examine the stalk test records in these two cases. The iron test on the unfertilized parts indicated that no potash was needed on this soil. The yields verified the test.

(Turn to Page 54)



Farmers examining cotton grown with and without fertilizer.

THE COMEBACK of the Cut-over

By Sid Noble

Twas in the smoking compartment of a New Orleans bound Pullman one hot summer day several years ago that I first heard the coastal plain region, that belts Mississippi just above the Gulf of Mexico, called "The New California." Branding this as a typical smoking-car conjecture I thought vaguely of bathing beauties, golf links, sunkist oranges, and whatnot.

The country was withal a rather drab train-window adventure in geography, mile upon mile of woods grass blowing in the wind, sprinkled as far as eye could see with stumps and charred ruins of what was once a great yellow pine forest. Here was the graveyard of innumerable pines, I thought.

At nearly every town the buzzing

whine of the inevitable sawmill cut through the noise of the train like a dirge, signifying the continual spread of the graveyard. How could such a land be termed "The New California"? Even then it must be reaching the end of its supply of virgin timber and coming closer and closer to the "dark brown taste" of the morning after.

As I listened to my chance acquaintance describe the section in glowing terms, I little realized that some years later I was to be given the opportunity to see logic in his reasoning. In fact, I promptly forgot the entire incident and never thought of it again until it was recalled to me a few days ago by another trip through South Mississippi.

This time I went to visit the Agri-



Director Ferris is shown standing in a plat fertilized with 240 lbs. of acid phosphate, 90 lbs. of ammonium sulphate and no potash per acre. The yield per acre was 648 lbs. of seed cotton, an increase of 126 lbs. over the check.

cultural Experiment Station at Poplarville, to talk with Director E. B. Ferris about its accomplishments. Poplarville, the county seat of Pearl River county, is in the heart of the region that years before had been so zealously described to me as "The New California."

Cut-over Land Abundant

Mississippi has some 10,000,000 acres in this region and although most of this was originally timber land, as far back as 25 years ago when the Experiment Station was established under the direction of Mr. Ferris, the pine forests were fast disappearing and cut-over land was abundant. More and more people were getting out of the business of saw-milling and turning to farming. It was well that the Station gained a foothold at that time for today the yellow pine is prac-

tically all gone and the people are almost wholly dependent upon the soil.

The mission of the Station was the development of a successful agriculture to meet the situation resulting from the dissipation of the timber. It was a big job and it grew bigger year by year as more and more farmers turned to Mr. Ferris for guidance.

He well outlined the proportions of his task to me when he said: "Our Station, since its establishment in 1902, has faced a problem that has not existed with the other stations of the State, nor perhaps of the nation, in that we had to serve the agriculture of a section where practically no

agriculture existed — the entire time and attention of the people having been taken up with timber. The general idea, at the beginning of our work in 1902, was that cut-over lands were too poor to have agricultural value, and it has required actual demonstration to prove the contrary.

"We feel that the work of this Station is better appreciated now than ever before in its history," he added. "There are several reasons why this is true: The Station is older and our people have come more and more to look to it for guidance in agricultural affairs; it is getting better support in recent years enabling it to start new lines of work, notably that with fruit and truck crops, under supervision of specially trained men; and as the timber has been removed the people are slowly but surely coming to a realization of the fact that

agriculture is their only present dependence and they are more ready to accept the teachings of experiment station workers.

"Better roads and the more general use of automobiles, with the fact that most of our counties have agricultural agents who lead parties on visits to the Station, have served to greatly popularize our work," he continued. "Numerous delegations of farmers, business men, students and teachers of agriculture have made a study of our experiments. The conducting of cooperative experimental work in several counties has brought many people into more intimate touch with our work. The people are coming to realize that they have a valuable asset in their cut-over lands and that when intelligently handled these lands can be made as productive as the richest natural soils. The work of this Sta-

tion with fertilizer has played no small part in bringing about such a realization."

The fact that the soils of the section are not naturally fertile constituted the biggest problem that Mr. Ferris and his coworkers had to face. From the first it was found that a few years' cropping sapped the meagre fertility. The plants were eager make vigorous growth in a soft climate that compares favorably with that of the fruit growing sections of Florida California and although the winters are slightly more severe and there is more rainfall.

The sandy texture of the soils is at once a curse and a blessing. Although they con-

tain little or no natural fertility their physical condition is ideal. Their almost mechanical perfection and the abundant rainfall they receive make them highly responsive to the proper use of fertilizer.

Dependent on Fertilizers

"The largest problem connected with the development of a permanent agriculture in this vast territory of South Mississippi is that of building and maintaining soil fertility," Mr. "In their natural state Ferris said. the soils are so poor that any kind of farming is unprofitable without fertilizer or manure. As the latter is practically non-existent, the country as a whole is dependent upon commercial fertilizers. Hence, the primary work of our Station has been that of determining the exact needs of these soils for fertilizers and the cheapest



This companion plat was fertilized with 240 lbs. of acid phosphate, 90 lbs. of ammonium sulphate, and 240 lbs. of kainit per acre. The total yield per acre was 1017 lbs. of seed cotton, an increase of 378 lbs. over the check.

and best means of supplying them.

"Such a determination is not as simple as it would seem," he added, "and new problems connected therewith are constantly arising. So one of the main lines of work here has been and will continue to be along fertility lines, the finding of the proper amounts and proportions of the needed plant food elements for the many crops.

"On hundreds of plots here and elsewhere over the section, we are working out these problems by carefully planned experiments agreed upon at conferences held annually at the State Agricultural College where the best thought of the agricultural workers of the State and the leading fertilizer men of the South is brought into play. Such experiments are carried out not only at the Station proper, where fertilizer tests are made with various crops on more than 300 plots, but also with farmers in several counties through the cooperation of the county agents," he concluded.

It is necessary to carry these experiments on diligently and constantly because the plant food demands of the soils are continually changing. What was a good fertilizer a few years ago may be an unbalanced plant ration today. For instance, not long ago the Station recommended a fertilizer analyzing eight per cent phosphoric acid, four per cent nitrogen, and two per cent potash for cotton. this was a good cotton mixture at that time, under present conditions it does not contain enough potash to feed the plants and help them resist rust and wilt. The potash in the cotton fertilizer recommended therefore been increased.

Important Information

Such information is important to the section because, similar to the remainder of the South, its major cash crop is cotton. Mr. Ferris says that by using the best varieties and the recommended methods of culture and fertilization it is possible to grow cotton in the coastal plain section as successfully as it is grown in the Mississippi Delta, which is famous for its (Turn to Page 56)



Bright tobacco has been introduced in the last few years.

Why

¶ Some farmers pay as high as fifty per cent per annum for short term credit

Credit Stays High

By Arthur P. Chew

U. S. Department of Agriculture

O much has been done to make credit cheaper for the American farmer in the last 10 or 12 years, that we are apt to regard the agricultural credit problem as more or less solved. With the Federal reserve banks and the intermediate credit banks and the farm loan banks standing ready to siphon funds from money centers to points where capital is needed, it is hard to believe that there can still be serious local shortages of credit in the United States. But if you live in certain regions, and till the soil for a livelihood, your short term credit may cost you 20, 30-yes, 50 per cent per annum.

That sounds incredible. Yet it is vouched for on the highest authority—that of the United States Department of Agriculture. In a survey made a few years ago in Georgia and North Carolina, the department found areas in which the average rate of farmer-credit was 24.3 per cent. Individual cases were found in which farmers were paying as high as 50 per cent. Another study made this year in the same general region has revealed that such conditions still exist.

To be sure the kind of credit in question here is not bank credit. It is merchant credit. Farmers in many parts of the United States are unable to obtain from banks all the short-time credit they need. It is consequently necessary for them to have recourse to merchants and dealers of various kinds, who naturally insist on being well paid

for doing a banking job as well as a trading job. Farmers who use merchant credit seldom know what it costs them, because ordinarily the cost is not based on a fixed interest rate but is covered in a higher price paid for supplies purchased on credit. That is how they come to be charged such terrific rates.

But the mere fact that this credit business is done through merchants rather than through banks does not make it less of an evil, or less of a blot on our credit system. Indeed, the contrary is true. Why must thousands of farmers struggle along without adequate banking facilities? Most of this high-cost merchant credit is well secured by chattel mortgages or crop liens. It is a clear case of neglected opportunity by bankers. Merchant credit is a miserable substitute for adequate bank credit. Its cost is prodigious, and it often deprives the farmer of all control over the marketing of his crop. What is wrong with our banking system?

No Shortage of Funds

Well, first of all we may dismiss the suggestion that the trouble is a shortage of loanable funds. This country is the greatest reservoir of fluid capital ever known. It is ladling capital out abroad at the rate of about five or six billion dollars a year—not always on very good security. At this writing a 3½ per cent Federal reserve rate in New York is contemplated. That

means the country has more money looking for investment than it knows what to do with. Our problem is to find out why more of this cheap money does not seep down to the farmer at low rates of interest.

It is true, of course, that interest rates on short-time loans for farmers have dropped considerably in the last 10 years or so. Moreover, they have declined most where they were formerly highest-particularly in some of the southern states and the mountain states. Anyhow, bank credit has. In Oklahoma, for example, the average rate on short-term agricultural loans declined 2.6 per cent from 1914 to 1923, and declines almost as substantial were recorded in other agricultural states. But 10 per cent is still a common charge-when extras are included -in many southern and western areas, whereas farmers in the New England and the North Atlantic states can borrow money at 5 per cent. What other business shows an equal spread in credit charges?

Ask the banker for an explanation, and he will probably tell you that interest rates are naturally high in regions where the demand for capital exceeds the supply and where the risk on loans is exceptional. Certainly the factor of risk must be allowed for. Climatic conditions affect interest rates through their influence on the amount and the variability of farm incomes. Perhaps interest rates will always be higher in the semi-arid, one-crop regions than in the humid, diversified regions. But should the spread be as large as it is? And as for the banker's suggestion that rates must be relatively high where the supply of loanable funds is small, the obvious retort is that there ought not to be any place in the United States where the supply of loanable funds is inadequate.

There would not be if money found its level rapidly like water, but it behaves more like molasses. Or perhaps it would be better to say that the fault is not a natural lack of fluidity in the

money supply, but lack of channels and conduits to move it around properly. Money circulates all right through the main arteries of finance and trade, but not in the minor blood vessels. If there is high pressure around the vital organs of our economic system, in the great money centers, the stream often runs mighty thin at the extremities. It gets thinner visibly, as rising interest rates show, when you move away from the industrial East toward the agricultural South and West.

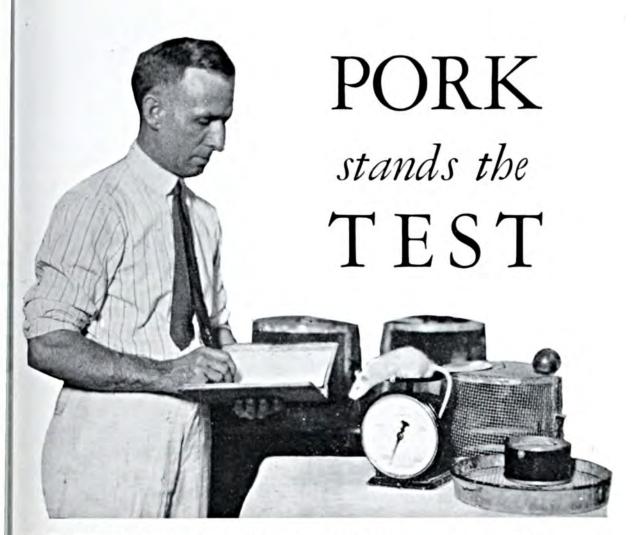
Credit Facilities Inadequate

All the causes of unduly high agricultural interest rates can be reduced to two—the risk of lending and an insufficient supply of funds. There will naturally be differences of opinion as to which of these factors is the more important in determining the level of interest rates in various sections of the country. It is not necessary to minimize the importance of the former in order to make out a case which will show that local shortages of funds, due to a clogged circulation system, are pretty significant.

The truth is that our agricultural credit facilities are still wofully inadequate. This does not mean that there are not enough country banks. In some states there are too many. North Dakota in 1920 had one bank for every 732 persons in its population, compared with one bank for every 12,625 persons in Rhode Island. North Dakota would have been better served with fewer and better banks in the last few years. What agriculture needs is not necessarily more banks, but banks with improved channels of communication between themselves and the big money centers. It must be made easier for money to flow from New York and Chicago to the small local bank that serves the farmer.

A small banker sized up his problem for me recently. It seemed to me that it helped to explain why credit is often

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in the hands of packers and prospects for lower priced hogs if consumers do not whet their appetites for sausage, ham, bacon, and spare ribs, the hog producers are going to have a rough time of it. But Ralph Hoagland, a biochemist of the U. S. Department of Agriculture, comes out with some cheering information regarding pork products which may increase the consumer's interest.

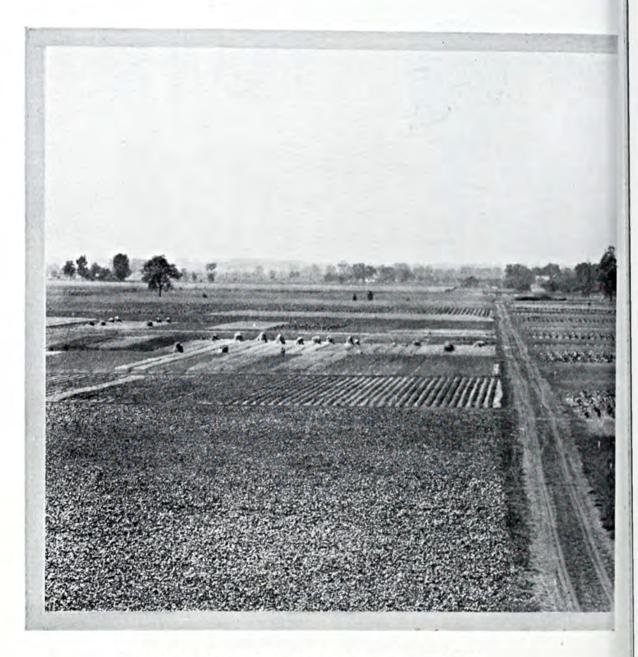
For one thing, Mr. Hoagland has proved from his experiments that the public's desire for pork in combination with certain other things is on a sound scientific basis. He says it is not an accident that produced the combinations familiarly known as ham and eggs, pork and applesauce, ribs and kraut. The combination of bread and ham in the popular ham sandwich is a good balance, and the fact that this is so may account for the great popularity.

This government scientist has used

4,000 albino rats in his feeding tests, selecting these animals because their food requirements are similar to those of man. Many valuable results have been obtained, one of them being the discovery that lean pork is rich in vitamin B but low in the fat-soluble vitamin A. Right here is the reason for the success of the ham and egg partnership. Eggs happen to be low in vitamin B but rich in fat-soluble vitamin A. For the same reason bacon and eggs have retained popularity with the public.

It has been known for some time that there is a great variation in the food value of proteins from different sources. Those from lean meat, fish, milk, and eggs have a higher nutritive value than those from such foods as wheat, corn, rice, navy beans, and oats. One of Mr. Hoagland's objects was to find the value of the protein in pork and the proteins of some other meats when they are eaten with grain products and vegetables. A result

(Turn to Page 56)



INDIANA

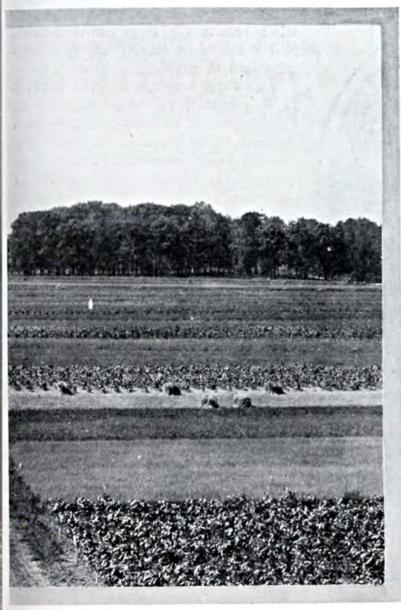
By T. R. Johnston

Purdue Agricultural Experiment Station

THE "Service Station for Indiana Agriculture."
This sobriquet, many times applied to the Agricultural Experiment Station at Purdue University at Lafayette, Indiana, may be true for other experiment stations, but it is particularly outstanding in the Hoosier state. There is not a class of farmers, from the corn and hog producers in the typical corn belt area

of the state, to the dairymen of the north or the fruit growers of the south who have not brought problems to the experiment station and received the help so necessary to the success of farming today.

With one of the largest staffs of research men in the country, 92, and situated in the eastern part of the great surplus food producing area of the United States, the Indiana Ex-



PURDUE

is the seventeenth visit in our tour of agricultural experiment stations. Note the excellent photograph of the experimental plots

periment Station at the state's Land Grant College is strategically placed to give a maximum of service. And it does.

Not long ago the writer was on one of the many tours used nowadays to impress on a group this or that practice.

"What does Purdue say about it?" or "What have the experiments at Lafayette shown?"

These two questions, put by dozens of men during the course of the trip, not merely on alfalfa, which was the particular project under discussion, but on everything from feeding a litter of pigs to reach the ton mark in six months, to spraying an orchard to control codling moth, were among the queries of the farmers taking part in the tour. They sought to learn



This plow has a rotary attachment for pulverizing the furrow slice.

what results the Experiment Station had obtained in solving the questions they had in mind.

This little incident is given because it is common at every meeting of farm men and women over the state. It illustrates the confidence which the Hoosier farm folks have in their state experiment station and school of agriculture.

Founded back in 1888, under provisions of the Hatch and Adams acts, the Experiment Station undertook at once several fertility tests. The half acre plots, laid out a year or two previous to this time by Prof. W. C. Latta, the original professor of agriculture at Purdue, are still intact with experiments going on there each year.

Prof. Latta was the director, staff, and instructor, all in one for the first experimental work, but with the development of Indiana agriculture, the research work has reached bounds undreamed of even a decade or so ago.

The original five acre tract set aside for experimental work, deemed at that time entirely adequate, has grown to no less than 20 farms and fields scattered over Indiana, all on different types of soil. Their total acreage is approximately 2,600, and more than 200 projects, seeking the answer to the questions which Hoosier farmers have asked or will ask, are





Experiment Station offices and laboratories are in this building. Above are Dr. E. C. Elliott, President of Purdue University; and J. H. Skinner, Dean of Agriculture.

October, 1927

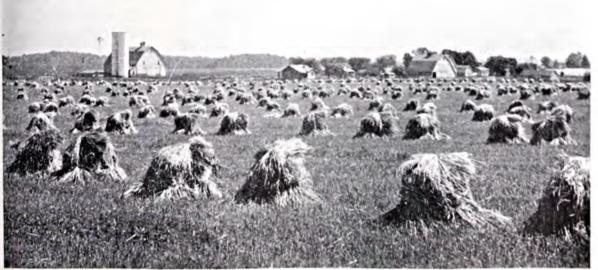
under way on these farms. In addition, hundreds of farmers over the state are cooperating with the research workers in seeking further light on many questions. Only last year agricultural graduates and former students were enlisted as a body to help in the soils and crops work, and more than 500 are cooperating in this experimental work which is followed later as demonstrations.

Oat Smut Control

Indiana for many years has been a heavy producer of oats. More than 20 years ago, smut became so bad in this crop that it threatened to put the farmers out of the oats growing business. Dr. J. C. Arthur, now professor emeritus of botany, working on the problem with his usual vigor, learned that formalin would control this disease. Today, not only the farmers of Indiana but wherever oats is grown know and use this treatment, worked out in the laboratory almost a quarter of a century ago. Similarly Dr. Arthur adapted formalin to the control of potato scab, which was perhaps the most serious potato disease in Indiana. Treating of potato seed is now a common practice, thanks to the extension service and the knowledge taken out to the farmers.

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Wheat on Murdock Farm, Tippecanoe County, Indiana. Above are Dr. G. I. Christie, Director of the Experiment Station; and H. J. Reed, Assistant Director.

Storing Apples

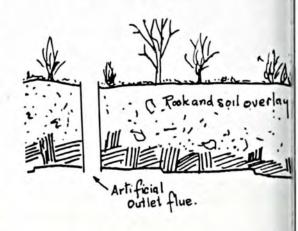
By C. E. Baker

Purdue Agricultural Experiment Station

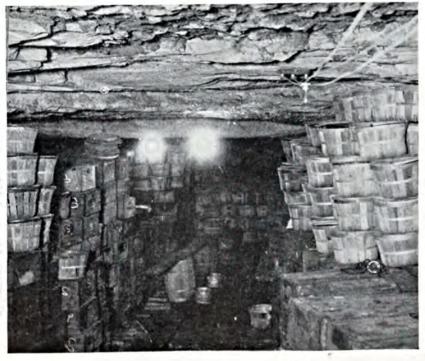
HE development of farm storage houses for apples during the last few years has brought forth some ingenious adaptations of already existing structures into structures for holding apples during the winter months. Home basements, deserted school houses, barns, and various other buildings have been converted into satisfactory air-cooled storages to prolong the season of marketing fruit from the farm.

What is undoubtedly one of the most interesting and novel undertakings of this kind has been conducted by the Burton Fruit Company of Mitchell, Indiana, in utilizing a natural limestone cave for apple storage. The orchard is situated near the seat of the Bedford stone industry and is near the center of an area covering many counties that is entirely underlain with deep limestone deposits. These deposits are characterized by

caves, caverns, and underground rivers; open caves of the kind made use of in this instance being common throughout this section of the state.



Natural Limestone Cave



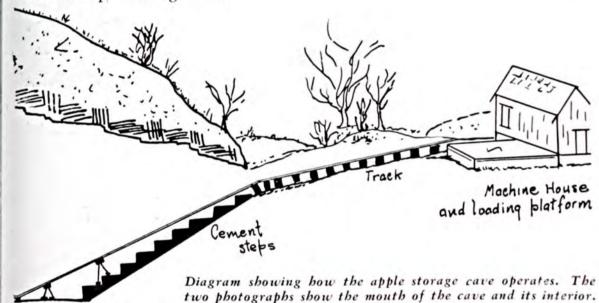
Realizing the necessity for storage facilities to care for a large commercial crop of apples, the company experimented with caves and found that they would provide very satisfactory storage conditions if sufficient ventilation secured be After this preliminary investigation, a large cave was leased by the company, and work was begun

to fit the cave for its new duties.

The first work necessary was to remove the debris from the bottom of the cave. As the floor of the cave was considerably below the level of the mouth, a large amount of soil had washed in. This, together with the loose rock along the walls and ceiling, was removed, and the cave was given a general overhauling and cleaning.

Irregularities in the floor were removed, and the depressions were filled with cement to give a level surface. Cement steps leading from



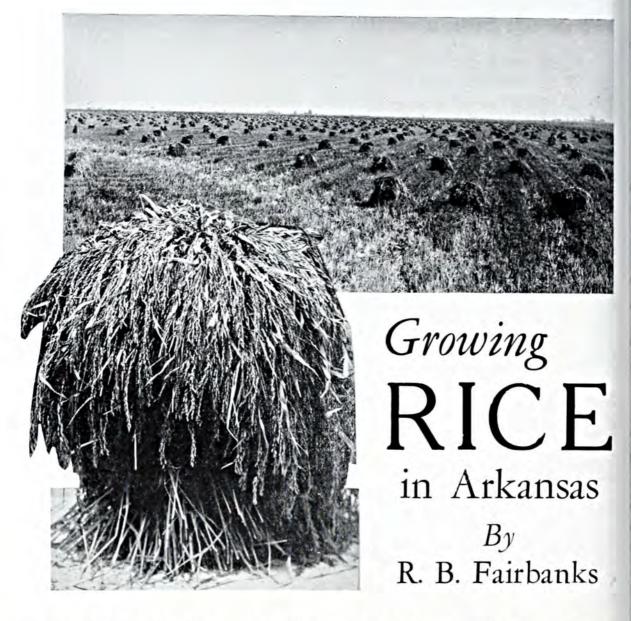


the floor of the cave to the mouth were also provided. The finished cave has headroom varying from 10 to 14 feet; the greatest length is 130 feet; its greatest width 50 feet, giving a storage capacity of 10,000 to 12,000 bushels.

As this cave had no natural outlet of sufficient size to provide adequate ventilation, it was necessary to cut an artificial warm air outlet flue from the top of the cave up through the rock and soil to the open air above. An electric fan to force the air up this flue was installed at its base. Electric fans also are placed at the sides of the cave to circulate air toward this flue.

The mechanical devices made use of

in operating this storage cave are like-The windlass wise very interesting. which lowers and raises the car is housed in a small building at the head of the track about 100 feet back from the mouth of the cave. The windlass is operated by a Ford power plant to which it is directly connected in such a way that the car may be either raised, lowered, or stopped at any point by a skillful manipulation of the Ford transmission system. The same motor drives an electric generator which operates the lights in the cave and the electric fans. When the Ford power plant is not in operation the electric generator may be run by a small one (Turn to Page 53)



OST of the rice grown in the United States is grown in the South, the leading sections being the Stuttgart region of Arkansas, Southwest Louisiana, and Southeast Texas. The methods of growing rice in the Stuttgart section are probably as intensive and up-to-date as can be found anywhere.

Large areas of comparatively level land are necessary for rice growing, in order that the irrigation water may be controlled for flooding the fields of rice. Practically all of the rice lands are prairie or level lands and near unfailing supplies of fresh water. This is necessary because of the large amount of water needed for growing this crop.

A humid, warm climate is needed to grow a good crop of rice. A comparatively long growing season is necessary, some of the varieties requiring four and a half to five months from the time the seed is sown until the grain is mature. When the temperature runs up to 90 to 100 degrees in the middle of the day and the humidity from 85 to 95 per cent, conditions are ideal for the growing of this crop.

Soils with a porous subsoil are not suited to rice growing. What is wanted and what must be had is a soil that has quite an impervious subsoil in order that the irrigation water will stay on the land and not seep down through it too rapidly.

Thorough Preparation

Despite the fact that rice makes most of its growth with several inches of water standing on the ground, soil on which it grows must be aerated. After a few years of being flooded for rice growing, the soil becomes very much in need of aeration and farmers have learned that the best way to accomplish this desired result is by the thorough preparation of the soil before the seed is sown.

Usually the preparation of the soil for the rice crop is started in January or February. The soil is flat broken, and shallow, say three to four inches deep. Then it is harrowed with a disc harrow, often being gone over several times with this implement. Then follows a section harrow. This in turn, is followed by cultipackers. The ground is gone over a sufficient number of times to put it in a most thoroughly prepared condition. On an average it is harrowed at least five or six times before it is properly stirred and aerated.

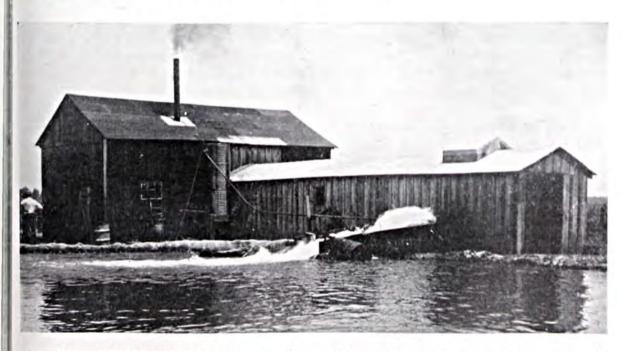
If the weather is not suitable for plowing in winter or early spring, the ground is often plowed while wet. It is often plowed when there is much water on the ground, and the rice is sown broadcast in the mud and harrowed in. This method, of course, is not desirable, but often fairly good crops have been produced under such



A cultipacker in a rice field.

conditions. When a crop is planted in this way, it simply means that it is all the more necessary to thoroughly plow and harrow for the next crop.

Just before the rice is to be planted the fields are surveyed and levees, very similar to terraces, are built for irrigation purposes. These are usually built on level contour lines and are two inches in elevation between each other. They are thrown up about 18 inches high and about eight to ten feet broad. Rice is planted right across the levees. The rice on these levees grows and produces just as good a crop as in between the levees but usually matures a few days later.



Pumping station on an Arkansas rice farm. Note that much water is stored in the reservoir. Usually, however, the water flows directly from the pump to the fields.

The planting is usually done with grain drills, such as are used for other small grain, as wheat and oats. Some sow the seed with broadcasting machines and the seed is harrowed in to cover it. The drill method, however, is considered to be the best.

Most of the rice is planted in April, May, and June, the biggest portion of it in May. Fertilizer is applied at time of seeding, being put in with a fertilizer attachment to the grain drill. Where the grain is drilled the rows are six to eight inches wide. About two bushels. or 90 pounds of rice, are used to seed an acre. This is the rough rice just as it comes from the threshing machine, and not the clean rice that we are familiar with as eating rice.

The following varieties are planted, the first named being the most largely planted, the second named the second most largely planted, etc., in the Stuttgart section: Blue Rose, Early Prolific, Japan Rice, Honduras, Lady Wright, Edith, Mortgage Lifter. The bulk of the crop in the section is of the Blue Rose and Early Prolific varieties. The Blue Rose is later than the Early Prolific and is a heavier yielder. though the Early Prolific does not yield quite so heavily as the Blue Rose, it is a desirable variety because of being earlier, therefore, higher prices are usually secured for it. The quality of the Early Prolific is not quite so good as that of the Blue Rose.

Potash Gives Good Results

Until the last few years fertilizer had not been used extensively in the Arkansas rice belt. It is not used very extensively now, but more and more the growers are beginning to realize that they can use it profitably. Tests show that potash is needed to make hard seed and to give strength to the straw. Much rice is lost from the weak straw, and for this reason, indications are that a reasonable amount of potash should always be used. Acid phosphate alone

seems to do no good. A complete fertilizer, however, seems to give profitable results. Some of the growers like a 10-4-4, others use a 12-4-4, and still others prefer a 10-4-2. It is desirable that the nitrogen used in the fertilizer come from sulfate of ammonia. The theory is that nitrate of soda undergoes a chemical change under the water that is injurious to the rice. From 200 to 500 pounds of a good high grade fertilizer is apparently desirable on rice.

When rice is up three to four inches high, which is usually about four to six weeks after planting, water is turned on until it is about four inches deep all over the surface of the field and nearly covers the rice. The pumping of water is continued from this time until harvest time comes, so as to keep about four inches of water on the soil.

In order to control the root maggots, it is customary to keep the water on the rice 18 to 20 days from the time it is first applied. Then the water is drained off entirely, and the field is kept dry for 14 days, when the water is again turned back, and the field is kept flooded for the balance of the season or until harvest time.

Euipment Cost High

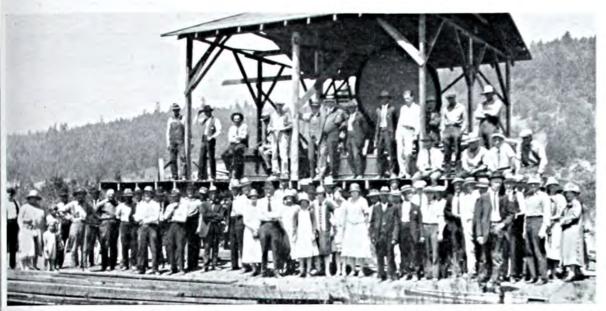
Cost of equipment on the average Arkansas rice farm is heavy and is about as follows:

10,000
1,500
1,000
300
1,400
1,000

Total \$15,200
To cover interest and depreciation of equipment, 20 per cent should be added to the above each year to get at actual cost.

Rice growers generally consider the cost of production, including harvesting, threshing, and hauling to market, interest and depreciation, approximately \$1 per bushel. Some years

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A. C. Brown's mint still being investigated by Douglas county, Oregon farmers with County Agent E. W. Cooney on a mint and vegetable tour.

Here's another money-making

MINT

By Guy A. Peterson

Madison, Wisconsin

INT farming is going West. It is becoming more and more common with Oregon and Washington farmers near the coast, as they find that they can produce a fine quality of oil with less danger of frost than is encountered in southern Michigan and northern Indiana.

Most of the mint in the United States has been produced in Michigan and Indiana since the muck land owners in these districts wrested the industry from the upland farmers in Wayne county, New York. From 1815, when the industry is said to have reached mature proportions, until 1889, the growing of mint was a prosperous undertaking in Wayne county. However, more favorable conditions in the Mid-west made it unprofitable for the New York producers to continue growing this crop.

Consequently the acreage in that state practically has fallen to zero.

A number of men now predict that the Northwest will ultimately produce most of the mint crop in the United States. They believe that many mint growers in Indiana and Michigan will soon use their muck lands for raising celery, cabbage, and other vegetable crops which can be marketed in the near-by population centers.

One writer states that yields of 50 and 60 pounds of oil per acre were formerly common around Mentha, Michigan, where the first Michigan plantings were made in 1835, but that 25 pounds are now considered good as the State average in some years is only about 11 pounds. Indiana's 1926 acreage was 47,000 and that for Michigan was 11,800. It is generally estimated that the United States pro-



Mint hay loading scene on the Hayes plantation near Silverton, Oregon.

duces three-fourths of the world production of mint and peppermint oil.

Oregon's mint industry was started about 20 years ago on a small scale. It was not until after the 1925 freeze which almost wiped out the midwestern crop and caused the prices of oil to rise to nearly \$25 a pound, that the acreage increase really began.

According to A. G. B. Bouquet of the Oregon Agricultural College, Oregon increased her mint plantings from 500 acres in 1925 to 3,000 acres in 1926. Washington likewise had a tremendous acreage increase in the Puget Sound district, as well as in

some of the coast counties farther north.

G. J. Moisan of Gervais, Oregon, has been growing mint on rented areas for a number of years. He says that the production range on peat ground near Gervais is from 40 to 100 pounds an acre. Many growers get from 70 to 85 pounds, although the average for the state is probably not much more than 30 pounds. In 1925 Moisan sold \$21,000 worth of oil from 28 acres and disposed of 17,000 sacks of mint bulbs at \$1.25 a sack. He got 900 sacks of roots from a single acre, but he says that is an abnormally high yield. It takes about 30 sacks of roots to plant an acre.

"In spite of these returns when prices are high," he declares, "quite a number of growers have made a complete failure with mint by not knowing how to grow it or from trying to raise it on land unadapted to mint culture. You want a soil with

plenty of moisture, but it must be well drained. Good oniongrowing land makes good mint land if the climate is right, but you want warm growing weather in the spring and rather hot humid weather in July so the oil cells will form on the under side of the leaves. Mint can be grown on up-(Turn to P. 57)



A. C. Brown, first mint grower in Douglas county, with Mark N. Tisdale, banker and fruit grower, standing in Brown's 20 acres of new planting.

Queen Alfalfa Smiles on the Shenandoah Valley

By W. L. Myers

HERE is an old saying in the North Central States—"Corn is King—Queen Alfalfa, Oh

You Princess Cowpeas."

While corn may still be King of the crops of this region, the army of European corn borers that only recently invaded the corn belt bids fair to force a surrender.

Alfalfa and other legume crops are not injured to any great extent by the corn borer. Fortunate indeed is this, for alfalfa being one of the best animal feeds will protect stock raisers from the serious losses they might otherwise suffer.

Farmers should begin to groom their fields for successful alfalfa crops. It would be foolish to wait until the corn borer has done its work when if proper steps were taken, alfalfa, the Queen, could be ready to play her rôle as a soil builder and profit maker.

There are certain essentials for successful alfalfa growing. First, one must have determination. With all other conditions ideal, the lack of determination to grow it means that very little will be planted or that areas

planted will be neglected.

Best crops of alfalfa result only on well drained, sweet, weed-free soils. Soils of average fertility will grow splendid crops, but require careful fertilization at time of planting and from time to time top-dressing with fertilizer mixtures suited to the soil and crop.

Thorough preparation of the seed bed is important. The soil should be tested and if acid, an application of (Turn to Page 45)



This alfalfa, grown in the Shenandoah Valley, Virginia, was fertilized before seeding with 400 lbs. per acre of 0-13-6 and top-dressed in the spring of the second year with 300 lbs. of 0-13-6.

Merrimack Potatoes

By E. W. Holden

County Agent, Merrimack County, New Hampshire

LTHOUGH Merrimack county, New Hampshire, is not a large potato producing area, an unusual interest in potato farming has developed during the past two or three years. It is developing rapidly as a major business on many of the general farms formerly engaged in straight dairying.

A few years ago most growers raised their potatoes in a far from upto-date manner; there were few power spray outfits; considerable hand work was done; and 500-1,000 pounds were the standard of the commercial fertilizer used per acre. Today such methods have been completely revised. Growers have increased their acreage so that they have been able to afford the most modern potato machinery; they have greatly increased in their use of certified seed; have given their soil better preparation; and have

doubled their fertilizer application.

Part of the interest of this section is undoubtedly the result of the general prosperity enjoyed by all engaged in potato farming in the past two seasons. There is another more important factor, however, in the increased activity in this branch; a campaign of the Merrimack County Potato Growers Association to supply its own markets with locally grown potatoes.

At the present no potatoes are exported from the county, while during the winter months many cars are imported from competing regions into the cities and towns. Local growers enjoy a market which prefers its potatoes, and marketing is only a matter of hauling to town and unloading at the door of the local storekeeper. There are no freight rates to pay and no commission charges. With such conditions existing, potato growers in



Spraying potatoes to control late blight and other diseases and insects.



This ten-acre field of H. E. Webster of Salisbury, N. H., won first prize in the New Hampshire Potato Contest with an average yield of 387 bushels per acre.

this particular section have a unique advantage which is enjoyed by farmers of few counties. They have a superior market which asks for a homegrown product which it is forced to buy from outside sources because there is an insufficient supply at home.

The greatest change of this twoyear period in the culture of the crop has been in the preparation of the soil and in the increased use of fertilizer. This has been the result of the efforts of the local association in campaigning for "greater yields at less cost." Two Merrimack county growers were first and second prize winners in the 300-bushel contest conducted by the New Hampshire Extension Service last year. H. E. Webster, of Salisbury, had an average yield on 10 acres of 387 bushels per acre and W. E. Currier, of Danbury, raised an average of 339 bushels on five acres. The success of these men can be attributed chiefly to the preparation which they gave their fields before planting. Last year was exceedingly dry in this section, yet these men had good yields

because they plowed and fitted their land in excellent shape.

The common practice of a few years ago was to select for potatoes a field which had been in sud for several years, manure it heavily, and apply 500-800 pounds of fertilizer in the drill at planting. The success of progressive farmers has proved that greater applications of fertilizer and less manure secure the greatest yields. Today, nearly all potato farmers use from 1,500-2,500 pounds of fertilizer per acre. If manure is used, a light application is made in the preceding fall, yet most growers prefer to use it for other crops, working potatoes into a rotation so that they will be planted on land that is in a fertile condition.

The common 5-8-7 and 4-6-10 have been the popular grades; 800-1,000 pounds are applied in the drill and the balance is broadcast after the plants come up. Potatoes are practically the only crop raised in this section which succeeds as well, if not better, without heavy applications of manure.

Where Insects Winter

By Don B. Whelan

University of Nebraska

THY is it that most farmers conduct a winter resort for insects? Year after year they make conditions ideal for these little pests to pass the winter unharmed. It is a well proven fact that many of our worst farm pests spend the winter in and under weeds and accumulations of crop refuse.

During the winter months insects are inactive and can be controlled more easily. Many insects spend the winter in the egg stage, some on weeds near the host plant, some on the remains of the host plant itself, others in the ground or trunks of trees. Other insects hibernate in the larval stage, generally within silken cases or cocoons of some sort. The adults often stay under trash, stones, or else a few inches in the ground itself.

If all weeds were cleared from the vicinity of the garden in the fall, or from our fields, by community effort or otherwise, some of our worst pests would soon be forgotten. Some insects like the flea-beetles pass the earlier part of their lives on the roots or leaves of weeds, and later, in their adult stage, they prove to be quite a pest of some

of the farm plants.

Many of the most destructive plantlice, or aphids, spend portions of their lives on weeds. The remainder of the time they satisfy their hunger on some particular crop. Thus the rosy apple aphid spends part of its time feeding on the narrow leaf plantain. The potato stalk-borer spends the winter as an egg on ragweed. The potato tubermoth, a very serious pest of potatoes in California, breeds on weeds, as also does the potato flea-beetle. Weeds not

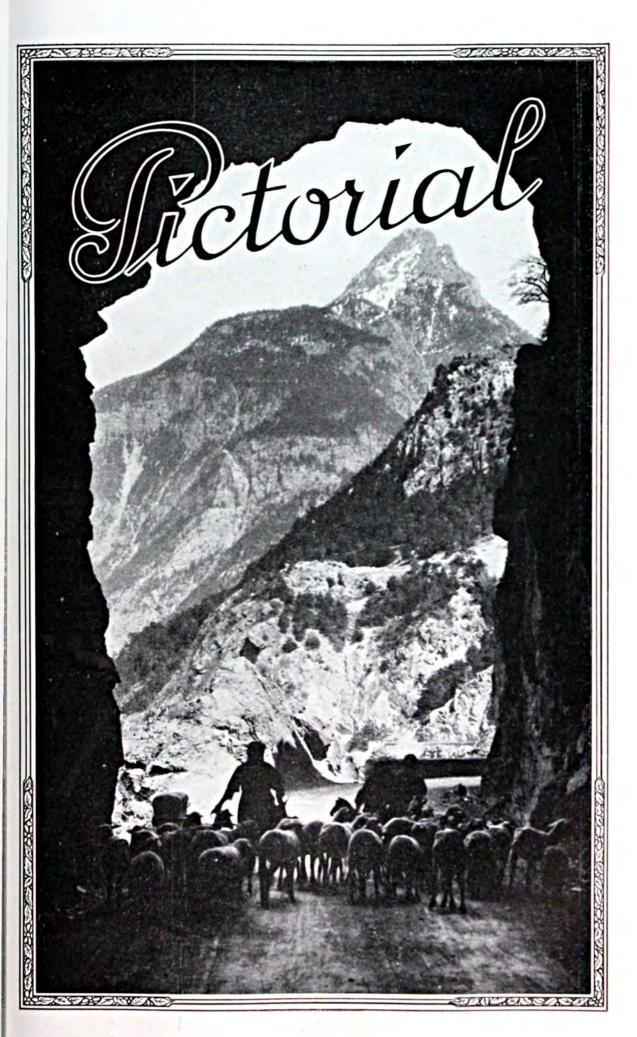
only occupy needed space and take nourishment from the soil, that is necessary to the plants, but they are the bridge that carry many of our

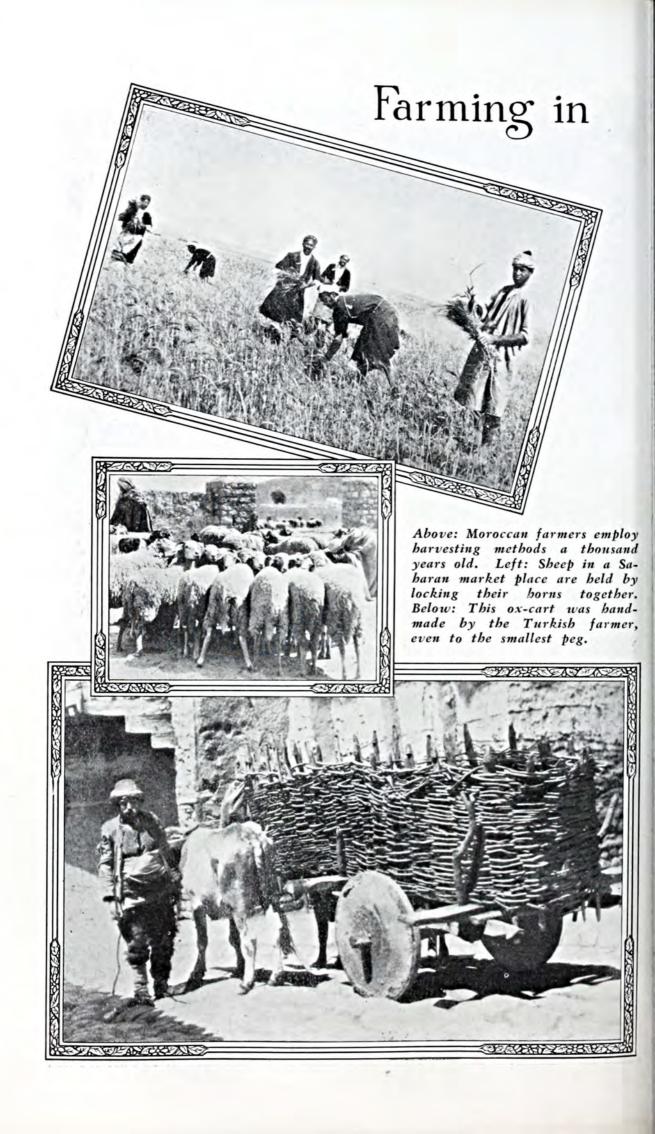
worst pests over winter.

It is a common practice, when a crop has been harvested, to allow the remnants of the plant to remain on the ground all winter. This is often true of the stumps of cabbages and cauliflowers, and very often the melon and squash vines that have been killed by the frost. The stubble of corn proves to be an ideal hibernating place, as does the sheltered ground under the shocks of corn. On the leaves and stumps of cabbages in winter, will be found the eggs of the cabbage aphids. The writer has bred the adult of the cabbage maggot from rutabagas that have beeen frozen in the ground all winter. The squash-bug and the tarnished plant bugs live under garden refuse, or in sheltered places near the field, during the winter season. These remnants of the past season's crops are a big source of next year's insect pests and should be cleaned up and either burned or buried, if it cannot be fed.

There are many other ways in which a little care and foresight will save the farmer much future trouble. he can destroy the breeding places or the hibernating retreats during the time of the year when these places are vital to the insect's existence, he will enjoy a greater freedom from their attacks the following year. For instance the plum curculio, the little snout-beetle that stings the apples, plums, cherries and other fruits, spends the winter in the grass or rubbish in or

(Turn to Page 46)









Left: A good field of corn and soybeans in Coahoma county, Mississippi.

Below: Canning club girls in Hillsboro County, Florida, demonstrating the slogan "from patch to can."



Right: Director G. I. Christie of the Purdue Agricultural Experiment Station is a keen student of practical farming methods.



Below: Chris. S. Gerber of Fairbury, Illinois, and seven good reasons why he is a hard-working farmer.





VH JH 时时 The Editors Talk VE Va /a

I extend pity to no man because he has to work. If he is worth his salt, he will work. I envy the man who has work worth doing and does it well. There never has been devised, and there never will be devised, any law which will enable a man to succeed save by the exercise of those qualities which have always been the prerequisites of success, the qualities of hard work, of keen intelligence, of unflinching wil!.- THEODORE ROOSEVELT.

Policy

Agricultural Farmers are not nearly so well off as their brothers in industry. For the satisfaction of their urban brethren who may have any doubt about it, "the present bad situation" is evidenced by the fact that though the

American farmer represents one-fourth the population, he receives only one-tenth of the national income, and agriculture brings in only 3 to 4 per cent on its capital investment while industry brings in 12 per cent.

These and other reasons are discussed in the report on the conferences relating to "An American Agricultural Policy" which was part of the Seventh Session of the Institute of Politics held recently at Williamstown, Mass.

What policy was proposed, what was decided, what progress was made? In ancient times certain of the tribes of Europe had a very simple plan. They set up a god Tuisto "sprung from the earth" and Mannus his son as the father and founders of the country and trusted them for their fortunes. But, as Tacitus the Roman reported, "Silver and gold the gods have denied them, whether in mercy or in wrath, I am unable to determine."

Today farmers are vainly seeking their share of the silver and gold. And apparently nobody is able to decide very definitely why the gods have denied them.

Let us hope, however, that it is in mercy and not in wrath, for the conference issues a salutary warning. It says, "failure to effect a satisfactory solution may well have important political results in the not distant future if the agricultural interests of the West and South can act together at Party conventions and on Election Day." Apparently the farmers will not call on the gods any more, but get down to business on their own account.

Out of this report of the conferences emerge three broad concepts: 1st, the farm situation is bad, 2nd: there is a great divergence of opinion regarding how to remedy it, 3rd: regarding progress: "At any rate it may be regarded as progress that some solution of the agricultural problem will be attempted probably within a year."

All of which may be very true, but all of which is not very encouraging for the farmer. Confusion of object and method, a lack of coordination and a lack of understanding of all the factors which effect the situation and how they operate, are the outstanding characteristics of the present form situation. Great gulfs exist between proposed remedies partly because great gulfs exist between the opinions of what the farmers should want and should have.

The theory seems to persist in some quarters that inefficiency on the farm must be accepted because the farm is the great primary source of the nation's moral values. But will the farmer ever be persuaded that to be poor and good is more desirable than to be industrially rich even though his morals may be in some jeopardy?

On this point the report states:

"It is asserted that the farms produce better citizens, alert and ready to take responsibility, while city life warps 80 per cent of the people. Everybody living in town loses part of the spiritual value of living. It is contended, therefore, that the family sized farm, despite the inefficiency of many farms, should continue to be the basis of American agricultural policy, such farms producing food sufficiently so that industrial laborers will not have to give too large a percentage of their wages for food, while at the same time the farm families themselves are being paid prices high enough so that they can build up an agricultural civilization which is as attractive to at least half the country children as the urban civilization."

In other words, there seems to be an opinion that the farmer be called upon to support the nation physically and spiritually; to be the source of the nation's food values and moral values that vast industrial centres may prosper; his pay to be the moral satisfaction of reverence to gods "sprung from the earth" that grant neither silver nor gold.

More encouraging is the concept discussed in the report that some people wish to formulate a policy which will coordinate industry and agriculture. To this end farm organization must assume that corporation farming on a large scale with scientific and modern business methods is part of a program. It is argued, however, that while such a system may be more efficient, it would produce lower moral values.

Certain it is that as long as economic inequalities exist there will be unrest and dissatisfaction. When farmers "sprung from the earth" start out to solve their own problems and put their own house in order, on the basis of a "liberal plan of equality, liberty, and justice" then may we look for the emergence of a national agricultural policy that will be good for all the people.

> Out of the night that covers me Black as the pit from pole to pole, I thank whatever gods may be For my unconquerable soul. HENLEY.

Farm Out- According to a recent news release from the United States Department of Agriculture, the agricultural look Better situation has improved during the past year. The purchasing power of farm products is 88 per cent of pre-

war, as compared with 83 per cent a year ago. When the purchasing power of a bushel of corn or wheat or a bale of cotton goes up, economists give it a number in order to measure it. This is commonly known as an index number. The index number of farm prices in the United States increased from 130 in April, 1927, to 139 in August, 1927. This is encouraging.

The rise in the index number has been due chiefly to the rise in the prices of cotton, corn, apples, and beef cattle. Probably the most important change has been in the case of cotton. In December, 1926, the farm price of cotton was 10 cents; in August, 1927, it was 17.1 cents. The index number rose 55 points, from 82 to 137. Conditions in the cotton belt are much better than last year.

This is good for southern farmers who suffered last year from the bad effects of the production of a record crop. What man has tried to do—limit production—nature in a measure this year has done for him.

Quoting from the news release, the Department of Agriculture sums up this season's apparent production and returns as follows:

"It can probably be called an average year for the South; for the wheat belt, a good year in the North and a fair year in the South; for the corn belt, a fair year in the West, but a poor year in the East; for the Far West, a good year in the range states and Pacific Northwest."

Sad is the day for any man when he becomes absolutely satisfied with the life he is living, the thoughts that he is thinking and the deeds that he is doing, when there ceases to be forever beating at the door of his soul a desire to do something larger which he feels and knows he was meant and intended to do.—Phillips Brooks.

Winter Meetings

We shall soon be hearing about winter meetings for farmers, short courses at our agricultural colleges, meetings arranged by the county agents and many others.

Decide now to attend at least one short course or good meeting. Nothing means so much as knowing the people doing work similar to our own. There is a danger nowadays that because of the large number of bulletins, circulars, agricultural magazines, and printed matter available, the farmers may think they can learn all they need to know from the printed page, the "litera scripta," one highly specialized means of reaching people.

They may well ask, "Why need we go up to knowledge when knowledge comes down to us?" Quite true. "There never was a time which promised fairer for dispensing with every other means of information and instruction." But farm problems are hard to solve. This is a complicated age. Discouragement is too often the result of an effort of trying to solve such problems alone, and when difficulties confront them, men of all ages have availed themselves of the ancient method of personal discussion, of talk between man and man. To make the most of various opportunities, we must talk to the living man who knows and hear his living voice.

It has long ago been pointed out that scientific men and thought cannot "dispense with the suggestions, the instruction, the stimulus, the sympathy, the intercourse with mankind on a large scale, which meetings secure." A

man who fails to meet his fellows, to meet the men who know best what the problems are and how to solve them, misses much. His purposes and plans are only half formed, and his methods tend to be narrow and ill-founded. Books, good as they are, necessary as they are, can never take the place of the opportunities presented by short courses or meetings. Now is the time to decide to include them in the winter's program.

"It is impossible to impress upon any one that there is dignity in residing upon a farm with impoverished soil, dilapidated buildings, and an environment of ignorance."—Dr. Seaman A. Knapp.

A Fall Clean-Up

With the harvest well along and with as much of a breathing spell as a busy county agent ever has ahead of him, what about a little more stress on a fall clean-up on the farm?

We have our rural beautification contests of various sorts—almost every spring program includes one or more of them. But little attention has been paid to the appearance of the farm as it goes into the winter season.

If a farmer cannot be approached from a purely aesthetic standpoint, there are two big economical reasons for his picking up around his premises in the fall. One of these is the millions of dollars lost in depreciation on farm machinery left out-of-doors. That farmers are careless in taking proper care of implements is evidenced by a survey made a few years ago by a midwestern experiment station indicating that several millions of dollars were lost in that state alone through farmers leaving expensive mowers, hay rakes, potato diggers, etc., unhoused during the winter. Replacement dates on these implements had jumped ahead three or four years. And farm machinery is one of the biggest items in the present cost of production of farm crops.

The other big point in favor of the fall clean-up is the possibility of killing countless insects by destroying the weeds and rubbish left in the fields after the crops have been harvested. These weeds and rubbish are veritable winter resorts for insects. Why should a farmer furnish protection for destructive pests which he will have to fight the next growing season?

Painting, fence repairing, and a general pick-up done in the fall will save time in the rush of the spring work.

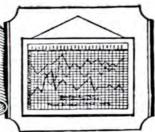
Why not stress the fall clean-up?

"In agriculture we should continue our effort to obtain higher productivity per worker, greater output per unit of cost. But we should not stop at that. We should aim to secure a wider joint effort by farmers to gain that bargaining power which industry and labor have attained by working together through their organizations built along lines of mutual interest."

-W. M. JARDINE, Secretary of Agriculture.



AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Winter vs. Spring Wheat

Wheat growers of central and southern Minnesota have been told by Andrew Boss, vice-director of the Agricultural Experiment Station, that they may expect much better returns by substituting winter wheat for at least a part of their spring wheat acreage. He says if a million acres of spring were changed to the right variety of winter wheat, farmers would get 5,000,000 more bushels of wheat. Although the price is usually lower he believes there would be a net gain of, perhaps, \$3,500,000 or \$4,000,-000. Minturki is the winter variety favored most in Minnesota. years ago only 70,000 acres of winter wheat were grown in the State. This year 201,000 acres were harvested. The Department of Agriculture says from 5 to 71/2 bushels more per acre may be expected from winter than from spring wheat.

Moldy Silage

For many years the molding of silage has been generally attributed to poor packing when the silo was being filled. But it has been shown at the Wisconsin Agricultural Experiment Station that the air pockets have little to do with the molding. The condition of the corn at the time it is put in, say the investigators, is really the determining factor. Three empty crates were buried at different levels in a silo as the corn was being put in. Along toward spring when these crates were uncovered no mold was found around them and the silage was in good condition.

"If the corn is over-ripe, wilted, or frozen when it is put in the silo," says Prof. E. G. Hastings, "it carries so much air that it takes several days before all the oxygen is used in the ensiling process. In this period the mold may make a rapid growth, and although it does not spread after the oxygen is used, it remains unchanged and appears newly developed when the silage is used." His recommendation is that corn for the silo be cut immediately after it has dented and before it has dried out. The filling should be finished just as the corn is becoming dry.

New Use for Combine Harvester

The last few years have witnessed a great increase in the use of the combine harvester, a spread to new sections, but this has not been the result of any new use. Now comes a report from Oklahoma that a farmer of Ellis county has found it a moneysaver in harvesting sweet clover for seed. County Agent Hyer says it cost this farmer \$3.00 an acre to harvest with the combine against \$12.00 if he had cut it with a binder and threshed it. He thinks more seed was saved than would have been secured by the old method.

Quackgrass Out in a Year

With a spring-tooth cultivator it is possible to rid land of quackgrass in one year, according to results obtained by Rex D. Kildoy, superintendent of the school farm on the Fort Totten Reservation in Benson county, North Dakota. He has been trying

out various methods. Last year he eradicated the pest completely from 32 acres. He reports that not a spear was left in spite of the fact the ground had been deeply plowed in the past and the roots were down nine inches. He is convinced quackgrass can be completely controlled if a small area is properly worked by a method that involves digging up the roots frequently and burning those collected.

New Sweet Clover Stays Green Longer

Because of the wide variability of sweet clover there is great opportunity for developing better strains. possibility has been realized in one direction by the Department of Agriculture which has discovered a strain that remains green much later in the It is one of several strains brought in by plant explorers from Europe and Eastern Asia. It is said to be a close approach to the ideal sweet clover which would be a kind that would stay green late, start early in the spring, and remain green all summer. There is now much interest in the production of better hay varieties, since most of the common sweet clovers, especially the white-flowered, are too coarse the second year.

Hen Should Have Doctor

In this, the most important poultry-producing country in the world, the hen deserves more attention from the veterinarians, said Dr. John R. Mohler, chief of the Bureau of Animal Industry at the recent meeting of the American Veterinary Medical Association. He called attention to the fact that up to the present, poultry raising has usually been considered an incidental enterprise, and as a result chickens have been left to shift for themselves, not being considered worth much trouble and expense. As an argument against this viewpoint he mentioned that last year hatcheries sold 800,000,000 baby chicks, that American hens lay an average of 760 eggs a second or 2,000,000,000 dozen a year, and that the annual value of poultry products is more than \$1,000,000,000, being outranked in the livestock field only by dairy products and the products from the swine industry.

Dr. Mohler says the most effective control of poultry diseases must come through poultry raisers who will employ veterinarians skilled in this work. The State and Federal governments, he believes, should aim at the exclusion of foreign contagion, prevention of the spread of diseases from state to state, and eradication of disease when it appears. He thinks each state in which the poultry industry is important should establish a competent veterinary poultry service.

Earliness Explained

Earliness, at least so far as the tomato is concerned, seems to be a matter of rapid vegetative growth of the plant early in the season rather than quick ripening. The discovery, by the New Hampshire Experiment Station, was a by-product of some fertilizer experiments.

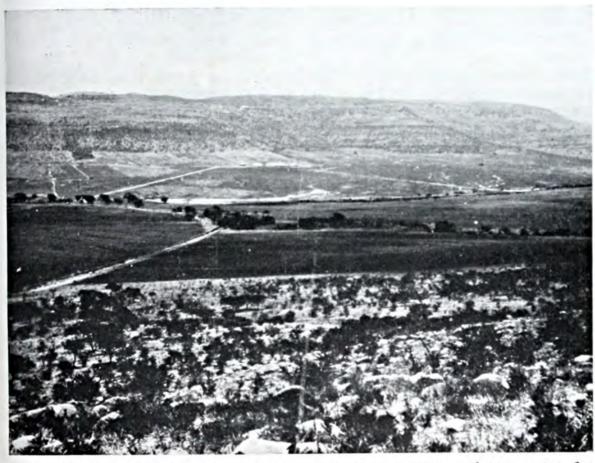
The experimenters found a great difference in growth between early varieties during July, first part of when the early kinds showed 35 per cent more vegetation. The late varieties got much of their growth so late that many of them did not have time to ripen fruit. The experimenters conclude that early growth may be an inheritable factor and may be accelerated by proper fertilization, temperature, and methods of culture.

The per capita consumption of wheat in the United States since 1904 has dropped from 6.58 bushels to 4.9 bushels. During the same period the per capita consumption of sugar has increased from 70 to 113 pounds.



Foreign and International Agriculture





A view of northern Natal cotton country. Note the mountains and intervening flat lands which have to be cleared of scrub bush before cultivation. A local ginnery is situated under the mountain (center) and the estate headquarters are on top.

South African COTTON

By H. E. Andries

Umbogintwini, Natal, South Africa

¶ How the other side of the world grows cotton

PART Two

HE writer of this article recently had occasion to investigate the cultural methods adopted as standard by the biggest estate in the country (to which reference was made in the first article of this review) and a brief summary of their practices is given below.

The estate comprises some 65,000 acres of land of which 42,000 acres are arable, the remainder consisting of mountains, dense forest, and exces-

sively stony or otherwise unploughable land. The 23,000 acres of non-arable land is devoted to stock raising and provides ample grazing for the 7,000 cattle. The estate lies mainly in the extreme north of the Natal Province. but overlaps slightly into the Transvaal Province and into the Swaziland Most of the arable Protectorate. land in the Natal portion of the estate is scrub country which has to be cleared before ploughing is possible. The land over the borders is very open country with perhaps one tree to two or three acres.

The cultivated areas are divided into so-called "sections" varying in size from 600 to 2,400 acres. is controlled by a section manager and one or two assistants, with sufficient native labor the working of the section. On a 1,500 acre section, for example, the native labor (Zulus for the most part) will vary from 60 during the ploughing period to 250 during the reaping season. The quota of "boys" required for each of the main cultural periods may be summed up as follows:

Ploughing and planting 1 native to 25 acres
Cultivating, thinning, etc. . . . 1 native to 12 acres
Reaping 1 native to 4 acres
Clearing and burning stalks . . 1 native to 20 acres

The quota of labor required for the reaping periods depends entirely upon the expected yield per acre, and varies a good deal from year to year. On the section under discussion there is an appreciable variation in the number of hands from week to week, and almost from day to day during the picking period.

On such a section 260 working oxen, with a sufficient quantity of implements to keep them fully occupied, are required. Certain sections have tried and either adopted or discarded mechanical traction, but on the section dealt with here ox-traction only is used. Costs and acreage given in the following paragraphs are for ani-

mal-draught and must not be confused with steam or petrol tractor figures.

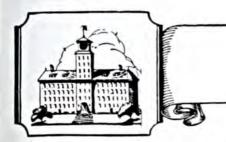
Stumping of virgin country is commenced as early in the year as possible. Starting in January or February (midsummer) stumping is continued on every opportunity until the middle of October (spring).

Ploughing is performed almost immediately over the newly stumped land and the soil thoroughly turned over with mouldboard ploughs. Cross ploughing with discs is performed in July and August; and in the second week in September the land is thoroughly disc-harrowed. This operation is followed by spike-tooth harrowing, and planting is commenced immediately. All planting should be completed by October 31, but may be delayed by droughty conditions which make working of the soil impossible.

Cotton may be planted as late as December, but this is very risky and not to be recommended, although in many cases the late crops were the only crops that survived the floods. Very late cotton, however, usually misses the rainy period and seed fails to germinate; or seed may germinate as a result of a thunderstorm and the young seedlings succumb to the subsequent intense dry heat and die off. On this estate almost 3,000 acres, which just missed the last rain at the commencement of the season, produced a poor stand or failed altogether.

On old lands the method of preparation is somewhat different. Only one ploughing is given and that immediately before planting. Discharrowing is dispensed with and only spike-harrows used. Ploughs are immediately followed by harrows and planters, and a big daily average is maintained. For turning over old land all available ploughs, disc and mouldboard, are used.

Fourteen teams of oxen, each of 16 animals, are used on the 1,500 acre section, and three-furrow ploughs are drawn. This gang can plough 25-30 (Turn to Page 47)



REVIEWS



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

"The Degree of Response of Different Crops to Various Phosphorus Carriers," Agr. Exp. Sta., Kingston, R. I., Bul. 209, July, 1927, Burt L. Hartwell and S. C. Damon.

Crops

As complete a treatise of sweet clover, a crop which has come into prominence in the last few years, as we have seen lately, is contained in Ohio's Bul. 405, "An Experimental Study of Sweet Clover." C. J. Willard, the author, not only gives the results of experimentation done at the Ohio State University during the years 1921 to 1925, but cites the results of agronomists of other stations who have worked with this legume. The bulletin is well worth the while of any one interested in the "weed" which has become a profitable farm crop.

Other bulletins are:

"Report of General Activities for 1926 with Financial Statement for the Fiscal Year ending June 30, 1926," Agr. Ext. Div., Univ. of Fla., Gainesville, Fla.

"Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Obio, Vol XII, No. 5, Sept.-Oct. 1927, Whole No. 128.

Department of Agriculture Immigration of Virginia, Richmond, Va., Bul. 237, Sept. 1927.

Economics

Shall I sell my wheat now or hold it for a higher price? How many times county agents in the wheat growing sections of the country have been asked this question! Considerable light is thrown upon the chances for making a right decision in Ext. Cir. 54, Kansas State Agricultural College, "Judging Price Risks in Marketing Wheat." R. M. Green and E. A. Stokdyk, the authors, have discussed the different factors upon which forecasts may be based.

Diseases

"Thread Blight," Agr. Eaf. Sta., Gainesville, Fla., Bul. 186, Mch. 1927, G. F. Weber.

Bul. 187, Florida Experiment Station, "Infection of Potato Tubers by Alternaria Solani in Relation to Storage Conditions," is a good description of early blight as it affects potato tubers. While L. O. Gratz and Reiner Bonde offer no definite control methods, their experimental work gives useful information on the causes and effects of this troublesome rot. Undoubtedly their work will lead to further research in an attempt to save growers the large losses now incurred from this source.

Queen Alfalfa Smiles

(From Page 27)

lime should be made. Two tons of ground limestone or $1\frac{1}{2}$ tons hydrated lime will usually be sufficient. In all new seedings it is important to inoculate the soil with alfalfa bacteria.

Alfalfa is rich in protein and is equally as good as bran as a protein feed. Why buy bran when pound for pound the protein in bran costs from four to five times as much as in al-

falfa? It is only reasonable to suggest the slogan:

Don't buy your protein-Grow it -Grow Alfalfa.

In addition to being a cheap, high protein animal feed, alfalfa helps save fertilizer bills by taking the valuable element nitrogen from the air. About the only fertilizer required, once the crop is established, are frequent topdressings of phosphoric acid and pot-Too frequently farmers in the Shenandoah have contented themselves with applying only phosphoric acid. In many cases this element may be all that is required, but if the stand is to remain good, the time surely comes when potash will become necessary.

Numerous observations on fields of alfalfa in the valley disclose that even now there are many fields of alfalfa that remain good two or three years, then begin to die off. Close examination shows indirect signs of potash starvation, a condition that could easily have been remedied by giving consideration to the potash needs of the crop. It is far easier to prevent poor yields due to plant food deficiencies than it is to restore a field of alfalfa to normal conditions. This aspect of alfalfa fertilization has been neglected and farmers would do well to modify their plans for care of this crop.

When a man is a success it is hard to hide the fact. This statement applies to J. L. Mean, a well known alfalfa grower and shipper whose farm is located near Mt. Jackson, Va. Mr. Mean has tested out high potash fertilizers on alfalfa with excellent results. He started his seeding in 1920 using two tons of ground limestone and 400 lbs. of acid phosphate. After the second year he decided the crop needed additional treatment and that year and each year since he has toppressed with 300 lbs. of 0-13-6. above treatment has yielded four cuttings each season on a hundred-acre field. The hay has been of excellent quality which has sold for an average price of \$25 per ton.

One outstanding result of the top-

dressing treatment, as practiced by I. L. Mean, is the extraordinary vigor of the alfalfa plants. The stand is even, plants sturdy, foliage of a deep green healthy color, and there is an entire absence of potash starvation symp-

What Mean has been able to do. surely others can do. Let the corn borer come if it must, but by all means farmers should have a substitute crop ready. Alfalfa offers the solution.

Farmers should take inventory of their fields and plan to seed new alfalfa and fertilize to restore old stands of alfalfa.

Where Insects Winter

(From Page 30)

near the orchard. The codlin-moth winters in a cocoon under loose bark or in the soil near the crown of the

It would undoubtedly be a big task to go out and clean up and destroy all of the insect habitations on a farm, but a little more care from day to day, during the harvesting of the crops, and after, will reduce these places to a minimum. Also it will materially lessen the number of pests the following spring.

November and December present an ideal time in which to forestall the insect damage by a general clean-up Late fall plowing does campaign. much in preventing insect trouble. By this time many of the insects are inactive and cannot defend themselves or reconstruct a winter home that has

been destroyed.

The drastic clean-up measures conducted in the territory of the European corn borer will bear fruit in killing millions of other insect pests. It will be found that many insects that were a problem to the farmer will no longer be a menace. Other districts could do well to start cleaning up in a similar manner.

South African Cotton

(From Page 44)

acres of new and 35-40 acres of old land per day. Work is commenced at daybreak (about 4.30 a.m.) and ceased at dusk (about 6.30 p.m.) with a breeak of 3 hours during the heat of middle-day, and half an hour for breakfast.

Harrowing as outlined above can be done at the rate of 10-12 acres per day with a disc harrow drawn by six oxen, and 15 acres per day with a spike-tooth drag-harrow drawn by a similar span. On sand land spike-tooth harrows only are used as disc harrows leave objectionable centrefurrows which develop into washouts. On heavy lands discs and spike are used.

Planting. Seven to eight acres per day can be relied on from a tworow cotton planter, with rows 42 inches apart, at a cost of 7d per acre (14 cents). Where fertilizer is used it is applied through a fertilizer attachment to the planter. The acreage is reduced, however, to 4-5 acres per day, on account of the time taken in filling up the hoppers, and the cost of the operation is increased to 10d (20 cents) per acre. Seeding is at the rate of 30-35 pounds per acre, this being regarded as rather higher than is usual in South Africa. The cost of this seed is roughly 5/- (\$1.20) per acre or 2d (4 cents) per pound.

Replanting is seldom found necessary if planting is completed within the period laid down above. Where patches are replanted the cost is 7d (14 cents) per acre, plus seed.

Fertilizer. The soil in this locality is rich in nitrogen, humus potash, and lime. On the other hand, phosphates are very deficient. This latter condition is strikingly evidenced by excessive vegetative growth and delayed maturity where phosphates are not supplied. A new railroad is under construction which will bring fertil-

izer and other goods right onto the estate.

Cultivation is given most thorough attention and commences when plants are four inches to five inches high, being repeated every nine days until the plants are too big to admit oxen and cultivators between the rows without damaging them. After rain, as soon as the land permits, cultivators are put into the fields irrespective of the date of last cultivation.

The so-called "Arch" and "Pony" types of cultivators are generally used, five acres per day being expected from each implement. As many as 24 gangs may be put into a field at one time. The cost of the operation is 6d (12 cents) per acre. From six to eight cultivations are given the crop at a total cost of 3/- to 4/- (72-96)

cents) per acre.

Thinning Out is performed as soon as safe, viz: when plants are about six inches high. If left too late plants grow tall and spindly and lower branches do not develop sufficiently The generally recommended practice of thinning out when plants are 12 inches or more high, as practiced in other areas of the union, is not approved of on this estate. Another objection to late thinning is the loosening of the soil by pulling out of roots, which renders the remaining plants insecure and easily blown over. The first thinning (for this is by no means the last thinning) leaves plants 8 to 10 inches apart in the rows. The richer the soil, and the bigger plants are known to grow, the greater the distance between plants after the first thinning out. Where soils are excessively rich in organic matter the first spacing may be as wide as 18 to 20 inches between plants in the row.

It might here be pointed out that in South Africa experiments so far performed have shown that thinly spaced plants grow quicker and produce more and better lint than unthinned plants do. These conclusions have been confirmed on the estate we are examining, and on over half the acreage, where plants grow six feet high and proportionately broad, the spacing between plants is as much as 36 to 40 inches in the rows.

One native can thin out from 2/3 to 3/4 of an acre in a day at a cost of 2/- per acre.

Hand Hoeing to remove weeds in the rows and to complete the thinning out operation should be as soon after the first thinning as possible. One native can hoe 3/4 of an acre in a day at a cost of 2/6 per acre, and seldom more than two such weedings are necessary during a season. Usually during prolonged rains when machine cultivators cannot be used, hand weeding is resorted to.

On the appearance of bolls all field operations are suspended as such may result in damage to plants, though, owing to favorable soil and climatic conditions inducing large growth, further thinnings may be necessary on certain fields, even up to the time of the first ripening of bolls. Dense vegetative growth excludes sunlight from the bolls on the lower fruiting branches, and must be avoided even at the cost of decimating the stand. The improved yield more than balances the loss due to the operation.

American readers will here no doubt contrast this practice of drastic thinning out with the system of closespacing adopted largely and recommended widely in the U.S.A. cotton states. We who are interested in cotton growing in South Africa have followed closely all the American work we could secure reports on, and have carried out similar experiments here, but with very different results. Whilst in many ways conditions in the Union of South Africa are similar to those in the U.S.A., yet many of the practices proved satisfactory in one country are by no means profitable in the other. Nevertheless, American

conditions are more like our own than are those of any other established cotton-growing country, and approved American practice has been accepted as the starting point for most of our work on this crop.

Picking is not quite as definite an operation as are the various cultural processes that precede it. Reaping may be broadly divided, however, into three stages. Lint may appear as early in the year as February, but sufficient will not be visible to justify picking until much later. When about 30 per cent of the crop is ready for picking, the reapers are put into the field to collect the first flush.

The second picking commences when the second flush is at its height, and should occur about May. Third and last picking should be completed by the end of July. Still later pickings may be attempted, but the yield of the fourth collection rarely pays for itself.

The cost of reaping depends largely upon the yield obtained, and reapers are paid at the rate of 1/- (24 cents) for 50 pounds seed cotton picked. Expert native pickers have reaped as much as 200 pounds of seed cotton in a day and averaged 180 pounds daily over a week. This is of course exceptional, the usual average being about 70 pounds. Taking a yield of 450 pounds as a basis, the total cost of picking is 10/- per acre.

Whilst the rate of payment stated above (viz. 1/- for 50 pounds) is strictly adhered to on all sections of the estate under consideration, smaller growers have various difficulties to contend with that make higher rates of payment unavoidable. These difficulties include inefficient contract labor, competition with other small growers during the picking season, efficient independent laborers and gangs of laborers who offer themselves to the highest bidder and demand in addition to their pay, their food and blankets. Under these conditions picking is often found to cost 17/6 per acre



This photograph shows thinned and unthinned cotton. The row in the foreground is thinned to about 18 inches between plants. These plants, however show the effect of late thinning: viz., first 8 inches of stem devoid of fruiting branches. The plants were thinned at 15 inches height or about six weeks age instead of at 6 to 8 inches height and four weeks age. This is on South Africa's largest cotton estate.

for the same yield as that which on large and well run estates does not exceed 10/- to pick; and more than one case has come to the writer's notice of an acre cost amounting to more than 24/- for a yield of 400 pounds of seed cotton per acre or 3/- per 50 pounds picked.

All the above figures for picking include weighing and filling into 450-pound packs in which the crop is forwarded to the ginnery, but they do not include the cost of these packs nor the cost of cutting to the ginnery.

Cutting and Burning Stalks. Immediately after the last picking the cotton plants are cut down, collected into piles, and burned. This practice is, however, not definitely thought to be the best, but until some better way of dealing with the plants is evolved, it will be continued. The idea of burning is agreed to be wasteful of humus but as yet no practical, inex-

pensive means of conserving this valuable constituent of cotton stalks has been discovered. Several machines for cutting up the stalks into small pieces have been experimented with, but so far without success. Even American appliances for chopping cotton stalks have failed to give satisfactory results. The cost of cutting, collecting, and burning is about 4/- per acre.

Ratooning is now never practiced on these or other South African estates. It has been found to be a dangerous and highly unprofitable undertaking.

Immediate reploughing after cutting and burning is not always possible. If labor is plentiful, every endeavor is made to plough lands, on which picking is completed early, immediately after burning so that they may lie fallow for two or three months. On a large area this is frequently impracticable, and ploughing has generally to be delayed until just

before planting.

The Costs of the various operations per acre given above are based upon those of an average section, viz. 1,500 acres. They differ to some extent from section to section according to the ability of the section manager and the efficiency of his labor, and they vary from year to year according to the season.

Approximately 3,000 acres of virgin country are cleared and broken and planted each year, but the heavy initial cost of stumping and breaking is left behind in the first year, so that over a number of years the average cost of the purely agricultural operations listed is in the neighborhood of £2:15:0 (\$13.20) per acre.

Yields are slightly lower on first year fields than is the case in later years. This is explained as due to the high humus content of the soil, which after thorough aeration by cultivations and reploughing commences to decompose and become available.

To the total given above must be added other costs such as of seed cotton packs, transport charges, ginning, delinting, selling, and certain overheads unavoidable on a big estate of this nature. The all-in cost of production per acre (on a basis of 450 pounds of seed cotton per acre) is officially stated by the company to be under £3:10:6 (\$16.92) taken as an average over the whole area.

On these bases, and presuming the value of lint to be 19 cents (9½d) and the seed to be sold as good commercial seed at £4:10:0 per ton (\$21.60), the balance sheet shows up as follows:

450 pounds seed cotton—

150 pounds lint @ 9½ £5:18:9

300 pounds seed @

£4:10:0 0:13:6 £6:12:3

1 acre ploughed, planted,
and prepared for sale ... 3:10:6

Net profit per acre 3: 1.9

Net profit per acre 3: 1.9 Equivalent to U. S. Currency \$14.81

Indiana

(From Page 19)

For 18 years winter cattle feeding experiments have been under way at Purdue, until today the cattlemen and educators rather accept this work as standard in this field. The corn, clover hay, corn silage, and cottonseed meal ration has become more or less standard not only in Indiana feed lots but also throughout the corn belt. More recently, however, experimental work with steers, fed 10 to a lot, has shown the value of soybeans in the ration, taking the place of the cottonseed meal and giving the corn belt farmer another home-grown feed. Each year several hundred feeders from all sections of Indiana gather at the university to attend the annual cattle feeding day program and get the latest experimental results.

For many years hog cholera swept Indiana farms and made the business of producing pork a rather precarious one. Finally, through the results of research, led by Dr. R. A. Craig of the veterinary department, the making of serum and virus and the dosage per pig were standardized to such an extent that where vaccination is followed consistently cholera is practically unknown. This one piece of work has been worth millions of dollars to the farmers of the country at large.

Approximately 75,000 acres of tomatoes are grown in Indiana each year for canning purposes, giving the state first rank as a producer of this crop. The average yield has been between four and five tons per acre. Working in cooperation with the Indiana Canners' Association, the experimental staff has developed an improved variety of the Baltimore tomato which will average about 10 tons to the acre under general farm conditions. Under most favorable circumstances and with the best care possible, it has yielded as high as 29 tons to the acre. The Indiana canners, realizing the importance of this work, have defrayed the expenses and through proper selection during 1927 distributed more than 10,000 pounds of seed to growers over the state. As a result, the yield per acre is going upward rapidly.

In the Same Field

Continuing in this same field, other research men are working with the canners' organizations to study factors affecting the quality of the tomatoes and tomato products handled in Indiana. This illustration, the growers being given help in production of their crop and then the canners in successful marketing, shows how a project in one field is carried to completion.

The same story might be told of the apple and peach growing industry which is thriving in southern Indiana.

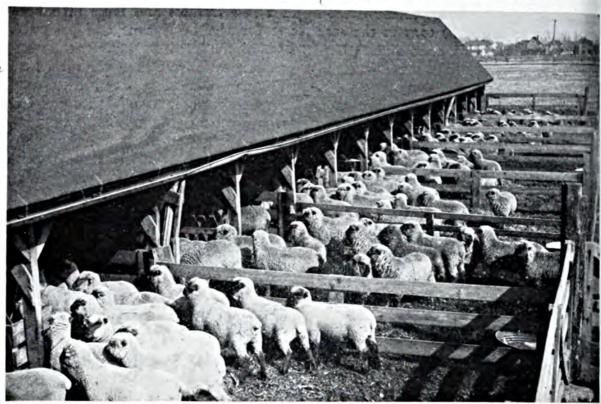
"We thought we knew how to handle our orchards and market our fruit until the Purdue men came down and showed us how not only to get better fruit but also how to pack it and ship it to best advantage," said R. A. Simpson, one of the most prominent growers. This comment related to extension work, but the extension men were carrying out the knowledge developed by the Experiment Station on the experimental orchards and farms near the commercial fruit center. When the Experiment Station received as a gift a wornout, run-down farm of 457 near Bedford, and transformed it within a few years from a place yielding about \$600 worth of fruit a year to crops worth as high as \$12,000 annually, the fruit growers took notice.

Each year, when the summer field day is held at this farm, from 1,200 to 2,500 farmers and fruit men turn out for the farm tour and program. Besides the fruit experiments, hundreds of tests have been conducted on the farm with fertilizers, field crop varieties, and livestock feeding and management. Since the soil type found there prevails over a number of counties in that section of the state, the information obtained is applicable to perhaps 20,000 farms.

Southeastern Indiana has several counties which have a white slash clay land. Jennings county farmers were so interested in results obtained on one small experiment field that they requested the county to purchase a larger tract for more extended work. Over a period of years, the areas not given any soil treatment have averaged 18 bushels of corn to the acre. The areas properly fertilized, limed, and manured after being drained have averaged 77 bushels to the acre. The one-day picnic meeting on this field, known as the Jennings County Experimental field, attracted 7,000 persons in August, 1927.

In Kankakee

In the Kankakee region of northwestern Indiana, which at one time was the duck hunters' paradise because of the broad expanse of undrained marsh, a large area has been transformed into fertile farms, the equal of any in the state. Following draining of this area, the Experiment Station leased a 67-acre field to conduct experiments with crops. Corn, which is the principal crop in Indiana, would grow a few feet tall, turn yellow, and produce only small nubbins. Experimental work vealed that limestone and potash were the limiting factors in the growth of the corn. When these were applied, after suitable drainage, the fields produced, and the old Kankakee marsh section today boasts of many 100bushel corn yields. Land values changed almost overnight when the experiments became common knowledge, and parts of a dozen northwest-



These lambs are in experimental feeding pens.

ern Indiana counties are using the data gained on this field.

A banker, the late William E. Pinney of Valparaiso, observed the results of the experiments on the field which was near his farm. So well pleased was he and so much did he appreciate the importance of the work to that part of the state that he gave to the Experiment Station a farm of 400 acres. On this farm is carried on more experimental work. It also serves as a demonstration center for that corner of the state.

Soft winter wheat has been grown in Indiana for years. Many millers blend with it hard wheats to make the flour the market demands. In meeting the problem of growing a hard wheat, one of the crosses developed in the plant breeding work of the Experiment Station has remained hard, and now farmers in many communities of the state are getting a premium for producing this hard wheat named Michikoff. It is a result of crossing Michigan Amber and Malakoff, a Russian variety. The wheat has retained its hardness and also hardiness, making it an excellent variety for the northern half of the state. Another

cross from the same wheats has been named Purkoff, and this variety thus far has proven superior to any other being grown in the state.

The average rainfall in Indiana is about 37 inches, ample for most crops produced in the Middle West, and oc-casionally "too ample" for the hay crop at cutting time. Alfalfa growers sometimes have had difficulty in curing their crops. Prof. W. C. Aitkenhead of the agricultural engineering staff, in 1926, developed a stack drier which uses oil as a fuel. drier will cure in a few hours a stack of hay which ordinarily would require several days of sunshine. drier is being tested on Indiana farms. This same department is doing some interesting experimental work in using wind to turn an airplane propeller and generate electric current for farm lighting and power.

Rural Electrification

Rural electrification generally is another important project of the Experiment Station. In various parts of the state, rural service lines have been built the last few years and the farmers along the lines cooperate with the Iniversity in studying the costs and racticability of various pieces of quipment. On the findings of these xperiments will be based the extent of the farm electrification project.

One of the more recent discoveries of the Experiment Station and perlaps as far-reaching in importance as iny is that of Dr. G. N. Hoffer of the botany staff who has devised a simple corn stalk test to determine the fertilizer needs of the field. Twenty-one experiment stations over the country are cooperating with Dr. Hoffer and the U. S. Department of Agriculture in extending this work. This discovery, while of a distinctly scientific nature, has a wonderful practical value because it can tell any farmer in a few minutes what his soils need in the way of plant food.

In the last few years the present director of the Station and extension work, Dr. G. I. Christie, has rendered a great service to research work through his activities in behalf of the Purnell measure, providing for funds for research in the previously almost unexplored field of marketing.

As chairman of the executive committee of the International Corn Borer Committee, Dr. Christie with Dean Curtiss of Iowa is in Europe as this story is written, arranging for cooperative research work with European institutions as part of the fight against the borer.

Seventeen States

The Purdue Experiment Station serves as headquarters for 17 different states which are carrying on cereal leaf rust investigations. Dr. E. B. Mains, leader of this project, maintains his headquarters at Lafayette, where many phases of this subject are being studied.

Scores of other incidents such as those mentioned might be given, for valuable contributions have come from each department of the Experiment Station. The feeds and fertilizer inspection laws and also the law of the creamery license division, all ad-

ministered by the Experiment Station, are worth more than passing note because they have served as models for similar acts in many states.

In 1926 the Department of Agricultural Statistics, formerly the crop reporting service of the Department of Agriculture, was moved to the Experiment Station. This change has been of distinct value to the service and also to the Experiment Station, because of the closer contacts maintained in all crop and livestock forecasts and reports.

This little resume of some of the more important things done and being done by the Indiana Experiment Station gives a birds-eye view of the institution.

"The big thing that impresses me about your staff is that they are up and coming and proud of what they have done and are doing for the agriculture of the state," commented one prominent educator recently after a visit to the Experiment Station and the university.

The staff members believe in their jobs and what they are doing as something distinctly worth while in the life of the state and nation. With such a feeling, the good results are bound to continue.

Storing Apples

(From Page 21)

cylinder engine.

This cave has been in use for the past three seasons and has given very satisfactory results as a common storage. It has the three principal qualifications of a common storage house, namely, the ability to secure and hold a low temperature, adequate ventilation, and sufficient humidity to prevent the wilting of the fruit.

The summer temperature of this cave when closed remains constantly below 45 degrees regardless of outside temperature. In the early fall months when it is difficult to obtain

a temperature of below 60 degrees in a common ventilated storage house, this is an important item. Even when several thousand bushels of warm fruit are brought in from the orchard the temperature is raised only a few degrees.

By actual comparison the temperature in this storage in late September, 1925, was equal to one common storage using ice to reduce the temperature, 8 degrees lower than another storage also using ice, and 15 degrees lower than a common storage without ice, all these storage houses being in the same vicinity. As the weather becomes colder, the temperature can be controlled by the amount of air permitted to enter the cave, and in severe weather freezing is prevented by closing the doorway constructed across the natural mouth of the cave.

Due to the lay of the land, the natural path of the cold air from the surrounding territory is toward the mouth of the cave, and as the warm air is being forced out, cool air continually finds its way into the cave and about the packages of stored fruit.

The natural seepage of water into the cave provides good humidity, especially before freezing takes place outside, and at all times the humid conditions are very satisfactory and the fruit is protected from shrivelling.

Last summer trial lots of Yellow Transparent and Duchecss apples were placed in the cave to determine the possibility of prolonging the marketing season of summer apples. The Transparents were stored the latter part of July and the Duchess the first week in August. The Transparent apples remained in good condition for a month, and the Duchess were still in good condition on September 15 when the Jonathan storage began.

A ventilated storage container has been found to be much more satisfactory than a tight container such as a headed barrel.

This is especially true in the case of Grimes, Rome, and Stayman as these varieties scald badly when stored in a tight package.

Beer cases from an extinct brewery are being used this season as a storage container along with the bushel basket and an unlidded bushel box. The beer cases have a lid that hooks shut and are of two sizes, holding one and one and one-half bushels respectively. The hand holes furnish a small amount of ventilation.

Cause and Control of Corn Root Rot

(From Page 8)

The potash applications gave practically no increases in yields just as was predicted by the stalk tests.

Another similar case occurred in Fayette county. Stalk tests in this county indicated that potash is not a limiting factor and the fertilizer test made by Walter Scholl proved this to be true. Where he applied potash the corn produced just one pound more corn than where he did not use fertilizer. Potash did no good just as the stalk tests would indicate.

These various fertilizer tests prove the value of potash and phosphate in the control of root rot of corn. They do more than that, they also show that the indications of the stalk tests are valuable guides to the fertilizers needed by the corn in the control of root rot.

Another Factor

There is another factor in fertilizer recommendations on corn that must be considered. Let us suppose that a soil is lacking in phosphate and the plants are stunted. These small plants show no signs of nitrogen starvation nor of potash deficiency. The indications would be that phosphate alone would remedy the trouble. But, when phosphate is applied and the corn makes an increased growth, there are more tissues developed all of which are demanding more potash and nitrogen. It is quite possible under these conditions that the corn plants will not develop properly, and the natural reaction would be: "This test is of no value. I applied the fertilizer needed and the corn does not yield much better." The answer to this is that when the phosphate was supplied, and the plants grew larger, the limited quantities of nitrates or potash in the soil were not sufficient to supply the increased growth of corn.

This is exactly what happened to Rauth Brothers in Warrick county, Indiana. Their corn was stunted and the stalk test showed iron accumula-Following the recommendations they applied 2-12-2 fertilizer, and as a result the plants produced

normal size stalks, but the corn was still chaffy and the yield was only about 35 bushels per acre. The next year they applied manure plus 160 pounds of 0-10-10 in one case and the same amount of 2-12-6 in another. With these fertilizer applications the yield jumped to about 70 bushels per acre of well matured corn.

What had happened? When 12 units of phosphate were applied the increased growth of corn increased the demand for potash and the 2 units supplied were not sufficient. However, under the same conditions, 6 units or 10 units of potash did supply the required amount, and as a result the corn stalks developed normally and the ears were filled and matured.

In other words when making fertilizer recommendations be guided by the soil reaction, the size and nature of the corn plants, as well as by the indications in the plants of the fertilizer deficiencies.

Growing Rice in Arkansas

(From Page 24)

it will be more and some years less. If \$1.50 per bushel is received by the growers, counting in all grades, this is considered a reasonably satisfactory price.

Many Arkansas rice farms are operated by renters, the land without water being rented at \$5 per acre. Where a pumping plant is already installed and kept in working order, the renter pays \$10 per acre, but does

his own pumping.

A well must supply seven gallons of water per minute for each acre of rice, with the flow continuing 24 hours each day and from the time it is first applied to the field until harvest time. When the weather is very dry or the rainfall is light, 9 to 12 gallons should be flowing from the well each minute for each acre of rice.

It takes approximately 32 inches of water to make a rice crop. This must come from rain or from irrigation water during the growing period. is in addition to the water that may be in the soil and used by the plants.

Most of the water applied for irrigation is given over a 90-day period, that is, during June, July, and August. Usually 16 to 20 inches of water are applied as irrigation, the balance coming from rain.

On a hot day from one-tenth to one-fourth inch of water is evaporated from the water surface in the rice field. This, of course, is completely lost and is not counted in the amount of water used by the rice. The pumps run night and day for the 90-day period to keep the water supply as nearly constant as possible.

Pork Stands the Test

(From Page 15)

has been to show that the proteins of meat not only have as high nutritive value when fed in a mixed diet as when fed alone but that they increase the power of the cereal protein. Here is where the ham sandwich gets its credit. The ham increases the value of the proteins in the bread.

After his many experiments and the study of results of the work of others, Mr. Hoagland has concluded that from a scientific standpoint pork is deserving of the high place it has taken in the American diet. He stresses its importance as a source of fat and energy. He says it contains a fair amount of protein of excellent quality with liberal quantities of vitamin B.

Ordinarily, he says, pork is highly valuable for persons doing heavy work, and the leaner parts such as ham, tenderloin and chops, are just as good for sedentary workers as other meats.

The Comeback of the Cut-over

(From Page 12)

natural fertility.

Thus with the aid of a bit of pioneering a country with naturally poor soils has made its lands fertile and by doing so has developed a working basis for a healthy, profitable system of farming. A South Mississippi farmer, who, with the aid of the correct fertilizer and the right methods of culture and boll-weevil control, can produce a bale of cotton to the acre, is little worried over the fact that the timber is gone from his farm and there are no more jobs to be had at the saw-mills.

The working knowledge of fertilizer gained through analysis tests with the principal field crops has aided in the work with other crops. Besides testing the varieties of cotton, corn, vegetables, fruits, and forage crops, in search of the hardiest, best-yielding strains and their plant food requirements, the Station encouraged the practice of commercial truck growing and introduced various horticultural crops.

The first organized work on satsuma oranges in South Mississippi was done when the Station proved that they could be grown successfully when grafted on trifoliata stocks. This practice has caused a general movement northward of the satsuma industry because these stocks are sturdy and survive severe temperature

A stranger, visiting the section today, is likely to be shown hundreds of acres of peaches, pecans, and satsumas next door to typical southern cotton farms. He may have pointed out to him a peach tree that produced at three years' growth four bushels of peaches which sold for \$2.50 per bushel, or a satsuma that produced 2,000 oranges which sold for \$40, or any number of other outstanding accomplishments.

Wide Diversity of Crops

The diversity of crop possibilities in the section is amazing. It appears that grapes have great commercial possibilities and experiments are being conducted to determine this. Strawberries have been continually recommended and their production as a commercial crop is expanding.

A few of the many crops the Station is testing as possibilities for the section are: bright tobacco, alfalfa, blueberries, plums, apples, apricots, almonds, Japanese persimmons, pineapple pears, figs, grapefruit, briar ber-

ries, raspberries, dewberries, and cherries.

Believing that South Mississippi offered an attractive field for the trucker, having soil and climate almost ideal and railroad facilities to the best markets, the Station started experimenting in truck crops in its early days. As a result several communities are now specializing in the production of such crops as

snap beans, squash, carrots, and tomatoes.

The commercial production of sweet potatoes has been introduced with great success. Winter cabbage is one of the most profitable crops that has been tried, and asparagus proved thoroughly adaptable to the section.

The coastal plain soil is excellent for syrup production, and a bulletin on sugar cane had to be run to several editions. Velvet bean experiments have been under way since the establishment of the Station. Practically every farmer who grows corn in South Mississippi grows velvet beans



Grapes grown on the Station farm.

as a companion crop depending on them to winter cattle as well as furnish considerable nitrogen for succeeding crops.

Lespedeza has attracted interest as a hay and grazing crop and a soil build-The first field of lespedeza grown in the section was a curiosity and very few farmers knew what the plant was. Today thousands of acres are in this legume.

Thus the coastal plain section of Mississippi is being developed as a profitable farming country. Whether or not it is "The New California" I will not attempt to say. However, the sun shines on it with much the same warmth and brightness with which it bathes the western state, and standing on a breeze-swept hill looking down at the soldierly array of a satsuma grove or a great peach orchard, and back across the miles of undeveloped land, one feels the rich promise of a new frontier. With this comes also a deep appreciation of the agricultural pioneers who are working so diligently to give it birth.

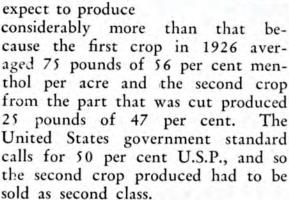
Mint

(From Page 26)

land soils if you irrigate it, but muck lands produce higher yields. Sub-irrigation is desirable in midsummer. It costs from \$50 to \$70 an acre to get a planting started and this planting will last three or four years on muck land before it has to be renewed."

What is probably the most extensive as well as interesting mint planting in Oregon is that of E. A. and J. O. Hayes at Lake Labish near Silverton. Manning Hayes, a graduate of the University of California, is operating this large holding for his father and uncle. About 700 acres

of mint will be harvested on this plantation in 1927. They have contracted for 20,000 pounds of oil a year for the next three years at \$5.00 a pound. However, they



Not many years ago Lake Labish was nothing but a swamp overgrown with brush, weeds, timber, and slash-For countless decades it had been the home of beavers for geologists say that the lake itself was made by these industrious animals. is why the soil is called "Beaver Dam"

The Hayes brothers saw the possibility of developing the project, and so they cleared the timber, drained the land, and brought it into a cultivated state. Until they started their mint production, onions, potatoes and other truck crops were grown. They made a specialty of growing onion Some years as many as 85 per cent of the onion sets grown on the west coast were produced on this farm.

Liberal amounts of muriate of potash were used in producing these onions because they found the peaty soil to be low in this plant food. Potash fertilizers will also be used on the mint crop although they were not applied in 1926, because of the residual supply left from the onions.

Manning Hayes says they will continue to grow a few onions, but it will be on a smaller scale if the mint proves to be as profitable in the future



Cutting Mint Hay.

as it is now. Last year he estimated that it cost about \$2.00 to produce a pound of oil on this high priced land even with the large scale production and its accompanying advantages from

the labor-saving standpoint.

Thorough Preparation

Before planting, the soil was thoroughly prepared and marked off into rows 30 inches apart. The roots were put into the ground in March by laying them lengthwise in these furrows and partly covering them with a quick turn of the foot. They were buried to a depth of about six inches with a two-way cultivator. A spike tooth harrow was made by fastening together three two-by-fours and driving 60-penny spikes through each of them at a distance of three inches apart. The mint was then harrowed four or five times with this implement until the plants were several inches high, after which they were cultivated once a week as long as the teams and cultivators could get through.

Hand weeding began the first of June and continued until cutting started the first of August. weed, dog fennel, and dock must be kept out as these weeds discolor the oil and give it an undesirable foreign

Some growers cut their mint by hand, but Hayes thinks the cost of hand cutting is prohibitive. mint is cut with mowers equipped with short sickle bars. They are pulled with tractors that keep moving right along. If the crop is heavy, Hayes rebuilds the divider, making it longer and higher, and sends two men with wooden rakes to rake the mint out of the way of the next round of the mower. If the crop is light or medium, a clover buncher cut down to the length of the sickle bar, will

work, and this requires only one man to follow to cast it out of the way. This is done because the oil cells break very easily, and every time a horse steps on the hay or a wheel passes over it, some oil is lost.

The mint hay is then cured and handled in much the same way as clover hay except that it is hauled to stills instead of to haymows. The still consists of a furnace and boiler for producing steam, mint tubs or vats, perfectly fitting covers, condensing worm, and receiving separator can.

Some growers have grapple power forks to unload the hay from the wagon to the vats, while others do this by hand. The vats run in pairs so that one can be filled while the other is being steamed out. One man tramps the hay after each forkful is put in. The vat is filled level with the top, after which the cover is placed on the water seal. The steam is turned into the bottom of the tub, and the cooling water turned on the condensing worm.

One Crop a Year

The distilling time varies from thirty minutes to three hours or more, depending on the condition of the hay and the moisture in the atmosphere. A smelling cock in the cover is opened from time to time to determine when all the oil has been extracted. The oil is run into gallon bottles in which it can be held for a long time without deterioration if it is stored properly. When oil prices are very high, these bottles are sometimes put in bank vaults for safe keeping.

There seems to be a tendency to cut only one crop a year in order to improve the quality and lessen danger of winter-killing. If mint is cut too green, both the yield and quality are poor. The menthol content is low in green oil and the odor is not so good. The plants should be in two-thirds to three-fourths bloom. The one or two early blooms should be disregarded, and the blooms on the

branches taken into consideration. Much of the desirable odor and flavor come from the flowers so one can afford to allow a few of the leaves near the ground to drop off if necessary in order to get the desired amount of blossoms.

Apparently no thorough fertilizer trials have been made on mint in the western states. Agricultural Agent E. W. Cooney of Douglas county, Oregon, started a series of trials on upland plantings this year.

L. O. Herrold, a large grower at

Salem, Oregon, says:

"The nature of the ground determines the kind and amount of fertilizer one should use. There is nothing better than barnyard manure applied in the fall and disked in, even though one may increase his weed troubles by using it. Lime is good on land that is long wet in the spring. On our muck lands, we use commercial 4-2-16 fertilizer at the rate of 125 pounds to 200 pounds per acre. Even though our muck lands are well supplied with organic material, they require a little readily available nitrogen to start the plants. On our river bottom and upland soils, we apply 200 to 250 pounds per acre of 4-4-16. If the land is run down, a 6-4-16 mix-The fertilizer is applied ture is used. evenly over the ground as early as possible after plowing in the spring."

Dr. J. E. Maxwell has an extensive acreage of mint on muck soils near Decatur, Michigan. He applies 300 pounds of 2-8-25 fertilizer to the acre and has found this to be a profit-

able practice.

A Profitable Undertaking

The profitable use of a fertilizer with a high potash content bears out the results of experimental work which shows the outstanding need of peat and muck soils to be potash. These soils are well supplied with nitrogen, and when first reclaimed ordinarily have enough phosphoric acid for satisfactory crop growth. After a few years' cropping, however, it may be necessary to supply both

phosphoric acid and potash.

Walter Van Fleet of the United States Department of Agriculture made an extensive study of the mint situation in Michigan and Indiana a few years ago, and his fertilizer recommendations are being accepted by western growers. He discusses their use as follows:

"Notwithstanding the high nitrogen content of the swamp soils on which mints are generally grown and the favorable texture of these soils for root penetration, there is often evidence of lack of quickly available plant food during rapid growth. Nitrate of soda, 50 to 150 pounds to the acre, well distributed and cultivated in before the tops have made too much growth, has been found profitable by progressive growers. Potash in the form of muriate or sulfate, from 150 to 300 pounds to the acre, has been widely used, with generally favorable results, to stimulate growth and darken the foliage. It appears particularly useful for a form of chlorosis apparently favored by too much water in the soil. Ground bone, acid phosphate, and lime have been tried in varying quantities by a few planters, but without marked benefit. The return of the steamed mint hay to the soil and the plowing under of the aftermath are most widely recognized as beneficial. Stable manure as a direct application is little favored, as it is often followed by watery growth and low oil content, while the resultant weeds are likely to become an intolerable nuisance. The indirect results of stable manure, when applied to preceding well-cultivated crops are, however, of inestimable value."

The future of the mint industry is hard to predict. The prices for mint have varied from 75 cents to \$25.00 a pound in the last 40 years, but the average price over this period has been about \$2.75 a pound. Conservative advisers, therefore, are suggesting that farmers use caution in planting much land to this crop unless they can produce oil at a lower cost than that. The large acreages that have been planted these past two years cannot help but bring the price down from its present high level even though there has been an increasing mint oil demand for candy, gum, medicinal and other uses.

Mint still manufacturing companies are advocating further plantings, but they have an axe to grind.

Mr. Herrold says:

"The outlook for the mint growers is a hard question. It is my opinion that where the ground is suitable and the growers are properly advised so that production costs are kept down, mint growing in the northwest will be a profitable undertaking. Only the financially strong should depend on mint alone. It should be grown in rotation with other crops because this offers other chances for income if mint prices get below cost of production."

Why Credit Stays High

(From Page 14)

dear to the American farmer while cheap to the shaky European state or the South American concession hunter. This banker, by the way, is not one of your gougers. He doesn't pile up charges by means of commissions and minimum balance requirements; nor does he collect interest in advance. But conditions oblige him to function on a purely local basis.

That is why his customers are continually inviting him to explain why his interest rates are high when money is going begging in New York at 4 per cent.

"It is like this," he said. "My bank is small, and that means that I have a high overhead cost per unit of business. Deposits are my chief source of loanable funds. In order to get deposits I have to compete with other pankers in our locality, and that means must pay high interest rates. Naturally, after having borrowed money it a high rate, it is impossible for me to loan it at a low rate. But that is not all. My loans are concentrated in a limited area, and the risk on them is greater than it would be were the loans petter distributed and diversified. High-cost money and high-risk loans are not favorable to low interest rates.

"Why don't I join the Federal reserve system, or get cheap money at the intermediate credit banks? I will tell you frankly. Membership in the Federal reserve system would impose too many restrictions on me, in view of the character and small size of my business. As for rediscounting at the intermediate credit bank, you know the deterrent there. The intermediate credit bank does not allow much of a spread between the interest rate it charges and the rate the banker may

charge his customer. It is limited, except in the case of livestock loans, to 1½ per cent. That, candidly, is not a sufficient inducement for the small banker to rediscount, although it may be for the big banker."

Imagine that situation existing in hundreds of agricultural communities, and you can see how local shortages of loanable funds can develop even when the country as a whole is oversupplied with capital. Most country bankers, of course, have city correspondent banks from whom they can obtain funds when need arises; but they don't care much about borrowing from their city correspondent because the rate is usually higher than the Federal Reserve discount rate and so the country banker makes nothing, or very little, out of the transaction. Credit is often high for the farmer largely because he is not put in touch with the national sources of credit supply.

Now it is obvious that in communities where most people want to borrow and few want to lend, the local supply of credit cannot be adequate. That is so plain indeed that much legislation has been passed to correct it, the most recent enactment being the Intermediate Credits Act of 1923 which is expressly intended to open pools of investment credit to agricultural uses. As yet, however, the intermediate credit banks have had in most areas only a limited call on their resources. So the farmer still gets off at a sign saying "No relief from high interest rates."

This article is not intended in any way to reflect on banks or bankers. Widespread economic evils are always traceable to general economic causes,

> rather than to individual responsibility. In the case of high agricultural interest rates, one obvious general cause is the fact that, as yet, our banking system is too much decentralized, notwithstanding the far-flung operations of the Federal reserve system and the Federal farm loan system and the intermediate credit banks. It is for the expert to point to the remedy. But whatever its precise form, it will certainly have to provide means for enabling the farmer to tap sources of credit where money is abundant and cheap. The present system, to a large extent, restricts him for short-time loans to the resources that country bankers can accumulate locally from deposits.



Neighbors

(From Page 4)

Of course I get the same degree of satisfaction that a man does who lays aside five hundred bones for his funeral expenses. When he has passed from disease into decease he has the assurance that the most polite and circumspect undertaker in town will supervise the obsequies.

The worst of it is that this loveyour-neighbor-second-hand business is creeping out into the country districts—that last staunch stronghold of the busybodies, the sick-watchers, the basket-bringers and the party-line eavesdroppers.

When it reaches the zenith of its bureaucratic dominance in "the sticks," we may see them skimming off the cream of human kindness in a centralizer run by a corporate dynamo. I think they may then have some just reason to kick about the test! If we could contrive to confine this bursting social fever to the cities the farmer would be saved—once more, halleluiah!

I T is a curious fact that the gregarious instinct of mankind settled America, on the one hand, while the hermit and the individualist did most of the prospecting and discovering.

The Pilgrims and the Puritans, the French Huguenots, the German refugees, and the Scotch-Irish covenanters possessed America by the call of neighbor to neighbor overseas, and by the common need for close habitations in the wilderness.

Then as the western urge to go over the Blue Ridge and beyond to the Ohio and the prairies came, we see an advance guard of hermits and lonely scouts making their camp fires glow in unknown lands.

It is related of Daniel Boone that he thought it wise to move onward as soon as he could hear the sound of his neighbor's ax or the crack of his neighbor's rifle.

Perhaps he feared that the borrowing fever might come and he would lose some powder or venison, or else somebody would lay a matrimonial snare for his restless moccasins.

Anyhow, Boone and his kindred were not noted as chummy, yet they made the way easier for the man who wanted to move in with an ox team, a feather bed, one wife, a breaking plow, and eighteen children.

On the contrary, some of those old scouts were over-neighborly and not any too discriminating or finicky in their choice of companions as we size it up these days.

For instance, I worked for several weeks on a Sioux reservation beside a benevolent old codger of poetic taste and gracious mien. He took a strange liking for me as a raw tenderfoot, and asked me over to his home to dine.

I went over all dolled up for a social evening, and was offered dog soup and burned potatoes a la carte served by his Oglalla squaw who chewed spear-head (not mint) and wore a deerskin chemise.

Since that night I have fully appreciated what it cost to civilize America. The odor of cabbages and fried onions in my apartment hall no longer spoils my day's routine.

Yes, we owe the noble red brother a debt of gratitude. He scared people into being neighborly in more ways than one.

S one of my trades is poesy, I observe after a period of brain bruising that the only words to rhyme with neighbor are sabre and labor. This is significant. It means that you can either fight with him or work with him. Personally, and in a local sense, I have done both alternately

nd have succeeded in getting better equainted both ways without formal attervention by a third party.

If I can do this, so can nations! But they will find it easier and cheaper o work with their foreign neighbors han to use the broad sword.

This summer a train load of people epresenting eighteen nations toured Canada on a trip lasting four weeks. English, Spanish, German, Italian, and Yankee families were occupying the ame sleeping cars, eating meals together, and dancing and attending ervices in the dining car.

I observed that the common denominator among them was the showng of kodak pictures of their children, their homes and gardens, and their places of employment. They were brought together in the first place by a desire to study and improve a branch of agriculture.

"We're a jolly lot and have had a cipping time," declared the editor of a paper published on Arundel street in the Strand, grasping the hand of Herr Schneider of Bingen as we all parted at Niagara Falls.

"If all the bloomin' diplomats in Europe could tyke a tour like we have and forget the red tape," said he, "we wouldn't need any more armies over theah!"

So, with an Egyptian on one end of the line and an Irish squire dancing on the other end, the gang joined hands around the table and sang "Auld Lang Syne."

Hence I do not find it so strange that I came home from that excursion feeling as neighborly and chummy with John Brown of Appleby, Scunthorpe, Lincolnshire, as I do with Frank Smith of Columbia Heights, who empties ashes on the same pile with me from October to May.

If the belligerent nations that crouch like measly tom-cats all through the long night of mistrust would stay awake and come into the sunshine of human contact, I say for one, that this old world would get a teal League of Nations. It would be

built on neighborly understanding and stay put.

Paradoxical, perhaps, is the fact that there are many more neighbors than there used to be, and yet we hear so many folks say, "We haven't any neighbors."

Strange and perplexing likewise is the aloofness common to cultured communities and the genuine shirtsleeve camaraderie found on the rickety front steps of tenement houses.

Book lovers and students cling to their winter cloisters and pull the evening shades to secure their concentration. Wrapped in their favorite authors and critics, they forget that the delightful Comedie Humaine they devour on the printed page was lived by contact on the writer's part. He knew his neighbors.

Repartee and original observations worthy of the name come hard to most of us in this period of selfish isolation. We lack the nimble fireside fluency of our fathers, whose chief inspiration to thought came direct and freshly vivid from mingling with contemporaries.

Contrast Abe Lincoln, Henry Clay, and John Calhoun with some of our machine-made minds who get their impressions from the press rather than from the people.

We must not forget that we have something to give as well as to gain by cultivating the acquaintance of good neighbors. We'll all admit that, surely.

If you think you haven't good neighbors worth bothering about, don't blame the real estate man who sold you the property. Pitch in and reform 'em; and if that fails, move!

But beware! Wherever you go you are going to be somebody's neighbor. Be careful—he might like you!

And when we reach the "last analysis" we shall find corner lots and neighbors in the cemetery.

Of course, if you are a real hidebound bitter-ender on this question you can be cremated or arrange a burial at sea!

"AMEN!"

Says H. J. PLUMB

County Agent, Stevens County, Washington

POR PEAT'S SAKE USE POTASH, said G. E. Langdon of the Wisconsin College of Agriculture in the November, 1926, issue of BETTER CROPS. "Amen," say we, basing our rejoinder on several years' experience with the peat soils of the Colville valley, Stevens county, Washington.

The accompanying illustration shows clearly the results obtained last year on the Peter Selleg farm in this county. A commercial fertilizer analyzing 32 per cent phosphoric acid and 21 per cent potash was used at the rate of 150 pounds per acre. It is remarkable that this comparatively light application shows the results that it does, which to our minds amply proves the advantage of using it, especially on the peat soils of the Colville valley.

The fertilizer not only effected the yields—making a difference of from a third to a half in the grain yield of oats—but noticeably stiffened the



Peter Selleg's oat crop.

straw, thus preventing lodging and greatly facilitating effective harvesting.

There was almost an equal effect on the legume and hay crop following which in this case is clover, timothy, or alfalfa—depending on whether the peat is well enough drained to permit the growing of the latter.

Good results are still observed in the third year removed from the applications of fertilizer.

Limestone Losses

Why is it that 75 per cent of Illinois land that fifteen to twenty years ago would grow good crops of clover without any special treatment now requires a dressing of limestone? reason, says an agronomist of the University of Illinois, is that crops make great draughts on the limestone supply and drainage water carrys much of it off. This investigator says four years of average crops of the kind commonly grown in the State take away the equivalent of 208 pounds of limestone. It was shown that a 50bushel crop of corn in one season takes out 271/2 pounds of limestone from an acre: a 50-bushel crop of oats takes

21 pounds: 25 bushels of wheat takes 14 pounds: and 2 tons of clover hav 146 pounds. On the famous Morrow plots at the University the effects of years of cropping have been shown in a striking manner. One plot has been supporting a rotation of corn, oats and clover for 50 years, all the crops being taken off and no limestone or fertilizer added. Last year red clover was seeded on this plot and, in spite of favorable conditions of weather, there was only a very poor stand of unthrifty plants. The adjoining plot on which limestone losses had been made up by applications had a good crop of clover this year.



ADVERTISING

A Jewish moneylender had been elected a member of an exclusive country golf club. The master caddy had asked him if he desired to have his name imprinted on his golf balls.

"And you vould put my name on

a dozen balls at that price?"

"Yes," was the response.

"And vould you put on them my address, too?"

"Yes."

"For de same price?"

"Yes."

"Vell, den, for the same price would you mind putting on them too—Office hours, 9 to 5?"—Exchange.

Mr. Billerton, the butcher, was a jovial soul. As he was cutting up an order of lamb chops for a lady customer she asked curiously: "Mr. Billerton, what led you to choose your present occupation?"

"Well, really, I don't know, ma'am," explained Mr. Billerton. "Maybe it was because I have always been fond of animals."—Exchange.

"I don't suppose you keep anything so civilized as dog biscuits in this onehorse, rundown, jay town, do you?" the tourist snarled.

"Oh, yes, stranger," the village merchant responded pleasantly. "Quite a few folks like you come through from the city, and we aim to have everything called for. Have 'em in a bag or eat 'em here?"

No man's a model husband when he's hungry.

AN UNWILLING PUPIL

"What is all that racket about out there in your barn?" asked a neighbor.

"Ma's trying to set a hen," replied a small boy who was swinging on the gate, "and you know pa's county agent and he's tryin' to tell her how."—
J. M. R.—Exchange.

Magistrate—"Why did you conclude that the defendant was drunk?"

Constable—"He was engaged in a heated argument with a bus driver."

Magistrate—"But that does not prove anything."

Constable—"Well, sir, there was no bus driver there."

"A toast, fellers!" exclaimed the hobo, lifting his tomato can. "Here's to de holidays! Bless de hull t'ree hundred an' sixty-five of 'em!"—Exchange.

"Do you and your wife ever think the same?"

"When I'm late at the club we do. She keeps thinking what she'll say when I get home and so do I."—Exchange.

"Did that patent medicine you bought cure your aunt?"

"Mercy, no! On reading the circular that was wrapped around the bottle she got two more diseases."

Brown (gazing for first time at city's heavy traffic)—"Jee-rusalem, Hiram, they sure are back with their hauling, ain't they?"—Wall Street Journal.

Nine Years After

EXPERIMENTS, conducted on nearly every soil type, show that most of the excess potash in heavy applications is not lost through leaching but remains available in the soil until it is utilized by crops. The beneficial effects of excessive applications of potash are often noticeable in crop yields several years after the potash was placed in the soil. Loose sandy soils are the only soils that lose potash to any extent through leaching and they will hold the element much longer than they will hold nitrogen.

The value of excessive applications of potash is definitely shown in the results of an interesting experiment conducted several years ago at the Pee Dee Experiment Station at Florence, South Carolina. Alfalfa was planted on Orangeburg sandy loam and highly fertilized. One plot received an additional amount of 1,000 pounds of muriate of potash per acre. Large yields of alfalfa were obtained, the best yield coming from the plot with the heavy potash application.

Nine years later the alfalfa was plowed under and the field was planted to cotton and fertilized at the rate of 800 pounds of 8-4-4 per acre. Although the large alfalfa yields had made a heavy drain on the potash in the soil (each ton of alfalfa hay removes the equivalent of 70 pounds of muriate), the plot receiving the heavy potash application nine years before showed a marked superiority over the remainder of the field in cotton yields.

The potash remaining in the soil through nine years caused the plot to yield more than a bale to the acre while the cotton on the remainder of the field rusted badly and gave poor yields. It must be remembered that the entire field received 800 pounds of 8-4-4 per acre and the only additional fertilizer that the heavy yielding plot received was the 1,000 pounds of muriate nine years before the cotton was planted.

To get the best results from nitrogen and phosphoric acid the farmer should always apply sufficient potash to meet the full needs of the crop grown. If excessive quantities of potash are applied it is not lost under ordinary conditions but remains fixed in the soil in an available form for other crops which follow. It is better to apply too much potash than not enough.

Agricultural and Scientific Bureau N. V. POTASH EXPORT MY.

of Amsterdam, Holland

19 West 44th St., NEW YORK, N. Y. McCormick Bldg., CHICAGO, ILL. 445 So. 15th St., SAN JOSE, CAL.

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BETTER CROPS PUBLISHING CORP.

19 West 44th Street

New York

Better Crops PLANT FOD

The Whole Truth-Not Selected Truth

R. H. STINCHFIELD, Managing Editor SID Noble, Editor

Editorial Offices: 19 West 44th Street, New York.

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NUMBER SIX

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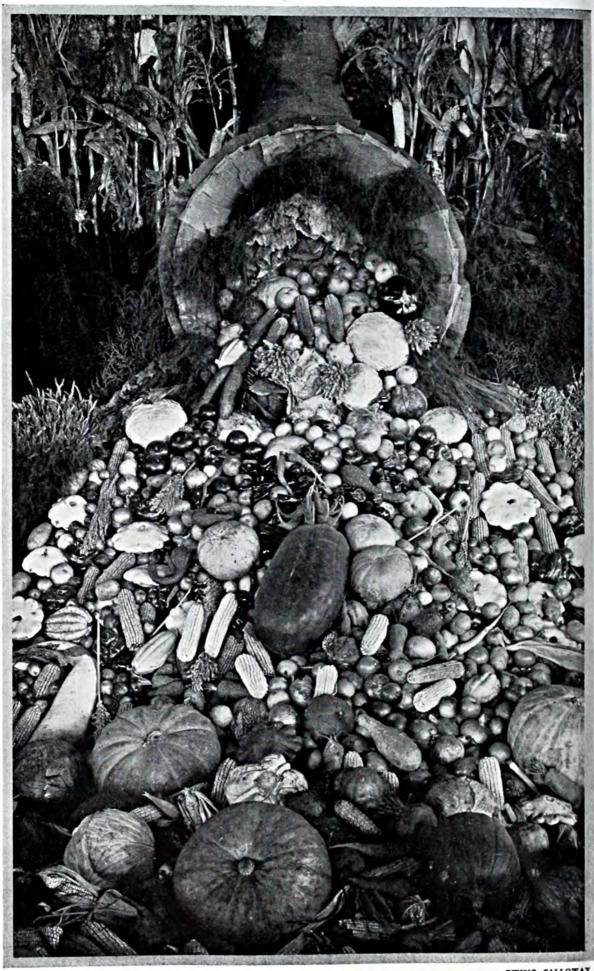
Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY. of Amsterdam, Holland

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Directors: J. N. HARPER

G. J. CALLISTER



Harbest's Horn of Plenty

EWING GALLOWAY



Published Monthly by the Better Crops Publishing Corporation, 19 West 44th Street, New York. Subscription, \$1.00 Per Year; 10c per Copy. Copyright, 1927, by the Better Crops Publishing Corporation, New York.

VOL. IX.

NEW YORK, NOVEMBER, 1927

No. 6

Napoleon called ingratitude the greatest weakness of all

Gratitude By Jeff M'Illermid

RATITUDE, like Charity, begins at home, but it needn't stop there. It is natural for many of us fellows to glow with appreciation when the big banker smiles at us, and then completely forget to acknowledge thanks to the modest Home Body who sews on our pants buttons.

I have a neighbor who claims to be one of those automatic, highgeared, self-made mortals. He is proud of the perfection he has attained and the performances he has pulled off, and is very grateful to himself for his brilliant career.

Not in a gossipy sense at all, I let you in for the fact that he has an older brother working on the section, who denied himself an education long enough to help my neighbor get his (with a frat pin to boot.)

Which one of these two cusses him-

self the most these days I leave you to surmise.

It is apparent from a casual case like this that self-sacrifice and gratitude seldom team together. The world often looks upon them both as weaknesses. The next built-to-sell edition of the dictionary may not carry either of these words in stock as accessories to the human trade.

That self-made neighbor of mine has not attained the fame of Napoleon Buonaparte; neither has he reached the heights of self-esteem and egotism occupied by the Man from Corsica.

Yet Emil Ludwig says in his book of seven hundred pages something about Napoleon that shows he had a memory for kindness shown him. One of the sublime forms of Napoleon's egotism was his gratitude.

But Napoleon's gratitude was not ordinary kindness, but the pride of a man who feels that he is unique and is determined to overwhelm with benefits anyone who has been useful to him, lest he should possibly remain in the other's debt.

He found sinecures for some of his old school chums who toiled with him at Brienne; he remembered his old associates in his will; and he wrote to Josephine: "As far as I am concerned, I deem ingratitude the greatest weakness anyone can have."

I shall loan my neighbor this book of Ludwig's soon, with a leaf turned down at page 558. It is nearly five years now since I loaned him \$3.25. I think maybe after he reads that passage he will take a little interest in the principle of the thing.

I N both its private and public sense, gratitude suffers because there is really so much to be grateful for that a fellow might as well buy a



sign "I Thank You" and fasten it to his hat.

Services and benefits and bounties are so common that they make us think of gratuity and gratis rather than of gratitude. Their common roots are mingled together anyhow and so it's no wonder we take things for granted.

Seldom do we purchase anything complex and mechanical in this machine age until we are sure that prompt service goes along with it.

Seldom do we stay long in the buyand-buy aisles of a store or enter upor the bye-and-bye installment system until we are certain that the clerks and salesmen are deferential to our smallest whim.

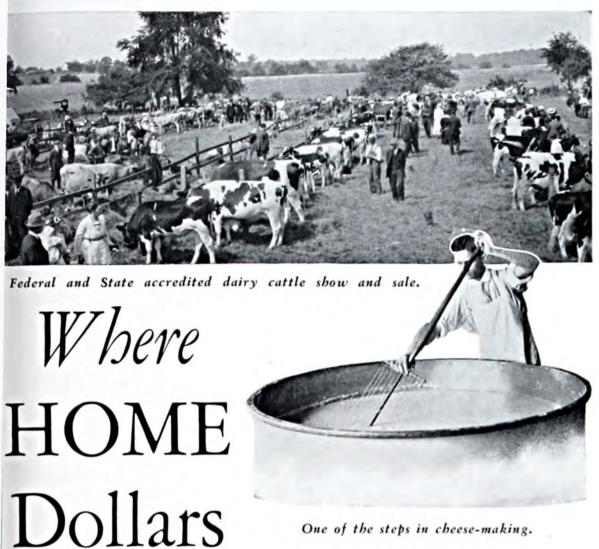
Even my benighted erstwhile friend Mrs. Plenty Horses, patron of a farwest emporium where I once clerked for a weekly insult, had absorbed the spirit of modernity in merchandising

She would wobble into the store and beckon me to wait upon her. I would show her everything, from the latest in beads to the oldest in eggs and exhibit everything saleable under the counter, in the show cases and on the top shelves until quite exhausted. Then I would call for the half-breed interpreter, and Mrs. Plenty Horses would blandly explain, via his stolid indifference, that all she wanted was "a little chewing tobacco and heap service!"

PARMERS complain about the wide disparity between wholesale raw food prices and the H. C. of Luxury at the retail end. When the average woman shopper discards the market basket and uses the telephone to have a cake of yeast and a box of matches delivered in half an hour what's the answer?

The answer is she gets the consignment in a two-ton truck and the store holds her trade at any cost against fierce competition.

More two-ton trucks at the producing end and more market basket: (Turn to Page 62)



One of the steps in cheese-making.

do Home Work

By William J. Maddox

DOZEN years ago Grove City was just a sleepy little westtown. Pennsylvania ern Whatever its bid for fame, it was certainly not as a dairying region. The few pastures about the town furnished little more than an athletic field for a nondescript handful of cows.

Years before, a creamery had been started, only to languish out a brief existence. Then came a cheese factory, which ended up in the hands of

the sheriff.

It was no exception among small towns.

There was the usual Chinese Wall of suspicion and prejudice between the townspeople and the country folk. Every spring and fall the rural carrier cussed his load of mail-order cata-And what cash the bank logues. didn't lend out "on proper conditions" -which virtually eliminated the farmer from getting any of it-was sent off to the big city for investment.

Now, it happened that about that time-1914, to be exact-the U. S. Department of Agriculture was looking for a creamery where it could try out under actual commercial conditions methods that seemed pretty good in its laboratories. A number of localities were studied.

Now, it happened, too, that in Grove City were a handful of business men who had vision enough to see over this Chinese Wall. There were a carriage manufacturer, a banker, a shoe dealer, a real estate man, a broom manufacturer—a varied assortment. They got wind of the government's quest.

"We are not much on dairying," they told the government experts, "but we're willing. And if cooperation will do it, don't look any farther."

Negotiations were entered into and a contract soon drawn up. Grove City was to finance the enterprise and supply the business management. In return the creamery would have the benefit of its official connection

with the U. S. Department of Agriculture, insuring the best of markets for its products. This was not to be used in advertising, though, or in any way to the prejudice of competitors.

One of the stipulations

made by the department was that the creamery would not be a dividend profit proposition. Both sides were embarked upon the development of a community, not creating a good investment for a few lucky stockhold ers. And the Grove City men saw the advantage of this.

A Stock Company

The result is that the Grove City Creamery, incorporated under the laws of Pennsylvania, is a stock company with a cooperative feature. After a rate of dividend, fixed by the agreement between the creamery and the department, is paid, the profits are returned to the farmers in proportion to the amount each has brought in during the year.

The initial plans were modest. They called for a \$12,000 building. The fund was way oversubscribed.



The creamery a Grove City that has brought prosperity to the entire countryside

Left: Swiss cheese curing. Scientist bave found what makes the holes and, incidentally the flavor. and instead a \$32,000 plant was erected.

May 3, 1915, the creamery opened for business. Its success has been little short of spectacular. In 12 years Grove City has become one of the model dairying communities of the country, if not the world. Its methods have been widely studied and copied. At least eight similar communities have been developed in Pennsyl-They, of vania alone. course, do not have the same direct contact with the Federal department.

From the department's point of view one such experiment station for carrying out its research work under real commercial conditions was enough, and it has been forced to turn down numerous offers of other controlled creameries in various parts of the country. But as far as actual methods are concerned,

whatever is learned at Grove City is made available for them to put into practice.

Grove City today is more than a town. It is a community. And when you speak of it you mean the whole countryside for 10 miles around in every direction. Farmers and merchants carry on in excellent cooperation. They find it pays in more ways than one. Farmers now belong to the Commercial Club, and they take an active part in all projects for community betterment.

The fact that the creamery is managed by the department probably gives it no appreciable financial advantage. The relationship is investigational and has not reduced the cost of manufacture of its products below that of other creameries. The products are always sold on their merit, the name of the department not being used to advertise them.



Presenting the bank's silver trophy for first honors in livestock judging.

Under the guidance of the department, the creamery has been something of a pioneer in introducing the public to the merits of sweet-cream butter. As a result its butter sells at a premium of from three to seven cents a pound over the usual New York quotations. The butter has proved so popular that it has been found impossible to meet the demand. A special trade takes practically the entire output.

A Success from the Start

From the start the creamery has been a success. The first distribution among the farmers amounted to \$25,-000. The next year this was more than quadrupled. Since then, each year it has increased steadily until now nearly half a million dollars a year in cash of the new wealth created goes back to the farmers.

In 1919, it was found necessary

to enlarge the plant. A \$60,000 addition was built. Already this has been outgrown and further extensions will have to be made.

Butter is not the only moneymaker. Its Swiss cheese is shipped to many parts of the country, some even going to Switzerland itself. New York is a good customer, as well as St. Louis, Kansas City, and Omaha. Some goes as far west as Los Angeles.

A creamery field man is employed by the department to assist in bringing about local dairy development. The chief purpose in attempting this work is to determine whether such dairy development will justify the cost, and whether it is advisable for other creameries to employ a field man. The department admits that it is difficult to measure such work in dollars, but it believes that it is largely through the influence of the field man that dairying has been able to build up the Grove City community.

When the field man first made his appearance in Grove City, most of the farmers looked on cows as just cows. Even the names of the great dairy breeds were almost unknown to many of them. Now they can talk blood-line with the best.

Carloads of Purebreds

The field man's first step was to confer with the cashier of one of the banks, a man who had taken a keen interest in the project from the start. The upshot of their talk was that the bank agreed to buy carloads of approved purebred dairy cows, ship them in at its own risk to Grove City, and sell them to the farmers at cost, the farmers to draw lots for choice of animals. During the first few years of operation the bank brought in eight carloads of purebreds. It reports that it has not lost a cent on any of the transactions.

In every instance the demand has been more than the number of animals imported. And all this was done in a district where dairying had never been a success and among people who before would not have raised money to purchase a purebred animal of any kind.

The bank did not stop there. It helped the farmers in many other ways. When the success of bringing in purebred cows had been proved, the bank financed the purchase of purebred bulls and took a leading part in organizing three breeders' associations—four bulls for each association.

If the community development is to be a permanent thing, the younger generation must be interested. Accordingly a boys' and girls' purebred cattle association was the next step in the bank's program. It financed the purchase of purebred calves for the boys and girls.

At the same time, and under the leadership of the bank also, cow-testing associations were formed and the work of culling out the slackers was undertaken. As soon as the association proves that a cow is unprofitable she is disposed of and a better cow is purchased to take her place.

One farmer found that nine of his eleven cows were unprofitable. He immediately sent all nine to the block and began buying better ones to take

their places.

One of the most effective organizations introduced into the community is the accredited herd and sales association. The herds of all members are tested for tuberculosis and accredited accordingly. As a result the Grove City herds have been brought up to such a high standard that they now constitute more than half of all the accredited herds in the state.

Each year Grove City has its dairy show. The bank provides prizes, and everything is done to make the show the dairy event of that part of Pennsylvania.

In the wake of the prosperity that has come to the community generally through the success of the creamery are the thrift clubs organ-

(Turn to Page 60)



The Bulletin

By John Fitzpatrick

PPEARANCES do not make a farm bulletin, but they do help to get it across to the farmer public. Farm folk, as well as other people, are attracted by appealing front covers on the numerous publications that enter their homes.

Time was when the front cover of farm bulletins and circulars did little more than advertise the institutions. Across the upper and middle portion of the majority of front pages appeared the name of the institution, in large bold face type, and below it was the author's name likewise set in conspicuous display. Then, tucked obscurely down near the bottom of the page, the title, set in small type, would peep out. This presentation undoubtedly made the farmer better acquainted with the institution, but it was not the most productive method of arousing interest in the pamphlets' contents. So subordinated was the title that many readers instinctively felt that the reading matter would prove uninteresting even though they knew it was important.

Some of the early bulletins had il-

lustrated covers but, for the most part, the pictures did not portray that action or human interest that is now considered so necessary.

Another characteristic of the bulletins of yesterday was that they were written over the heads of their farmer audience. Written in scientific phrase-ology they were not comprehensible to the men of the plow and furrow for whom they were prepared. Some of them seem to have been written with a distinct take-it-or-leave-it attitude. This was unfortunate, for while these bulletins were just as valuable as the present day publications, their unfortunate method of presentation caused them to fail to get the attention they rightly deserved.

The Show Room

Today the front cover, as the show room of the bulletin, has been decorated. Because of so much free literature, such as catalogs and other commercial booklets that go daily to the rural homes dressed in attractive covers, the farm bulletin faces competi-

(Turn to Page 56)

Leading Farm Folks to Play and Work Together

By H. E. McCartney

S. Benson, County Agricultural Agent, there was an average attendance of 367 farm folks at 190 meetings held in Knox county, Indiana, last year. These were strictly rural community gatherings, held in the consolidated schools or in the rural churches of the county. Prior to the coming of Benson to the county, three years ago, the attendance seldom exceeded 30 or 40 when an attempt was made to get the folks of the country districts together.

In his work Benson has changed the whole attitude of the people of his county toward rural life and has set them to work at solving the problems that confront them as residents of a rural district. He has carried on his work of rural leadership with the idea that he could best help the people by leading them to help them-

selves. One of his first acts was to call together a selected group of prospective rural leaders. People who came to this preliminary meeting stated emphatically that it was a hopeless task to try to accomplish anything in the country in the

way of holding meetings.

"It has been tried in Knox county before and has always failed," they said.

To these Benson replied:

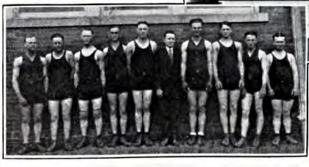
"If we will prepare programs that are interesting, people will come. If they do not attend, we are to blame in not making the evening's entertainment attractive."

His logic won and plans were drawn up for the preparation of programs calculated to be interesting and attractive.

A Program for Each Township

The plan as devised and developed under Benson's leadership is for the people of each of the 13 townships to prepare one program each year. This is put on, first, in the home township at its regular monthly meeting. Then, after the manner of an old-fashioned





Above: A group of Knox county, Indiana, farmers ready to start the evening's entertainment.

Left: The championship farmers' basket ball team, of Knox county, representing the Palmyra township. traveling show troupe making one night stands, the entertainment is taken to the other townships. Saturday and Sunday nights are omitted, but otherwise the performance is given nightly until the county has been covered. The entire circuit is completed in less than three weeks. Then at the beginning of the succeeding month the next township in order starts on its pleasant task of furnishing the talent for a series of meetings.

The people have become so much interested in their meetings that no condition of weather or other circumstance can keep them at home. Ex-



Above: H. S. Benson, county agent, Knox county.

Left: A group of farmers ready to start a tour through a neighboring county.

cuses that were quite sufficient in the old days are now laughed into the discard.

A few months ago, a prominent man went to the county for the purpose of studying Benson's system at first hand. It happened to be rainy when his train arrived at noon. A downpour continued through the afternoon. As the time approached to drive to the country for the meeting, he gave up all hope of seeing a typical Knox county community meeting until another day. In disappointment he said to Benson, "How shall we spend the evening?" Benson replied, "We shall go to the country just as we had planned." Arriving at the consolidated school they found that a crowd of 400 had already assembled. During that same month there was an average of 322 at each of the 13 meetings in spite of the fact that nine of the meeting nights were rainy.

Benson's plan of developing the

programs has called for the use of the best talent in each township. It has caused careful search to be made for the most suitable plays and for the best ideas in entertainment. It has required strenuous training on the part of those who had parts to perform. Yet those who have had the privilege of taking part are always eager to do so again. They say that the training and experience they receive more than repays for their time and effort. Last year, 260 farm folks had an active part in putting on these entertainments.

Variety of Entertainment

The variety on the programs is limited only by the number of opportunities. A home talent play is proving to be just as "taking" as it was in the days of the country literary society. A minstrel show is ever one of the most attractive forms of entertainment. No season passes in Knox

county without one or more programs of this character being staged. Musical numbers are popular with these progressive rural folks. Some of the townships have developed orchestras. Others have put on special numbers either instrumental or vocal. Novelty features find a prominent place on the programs. One month a broomstick fiddle skillfully manipulated by a local artist was a star attraction. On another program a cartoon sketch set up by a local man created unusual interest. Whatever the nature of the entertainment, the fact that home folks or the friends and neighbors from another part of the county are giving it is sufficient attraction to draw a crowd.

The evening is not all devoted to entertainment. Usually an hour or so is spent considering the many items of business that may properly come before a community in its Farm Bureau organization. Then comes a short address by some local person who has prepared something worth while, or by some person of note who has been brought to the county to be the speaker.

As a climax to all the gatherings of the year, Benson staged a county farmers' picnic. This was held at Vincennes, the county seat. This little city is the location of the capital of the old Northwest Territory. The crowd of farm folks assembled that day required 3,000 autos to bring

them to town. The parade that wended its way through the streets of Vincennes was something never to be forgotten by those who saw it. In its line were floats, pantomimes, and miniature pageants representing a wide variety of subjects. Some of these were log cabins; the rail splitting age; old methods of farming vs. modern methods; spinning cloth from home-carded wool, grandfather going to mill; fashions of 1808 compared with those of 1925; Goddess of Liberty; signers of '76; and many others of local and general interest. Each had been worked out by the farm folks under Benson's leadership and direction.

Athletic Events Prominent

Development along many other lines has come as a result of the splendid spirit generated at the monthly township meetings. Athletic events have come to be prominent features. Interest reaches a high pitch when the winning team in baseball or basketball from the south half of the county plays the best team from the north half for the county championship.

Projects of a practical nature have seen a wonderful development since the people began to get together in their community meetings. These projects have included production and marketing and work connected with the home. Camps for boy and girl club members have been held with

most remarkable success. It would seem that, in getting together at the meetings and in working together to make their meetings successful, the people have learned to play together and to work together on any project that may be helpful to the country or its farm folks.

Benson is modest in his claims for personal (Turn to Page 58)



A meeting of Knox County nutrition project leaders.

The Fertilizer Outlook

Agricultural and Scientific Bureau

N. V. Potash Export My.

SERTILIZER consumption 1928 will probably be greater than in 1927, though the outlook is not uniform. The present high cotton prices indicate a big increase in tonnage in the eastern part of the cotton belt. Tobacco and potato prices, however, over the country as a whole, tend towards a decreased tonnage, offsetting to some extent the probable increase due to cotton. The farmer pays his fertilizer bill with money which he receives for his When the production of a crop is profitable, there is a tendency for farmers to expand the acreage and use more intensive methods of production, such as more fertilizer, better seed, and more cultivation. When the production of a crop is unprofitable, the opposite is true; farmers plant a smaller acreage and adopt less intensive methods of production. They use less fertilizer.

This general fact is well known. Its major importance has been proved in detail by a study of factors affecting fertilizer consumption. During the 15-year period, 1900-1914, the fertilizer tonnage sold in the United States increased almost without interruption. In only one year during that time, 1912, did the tonnage decrease from the preceding year.

The value per acre of cotton increased during this period. The trend in fertilizer tonnage also increased. There was general agricultural prosperity. It is true that there was an upward trend in the general price level, that is, in the price of the things farmers bought. The prices of farm products, however, tended to increase slightly faster than the general price level. Farmers as a class were prosper-

ous and fertilizer consumption increased.

In contrast with this, the fertilizer tonnage has fluctuated much more violently during the 14 years, 1914-1927, and there has been practically no general upward trend. In 1915, the tonnage was 1,800,000 tons less than in 1914. In 1921, the tonnage was 2,400,000 tons less than in 1920. In 1927, there was a marked decline in tonnage.

In 1914, the value per acre of cotton declined. This was followed by the decline in tonnage in 1915. Cotton declined in 1920. The tonnage declined in 1921. A change in the value per acre of cotton is an important factor in causing changes in fertilizer tonnage. These violent fluctuations in tonnage are also one of the chief causes of losses in the fertilizer trade.

The value per acre of tobacco and potatoes also have an important influence on fertilizer consumption. During the past 25 years when the December 1 value per acre of cotton increased one per cent over the preceding year, the fertilizer tonnage increased about 0.4 of one per cent. A one per cent change in the value per acre of tobacco caused a 0.3 of one per cent change in the fertilizer tonnage.

The three parts of the fertilizer problem are—increase in consumption, stabilization, and adjustment to inevitable conditions. The immediate outlook, therefore, has some practical significance.

Discussing the eight cotton states first, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Arkansas, and Texas, the October

(Turn to Page 53)

COTTON LINTERS

By C. B. Sherman

U. S. Department of Agriculture

orton linters constitute a crop which has developed entirely within this quarter century, yet its value has reached \$22,-000,000 during some recent years. As a matter of fact the crop became important only when the World War demand for munitions made it worth while for the oil mills to produce linters in quantity. Until that time linters were considered an unimportant by-product only.

Between 1890 and 1900 there was a saying in the oil business that there was a fortune in store for the man who would invent a means of cleaning the lint from Upland cotton seed so that it would have the appearance of Sea Island or Egyptian seed. Several delinting machines have been invented since that time and the problem has been solved.

With the exception of Sea Island and Egyptian cotton, seed of all cultivated varieties of cotton bear two commercial types of fibers on their seed coats-a fiber that is suitable for spinning purposes and a short fiber or fuzz that is closely matted about the Fiber of the first type is removed and baled at the gins and constitutes the cotton of commerce. It is the other type, or fuzz, together with any of the first type that may escape removal at the gins, that is removed by a second process usually performed at the oil mills in the cleaning and preparation of the seed for crushing, that constitutes our crop of linters.

Crop and Prices Variable

Commercial values of linters naturally vary from time to time, but it is an interesting fact that they do not

\$22,000,000 Crop Developed Within Twenty-two Years

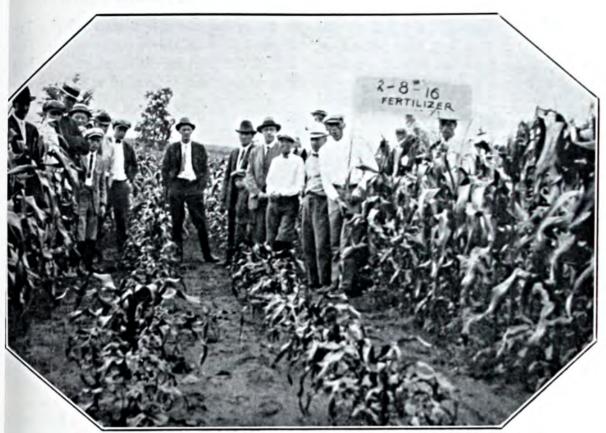
commonly follow the fluctuations in the cotton market. Nor does the size of the linter crop depend very largely upon the size of the cotton crop. The delinting is so arranged that supply is adjusted rather well to demand.

Uses for linters are varied and the chief products from their use are the opposite ones of explosives and mattresses. The proportions of the crop going into the one manufacture or the other naturally varies with the times. During the World War the Cotton and Cotton Linters Section of the War Industries Board ruled that after May 1, 1918, all linters should be cut to the munition type, running 145 pounds and upwards to a ton of seed crushed. The same regulation fixed the price at 4.67 cents a pound and provided that linters be sold only to the company that acted as purchaser and agent for the Ordnance Department. But the Ordnance Department was a good customer and under its demand the crop reached its peak of more than a million bales valued at more than forty-five million dollars:

For a while after the war, interest in linters fell off precipitously and the crop decreased to something like 422,-000 bales, worth only about three and a half million dollars. Recently, however, interest has increased again, the mattress and allied industries are active in the market, and the crop is again an important and valuable one.

Standardizing Grades of Linters

When the Government commandeered all linters, a great deal of difficulty was experienced, in many quarters, in establishing values for the (Turn to Page 50)



200 pounds per acre of 2-8-16 fertilizer made this difference.

HUNGRY SOILS

By C. J. Chapman

Wisconsin College of Agriculture

when a farmer asks the question, "What fertilizer shall I use?" is not always easy, but Robert Amundson, county agent of Outagamie county, Wisconsin, has so thoroughly familiarized himself with the soils of his county and their requirements that he comes pretty close to hitting the bull's eye in answering such questions.

It has been recognized for some time that in general the soils of the northeastern counties in Wisconsin are very deficient in phosphorus and almost unbelievable results have been secured through the use of acid phosphate on these upland phosphatehungry soils. Yet it is only within the last two or three years that the evidence of potash hunger has manifested itself on certain soil areas within this northeastern portion of the state.

Mr. Amundson has made some close observations, and at the same time has carried on some simple tests by which he has learned of the need for potassium. It was noted that wherever wood ashes were used on these peculiar soils that striking differences in the growth of all crops resulted. Tests for acidity on these soils which responded in such a marked way indicated that most of them were well

supplied with lime. This led to the conclusion that it was the potash of the wood ashes which was responsible for these striking differences.

Subsequent trials with commercial fertilizers high in potash compared with straight acid phosphate conclusively showed that it was the potash which was chiefly needed on these particular soils.

The characteristic soils of this area which show such marked response to potash are the dark, fine sandy and silt loams on the more level or gently rolling areas within this district. western portion of Outagamie county includes thousands of acres of these While we have always recognized the need for potash on the black muck, peat, and border marsh soils in this state and have more recently learned that a large percentage of the sandy soils in the central portion of the state are deficient in potash, vet the fine sandy and silt loams were never suspected of being low in their content of available potassium.

Soils Meetings

The texture and structure of the soil are excellent, and for the most part it is well supplied with organic matter and very retentive of moisture. For the first few years after it is brought under cultivation this soil is fairly productive. The meager supply of potash has been kept in circulation to some extent through the return of manure, and dairy farmers have been able to grow fairly good crops on this land since most all crops grown were fed and manure returned to the land. A large portion of this type of soil is now under cultivation.

While the water table is fairly high, the drainage is good except in excessive wet seasons. There is some relief to the country, in fact in some places the land is quite rolling. These soils are mostly terrace formations or glacial outwash plains. The introduction of cabbage and potatoes within the past few yeaers has tended to accentuate this need for potash.

Mr. Amundson has used all the information available in diagnosing the ills of the soils of his county. He has not only made a detailed study of the soils report and soils map of Outagamie county, but has dug up all of the records of chemical analyses made on soil samples in his county. It has been found that in general the total potassium in this type of soil is from 10,000 to 15,000 pounds per acre less than on the heavy clay soils of the eastern portion of the county.

Mr. Amundson has worked out a unique mail order system in his study of the soils of his county. Mailing tubes containing small aluminum cups together with a question blank are sent out to the farmers, and the samples of soil sent in are not only tested for acidity, but observations are made as to the texture and structure and the farms from which they were taken are located on the soils map. The information contained on the question blank is used as a supplement to the other information secured in making final recommendations to his farmers, and Mr. Amundson has been able to hit with great accuracy in his recommendations to farmers of his county.

Not only has Mr. Amundson made a close study of the soils of his county on his own initiative, but he has always kept in close contact with the College. He has used the services of the Extension agencies to the fullest extent. It has been the privilege of the writer to accompany Mr. Amundson and groups of farmers on farm tours throughout the county during the last two summers. This last winter we held soils meetings in practically every important center in the county.

While potash has been the chief limiting element on these peculiar sandy and silt loams in the western part of the county, yet phosphates are needed in addition to potash for best results on these soils. The 0-12-12, 0-14-14, 0-8-24, and 0-9-27 are the mixtures chiefly used for the general crops,



Showing the residual benefit of potash to the clover crop at the Branch Experiment Station, Hancock. Total amount of fertilizer in rotation is 400 lbs. per acre, all applied to the corn crop ½ in hill and ½ broadcast. Above 6-8-0, below, 0-8-6. Both corn and small grain show the same differences as noted here on the clover crop.



while mixtures such as the 3-12-12, 2-8-16 and other combinations containing some nitrogen are used for corn and special truck crops where some nitrogen is required.

The red clays, silt loams, and certain of the lighter textured soils in the eastern portion of the county respond chiefly to phosphates. The eastern half of Outagamie county includes large areas of these phosphate deficient soils,

and results with phosphate fertilizers here are frequently as striking as in Marinette and Door counties of this state. Mr. Amundson has learned that there is no one blanket recommendation which will cover the requirements of all the soils of his county.

In general the upland soils of Wisconsin need phosphates and lime, and we stress the importance of the lime and phosphates in a fundamental soil-

building program. But county agents in general must not be content with these more general recommendations since there are wide variations in the requirements of soils within a given area. When making recommendations to farmers several factors should be considered such as the type of soil, the length of time under cultivation, the system of farming practiced, the amounts of manure used, the kind of crops to be grown, the topography of the land, the drainage, etc.

Influence of Agent

The soil and crop departments of the various experiment stations and colleges throughout the country are conducting many experiments on their more important soil types and soil areas, yet it is impossible to apply the findings of the experiment stations to every farm, even where the soil type is the same. The county agent must familiarize himself with the soils of The extension specialist his county. of the experiment station and college renders a valuable service but is limited in the time he can give to the individual county agent.

In addition to the help offered by branch experiment stations and soil specialists, we have here in Wisconsin a service known as the State Soils Laboratory through which farmers may secure help in solving their soil problems. This service includes an inspection of the farm by a representative of the Soil Department of the University who takes his own soil samples and then makes analyses for total nitrogen, total and available phosphorus, potash, and acidity.

Information as to the type of soil, topography of the land, length of time under cultivation, and the system of farming practiced, is secured first-handed by the soil specialist at the time of examining the farm, and a close contact with the farm and the problems of the farmer is thereby established. In the final report to the

farmer, based on the information secured when making the examination together with additional help which may be gained through the analyses of the soil samples, recommendations as to the lime and fertilizer requirements of the soil are made, and a fundamental program of soil and crop management which will be a guide to the farmer in future operations is laid down.

More than 3,600 farms have been examined through this State Soils Laboratory service, and the information gained has been of great value to the county agent in his more general knowledge of soil conditions in his county.

We also have in Wisconsin an organization known as the Wisconsin Soil Improvement Association, with local county orders affiliated with the state organization. The county agent acts as the local secretary for his particular county. Through this association farmers can secure help and advice direct from the soil specialist of the College. Members are entitled to free tests of soil samples both for acidity and available phosphorus, and reports to the farmers are based not only on the tests made on soil samples but on information supplied through the questionnaires which the farmers fill out and which accompany soil sam-

The bulletins and circulars by the College all help the county agent, but in the final analysis the influence of the agent in his county is of greater value than all of these outside agen-He has within his county the Smith-Hughes high school and other agricultural institutions which he works. In fact the rural school teachers can, and frequently do, cooperate in projects pertaining to the fertility of the soil. In other words the county agent should be the hub around which all of these other agencies revolve. He has a wonderful opportunity for service to the farmers of his county through demonstrations,

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SOIL FERTILITY for Business Reasons

By W. A. Albrecht

University of Missouri

BETTER CROPS WITH PLANT FOOD is not only a magazine title, but is the chief business principle in the mind of Eugene M. Poirot when it comes to managing an 1,840-acre farm in Lawrence county of Missouri.

To take over an extensive tract in

1921 when agriculture was riding the toboggan toward depression, demanded a rather specific and reliable policy and gave no room panaceas or for wildcat ideas. Realizing that he was undertaking n o kid's job, but a cold business proposition that had to pay, Mr. Poirot hitched himself to the idea that proper management of the soil fertility would be his main control of economic production. He thought that if he used his soil as a factory f o r converting crude plant foods into high yields of marketable finished products, economic returns on the business would be possible.

That his principles have been properly chosen is indicated by his success in growing legumes on land where they were almost unknown, by his crop yields which have been steadily increasing, and by the farm's cash returns which have almost doubled.

For the raw materials or the soil fertility out of which to grow his crops, Mr. Poirot does not confine himself to his own farm, but uses purchased plant foods. There is no hesitation to invest in these provided they return the investment with a profit.

"Economy," he says, "does not consist in refusing to spend money, but in spending it where it comes back with largest profit."

So far, his purchased plant foods have been only nitrogen and phosphorus, with attention to organic matter as barnyard, artificial or syn-



Starting wheat straw on the road to artificial manure by applying chemicals for process through the thresher.

The wheat above was fertilized with acid phosphate and limestone.

thetic, and green manures as a means of making the ample soil supply of potash available.

On the Poirot farms the nitrogen problem is handled mainly through legumes. To grow these on the sour, flat, tight-subsoiled Gerald silt loam, making up the farm, is no small task; but they are being grown through the use of limestone, acid phosphate, and manure. All of these go on the wheat nurse crop for the legume, the limestone much in advance of, the phosphate at the time of, and the manure a few months after the wheat seeding.

Rots Straw Quickly

"Manure making for such extensive farming is impossible" you will say, and truly so in most instances, but Mr. Poirot is working on the farm possibility of converting his wheat straw from one crop into artificial or synthetic manure—by methods suggested by the English process—to have it ready as a winter top-dressing for the next crop. By this method, he puts commercial nitrogen together with other chemicals into the straw to rot it down to manure quickly, and at the same time to add this purchased

plant food to his wheat and clover.

His experience during the past year, under the guidance of the Missouri Agricultural Experiment Station, led him to believe that for every acre of wheat grown one year he can manure one-half acre of wheat the next year, and not only improve the quality of the wheat, but spell the difference between success and failure in the legume crop following. The artificial manure seems to be the final boost in the legume problem on this soil type.

The use of lime and acid phosphate, commonly considered as the last words in growing legumes, are not the whole requisite. The top-dressing, with the synthetic manure, most any time in winter from December to February, gets the stand by furnishing covering for the seeds and small plants during the late winter and by supplying readily usable plant food at the time when the other treatments fail.

Mr. Poirot's success with the artificial manure, and his stand of legumes on a soil type not commonly considered as a legume possibility, were a marvel to the soil scientists of the International Soils Congress excursion



This wheat was fertilized with acid phosphate, limestone, and straw.

who recently paid the farm a visit. Mr. Poirot is going ahead with the synthetic manure idea. He has a simplified machine for putting the chemicals into the straw pile directly through the thresher, and making the piles so that the rainfall does the final job. With normal rainfall he is able to use the process regularly to make his straw pile carry commercial nitrogen as top-dressing to the wheat, to make his commercial nitrogen hustle the wheat straw, ordinarily wasted, back to the land in the form of manure.

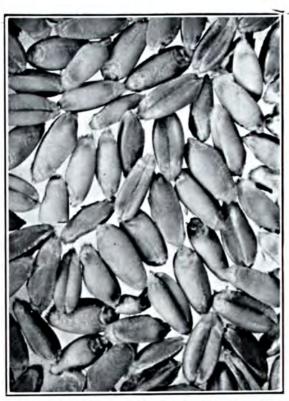
Recognizes Deficiencies

Both of these fertility contributions serve to get an excellent legume stand for feed or soil improvement purposes. With successful legume stands gathering free air nitrogen, with the return of the straw, and with applications of commercial nitrogen, the problem of soil maintenance with respect to this element is solved.

For phosphate up-keep, an application of 200 pounds of 20 per cent acid phosphate on the wheat is the practice. In a four-year rotation, such a treatment will not entirely maintain



Alsike clover after wheat fertilized with artificial manure.



This wheat was fertilized with acid phosphate, limestone, and artificial manure. Photographs enlarged 3.4 times.

the phosphorus of the soil. However, with prompt return of the wheat straw, through artificial manure, the shortage in phosphorus can almost be offset. For this purpose Mr. Poirot is carefully observing the experiment station projects on corn fertilization and is about to adopt phosphate treatment for his corn that goes on to the legume sods with decided improvement in the crop as a result of this cropping sequence. Under such a scheme, the farm factory can be kept running without lowering its stock of raw material.

Soil fertility is Mr. Poirot's business thinking, largely because he recognized at the outset the handicap in the soil type he farms. Quite contrary to many, he recognizes the deficiencies of his land rather than extols its virtues, and aims to make the most of it. His thinking bears fruit in a prolific outlay of ideas, none of which, however, endanger the credit side of the business through hasty or premature adoption of farm practices. They must first receive the careful scrutiny (Turn to Page 50)

Postponing HUNGER

By T. K. Wolfe

Virginia Agricultural Experiment Station

States have passed through and are still passing through, but with finer adjustments than formerly, an agricultural depression that has sorely tried their souls as well as their purses. There are many who wish to help the farmer and rush to his rescue, but usually the results are unsatisfactory from his standpoint.

Too frequently, especially in case of farm legislation, those who have the power do not have the knowledge and those who have the knowledge do not have the power to be of material service. Some think the farmer should be allowed to work out his own salvation unaided and unhampered by governmental influences; others believe he should receive considerable nursing from the financial breasts of the nation. Since the fruits of farming are of nation-wide concern, it seems that the agricultural ship should be steered through a middle course and the farmer aided to some extent so that he can work out his own salvation more easily.

Added to his problem of self-support, the farmer is faced with the problem of feeding our rapidly increasing population. It has been shown by eminent biologists that our population is increasing more rapidly than our food supply. However, the farmer will probably look askance at the problem of raising more food to feed a rapidly increasing population when he cannot sell, at a reasonable profit, the crops he now produces.

Too frequently the farmer's profit is due to a short crop in this country or in foreign countries, or everywhere. Frequently, so frequently that it is the rule rather than the exception, the farmer realizes more actual profit from a small crop than from a large one. Such existing conditions will not stimulate our farmers to increase production to feed our increasing population. Today the farmer is more concerned with disposing of agricultural products at a fair profit than he is with increasing production to feed an increased population 100 years from now.

Economical Production

If there is anything in the statement that "charity begins at home," the farmer can be justified to some extent in this attitude. If some way can be devised whereby the farmer of today can obtain more remunerative returns, our population of the future will be fed much better than if nothing is done to help the farmer at present. The agricultural situation can be greatly helped by the more economical production of farm products.

Our population—present and future -must be fed. No one will attempt to refute this statement. It is a settled fact that more and more foodstuffs will be consumed from year to But the farmer has found, to his sorrow, that a general high production has too often meant low prices. On the other hand, high yields per acre, within limits, are more economical than low acre yields. other words, for most economical production and for increase in our food supply, the farmer must produce more per acre than he is now producing. It is common knowledge that the farmer whose acre yields are well above the average for the country

usually makes a profit even when prices are low, and makes greater profits when prices are high. General high production may mean lower profits, but individual high production, within limits, always means

greater profits.

There are many factors which may influence the acre yields of crops. Among these may be mentioned crop rotation; control of insect pests and diseases; use of fertilizers; the addition of organic matter to the soil in the form of stable manure, green manures, and crop residues; better use of irrigation water; the use of good seed; and improved adapted plants. The factor of improved adapted plants in its relation to the food supply and population increase is worthy of serious consideration.

A number of plant improvements of great importance have been accomplished by plant breeders. A new variety of wheat has been developed and recently distributed by the Cornell University Experiment Station under the name of Forward. This

wheat is immune to loose smut, which frequently causes great losses in wheat. In 1924 loose smut alone reduced the yield of wheat 9,800,000 bushels, an amount sufficient to furnish wheat bread for 1,750,000 people for one year on the basis of our average per capita consumption. The production of this variety indicates the possibility of the production of varieties with the same characteristic for all the wheat growing sections of the country.

Immune to Smut

A variety of oats known as Markton has been developed by the United States Department of Agriculture, and it is an outstanding variety because it is immune to covered smut. The smuts of oats annually cause a loss of approximately 50,000,000 bushels of oats, much of which loss is due to the covered smut. The Markton variety yields well, and it should prove valuable for crossing with other varieties to produce smut-immune oats for different sections of the country.



Plant improvement increases our food supply. The double rows of cabbage showing good stands are planted with Wisconsin yellows-resistant selection; the other rows with ordinary commercial varieties.

At the West Virginia Experiment Station strains of corn resistant to smut have been isolated by inbreed-These types should prove of great value in breeding high-yielding, smut-resistant kinds of corn. reduction of smut in corn will mean much in increasing our food supply. It is estimated that during the four years, 1917 to 1920, the average annual loss from corn smut was 80,-000,000 bushels. If this loss could be prevented and the corn thus saved used for pork production, 800,000,-000 pounds of pork could be produced, or the equivalent of 4,000,000 hogs weighing 200 pounds each. These 800,000,000 pounds of pork 1,280,000,000,000 contain which are sufficient to feed 1,280,000 people for a period of one year, assuming that people can live on pork

Another plant breeding accomplishment of great importance is the Robust bean, developed through selection by the late Professor Spragg at the Michigan Experiment Station. It is partially resistant to blight and anthracnose and apparently is immune to mosaic. At the Michigan Experiment Station it yielded 11 bushels more per acre than its nearest competitor in the test. If we assume that Michigan's bean acreage is planted to the Robust type and a difference of 10 bushels per acre is maintained, the increase in production for Michigan alone due to the use of this improved variety would be 4,436,000 bushels. One pound of navy beans contains 1,500 calories, and on this basis the above increase would be sufficient to feed 399,240 people for one year.

However, just as people cannot live on pork alone, they cannot live on beans alone. But if we learn a lesson from our New England cousins, they can fare well on pork and beans. Thus, if we can increase our corn yield by reducing the smut and increase our bean yield by using Robust beans, we should be able to feed many additional people.

At the Wisconsin Experiment Station Dr. Jones and Dr. Walker and their co-workers have developed by selection strains of cabbage resistant to the disease known as yellows. It is now possible to grow cabbage on land on which the cabbage crop was once a failure. Not only have the results held good for Wisconsin, but tests in Virginia show that the yellows-resistant types outyield ordinary commercial types. Dr. Fromme of Virginia Experiment Station found in his tests that only 15 per cent of the plants of commercial varieties escaped yellows infection as compared with 94 per cent for one Wisconsin strain and 89 per cent for Two commercial varieties another. averaged 2.5 tons of cabbage to the acre, while the average yield of the two Wisconsin strains was 14 tons to the acre.

Plant Improvement

A classical example of plant improvement is that of Marquis wheat. It is a hard spring wheat which Saunders in Canada developed by crossing an early ripening Indian wheat, Hard Red Calcutta, with Red Fife. with high bread strain strength and good color of flour was selected from the descendants of this cross. Among its advantages it numbers early ripening tendency, a quality which allows it to escape rust; stiffness of straw; heavy weight per bushel; good appearance of grain; and high milling and baking quality. In 1914 it made up about three per cent of the wheat acreage of Minnesota and the Dakotas. Since that time this variety has increased rapidly in popularity, and in 1919, only seven years after being introduced, it made up about 60 per cent of the total spring-wheat acreage.

As another instance of wheat improvement, may be mentioned the Kanred variety developed at the Kansas Experiment Station. It is a selection of one of the hard red winter

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By F. N. Darling

County Agent, Cabell County, West Virginia.

DEAN ALFRED VIVIAN of Ohio State University once made the statement that at least 85 per cent of the leading business and professional men were coun-

try reared.

We decided to put this statement to the test during one of the regular luncheon days of the Huntington West Virginia Kiwanis Club. There were more than 100 Kiwanians present, and 90 per cent of them raised their hands, signifying that they had been country reared.

It was right at this point that the club's agricultural committee saw its opportunity to start a real building program, for "We Build" is the Kiwanis slogan. A conference was held with the county agent and the follow-

ing plan of work outlined:

1. Secure 50 Big Brothers for the 4-H Club boys and girls. The main object of this work is to encourage these boys and girls in various ways. Financial aid is not required.

2. Cooperate with at least five communities in holding meetings. Furnish a part of the program.

3. Invite the whole club to visit

the 4-H Camp and lunch with the boys and girls.

4. Provide a program for two regular noonday luncheons.

5. Supply speakers for community meetings from time to time.

Conduct a roadside beautification contest.

This all happened nearly two years ago, and it is interesting to note the many pleasing results. Not only was every goal mentioned in the program reached, but much additional work done. Nearly every Kiwanian became so enthused over the agricultural program that it soon became the club's leading activity. Fifteen neighboring rural communities were reached in one way or another, bringing about a very friendly relation between the farmer and the city man, so much so, in fact that rural folks are now inviting the Kiwanis Club to furnish many of their programs.

The Big Brother project proved to be the most popular. In carrying this out each Kiwanian, and there were 62 or 12 more than the original goal, played the part of a buddy to some

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Why Burn Corn-stalks

By George H. Harrison

HAT should become of the corn-stalks?

Every year hundreds of

Every year hundreds of thousands of acres of them in the corn belt go up in smoke, for the farmers who burn them do not care to wrestle with them in the preparation of their fields for the new crops. Neither would they have them on the shovel points in corn cultivation time, nor yet on the surface to clog the hay of a new meadow that followed where the small grain was taken off. There appear to be a few excuses for burning stalks instead of conserving them, but there is one big reason why they should remain in the soil. help to prevent erosion.

There is some fertility to be gained from the decomposition of the fodder in the soil, but this is as nothing compared with the benefits from the stalks in the partial arrest of the sheet erosion that takes the best of the soil down toward the gulf. I have seen many farmers keeping the stalks on the ground at all hazards. When questioned, they gave as a reason that where the stalks remain, the washing is much lighter. This has to do with the rolling areas of the corn belt espe-

cially.

An example of this class is F. L. Lartz, apparently one of the best farmers in Cass county, Iowa, since his fields remain rich, his buildings in a high state of improvement, and his slate clean of debt. His farm is quite sharply rolling.

"I couldn't think of burning the stalks," Lartz explained. "If it were not for the stalks I keep plowing under, or disking to pieces in preparation of the small grain seeding, my fields would not be so rich, and then

there would be a lot of little ditches coming down the hillsides. If the ground were cleared off by burning them, it would give the water a full sweep. You see the stalks act like so many little dams. If the water does run over them, part of the soil, at least, is held behind them."

Also, Lartz finds that with the stalk left in the ground he gets more advantage of the rainfall. More soaks in because of the slower run-off.

Lartz is one of a great many who hold to that idea of soil erosion arrest by saving the stalks, and they reside and farm in the rolling areas. But when you go down on the level lands, there are farmers still conserving the stalks though they do not have much of the erosion problem. They will state, pointblank, that burning cornstalks is a rank waste of fertility.

Turned Under Soon

Joseph Ostertag living near Honey Creek, Pottawattamie county, is so well sold on the idea of corn-stalk fertility that he does not even allow his farm animals to clean them up in the fall. While men are picking the corn, Ostertag is following as closely as he can with his gang plows and turning the field under. The sooner the stalks can be plowed down, the more they decompose before the next cropping time, he avers. And he believes that the foliage of the stalks is more valuable fed into the soil than it is into the livestock. Ostertag is a mighty good and successful farmer. His is a farm of weedless fence rows.

Gilbert Akerlund, near Fremont, Neb., in the Platte river valley, makes use of the stalks because they make

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A fine field of certified Tennessee winter barley.

Controlling Loose Smut

By J. S. Wills

County Agent, Botetourt County, Virginia

HEN the Virginia Crop Improvement Association undertook some years ago the certification of seed crops, the control of loose smut (Ustilago Tritici) in wheat and barley was something of a problem. Certified seed must show less than one per cent of transmissible disease. In some instances fields of grain would show as high as 15 per cent loose smut infection by actual count, but meet every other requirement for certification.

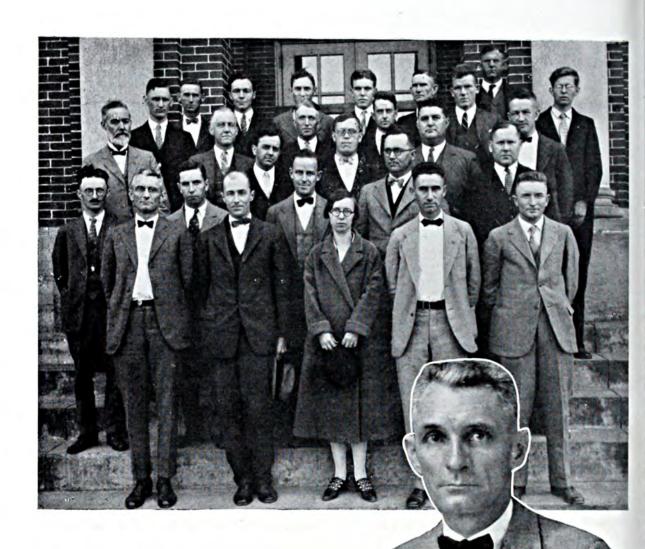
In order to control loose smut and its near relative, covered smut, the hot water method of treatment was resorted to with a very large measure of success. The work has been done on a larger scale probably in Botetourt county than anywhere else in Virginia. Large quantities of certified barley, as well as wheat, are grown in

this county and the hot water treatment of the seed to be planted has been practiced each year since 1922.

The treatment of grain by the hot water method may seem a bugbear to the uninitiated, but it is not half so bad as it sounds. On September 28, 1925, Jas. G. Godkin, Extension Plant Pathologist, V. P. I., and the writer, with the help of the farmers for whom the work was being done, treated 157 bushels in eight hours, and we have frequently treated 100 bushels in a single day. This, however, was group effort, but is as relatively simple when undertaken by the individual.

Considerable care has to be exercised in drying the grain after treating; a clean floor, such as may be found in the granary or barn on the average farm, is needed. Spread out in

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ALABAMA

Experiment Station

By P. O. Davis

Alabama Experiment Station

N the beginning of the Alabama Experiment Station Col. J. S. Newman, director, made the following statement in Bulletin No. 1, the first official report published July, 1888:

"An exhausted farm of 226 acres was purchased to be used for the purpose. Much of it was turned out on the commons; the buildings and fences on the remainder were in a very dilapidated condition. A large

M. J. Funchess, Director of the Experiment Station, and Dean of Agriculture, Alabama Polytechnic Institute, with his station staff.

portion of the land had been abandoned for cultivation on account of its poverty and gullied condition.

"Under these circumstances, with only one official connected with the station, the director who was also professor of agriculture, progress in development was slow, especially since the funds appropriated to the station were small in amount. Notwithstanding these difficulties, considerable progress has been made in some departments of the work—especially is this true of the horticultural department."

This report was a resume of the first five years—1883 to 1888. Field experiments had been conducted each year, and manuscripts for bulletins furnished to the department of agriculture for publication as required by law.

Work was divided into two general classes: first, the demonstration of facts already known to the advanced agriculturists, but not generally disseminated; and second, original investigation having for its object the discovery of truth.

On the equipment he added: "The equipment, so far as machinery and improved implements are concerned, has been, until now, inferior to that of an ordinary well conducted, private farm.

"Much time and labor has been expended in clearing up pine thickets, filling gullies, building fences, and arranging for a supply of water under pressure." Therefore, the Alabama station had a humble beginning.

Col. Newman was a farmer and a writer. He was a Georgian. He was the first director of the station and served from 1888 to 1891.

Research Started

Although the station was actually started by state act in 1883, it was not until 1888 that a well planned program of research work was started. The Hatch Act which had been fathered by Col. William H. Hatch, a Missouri Congressman, became a law that year and this appropriation of Federal funds marked the real beginning of the Alabama Experiment Station. It is said that Col. Hatch battled for a half dozen years before this act which perpetuates his memory was enacted into law.

From 1891 until 1902, Dr. William Leroy Broun, president of the Alabama Polytechnic Institute, was president of the board of direction of the experiment station. At his death in 1902 Dr. O. D. Smith, acting president, was acting director of the experiment station board for eight months. Dr. Charles C. Thach, new president of the college, then filled



Comer Hall, agricultural building, Alabama Polytechnic Institute.

this position for a few months, or until July 1, 1903, at which time John Frederick Duggar was made director. Professor Duggar served in this capacity and also as agriculturist for the station and for the college, until July, 1921, at which time Dan T. Gray was made director of the station and dean of the college of agriculture. He served in this position until January 1, 1924, at which time he was succeeded by M. J. Funchess, present dean and director.

Fertilizers for Cotton

Thus the station has had few directors. It has had no branch stations. As this is being written the legislature is being asked to appropriate funds for establishing and operating four branch stations on the four big soil divisions.

Early bulletins published by the Alabama station record the fact that from the beginning this station has been making inquiry into a large number of subjects. Fertilizer tests on different field crops, fruits, and vegetables, variety tests, insect and disease control, animal feeding and breeding, and other subjects have received attention from the beginning.

But the station is best known for its work on fertilizers for cotton. Here it has rendered its greatest service to the state. In recent years the annual fertilizer bill varied from \$15,000,000 to \$20,000,000, and 80 per cent of it went under cotton. Consequently, a study of fertilizers for cotton on the different soil types has been a major research project.

In the early days when the fertilizer business was struggling to become an industry there was a lack of uniformity and it was difficult to plan comprehensive fertilizer experiments. Later it became possible to plan uniform experiments based upon the different ingredients and by following a standard plan over a long period of years the station has learned what fertilizer makes the best returns on

the different soil types. In addition, considerable progress has been made in determining the amount to apply per acre.

Therefore, much waste in the use of fertilizer has been eliminated. Especially is this true of those farmers who have followed the results of the experiment station. No longer is fertilizer surrounded by mystery. Certainty prevails.

The work has proven beneficial not only to farmers but to the fertilizer industry. It has helped farmers by telling them what to use and how to use it, and it has helped the fertilizer industry by increasing consumption.

In working out what has become known as the "Auburn Method" for fertilizing cotton the Alabama station has taken a unique position. It has become nationally known. This work is invaluable.

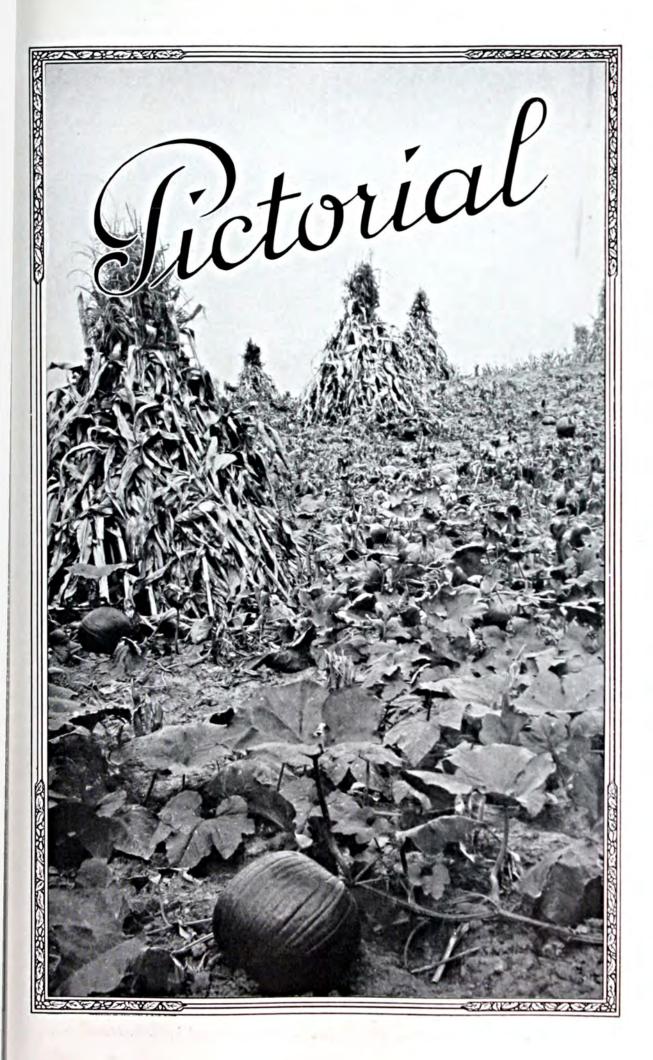
Winter Legumes

Perhaps the work on winter legumes ranks second in importance. the Alabama station took hold of the winter legume situation and set to work to untangle it and give the farmers practical information, winter legumes were hardly known except in name. Farmers here and there had tried them in a small way, but no one seemed to know how to succeed with them. It was a hit or miss proposition. Agricultural leaders were in the position of advising farmers to plant winter legumes without being able to tell them which one to plant and how to plant it.

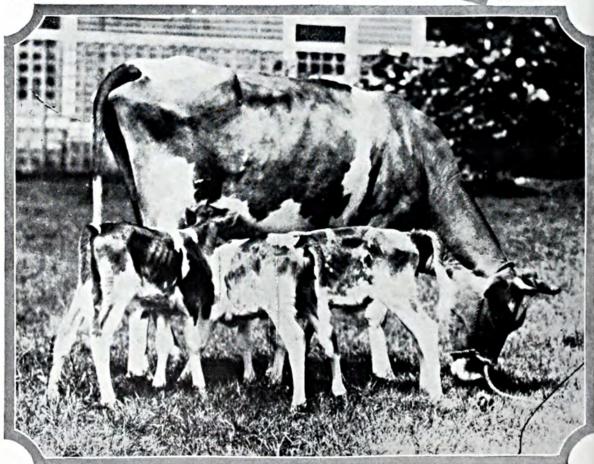
By a system of experiments the Alabama station learned the advantages and disadvantages of the different winter legumes. Those not measuring up were discarded. Meantime, fundamental facts were revealed as to how to grow them.

The result was that winter legumes narrowed down almost entirely to hairy vetch. In the lime land section a few farmers still hang to bur

(Turn to Page 58)

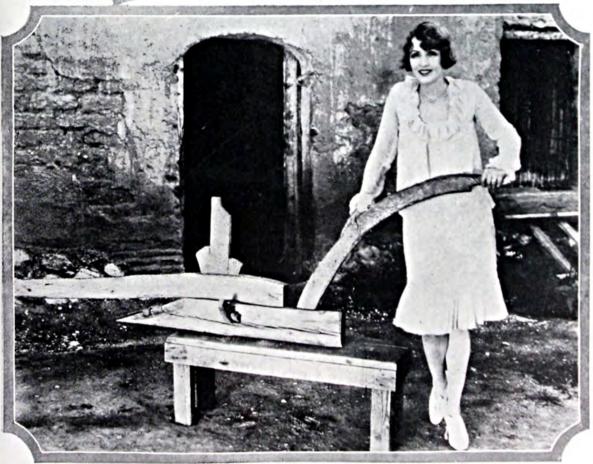






Only two weeks old are Tom, Dick, and Harry, the three young Guernsey calves with their mother "Claire of Fox Run". They were bred by Leon Whitcomb, superintendent of Maple Rock Farm, Pepperell, Mass., and are owned by J. B. Henderson.





Claire Windsor, motion picture star, is shown with the primitive plow that broke the ground for the old San Fernando mission. This mission was founded in 1812 and is one of California's most famous land marks.

Miss Helen Bernaby, last year's winner of the annual mowing contest at Durham, N. H., congratulating this year's winner, Walter Stickney, who mowed a quarter of an acre in 6 minutes $3\frac{1}{8}$ seconds.





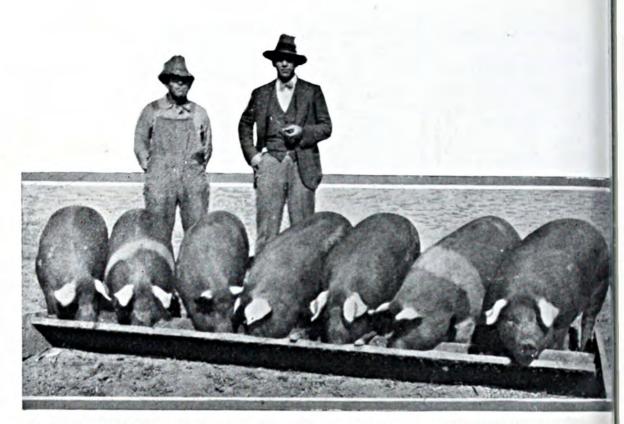
Miss Ellen Crossman of the Government bee farm at Somerset, Maryland, holding a honeycomb full of bees from the farm. Scientific studies are made of the habits of the bees. They are weighed before and after they have collected honey from flowers and the honey is studied for its chemical qualities.

An official of the Department of Agriculture Experiment Station at Beltsville, Md., where experiments are being conducted in an effort to help each hen attain her aim of "an egg per day".





Some of the last of the longborns are shown here in a lot in San Antonio, Texas. They are to be used for breeding purposes in restoring this famous and picturesque cattle.



These seven pigs, owned by Tom High of Walters, Oklahoma, reached the weight of 330.7 pounds each at the end of 180 days of feeding in a Ton Litter contest. This is believed to be the highest average weight reached by a litter in the United States.

The litter was cross bred, a purebred Duroc boar having been used on a purebred Hampshire sow. Of the 11 pigs at farrowing time, two were born dead and two others were chilled. Ground barley with forage over a range of 160 acres of land were the principal feeds this litter received. A profit of \$22.71 over feed costs was secured. The pigs gained an average of 1.81 pounds a day at a cost of \$6.33 per hundred pounds.



Dr. Henry G. Knight, new Chief of the Bureau of Chemistry and Soils of the U.S. Department of Agriculture, being sworn into office by Mr. R. M. Reese, Chief Clerk of the Department, on October 1. Secretary W. M. Jardine stands at Dr. Knight's left.



All days are good days. If we resist what the day brings, we make a "hard day." If we go about our work sullenly, doggedly, our work becomes the "daily grind." If we meet the day in a full sense of its blessings, we have a "full day"—a day of opportunities, in which we should rejoice. (Ex.)

All Days Good

In no home is the real and intended spirit of Thanksgiving so genuinely instilled as in the American farm home. To those who have ever had the privilege of sitting around its festive board comes an unforgettable

picture of peace, plenty, and reverence to a guidance that has seen toilers through another year of hard work.

Another Thanksgiving is at hand. We can rejoice with our farmers in the completion of another harvest. We are thankful to know that the year as a whole has been favorable to them. According to a report issued October 1 by the Bureau of Agricultural Economics at Washington, the farm situation is better than it was a year ago. The Bureau places the general index of purchasing power of farm products at 88 compared with 83 at the same time last year, the 1909-1914 five-year period being used as a base of 100.

In summing up the season's apparent production and returns in the different sections of the United States, the Bureau says: "It can probably be called an average year for the South; for the Wheat Belt a good year in the North and a fair year in the South; for the Corn Belt a fair year in the West, but a poor year in the East; for the Far West a good year in the range States and Pacific Northwest."

We know that there are farmers as well as others who are discouraged and disappointed with the results of their year's efforts. Let us remind them of the spirit with which the pilgrim forefathers in the face of inconceivable hardships and privations set aside the first day for Thanksgiving 307 years ago.

"The great rural interests are human interests, and good crops are of little value to the farmer unless they open the door to a good life on the farm."—Theodore Roosevelt.

Rural Yard Sticks

Rural life is getting itself measured. What the good country people neglect to measure for themselves, well-intentioned friends willingly measure for them. Thus, there arises the question of the yardstick and

there are a great variety available. Which one shall be used to measure the good and the bad in our country life?

This subject has been ably discussed by Liberty Hyde Bailey in an address before the Tenth Annual Meeting of the American Country Life Association held recently at the Michigan Agricultural College.

Dr. Bailey made one fundamental idea the theme of his address. He said, "I have been impressed for many years that if we made mistakes in our country life work the major ones are not in our reports. They are not in our findings.

They are not in our intentions. They are in the emphasis that we place on certain facts, certain points of view, certain positions."

Measuring all things by one thing; a habit that has held up progress in many fields of work!

A yardstick of immediate interest is the economic viewpoint. The speaker said that people in general overstress the relative importance of the economic situation. That is, we are measuring farming by economics. But, as Dr. Bailey pointed out, "I am casting no aspersion on the great science of economics, which must make a vaster contribution to us than in the direct realms of commerce and trade. It is said," he continued, "that commercial economics is founded in principle on the law of supply and demand."

Dr. Bailey apparently has grave doubts about the actual working of the law. He suspects that the law in commercial practice is not allowed to operate freely. "The lock-out, tariffs, discriminatory laws, and all kinds of conditions and regulations subvert the operation of the law of supply and demand. It is a question whether a regulated law of supply and demand is a law of supply and demand at all."

If this is so, how can commercial economics be soundly based on a principle that is only partially operative? Further and of much more importance, how can such "commercial valuations" be applied to "rural situations"? The speaker concluded on this point that it is a question if the commercial yardstick can be successfully used as a measure of the rural phase of our civilization.

Truly, the great science of Adam Smith has a responsible future before it—possibly a stormy future. All the more credit to our present agricultural economists who are blazing a trail through a tangle of misunderstanding to measure rural economic values by rural yardsticks. Probably, as time goes on, the world will learn something more of the workings of the law of supply and demand.

There are others who would measure the rural situation by the social group "and I think they are as far wrong as the other."

Another measure is dissatisfaction. Beware of "professional dissatisfiers." Dissatisfaction apparently is so quick to respond in the human breast that it can be organized and capitalized. Excellent advice! On the other hand, the speaker pointed out that all farmers cannot, under present conditions, be made prosperous and contented. For one thing, too many farmers unfortunately are on land that should not be in cultivation—marginal lands not fit for farming at least under present conditions. A vast question of national land utilization presses for solution.

The idea of limiting production is emphatically disapproved by Dr. Bailey. The idea is "not democratic" in his opinion and many people must agree with him. Over-production is undoubtedly an evil for the farmer, but it is equally doubtful, if the remedy is to be found in an arbitrary limitation of production.

Lastly, Dr. Bailey in conclusion points out "that we are too ready to measure all the elements of the rural situation in terms of our present-day standard. Farming is as old as the hills. We are trying to solve it by twentieth century criterion. No wonder we fail."

Country life is a mode of living. It can only be measured when it is lived for its own sake. It expresses the most fundamental of man's characteristics. Superficial measurements lead only to confusion. Since the dawn of history, farmers have managed to look after themselves and much of the world besides. Given what they demand, a fair and equitable opportunity with other great groups, and there is little doubt they will supply simple and unmistakable yard-sticks for expressing the real values of our national country life.

Hence lastly springs care of posterities;
For things their kind would everlasting make:
Hence is it that old men do plant young trees,
The fruit whereof another age shall take.

-SIR J. DAVIES.

Tree Census

An added interest has of late been taken in counting people and things. For the first time the Turks have recently carefully counted themselves, considering it so important that they stayed indoors all day to be counted. Most of us are content to be counted wandering about wherever we may be.

In the realm of counting things, there is a proposal before one of the House Committees for counting the trees of the United States. A tree census should be regarded as essential. It should be supported. Time and space both are required to grow a tree. As population increases, the need for trees will increase; though, unfortunately, it is the tendency as population increases to be more thoughtless and try and get along with less.

A debt, however, is owed to the future. In looking into the future, it is time that a tree census is made; that stock is taken of our diminishing national resources. It is essential that there be intelligent planning of the most productive policies of the future to bring home more forcibly to the consciousness of the people, the great esthetic and practical value we have in trees.

Spirits that live throughout, Vital in every part, not, as frail man, In intrails, head, or heart, liver, or reins, Cannot but by annihilating die.

-MILTON.

The Goal

Gallant efforts have been made to cross the ocean by aeroplane. Many such efforts have been made to reach America; to sail westward from the older countries America—or as the early voyagers called it, "that great

and land on the coast of America—or as the early voyagers called it, "that great tract of land stretching from the Cape of Florida unto those islands which we now call Newfoundland."

This great tract of land was the goal of mariners in the sixteenth century; it is still the goal of aviators in the twentieth. Something has been said about making laws to prevent aviators doing such things. While possibly the value of such exploits may be increased by some measures of coordination and control, no laws will stop a man expressing the faith that is his. Lives have been lost but the great faith, courage, and endurance of our forefathers are not lost. The Atlantic has recently been searched for those who have given their lives in these great enterprises. In the sixteenth century, as now, the Atlantic Ocean was searched for those who were lost in voyages of discovery of our coast. Witness the account of the last memorable voyage of Humphrey Gilbert, afterwards written by Hayes, Gilbert's Rear Admiral. The two were sailing in separate vessels—Gilbert in the Frigate—Hayes in the Hind:

"Monday, the ninth of September—in the afternoon the Frigate was near cast away, oppressed by waves, yet at that time recovered; and giving forth signs of joy, the General setting abaft with a book in his hand, cried out to us in the Hind so oft as we did approach within hearing: 'We are as near

to Heaven by sea as by land."

"The same Monday night about twelve o'clock—suddenly her lights went out—our watch cried the General was cast away, which was quite true. For in that moment the Frigate was devoured and swallowed up in the sea."

"Yet still we looked out all that night and ever after—omitting no small sail at sea."

That great tract of land from Florida to Newfoundland was discovered by the undying expression of man's faith and courage. It has been developed by the same supreme qualities and no laws that man can make will ever prevent him so expressing himself.

Would I a house for happiness erect,

Nature alone should be the architect;

She'd build it more convenient than great,

And doubtless in the country choose her seat.

—COWLEY.

Rural Roofs The Almighty made the country beautiful. Man seems to try and make it ugly. In fact, had Nature not had a few hundred thousand years start on man, it is difficult to imagine what some parts of the country districts would look like today. Possibly that is why Nature took so many hundreds of thousands of years to prepare the earth for man. She wanted an even chance.

Bill-boards and false front single story buildings are two abominations.

Progress is being made in getting rid of bill-boards, and those that must remain are being made more artistic. Every credit should be given to the agencies doing this good work. The ugly false front above many one-story buildings does not seem to have attracted so much attention. Just what impression a false front second story is supposed to create is difficult to say, since it is only by standing exactly in front of such a building that the illusion of two stories is even faintly created.

The roof of a house is the chief thing about it. It shelters the inhabitants; it is the sign of hospitality. The roof should be visible or at least there should be no effort to hide it.

Ruskin commented to the effect that we ask our friend to share our hospitality under our roof. We do not ask him to come and stand under our wall. There is nothing to be ashamed of, even of a roof of a one-story building.

The humblest home should have an honest and visible roof.

While there may be in many cases practical difficulties in building onestory buildings, there is by the same token a great field for some one to plan the smaller types of buildings of a type that fit into the rural background; buildings simple and honest in design, that are planned for those conditions; that because of their simplicity and honesty invite, and not by their sham and pretense repel.

Many fine examples exist, particularly the older types of homes and small buildings. A campaign is needed to make such suitable types better known.

Both bill-boards and false front buildings should go.

FERTILITY

"There is a definite relation between the fertility of the soil and the fertility of the human mind. People that live on exhausted, infertile soil are not mentally up to the standard of people living on soil whose fertility is maintained."

—Hubert Work, Secretary of the Interior.



By P. M. Farmer

Sheltered Machines Last Twice as Long

Whether or not it pays to house farm machinery may be judged by the reader after he has gone over the following conclusions of Professor J. C. Wooley of the University of Missouri:

A walking plow, according to the best averages obtainable, lasts 15 years if not housed, 20 if housed, and in either case costs \$2.25 for repairs.

A gang plow lasts 10 years exposed, 20 housed, and costs \$9.00 for repairs.

A corn planter lasts 4 years exposed, 8 housed, and costs \$13.34 for repairs.

A corn cultivator lasts 8 years exposed, 20 housed, and costs \$7.50 for repairs.

A mower lasts 7 years exposed, 12 housed, and costs \$14.15 for repairs.

A binder lasts 5 years exposed, 12 housed, and costs \$23.34 for repairs.

A farm wagon lasts 10 years exposed, 24 housed, and costs \$20.00 for repairs.

A disk harrow lasts 8 years exposed, 15 housed, and costs \$9.38 for repairs.

Corn Borer Becoming Dictator

The corn borer, in spite of \$10,-000,000 of Federal money spent recently to "show him," is becoming a dictator of crop methods in the region he has invaded. Even in those states where his hordes are expected soon, plans are on foot to change practices to meet the invasion. The fol-

lowing statement from Iowa State College shows how that state is concerned: "The arrival of the borer will mean changes in the crop rota-It will mean that no longer can farmers disc their oats into stalk Either the stalks must be fields. burned or plowed under very thor-The use of soybeans and oughly. other crops in the place of oats is a possibility. Varieties of corn which can be planted late and still mature will probably be used. Plows will have to be used which will turn under corn-stalks and trash very efficiently. A properly adjusted rolling cutter and jointer will be needed, and these supplemented by wires. Borers can not live in silage juices and hence the silo may receive more attention in many quarters. Also the shredding of cornstalks will destroy the borers so that this practice may increase. Because it is necessary to burn the stalks where borers are present, Iowa farmers should begin building up the organic matter in their soils by applying manure or turning under green manure crops such as sweet clover. It appears now that the borer does more damage in certain types of soil than others and more study needs to be given to determine in what soils they do the most or least damage."

Let Lightning Lighten Labor

Electrification of all farms of the country could be accomplished within five or six years if each farm set aside, for that period of time, an amount equal to the annual cost of operating the cheapest automobile, it is calcu-

lated by Prof. E. W. Lehmann, head of the farm mechanics department, College of Agriculture, University of Illinois. Farms of the country could be electrified within 10 years, he says, if each farm set aside, for that number of years, an amount equal to the annual cost of keeping one horse. "Human energy must be valued at a frightfully low figure," says Prof. Lehmann, "to compete with the electric motor in the performance of farm chores and work. From tests made by the Illinois college on rural electrification, when electrical energy was valued at 10 cents a kilowatt hour. it was found that 5 cents worth would wash 33 pounds of clothes, separate 1,000 pounds of milk or draw 250 gallons of water. In a recent report of the national committee on relation of electricity to agriculture, more than 200 uses of electricity on the farm were listed. If only a small percentage of these were practical for the average farmer, the field of uses for developing a load would be very great.

Reenforcing Wheat

Investigations by the crop chemistry laboratory of the Bureau of Chemistry and Soils, United States Department of Agriculture, have shown that by applying mineral nitrogenous fertilizers at the time wheat is heading, the protein content of the grain may be increased by about 30 per cent regardless of whether the soil needs nitrogen or not. Sometimes the protein in the wheat is increased as much as 50 per cent. This treatment also prevents "yellow berry" which frequently afflicts winter wheat and detracts from its value. though it usually happens that in wheat having a high percentage of protein the berries are shrunken, in the wheat obtained by applying nitrates at heading time the berries are just as plump and yield as much flour as normal wheat, and, because of the higher protein content, have a higher

food value. The increase in the protein of wheat not only adds to the food value of bread, but also improves the baking qualities of the flour. The loaves made from the high protein wheat obtained by applying sodium nitrate at the time the wheat is heading are larger and of better quality than bread made by exactly the same methods but from the flour of wheat not treated with sodium nitrate at the heading stage.

Forest Soils Hold Water

Soils in forested areas absorb more water and hold it longer than soils in the open, according to the Department of Agriculture in calling attention to the importance of different factors in flood control. The Department emphasizes the importance of results in this direction obtained by Prof. Bode of Iowa State College who found that the average content of water of soils in timber-covered areas, as well as the maximum and minimum contents, was above that for soils in unprotected areas. Seepage of soil water was found to be most rapid on open slopes following a rain, while it was greater in quantity, steadier, and distributed throughout a longer period in the timber areas. This backs up the theory that forests regulate stream flow, reducing the danger of floods, and preventing the drying up of streams.

Corn-Stalk Has Big Housing Capacity

That a corn-stalk may become a veritable apartment house for borers was shown recently near Toledo, Ohio, when 35 borers were found per stalk in one field. There are at least 10,000 stalks on an average acre which means, at this rate of infestation, 350,000 of the insects. It is to prevent this sort of overcrowding in corn-stalks that the big clean-up campaign has been carried on.



Foreign and Intermational Agriculture



The Oldest Station

By G. E. Langdon

Wisconsin College of Agriculture

NUMBER of the fields at
Rothamsted have been under known cropping for 88
years, and under the same treatment
for 83 years. The facts obtained
from the observation of these old
plots are not exactly new in any sense,
though they do grow more interesting through new developments as they
age.

The so-called grass plots, which have been in hay for 70 years, show some interesting things. They have proven conclusively that grass especially requires lime, and in addition is particularly dependent on a good supply of the minerals, potash and phosphorus. This is quite as true of legumes

They have found also, on careful analysis of samples from each plot taken every year, that the grass which yields the heaviest more often has less feeding value than some of the yields considerably less in weight but higher per gram in nutritive value.

In England they frequently refer to the color of grass as being "a healthy green" or contrastingly "an unhealthy green." A bluish gray green, which they term an unhealthy color for grass, is evident on those plots where an excess of ammonium sulphate has been applied. While there is a heavier growth on these plots, the feeding value, they find on analysis, is quite low. The contrasting green colors, depending on the

fertilizer applied, are quite apparent. Another clearly demarcative line divides the limed from the unlimed part of the field. Still another plot, unmanured and untreated for 60 years, is nothing but weeds of every description and kind. All plots are treated alike in that all of them are mowed at the same time every year.

The wheat plots are the oldest of all, dating back to 1837. The top yield of 35 bushels was attained by using a mineral mixture of sodium, magnesium, and potassium sulphates, plus superphosphate and what they term a triple dose of ammonium sulphate (618 pounds to the acre). This plot though had been fertilized beyond the point where the crop received paid a profit over the cost of fertility; it was beyond the point of "diminishing returns."

Man and Nature

One plot, unmanured and untreated in any way, since 1839 is still producing at the rate of 12 bushels. In 1882, just as an experiment they cut off a strip at the end of this wheat field, which had been constantly in wheat for 43 years. They allowed it to lie fallow and have never touched it since that time. It is now one of the most dense of miniature forests and impenetrable underbrush, showing what would happen to England if for so short a time as 50 years man's influence over nature should stop.

Another unusual bit of experimentation carried on in connection with these wheat plots is in the form of baking and milling tests, for the purpose of finding out whether different fertilizers have different effects on the quality of the end product of the wheat, as say bread. So far, they find there are none.

Some of the more recently under-

taken work at Rothamsted is in a statistical way of evaluating the effects of the weather on the wheat crop, as the effects of sun and rain separately, at different stages of the plant's growth.

At Rothamsted, mixed fertilizers including potash have been used with success on potatoes and beets, especially, and with other root crops."

Plant Hunters Return

P. H. Dorsett, an agricultural explorer for the United States Department of Agriculture, recently came back from Asia with thousands of selections of seed, plants, scions, bulbs, tubers and cuttings which it is hoped may contain many that will be of use in this country. Mr. Dorsett was assisted in his explorations by his son, J. H. Dorsett. Because of the importance of wheat and barley in this country and the increasing importance of soybeans and mungbeans, many selections of these crops were made. The explorers got together one of the best collections of soybean varieties ever brought in. They were obtained in Manchuria with the assistance of B. W. Skvortzow, a Russian botanist teaching agriculture in Harbin, Manchuria.

Manchuria grows about 70 per cent of the soybeans produced in China, and has more than 9,000,000 acres devoted to the crop, about 2½ times as much as grown in the United States. The mungbean is also an important crop in Manchuria and other parts of China, and is increasing in importance here.

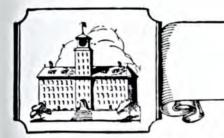
Among the ma

Among the many interesting methods noted by the Dorsetts was the winter storage of persimmons in North China. There the fruit is stored out of doors in a cold climate, and is unprotected except for a light covering of straw mats which later in the season is supplemented by loose hay, straw or corn stalks. The



P. H. Dorsett and his son, J. H. Dorsett.

fruits, averaging about 4 inches in diameter, are corded up in beds 12 feet x 18 or 20 feet in length and to a depth of six fruits. This method is possible because of the comparatively dry winter with even, cold temperature. The persimmon is peculiar in that it is not only benefited by frost but not injured by freezing. This practice is said to be unique in the world.



REVIEWS



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

What can be done to produce good truck crops when the national manure heap is getting smaller each year? This is becoming quite a problem all over the country. Experimental work has been done at various experiment stations showing that the right commercial fertilizers will profitably replace at least a part of the farmyard manure. Smaller amounts of manure, together with commercial fertilizers, will produce profitable results.

Additional evidence on this point is always welcome. A new bulletin on this subject is "Chemical Fertilizers for Greenhouse Lettuce," by J. H. Gourley, Ohio Agr. Exp. Sta., Bul. 408,

Aug., 1927.

The author shows that in greenhouses "on many soils the amount of manure may be reduced to half if it is supplemented with one-half ton of a 3-12-4 fertilizer (or one of somewhat similar analysis) and maximum com-

mercial crops be grown."

Another important result was that a complete fertilizer produced the best results, that is, a fertilizer containing nitrogen, phosphoric acid, and potash, in preference to a fertilizer containing one or two elements only. If no manure is available, it was found that for lettuce a ton of 3-12-4 or 3-7-9 fertilizer applied annually, together with a green manure crop of soybeans, may produce crops of lettuce that average 80 per cent as large as those grown with the manure, and in some seasons nearly as great.

This work shows that, on lettuce grown in greenhouses, commercial fertilizers have a very definite and profitable place in supplementing manure.

The state of Indiana keeps very detailed figures on the fertilizers sold in the state. A new circular (64 pages) No. 146, "Commercial Fertilizer," has recently been published, giving practical and authentic information on the fertilizers sold. The consumption of fertilizers has increased rapidly during the last seven years. Calculating on the basis of actual plant food in tons since 1920, nitrogen has increased 181 per cent; available phosphoric acid, 127 per cent, and potash, 312 per cent. This is very significant. It seems that the farmers are finding by experience that fertilizers are essential and profit-It also probably means that farmers over the whole of the eastern part of the corn belt are finding that nitrogen and potash are much more essential than they were years ago.

"Analyses of Commercial Fertilizers," Agr. Exp. Sta., Clemson College, S. C., Bul. 241, Aug., 1927, R. N. Brackett and D. H. Henry.

Soils

"Marion County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 34, Nov., 1926, R. S. Smith, E. A. Norton, E. F. DeTurk, F. C. Baner, and L. H. Smith.

"Will County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 35, Dec., 1920, R. S. Smith, O. I. Ellis, E. E. DeTurk, F. C. Bauer,

and L. H. Smith.

"Lee County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 37, June, 1927, R. S. Smith, O. I. Ellis, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Woodford County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 36, R. S. Smith, E. E. DeTurk, F. C. Bauer, and L. H.

Smith.

"Soil Survey of Iowa Woodbury County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Re-

port No. 40, May, 1926, W. H. Stevenson and P. E. Brown.

"Soil Survey of Iowa Page County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Report No. 41, June, 1926, W. H. Stevenson and P. E. Brown.

"Soil Survey of Iowa Jasper County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Report No. 42, July, 1926, W. H. Stevenson and P. E. Brown.

"Grouping of Soils on the Basis of Mechanical Analysis," U. S. D. A., Washing-ton, D. C., Dept. Cir. 419, July, 1927, R. O. E. Davis and H. H. Bennett.

Crops

Many publications on crops came into circulation during the month. Some of these are of a technical research nature, others intensive studies of special crops.

Of more general interest will be Arkansas Bulletin 222, "Effect of Different Dates of Planting Corn on Yields." C. K. McClelland, Asst. Professor of Agronomy, the author of the bulletin, while giving no conclusion regarding the best date for planting, analyzes conditions, results of experience, and comparisons of results so that many a grower may make his own decision with regard to date of planting his crop.

We want to also comment in this section upon the report of the U. S. Department of Agriculture on the "Cooperative Extension Work 1925," which is just being distributed. The report is quite complete on all projects and is well illustrated. should be of especial interest to all county agents and vocational teachers.

"The Inheritance of Red Plant Color in Cotton," Agr. Exp. Sta., Fayetteville, Ark., Bul. 220, July, 1927, J. O. Ware.

"Crop Yields from Illinois Soil Experiment Fields in 1926," Agr. Exp. Sta., Urbana, Ill.,

Bul. 296, August, 1927, F. C. Bauer. Thirty-ninth Annual Report of the Agr. Exp. Sta., U. of Ky., for the year 1926, Part 1., Lexington, Ky.

The Quarterly Bulletin, Agr. Exp. Sta., East Lansing, Mich., Vol. X, No. 1, Aug., 1927.

"Report of Three Acre Better Cotton Production Contest 1926," Ext. Dept., Mississippi A & M College, A & M College, Miss., Ext. Cir. 51, Feb., 1927, R. S. Wilson.

Thirty-third Annual Report of the Agr. Exp. Sta., U. of Mont., July 1, 1925 to June 30, 1926, Bozeman, Mont.

Fortieth Annual Report of the Agr. Exp.

Sta., of Nebraska, Lincoln, Neb.

"Fruit Varieties in Ohio, II," Agr. Exp. Sta., Wooster, Ohio, Bul. 407, Aug., 1927, J. S. Shoemaker.

"Walnut Drying and Packing in Oregon," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 227.

May, 1927, Ernest H. Wiegand.

"Investigations on the Harvesting and Handling of Bosc Pears from the Rogue River Valley," Exp. Sta., Corvallis, Ore., Sta. Bul. 228, July, 1927, Henry Hartman, J. R. Magness, F. C. Reimer, M. H. Haller.

"Varieties of Cotton in Northwest Texas," Agr. Exp. Sta., College Station, Texas, But. 364, Aug., 1927, R. E. Karper and D. L.

Jones.

Department of Agriculture Immigration of

Virginia, Bul. 236, Aug., 1927.

"Apple and Pear Picking Guide," Extension Service, Pullman, Wash., Ext. Cir. 14, M. D. Armstrong.

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Economics

One of the noticeable changes in agricultural production has been the expansion of the cotton belt to the North and West. The development in Texas has been accompanied by new methods of production; a greater use of machinery so that one man can handle a larger acreage of cotton than formerly. The extensive methods of production used in Texas are dis-

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Pages From A Field Note Book



Fertility Maintenance

By G. R. Cobb

Salisbury, Maryland

FOR generations the Insleys of Bivalve, Maryland, have been farmers. The old homestead on which George W. F. Insley now lives has been in the family for many years, and yet the fertility of the land has increased year by year. In the proper use of lime, legumes, and commercial fertilizer, plus some manure, the soil has been improved until now it is a question of maintenance of fertility rather than one of increasing this quality.

During the season of 1927, Mr. Insley spent \$1,704.32 for commercial fertilizer while the average expenditure per farmer in Wicomico county is but \$200. Mr. Insley, after checking up the yields obtained, together with the added fertility, is convinced that this large amount of fertilizer paid well on the investment.

For instance, in 1927 he cultivated and cut eight acres of asparagus on which he used two tons of bone in the spring, and, just after cutting the grass, applied five tons of a 7-6-5 commercial fertilizer. Next year, however, he will use a 3-8-8 formula as he is convinced that the crop needs more potash.

On 12 acres of sweet potatoes, he used 1,800 pounds per acre of a 3-8-8 commercial fertilizer. This is one of the two analyses most generally used on the Eastern Shore, the other being a 2-8-10 formula.

One of the largest crops grown on the Shore is tomatoes, and Mr. Insley had 16 acres of this crop on which he used 1,000 pounds of fertilizers per acre. Before setting the plants he applied 600 pounds of a 3-8-8 fertilizer and later, when the plants had become established, he side-dressed with 400 pounds of a 4-8-4 formula. Incidentally the 4-8-4 was at one time the only formula used on tomatoes, but recently the growers have discovered by experiments that the 3-8-8 gives larger yields and better quality fruit, thus a drift from the 4-8-4 to the 3-8-8 mixture.

Until recent years it was thought that on the Sassafras series of soils, phosphorus was the limiting factor, but work by the Delaware Experiment Station has shown potash rather than phosphorus to be the limiting factor on this type of soil. For this reason and because of results secured under farm conditions the growers are demanding and getting higher potash fertilizers.

Small fruits, especially raspberries and blackberries, have been the "hobbies of Mr. Insley for years and no one on the Peninsula has done more experimenting with these crops. As a result of his experiments, he has learned their likes and dislikes to such a degree that he now gets yields larger than any one else and a quality that tops the market. On these two fruits he uses commercial fertilizer at the rate of 800 pounds per acre analyzing 7-6-5. In addition to this he uses wood ashes and kainit "whenever the plants need them."

For cover crops Mr. Insley uses cowpeas. He also has several acres of alfalfa which he turns under for humus. Lime is used at the rate of 1,000 pounds per acre, but not regularly as he has learned that lime lasts longer than was supposed and also that unless green matter is turned under, the need of lime on many crops is not great.

Mr. Insley will cut from 1,800 to 2,200 bunches of asparagus per acre as compared with an average of 1,000 to 1,200 bunches cut on farms around him; 500 baskets of tomatoes per acre, whereas the county average is 200 baskets; 400 bushels of sweet potatoes per acre as compared with from 200 to 250 bushels; 3,500 quarts of raspberries and a like number of blackberries are 1,500 quarts better than the average other growers get per acre.

All produce is sold on the farm to buyers who come from Philadelphia, Baltimore, Washington, New York, and even as far away as Boston.

Because of superior quality of product, Mr. Insley secured an average of 40 cents per quart for raspberries, although he did get as high as 40 cents per pint for many crates; 30 cents per basket for tomatoes (these were used at the canning house of which he is part owner); for sweet potatoes \$1.25 per bushel, and for asparagus \$4.25 per crate.

Early in the season these prices were topped in most every case, but the above indicates the average during the season.

Potash and Potatoes

By Henry T. Maddux

Atlanta, Georgia

TWO series of potash demonstrations conducted this year on the farm of Mr. J. G. Padrick, Tifton, Georgia, under the supervision of Mr. Otis Woodard, horticulturist of the Georgia Coastal Plain Experiment Station, indicate that sweet potatoes need large amounts of potash.

The farmers around Tifton and throughout south Georgia have been using an 8-4-4 or an 8-4-6 fertilizer for sweet potatoes and, in some instances, a 9-3-3.

In the first series of the demonstrations the yield of No. 1 sweet potatoes was at the rate of 2,980 pounds per acre where 1,000 pounds of an 8-4-4 fertilizer were used. Where 1,000 pounds of an 8-4-9 fertilizer were used, the yield of No. 1 potatoes was at the rate of 4,116.8 pounds per acre. The increase in yield was 38 per cent. In the second series the yield of No. 1 sweet potatoes was at the rate of 2,604.5 pounds per acre where 1,000 pounds of an 8-4-4 fertilizer were used and 3,283.5 pounds where the same application of an 8-4-9

was applied, an increase in yield of 26 per cent.

Both demonstrations were ducted in the same manner. Porto Rico sweet potatoes were planted on March 25 with an 8-4-4 fertilizer at the rate of 1,000 pounds per acre on In both series muriate of all plats. potash was applied as a top-dressing to alternate checks at the first plowing at the rate of 100 pounds per acre. This gave an 8-4-4 on the check plats and an equivalent amount of an 8-4-9 on the potash plats. Crops from both series were harvested and graded on July 25.

The soil of the first series was a Tifton sandy loam at plat No. 1 with a gradual gradation to a Norfolk sandy loam at plat No. 7. The soil of the second series was a Norfolk sand. With a rainy season and a leachy soil, it is probable that not enough nitrogen was retained in the second series for potash to demonstrate its full value.

Detailed figures of both series of demonstrations follow:

FIRST SERIES

Yield Expressed in Pounds Per Plat. .15 Acre Plats

8-4-4	8-4-4 ぢ										
	Total	No. 1s	No. 2s	100 1	bs. Muriate	of Potash	per Acre				
1	563.0	513.0	50.0	1	732.1	680.1	52.0				
2	496.5	451.5	45.0	2	659.5	606.2	53.3				
3	497.0	460.0	37.0	3	641.2	590.4	50.8				
4	413.1	378.1	35.0	4	668.8	620.5	48.3				
5	541.1	488.3	52.8	5	777.1	716.1	61.0				
6	493.0	440.5	52.5	6	657.1	589.1	68.0				
7	453.0	397.6	55.4	7	572.3	520.3	52.0				
Totals	3,456.7	3,129.0	327.7	Totals	4,708.1	4,322.7	385.4				

SECOND SERIES

Yield Expressed in Pounds per Plat. .10 Acre Plats.

8-4-4	8-4-4 ぢ									
	Total	No. 1s	No. 2s	100 lbs	s. Muriate	of Potash	per Acre			
1	329.1	294.1	35.0	1	389.6	347.6	42.0			
2	273.8	238.6	35.2	2	327.5	296.7	30.8			
3	302.9	255.5	47.4	3	403.2	. 363.8	39.4			
4	301.6	253.6	48.0	4	343.8	305.3	38.5			
Totals	1,207.4	1,041.8	165.6	Totals	1,464.1	1,313.4	150.7			

Good Farming

By Earl Kilpatrick

Marianna, Arkansas

SEVEN years ago L. M. Brilbey bought for \$3,000, mostly credit, a 35-acre farm near Imboden, Arkansas. Two years ago he bought an additional farm paying \$125 per acre for 30 acres; \$3,000 worth of buildings have been built and paid for during the seven years.

Although the soil is naturally somewhat thin, it has been brought to a high state of fertility by proper terracing, crop rotation, and fertilization.

About five acres of sweet potatoes are grown each season. Most of the potatoes are sold locally and in the adjoining towns. He sold \$1,450 worth last season.

Potatoes are followed by wheat and

very often clover. His average yield has been 200 bushels of potatoes per acre.

He began using commercial fertilizer last season on three acres; 200 pounds of nitrate soda, 400 pounds of 16 per cent acid phosphate, and 100 pounds of muriate of potash to the acre. This plot made 1,080 bushels, or a rate of 360 bushels of potatoes per acre.

In addition to his farm crops, Mr. Brilbey specializes in white leghorns, selling eggs for hatching purposes and baby chicks. He grows the feed for his work animals, has his own milk, and sells a little surplus cream. A good garden helps keep down grocer bills and one-quarter acre of strawberries netted \$150 last season.

Cotton Linters

(From Page 14)

various qualities, and disputes and controversies arose. Moreover, when the war was over, the War Department had on hand a great confusion of qualities of linters in enormous quantities. At the request of the War Department, the U. S. Department of Agriculture worked out four tentative grades for these linters, but after this surplus was disposed of, the interest in grades for linters ceased.

Three years ago at the instance of the Interstate Cottonseed Crushers' Association the question of standardized grades was again given study by the Department of Agriculture. Since that time, work toward developing and perfecting a new set of standardized grades has progressed steadily. Now under the authority of the Cotton Standards Act, the Secretary of Agriculture has formally promulgated the official standards of the United States for American cotton linters. These consist of seven grades represented by 12 samples each and an eighth or descriptive grade which covers the form of linters known as Hull Fiber.

Industries Cooperate

In this work the Department had the continual assistance of leading representatives of the linter industries including a committee appointed for the purpose by the Interstate Cotton Seed Crushers' Association, a representative of the Better Bedding Alliance of America, and a representative of the American Cotton Linters Association.

The linter crop is handled in practically the same way as cotton. The baling is done in the same way and the size of a bale of linters is similar to that of a bale of cotton, for in almost all cases linters are baled in press boxes much like those used for cotton. Linters can be steam compressed, as cotton is, without injury to the fiber. Bales of linters weigh about 475 to 650 pounds each, but the average weight is about 500 pounds to the The crop is marketed through channels that are somewhat similar to marketing channels for cotton. Many firms deal exclusively in linters but some cotton dealers handle linters as well as the regular cottons.

The linter crop is almost exclusively an American crop, for the other cotton growing countries have not yet gone into the production of linters to any considerable extent. But the distribution of the crop is effected in Europe as well as in America, and the Bureau of the Census supplies monthly reports on our export of linters. Exports have gone beyond 600,000 bales during some years.

Soil Fertility for Business Reasons

(From Page 21)

of the men at the experiment station, or the advisers of the extension service, with which Mr. Poirot is always in close contact. His prolificacy of ideas in no way runs away with good judgment or his willingness to follow good advice.

These are some of the assets in the manager in addition to the farm practices that have done much to give to the Poirot Farms the attention of the farming public they justly receive in Lawrence county of Southwest Missouri.

"Extras" for Farm Hands

By Solon R. Barber

U. S. Department of Agriculture

ITY workers and industrial workers who know nothing about the "real" wages of farm help are apt to permit themselves the luxury of a snicker at what appears to them to be the pitifully low level of farm wages. They read, for instance, that "farm labor supply and demand are in close balance this year (1927), the supply for the United States as a whole being 100.4 per cent of the demand" whereas farm wages in the United States average \$35.59 per month with board, and \$49.54 without board. trial workers know that this wage scale (which, by the way, is a pretty fair average for long-time periods) is much lower than their own. Yet there seems to be plenty of farm hands ready to work for such wages.

As a matter of fact, the monetary wage does not represent at all the "real" wage of farm hands. Numerous "extras," the number and character of which depend on the section of the country and the liberality of the employer, go with the monthly pay envelope and contribute to the willingness of farm hands to accept a wage lower than their city cousins receive.

Says J. C. Folsom of the United States Department of Agriculture:

"The majority of farm operators give their men hired for the season various privileges on the farm or allowances of farm products in addition to their wages. Some of these perquisites have been customary for years and are given and taken as a matter of course. Others are so new that frequently the farm operator feels

they have been forced upon him that he had to give in or lose a good farm hand."

Married men get more of these perquisites than single men. Some farmers allow more than others. Farmers in certain regions are more liberal than those in other sections. But regardless of the number and character of perquisites granted farm hands, they all cost the farmer who hires the help a pretty penny and are worth consideration in a farm journal.

Mr. Folsom says that few farmers give their men cash wages without 'extras" of some kind. Board, lodging, house rent, fuel, milk, meat, vegetables, fruit, a chance to keep livestock of their own, feed or pasture for that stock, and the use of the employer's tools, horses, mules, or automotive equipment are the perquisites ordinarily allowed hired men by their farmer-employers. Garage space is a somewhat less common one. Some operators even allow their hands the limited use of their own automobiles, if they own them. A study made by the Department of Agriculture indicates that the "total farm value of the perquisites given each class of men (married and single) is nearly the same; for single men, \$30; for married men, \$31 per month. The single men usually get their board and lodging on the farm together with the use of their employer's horses and mules and vehicles, and garage space for their car. Of course the wages are less when the hands receive board and lodging. Not many married men are given board, "but the majority receive the use of a house or cabin.

and some fuel," the study says. In addition, they receive many other "extras" such as fuel, milk, meat, and one or more of the others listed above.

Board and lodging are the "extras" most costly to the farm owners who give them. "Board alone averaged over twice the value of any other perquisite reported," the study states. "The separate value of the more numerous perquisites given married men averaged lower; for instance, house rent, when given, \$9; wood or coal, \$4; dairy and poultry products, \$10; meats, \$5; feed for livestock the man was allowed to keep, \$6. Few men get more than a few of these perquisites."

The "real" wage of farm hands thus becomes much higher than the monetary quotations would indicate; from \$65 to \$75 per month. Furthermore, if the hired man had to pay average city prices for the "extras" he gets on the farm, he would frequently have to pay two or three times their farm values for them. Rent, fuel, light, in the city cost more than their equivalents on the farm, while if he had to buy milk, potatoes, meat, etc., at city prices the farm hand would pay much more than their quoted farm values and probably not use nearly as large a quantity of these necessities.

city worker has little opportunity, as a rule, to keep a garden, poultry, a cow. He must buy vegetables, eggs, and milk at city prices. Mr. Folsom says that "the average married man's perquisites, worth about \$30 per month, on the farm would probably cost him nearly twice as much if paid for in the city."

It is true that these "extras" cost the farmer himself very little in actual cash in many instances. Their value to the operator is little as compared with their value to the hired help. It is not often that the farmer is put to any inconvenience by allowing the hired hand garden or garage space, or to any particular expense for his help's use of farm tools or work stock. But the value in good will created between the workers and the operators is not so small. Good employers build up loyalty and affection in their hired help by allowing them privileges.

"Many farmers needing a good class of steady hired help should consider giving additional perquisites possible on their farms, especially those which cost little but mean much to the laborers," Mr. Folsom says.

In other words, giving these "little extras" is an excellent and practical way to attract and hold the best farm hands.

Room for Mushrooms

Cottonseed meal mixed with compost gives promise of being a means of utilizing the space under greenhouse benches for the profitable growing of mushrooms, according to F. C. Stewart, the mushroom specialist at the New York Agricultural Experiment Station, who has been carrying on a series of compost tests.

"The striking results obtained in these experiments," said Mr. Stewart, "indicate that cottonseed meal may have an important place in mushroom culture. Success with mushrooms is uncertain, particularly among amateur growers. It is quite possible that many failures are due to defects in the compost which might be remedied by the use of cottonseed meal. The material is inexpensive and easily applied. In our experiments it has been mixed with the manure at the beginning of fermentation in the proportion of about 69 pounds to 100 cubic feet of unfermented manure, or from six-tenths to eight-ninths of a pound per cubic foot of compost ready for the beds. It remains to be determined what quantity is best to use."

The Fertilizer Outlook

(From Page 13)

farm price of cotton was 21 cents. In December, 1926, the farm price was only 10 cents. The prospective yield in 1927 is only about 18 per cent less than last year. In addition to the farm price of cotton and cotton yield, other factors that influence consumption in the eight southern states are: cotton acreage, the fertilizer price index, tobacco price, and relative agricultural prices. Changes in these six factors account, under present conditions, for a large part of the variations in fertilizer tonnage sold each year in these eight states.

Under present conditions it is the composite effect of these six factors that decides the tonnage that will be sold in the following year. The composite effect of these factors now, October, 1927, indicate that the 1928 fertilizer consumption in these eight states will be considerably higher than in 1927. It will be another month however before a percentage increase can be estimated. This does not mean that the prospective increase will be uniform in each state. There will be

individual variations. Some states will increase more and others less. The present conditions of the six factors mentioned indicate that South Carolina, Alabama, and Louisiana will show the highest increase of fertilizer consumption, and North Carolina, Georgia, Mississippi, Arkansas, and Texas an increase, but less than the first group.

The outlook in certain tobacco areas in general is not as favorable for 1928, as it was for 1927. The price of potatoes is less than it was a year ago. Thus, while the outlook is for an increase in fertilizer consumption in the cotton belt, this regional increase is partially offset by probable declines in some tobacco and potato sections of the United States.

How much increase actually occurs, also depends a great deal on the amount of work that is done to help farmers make profitable investments in fertilizers. Certainly, the conditions are better on the whole than they were last year. The most should be made of the opportunity.

Reviews

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cussed in bulletin: "Large-Scale Cotton Production in Texas," Agr. Exp. Sta., College Station, Tex., Bul. 362, July, 1927, L. P. Gabbard, F. R. Jones.

The data presented in bulletin, "Cost of Feeding the Nebraska Farm Family," Agr. Exp. Sta., Lincoln, Neb., Bul. 219, June, 1927, J. O. Rankin, were obtained from a survey of 342 Nebraska farms. The average value of food consumed per family was \$735. An average of \$230 per family was spent at stores for food. The difference, \$505, was the estimated value of farm grown food consumed by the family.

The average consumption of food per capita (adult equivalent) was about 2,500 pounds. This is almost three times as much as the urban consumption. There is, however, a considerable difference in the type of food consumed on farms and in urban centers.

The rapid rise in the price and purchasing power of California grapes during the seven-year period, 1914-1920, stimulated planting. The increased production from these vine-yards has been accompanied by a general decline in the price of grapes. The primary factor affecting prices is the supply, thus the immediate outlook is

not very favorable. An analysis of shipments by regions and seasons is also given in "Economic Status of the Grape Industry," Agr. Exp. Sta., Berkeley, Cal., Bul. 429, June, 1927, S. W. Shear, H. F. Gould.

"Larger Markets for Montana Wheat," Agr. Exp. Sta., Bozeman, Mont. Cir. 135, August, 1927, E. J. Bell, Jr.

Diseases

North Carolina Ext. Cir. 166, "The Control of Covered Smut of Wheat with Copper Carbonate Dust," goes into detail with instructions and pictures on a practical method of saving Southern wheat growers hundreds of G. W. Fant, the dollars in losses. author, states that from 10 to 40 per cent lost in the wheat crop from smut in individual fields is not unusual in North Carolina. "Spraying for the Control of Fig Rust,"

Agr. Exp. Sta., College Station, Texas, Cir. 47, July, 1927, W. B. Lanham, R. H. Wyche, R. H. Stansel.

Insects

Of wide interest will be "Further Experiments with Poisoned Baits for Grasshoppers," Nebraska College of Agriculture, Res. Bul. 41, written by N. S. Swenk. Grasshoppers take a large toll in forage crops all over the United States each year. Many sections undoubtedly can use to advantage the information contained in this bulletin.

"The Tobacco Budworm and its Control in the Georgia and Florida Tobacco-Growing Region," U. S. D. A., Washington, D. C., Farmers' Bul. 1531, A. C. Morgan and F. S. Chamberlin.

Postponing Hunger

(From Page 24)

varieties and is resistant to the forms of leaf rust and stem rust which occur in the hard, red winter-wheat district. It is winter resistant and has outyielded the most commonly grown commercial varieties by four bushels per acre based on a 10-year average. About 2,000,000 acres of land were seeded to this variety in 1921. If the 4-bushel increase was maintained, the 8,000,000 additional bushels of wheat produced would be capable of furnishing the wheat bread ration for 1,400,-000 people for a period of one year.

It is possible to continue, almost without end, giving examples showing how through plant improvement our food supply can be increased without increasing our cultivated acreage. One is safe in predicting that plant improvement achievements in the future will far surpass those of the past. If this prediction proves true, it is difficult to say how long it will be before our population overtakes our food supply.

If agricultural science, while yet in its infancy, has obtained such notable results, can we not expect infinitely more of those who follow us, profiting, as they must surely do, by their discoveries as well as by the accumulated discoveries of the past? of us are interested in the future as it affects our population and food It presents a complex problem. Much remains to be done which will affect the future. We have barely started to utilize the possibilities of plant and animal improvement. As the demands of necessity for more food increase, man's efforts will increase in an attempt to meet them. Much which now seems impossible will be made possible through the application of science to agriculture.

[&]quot;I think there is company downstairs."

[&]quot;How do you know?"

[&]quot;I just heard Mamma laugh at one of Papa's jokes."

Why Burn Corn-stalks

(From Page 26)

for both fertility and better aeration of the soil. He bemoans the fact that while a good many farmers buy stalk cutters, most of them neglect to use them, and so many good stalk cutters rust out instead of wear out.

Corn-stalks are something wrestle with if they are not properly handled, Akerlund admits, but he says his plan for cutting them up has

everything else beaten.

He saw the disuse of the single-row stalk cutters that brought low prices at public sales. He went about it and bought three of these units. he assembled them into a big wooden frame so they would cover three rows at a time, and to this he hitched his farm tractor. With such a plan, stalk cutting in the spring is a short job, and it can be done before other work is due. Cutting the stalks into the short lengths puts them into shape so that they give little or no trouble for the other implements to follow.

It may not be really a shame to see the stalks burning all over the coun-

try every year, for possibly the farmers who burn them can show good reason for their acts. Possibly their land is too rich as it is; possibly they need to have its face washed a little more than stalk-covered land would permit; or maybe they require a few grooves down the hillsides to break the monotony of the rounded contour. It is a fact that corn-stalks, too many of them in the soil in a droughty year, aggravate the drought, because they do liberate a little moisture. that only applies in an occasional year, and then mainly toward the arid districts farther west. There is no more excuse for firing the corn-stalks in the field than there is for setting fire to the straw stack. Both have value.

There will be time enough to burn stalks after the full advent of the corn borer, but while yet the fields are free from that pest, let's keep that other pest, the fire, entirely away, and prepare stalks in a modern way for the best burying possible.

Kanred Wheat Makes Record

The Minister of Agriculture of Argentina, one-time ambassador to the United States, has long taken a great interest in agricultural developments in this country and has always been quick to adopt anything that might benefit his own country. For some time he has been watching the development of Kanred wheat and last year he secured 200 tons of seed of this new variety which was developed at the Kansas Agricultural Experiment Station from seed brought from Russia in 1900 by the U. S. Department of Agriculture. As a result of this experiment in Argentina, the

Kanred wheat outyielded the varieties commonly grown there by from 50 to 100 per cent. The present Argentine ambassador at Washington, Honorio Pueyrredon, reported to the Department of Agriculture that from 960 acres sown by one farm corporation an average yield of 19.4 bushels per acre was obtained and in some cases the yield was even higher.

When sown under the same conditions as one of the leading varieties of Argentina, a variety which obtained a medal at an Argentine exposition last year, the Kanred yielded 90 per

cent more.



The Bulletin

(From Page 9)

tion. If it is to be given a welcome it, too, must possess the features that will beckon the farm family inside its covers. Though the name of the institution carries prestige and authority, these alone are not sufficient to guarantee the bulletin a thoughtful reading. Because of a realization of this, from many agricultural colleges the farm bulletins and circulars now come as works of art.

Unlike their predecessors the modern agricultural bulletin and circular strive to make a distinct appeal to the farm folk. When illustrations are used they are chosen for their ability to tell at least part of the story related on the inner pages. The title is as short as is consistent with a clear understanding of the subject, and it is given the most prominent display. Subordinated to it is the name of the institution publishing it, the number of the publication, and the date. The author's name has either disappeared from the front page, and is now to be found on the inside, or else it is set in smaller type faces on the cover.

Big Brothers

(From Page 25)

boy or girl who belonged to a 4-H Club. Since this 4-H Club member was doing some definite piece of work, such as the growing of a pig, a calf, or some special canning and sewing projects, the Big Brother was given many opportunities to encourage his little brother or sister.

Here are a few examples of what actually happened in 15 rural communities. A Big Brother, upon making a personal visit, found that his 4-H friend was about to give up the idea of going to high school. After

talking things over in a heart to heart fashion, the boy was finally persuaded to enter school this fall. The Big Brother has made five different visits to the boy's home, proving that he is a real Kiwanian.

Another Big Brother and his family spent a whole Sabbath day at the 4-H boy's home. The result has been a very close friendship. So pleased was the father of the boy, that he brought his two young sons to the Kiwanian's place of business the following week. This same Kiwanian

further spread his influence by giving his country friend some used magazines and books, which were not only read by the boy and his parents, but by several other families in the community. It is no exaggeration to say that Kiwanis has become a byword in this community. Is not this kind of contact worth while?

Two years ago a red-headed 4-H girl invited her Big Brother to attend a picnic party. Our Kiwanian became so interested in the little girl that he offered to give her financial aid towards her schooling. More than that, he offered her a position in his place of business when she should have completed her schooling. Our little sister accepted the kind offer and is making every effort to fit herself for a useful position in life.

In many community meetings our Kiwanians played an important part in the program. President Sisler was the principal speaker at the annual meeting of the Farm Bureau. There were many other Kiwanians present. The Kiwanis Chorus rendered a fine musical program at a recent meeting in a country church. The entire Kiwanis Club with their families attended the county picnic at the County 4-H Camp.

Is there any better way to build the future generation of the city, or to bring about a closer relation between the country community and the city, than the plan adopted by the Huntington Kiwanis Club? If there is any civic club that wants to render some real service, we heartily recommend this project.

Hungry Soils

(From Page 18)

experiment fields, etc.

Mr. Amundson, fully appreciating the importance of the soil problems of

his county says,

"It isn't hard to get farmers to adopt sound practices. If the idea is right it is soon recognized. You can't fool farmers or get them to adopt impractical schemes for doing their work. We must reduce our recommendations to the practical things which the average farmer can follow."

But before we can teach farmers, we must know ourselves. A knowledge of the fertility requirements of our soils is prerequisite to everything else. Some soils need phosphates, some need potash, others combinations of these elements. In fact there are some soils which need only good management and proper systems of cropping.

If Mr. Amundson had taken the blanket recommendations of the Soil Department of the College, he would have been recommending lime and phosphate where potash was the chief limiting element. He would have

failed in his demonstrations and farmers would have lost faith in their county agent.

Our lime and phosphate campaigns have resulted in much good in Wisconsin, yet there have been counties and localities where neither lime nor phosphates were needed, and county agents should be informed as to the fertility requirements of the soils of their county in order to get their farmers started in right practices in the use of fertilizers. Campaigns for the use of lime and the use of phosphates where these elements are needed chiefly in a given locality are valuable, but it would be better to put on campaigns in which soil fertility is stressed rather than the need for any particular element, since there is danger of getting farmers started in the wrong practice in the use of fertilizers.

Soil fertility campaigns should always be a part of the program of the county agent, but county agents should know their soils.

Leading Farm Folks

(From Page 12)

Perhaps his attitude is that of a real leader of farm folks. he has had wonderful help from local leaders, for during the year it is officially recorded that 432 men and women gave generously of their time to act as chairmen of committees or in other types of active local leadership.

Benson has been the inspiration of his leaders and the balance wheel that has kept the work going along constructive lines. All this he has done for the sake of the ideal, "That farm life may be so changed that there shall be a happy and contented family on every farm in Knox county."

Controlling Loose Smut

(From Page 27)

a thin layer and stirred several times a day with a garden rake or similar tool, it dries very quickly. However, the grain may be planted immediately after treating provided it is well drained and the drill is set to allow for swelling.

Plant pathologists tell us there is no other effective remedy for loose smut in wheat. In barley it may be partially controlled by the formaldehyde treatment, but the experience of Virginia growers of certified grain has been that all smuts-loose, covered, and stinking—and perhaps some other diseases in both wheat and barley, are completely controlled by the hot water method.

In five years' work with smut control in Botetourt county, results have been almost perfect. No greater in-

fection than a trace has been found in any of the treated fields, and there is good reason to believe that this slight infection was due to top-dressing with manure in which infected straw had been used as bedding.

One lot of barley treated October 2, 1924, came from a field in which there was 14 per cent infection and for this reason could not be certified, came through the following spring without a trace of smut anywhere in Another field sowed from the same lot but untreated showed 11 per cent infection.

It is estimated that the average annual loss in Virginia from loose smut is three per cent or about 300,000 bushels, yet some farmers say that smutty heads are a sign of a good

crop.

Alabama

(From Page 30)

clover and crimson clover. More recently Monantha vetch has been introduced by this station, and it promises to replace hairy vetch because it matures earlier and it is a seed producer.

However, it, too, was introduced into the state by the experiment station. The Austrian winter pea is another leader.

Not only have these been introduced, but facts about their growth have been worked out and promul-

Due to this winter legume work Alabama farmers know how to add to the soil all the nitrogen they need, and along with it a large tonnage They know how to enof humus. rich their land during the winter without interfering with the produc-

tion of summer crops.

With a crop of winter legume they can add 50 pounds to 200 pounds of organic nitrogen per acre in one season. The minimum amount is more than the average farmer applies when he is buying commercial nitrogen. When all farmers in Alabama grow these winter legumes they will save approximately 50 per cent of the annual fertilizer bill of \$15,000,000 to \$20,000,000. Therefore, this work alone is leading to a saving of millions of dollars annually.

Another Achievement

Another major achievement of the Alabama station was the development of better varieties of cotton. 307, Cook 1010, and Cook 588 are three of the leading varieties of Ala-They were developed bama cotton. at Auburn. Cook 307 is a wilt-resistant cotton which with Covington-Toole, another wilt-resistant variety but not developed at Auburn, constitutes most of the cotton produced on wilt-infected land in Alabama. fore these wilt-resistant varieties were developed, cotton production on large areas of Alabama was not profitable due to wilt which was very destructive.

Cook 1010 and Cook 588 are lead-

ing varieties in other sections.

developing and establishing good varieties, rag-tag varieties have been eliminated. Cook and Cleveland strains of cotton are now favorites throughout the state. Therefore, Alabama cotton is being standardized due to the work of the experiment station.

Likewise, vari-

ety tests of corn have revealed the best varieties to plant. The station has not developed a variety of corn, but merely tested the different known varieties. Weekley, Whatley, and Hastings are the three leaders.

The station is now turning its attention to machinery and power for Alabama farmers. The director and his staff realize that Alabama farmers are facing a huge problem in cot-

ton production.

Not many years ago the West sent to the East the boll weevil which revolutionized farming in Alabama and other states east of the Mississippi River. More recently Texas and Oklahoma have sent to them a challenge to either make cotton cheap, reduce their standard of living, or quit making cotton. This problem is being tackled from a power and machinery standpoint in addition to information already worked out on fertilizer, variety, and production methods.

Poultry work is becoming a major project because of the growing importance of poultry. Here the station is making another major contribution to Alabama agriculture.

The work of the Alabama station on insects and also on animal feeding and breeding as well as vegetables and fruits has been done along

> lines similar other stations. Wherever a problem has arisen in Alabama agriculture, the experiment station has undertaken solve it. In most cases it has succeeded, and this success has rethe turned to state and the nation a hundredfold dividend on money spent in research.



Potash Salts

Muriate of Potash	80-85% KCl
Sulphate of Potash	
Sulphate of Potash-Magnesia	
Manure Salts	
Manure Salts	20% K ₂ O
Kainit	14% K ₂ O
Kainit	12.4% K ₂ O

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Where Home Dollars Do Home Work

(From Page 8)

ized by the bank among the school children of the country districts. Officers of the bank give personal instruction in the processes of banking, so that banking may be better understood and some of the diffidence in using the bank removed.

Finding that it paid to help the farmer, the bank did not stop with the purchase of cattle. It soon began lending money to the farmers with which to improve their farms and farm buildings. Money that was formerly sent to the city for investment is now kept at home and put to doing home work. Instead of developing industries that would eventually draw many of the young people away from the farms it now goes to develop the farms and to make farm

life more interesting and profitable. This has done much to encourage the boys and girls to remain at home.

Prosperity Reflected

The prosperity of the whole community is to be found reflected in the improvement of the banks. The profits that have come to the farmers on account of increased and improved farm business are deposited in the local banks and again lent out to improve other farms and create new wealth. And like the rolling snowball it becomes greater with each revolution.

Let's see what the effect on one of the banks has been.

In October, 1916, when the first

carload of cattle was brought to Grove City the bank's deposits were \$894.445.46. On January 1, 1918, — 15 months later — they totaled \$1,325,308.28, a gain of \$430,862.82.

During the same period the number of depositors increased from 4,614 to 5,343. The radius of bank patrons widened from five miles to ten. In this short time, 146 farmers bought, through the bank, purebred cattle.

A conservative estimate of a year's gain in country deposits, due to the bank's aggressive program, is \$150,-000, or a third of its total increase. Of the total deposits of about \$4,-000,000 in both the Grove City banks

close to half represents farmers' accounts.

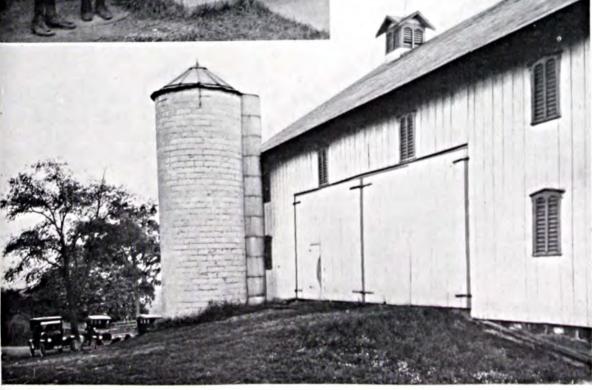
Increased financial prosperity, however, is only a small part of the gain that has come to the community. Better schools, better churches, better homes, and better social conditions generally are coming as a result. The people have learned to work together with a community spirit. The gulf between the town business man and the farmer has been bridged.

There's a lesson in the Grove City project for thousands of small towns all over the United States. It may not be dairying but some other latent possibility that only awaits the vision

of the community — and the will to bring prosperity home.



Left: Some of the young consumers of the creamery's products. Below: Ear-marks of the practice of better farming.



Gratitude

(From Page 4)

at the receiving end might make all concerned more satisfied and grateful.

Everything is planned to save steps and cater to comfort. Children are reared in a radio-motor mania, develop "nerves" and are unbearably peevish if the funny sheet is missing

on Sundays.

In public life it is the same. We elect a hero to office amid acclaim, and then proceed to tear his reputation to pieces in a fortnight. Columbus was not the only public man to feel the pangs of an ungrateful world. We have had our Deweys and Wilsons, who felt the sudden and unreasonable backwash of public opinion.

It is to be hoped that Lindbergh will never even so slightly let himself in for possible criticism for an overt act, for if he does the ravens of rapacity will croak so loud that the glory of May, 1927, will be tarnished.

The man who said "the bigger they are the harder they fall" was well up on the high mortality rate of human

gratitude.

YET we are not so much a devotee of Menckenism that we refuse to see that there are extenuating circumstances — conditions nowadays that choke out the natural growth of gratitude.

Lack of gratitude exists because of ignorance of our benefactors due to the bewildering rapidity of invention

and discovery.

A man named Jenkins of Washington, D. C., invented the first motion picture reel. Perhaps some may not consider him as a serious candidate for gratitude (considering Fatty Swashbuckle, et al)—but at any rate, you'll agree that Jenkins is not found on the household shrine beside Babe Ruth, Henry Ford, and the Smith

Bros. (Trade and Mark.)

Since his day, have come others who have perfected the projection lenses, improved the screen, "de-flickkerized" (and perhaps) devitalized the silent drama, improved the technic of love making and pie throwing—and in generous but forgotten measure rendered yeoman service to us all.

Every school kid knows that the Wrights of Dayton were the fathers of aviation in its crudest forms; but who can name the men who are improving airplane engine lubrication, compass control, and wireless direction guides as the era of aviation rap-

idly unfolds?

In plainer terms, I bet you can name the substantial grub you found in your old battered school time dinner-pail, but have forgotten the multitude of courses you consumed or refused at the Rotary banquet last week.

"Too much is enough," is a maxim that can be put forward to excuse ourselves for our ignorance and our confusion, with its inevitable ingratitude. We are simply moving too fast to count the milestones or praise those who erected them.

RATITUDE in this age is a sluggard. It takes a big noise to wake her up. Our wonder and pleasure are chiefly aroused by the spectacular, the bizarre, the lurid, the thrillers.

The hum-drum hero is out of luck. Gratitude is measured by the head-lines. The reporter often dictates when we shall be grateful and glowing to some individual for performing a public prank of prowess. Likewise, the newspapers help us to select and dispense our charity, so that we cannot even be grateful to ourselves without outside interference.

At the time when the chewing gum

rictims provided a purse for the Channel Swim, and the telegraph news service of the continent was listening or the first splash of the oily victor; it the time when over-seas flights were the top headliners of the international press-two heroes of great valor died innoticed, unmedaled, and unsung.

Down in Alabama a soldier of the Spanish-American war died in poverty, and he was the man who sacrificed his body to the research chemists to control yellow fever in Cuba. Yes, I am also lacking in something, for I have forgotten his name. But the fellow who won the spearmint race was young Young.

Last May during the airplane furore a single intrepid river man in Mississippi saved more than three hundred souls from certain death because he knew the vagaries of the channel and the best way to get them provisions.

He got a paragraph, but Congress has not struck off any medals for

him that we know about.

The comforting thing about such cases is that he-men of that kind are not usually looking for plaudits, being content to take their thanks in the tearful admiration of the home folks.

Then of course, in later life he will have something nice written to engrave on his tombstone. helps!

IF anything at all definitely shows how bad off we are for supplies of natural gratitude, it is the w. k. sad case of the embattled farmer and his kindred. Tag along and I will state the case. Ever since the Pilgrim Fathers celebrated the first Thanksgiving on a feast of clams and parched corn, holed in against the irritating Indians, agriculture has until recently taken the good with the evil in a stoic manner quite credit-

Inured to hardship and the wind through the cabin chinks, used to toil and disappointment, long treks to a

small market, and getting few free favors, the farmers who made America were people of neighborly grati-They appreciated what they got and surrounded their occupation with an aura of blessed bucolic content.

But of late we have seen some leaders arise with the penchant for seeing how many things farmers could rake up to growl and be ungrateful They are bound to knock all that sentiment of gratitude into a cocked hat, for they say farmers are entitled to become as complex, as confused and as bitterly ungrateful as anybody else. This they must and will get through a higher standard of living in ever-increasing ratio, adding to the misery and piling up gallons of gall and cords of worm wood.

These spokesmen are teaching ingratitude to government for farm legislation or the lack of it, yelling against college and experiment farms, and are belittling bulletins and dem-

onstrations.

A mean man always turns first on the friend who has placed him most The false prophet always preaches hate and strife. ture will never have real satisfaction if it forgets gratitude. So it is with all walks and all callings. Unless a man has a good memory for good deeds done him and bathes his soul sometimes in gratitude, what real satisfaction can he realize at the end of his work?

Even a dog has it.

And at this moment I take occasion to place myself in your deepest gratitude, for this is positively the end of my essay.

HIGH COST OF IGNORANCE

Senior-"What will it cost me to have my car fixed?"

Garageman—"What's the matter with it?"

Senior—"I don't know."

Garageman-"Fifty-two dollars and sixty cents."-Yale Record.



A PROSPECT

"Oh, darling," he murmured, "I love you so. Please say you'll be mine. I'm not rich like Percival Brown, and I haven't a car, or a fine mansion, or a well-stocked cellar like Brown; but, darling, I love you better than life itself. I cannot live without you"

Two soft, snowy white arms stole around his neck, and two ruby lips whispered in his ear: "And I love you too, darling; but where is this man

Brown?"

Proud Parent (who served)—
"What I told you is the story of the
World War."

His Son—"But, papa, what did they need the rest of the army for?"—
Answers.

When you trip, fall forward and get up farther along.

Mistress—"You tore up your references? You silly girl!"

Prospective Maid—"You wouldn't say that if you'd seen them."

Cinderella—"Godmother, must I leave the ball at twelve?"

The Good Fairy—"You'll not go at all, if you don't stop swearing."—
The Enamelist.

WHERE IT LANDED

Little Boy—"Please, may I have my arrow?"

Lady of the House—"Why, certainly, where did it fall?"

Little Boy—"I think it is stuck in your cat."

STILL BUBBLING?

Little Boy (returning from swim)— "Mother, papa certainly is a good swimmer."

Mother—"Why, sonny, your pap: can't swim a stroke."

Little Boy—"Well, anyway, he car stay under water a long time."

THE MODERN BOY

Nurse (to eight-year-old Bobby)—
"Would you like me to show you the
nice, cute, little baby the stork
brought your mother?"

Bobby—"Naw; show me the stork."

That he might patronize the institution of his employment, Sam, the colored janitor of a bank in a northern city, had drawn a check for \$350.00 on the colored bank in his home towr in Georgia. It had just been returned with a slip attached, "Not cashed for the lack of funds." The cashier, after being assured by Sam that the money had actually been deposited there wrote a very caustic letter to the cashier of the colored bank. In due time this answer came back, "Wen we sends back a check saying thar ain't no funds, we all don't mean that the customer ain't got no funds; we means we ain't got no funds."

FALSE ECONOMY

Browne—"Did you give your wife that little lecture on economy you talked about?"

Baker—"Yes."

"Any result?"

"Yes—I've got to give up smoking."—Answers.

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WHEN you have surplus funds to invest, play safe! Invest in Federal Land Bank Bonds—safer than any single first farm mortgage. Back of these Bonds are mortgages on more than 400,000 farms valued at over twice the amount loaned upon them. The

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Send for Federal Farm Loan Circular No. 16, "Financing the Farmer," to

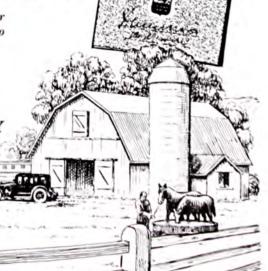
Charles E. Lobdell, Fiscal Agent

Federal Land Banks

31 Nassau St.

NEW YORK CITY





FEDER

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Is each acre giving the maximum in yield and quality? It is easy to make your farm do its best because most trucking soils, though deficient in plant food, are very efficient in rendering fertilizers available to crops. The grower has it largely in his power to determine crop yields and quality by the amount and kind of fertilizer he applies.

You can easily find by a simple test whether you are getting all the profits you should. Give a few rows a substantial increase in fertilizer over your usual application. Be careful to weigh yields and note marketable quality of these rows at harvest time. See if they stand out.

Sanford, Florida, celery growers have found that increased yield of better quality at a lower cost per crate parallels to an extent the increased use of high analysis fertilizers. Today they lead in intensive fertilization, applying four to five tons per acre on their celery and—the curve of profit is still rising due to bigger acre yields of better celery.

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R. H. STINCHFIELD, Managing Editor SID Noble, Editor

Editorial Offices: 19 West 44th Street, New York.

VOLUME X

NUMBER ONE

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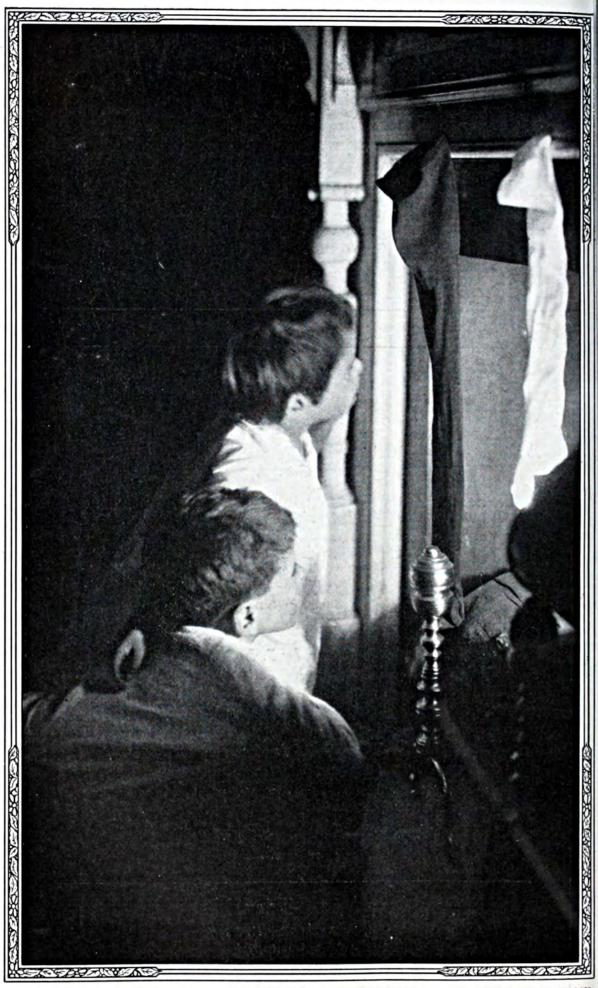
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G. J. CALLISTER

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"'Twas the night before Christmas!"

BACHRACH



Published Monthly by the Better Crops Publishing Corporation, 19 West 44th Street, New York. Subscription, \$1.00 Per Year; 10c per Copy. Copyright, 1927, by the Better Crops Publishing Corporation, New York.

VOL. X

NEW YORK, DECEMBER, 1927

No. 1

"The Lord loveth a cheerful giver"

Generosity

By Jeff MI Dermid

HEN the world knows so well that Andrew Carnegie gave millions of books, and General MacDuff gave thousands of blows, how can it persist in calling the Scotch race a "close" one? In the same age that we have said, "Lay cornerstones, Carnegie," and "Lay on, MacDuff" we have been guilty of calumny against a canny set of folks whose attribute lay not so much in parsimony as in "purse o' money." They were good at acquiring the world's desirables, but not reckless in dispensing them. They knew and acquired values; and so Scotch thrift became a jibe in the mouths of wastrels and go-easies.

The goofer who told me the last, worst Scotch joke was sitting in a street car while a charwoman from Argoyle stood in front of him holding a baby and a heavy market basket. She was doing more for her country on fifteen dollars a week than he ever dreamed of doing on the royalty from his oil wells. He didn't seem to realize that a gentleman can be generous by just getting up off the seat of his

pants in a crowded Broadway car.

Charity begins at home all right; but in his case there wasn't anybody home!

And that's the trouble about generosity in America. We don't think it through. To many of us generosity means to let go of something very valuable—and to our crazy notions these days value always means money.

Ordinarily public generosity is called

philanthropy. Philanthropy means benevolence and good will towards all humanity, with or without press agents. It should be able to operate sometimes without newspaper headlines to keep wealthy rivals informed of each other's progress in the donation marathon. Sad to say, most of our public benefactors are hunting for the nearest broadcasting station of large wave length rather than modestly seeking for the proverbial bushel.

On the other hand, it is easier to be rich and stingy than to be rich and generous, if you count the cost and bother of social secretaries and charity dispensers in your office.

Your real stingy Scrooges are left alone, but once let a moneyed man give to some importunate jigger, and the whole hungry pack are at his heels. Thus there is some credit coming to these wealthy hand-out boys, and I mustn't fail to give them justice, although it comes hard to sing lofty praises to those whose chief philanthropy lies in kissing good-bye to soft dough.

As you will recall (if you are oldfashioned in your reading) there was once a Rich Young Ruler who got the Best Advice obtainable on this subject. It was in Palestine one day when the said R. Y. R. was speculating upon what use he should make of his talents -the coin kind mostly. As that was before the days of air ships and long distance swimming matches, there was no quick way to let go of it without either a headache or a hold-up. So he sought Help in the matter. The presumption is that he took the Advice, and found that if he gave all of himself along with a little of his wealth, he would be more serviceable to the world than if he doled out material charity through his flunkies.

Blustering gustoes of oratory have been jabbered at many a scene of public benevolence, with no ring of force or truth. The capital S in Sentiment has been crossed too often at such times with two perpendicular parallel bars.

Edmund Burke rarely got heated to perfervid rhetorical pitch unless there was a good and sufficient reason for high pressure oratory. In 1780 Burke paid one of his most eloquent tributes to a certain philanthropist, John Howard, High Sheriff of Bedfordshire. Burke exclaimed:

"He has traveled to the uttermost ends of the earth, not as others did for pleasure, but to remember the forgotten, attend to the neglected, to visit the forsaken. His work has been as full of genius as it was of humanity; it was a voyage of discovery; a circumnavigation of charity."

John Howard's memorial statue was the first one placed in St. Paul's cathadral; not because he happened to be a wealthy citizen who lavished with his checks, but because, from London to Moscow, from France to Smyrna, John Howard did more in twenty tireless years for real prison reform than any single individual has accomplished before or since. Finally he earned the laurel crown under that greatest and noblest of captions: "Greater love hath no man than this"—for he died of camp fever in a Turkish prison.

Contemporary with Howard in that and swashbuckling era was James Oglethorpe, who left a life of softness to lead a colony of Moravians, Scotch Highlanders, and Cheapside prison outcasts, with the solemn Wesley Methodists to boot, into the unknown hinterlands of Georgia. County agents of the Savannah coast region must not take too much credit to themselves for being pioneer reformers and philanthropists down there. James Oglethorpe carried out a job that was even worse to tackle than Henry Ford undertook on the troublesome voyage of the Oscar II.

This brand of dare-and-do philanthropic philosophy is scarce these days perhaps. It is so much easier to wait

(Turn to Page 62)



The busy terminal market shown in this photograph is in Los Angeles, Cal.

America's Markets

By Frank George

U. S. Department of Agriculture

¶ First of a series of articles on the process of getting the nation's food supply from producers to consumers

A TOUR of America's great consuming markets impresses one with the immensity of the job of feeding 120,000,000 people. While the city sleeps an army of distributors from wholesalers to retailers are hauling, storing, or placing on display the food supply for the ensuing day. Railroad terminals, wholesale markets, produce auctions are a bedlam of noise and confusion. A day's supply of farm produce at a single market is measured in hundreds of carloads, valued at hundreds of thousands of dollars.

The quantities of food supplies at some of the big consuming markets have practically doubled during the last 10 years, taxing to the utmost the machinery of distribution. New terminals have had to be erected in some places to handle the Gargantuan food

supply, and plans projected for relocating city distribution centers. The marketing facilities of 10 years ago have become antiquated and inadequate to meet the needs of increasing millions of consumers.

New York City alone now receives in a year more than 76,000 cars of 10 leading fruits and vegetables compared with 48,000 cars in 1920; Chicago gets 40,000 cars of these products against 27,000 cars seven years ago; Philadelphia receives 21,000 cars compared with 17,500 cars in 1920; Detroit 13,000 cars against 6,000 cars; Cleveland 10,600 cars against 7,500 cars. These receipts, except in the case of New York City, do not include less-than-carload supplies received by motor trucks and farm wagons.

Carlot shipments of leading fruits

and vegetables now total upwards of 1,000,000 cars a year, compared with 500,000 cars 10 years ago. Per capita consumption of meats has decreased somewhat, but the total consumption has increased. Total consumption of all food and fiber products has increased tremendously during the decade. Foods that were formerly regarded as seasonal products, such as lettuce, celery, and citrus fruits are now eaten the year round.

The Reasons Why

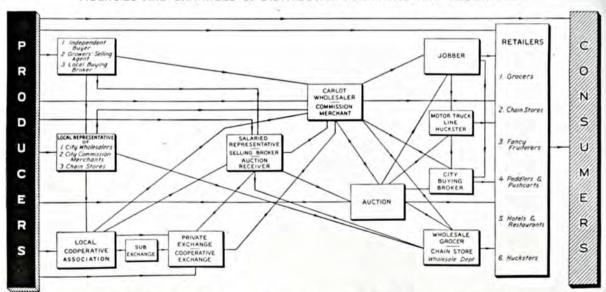
Increased population, higher living standards, and cheap transportation are the outstanding reasons for this increased consumption of food products. Population has increased approximately 15,000,000 persons in the last decade, practically all of the increase occurring in urban centers. Higher standards of living have come about chiefly through an uninterrupted period of relatively high industrial wages, and the continuous campaigns waged by public and private institutions in effecting better dietary.

Time was when only consumers in large centers of population were able to buy the entire range of products from American farms. Thousands of small communities had to go without citrus fruits and many of the vegetables such as lettuce and celery because they did not provide sufficiently large consumption outlets for such commodities. But now as a result of scientific refrigeration and heating in transit, cheap rail transportation, the advent of the motor truck, and the development of more efficient systems of distribution, the consumer in the small market is on a parity with his city cousin in choice of foods.

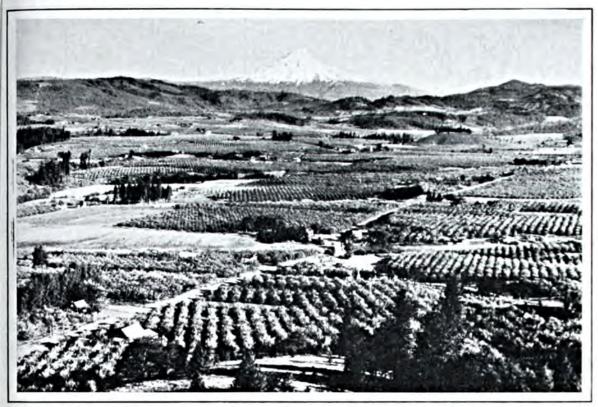
Fleets of motor trucks are hauling products within a 200-mile radius of consuming markets, and placing the food in the trading centers in better condition than is possible by rail or water transportation. The strawberry growers on the eastern shore of Maryland and Virginia this season, for example, shipped one-third of their 3,300 cars of strawberries by motor truck to markets as far north as Albany, New York. Asparagus growers of the Morrisville section of eastern Pennsylvania similarly are using motor transportation to Newark and Jersey City. Other examples could be cited.

Shippers who use motor transportation declare that with good roads there is less injury to products in motor trucks than in freight cars. The products are loaded at the orchard or packing house during the late afternoon and hauled to market when the temperature is falling, so that the load is well ventilated and cooled en route.

AGENCIES AND CHANNELS OF DISTRIBUTION FOR FRUITS AND VEGETABLES



An array of wholesalers, brokers, jobbers, and retailers handle the nation's food supply.



This beautiful stretch of country with its many orchards is in Hood River Valley, Oregon. Large commercial producing areas are being developed thousands of miles from consuming markets.

Rail transportation requires the produce to be loaded at the farm, hauled to shipping point, unloaded on the platform, and loaded later in the cars; and at destination, unloaded, loaded on trucks, and unloaded at the wholesale markets. The motor truck eliminates most of the handling, effecting virtually farm to market delivery.

Using Motor Trucks

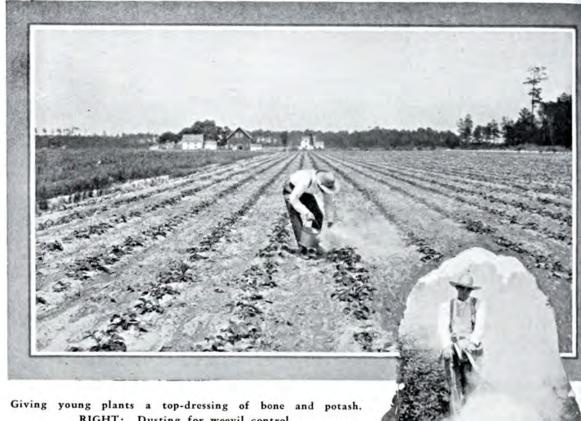
Many distributors in small markets who formerly received mixed carloads of produce from larger consuming centers, now are using motor trucks. A dealer in Beaver Falls, Pennsylvania, for example, telephones a produce broker in Pittsburgh to make up a car of mixed fruits and vegetables. The produce is loaded in a motor truck, and within a few hours it is received at Beaver Falls. There is no delay to secure a freight car, a minimum of handling expense, and the products arrive in fresh and wholesome condition.

Appreciating the need for larger and more modern terminal facilities to handle the steadily increasing volume of business, the railroads during the war had projected plans for building more efficient structures in the receiving markets. To be sure, they had an eye for business, for the road which had the better facilities would get the haul. These projects had to be postponed, however, because of the wartime restrictions on commercial building, and immediately following the war high building costs were a further deterrent.

The need for better terminals became increasingly imperative by reason of the increase in urban population which meant larger volume of shipments, and despite the costliness of present-day construction, building was begun on a number of projects. New terminal facilities have been built or are in course of construction in Boston, Philadelphia, Cleveland, Pittsburgh, Newark, Los Angeles, and other markets. The number of auctions at consuming centers also has increased where farm products are sold with lightning-like speed in a free supply and demand market.

While marked changes have occurred on the consumer side of the ledger in the last 10 years, there have

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RIGHT: Dusting for weevil control.

"Strawberries Were My Salvation"

By William J. Maddox

-PAUL GUNBY

CEVENTEEN years ago, when Paul Gunby moved back into the "pine thicket" to reclaim the old homestead, the place might very well have been rated as abandoned.

The Gunbys still owned it. Five generations of Gunbys had tilled that selfsame soil, going back to pre-Revolutionary days. They had taken their crops—mostly wheat, corn, and oats—and left it largely for nature to repair the damage.

They were no different from their neighbors. That was pretty generally the practice on the Eastern Shore of Maryland, on the peninsula that comes down between Chesapeake Bay and the ocean and contains also the state of Delaware and a fragment of

Virginia. It did no special harmthat is, none that was noticeable from year to year as crops went in those days. Land was fairly plentiful and labor was next to nothing. At least that was the popular fallacy with respect to slavery.

People lived well. Good food and plenty of it was the tradition. If bigger or better crops were needed, new fields were brought in. And in this way things evened themselves up very nicely.

Just before Paul's day, though, the overworked land showed symptoms of balking. The crops had shrunk to such a thinness that the Gunbys decided it was a losing game to stay there, and so moved to another farm.

The old place was left to shift for itself.

Let it be understood right now that it was not sentiment that took the young Gunby back. There wasn't any room for him to set up for himself in the new neighborhood into which his people had moved. Then, too, he wasn't flushed with money, and the old place was about the only one within his means.

So he went back into the "pine thicket" practically without a cent in his pocket. He staked all his cash, some \$300, as the down payment to the rest of the heirs. In addition he gave them a mortgage of \$3,000.

In all there was about 128 acres. Some of the fields had been out of cultivation for 10 years, some were grown up in poles. The longer ones he disposed of to the fishermen at Crisfield, seven or eight miles farther down on the bay, for their fish pounds. The shorter ones he sold as bean poles.

He made enough from them to pay for clearing the land.

There was only one barn on the place.

Strawberries went into the first cleared patch the very first season. They were comparatively a new crop on the Eastern Shore 25 or 30 years

For Gunby, they were money-makers from the start.

"Strawberries have been my salvation," is what he says of them today.

Mortgage Is Paid

The first two crops paid off the mortgage. And with this out of the way he was free to put more back into the soil to make up for what it had been losing all those years. In addition he has added more acreage. The first was a tract of 74 acres, the next was 26 acres, now giving him in all 228 acres.

From the first Gunby set the pace



is a strawberry-growing community. Within several miles of Gunby's is Marion, one of the chief strawberry shipping points. Direct shipments are made not only by rail to the big cities, but by truck overnight to points as far away as New York, getting there in time for the early

morning market.

It costs Gunby around \$80 an acre to raise his crop, and he keeps an accurate account of all his operations. He knows every season just where his money and time went and what he got in return for them.

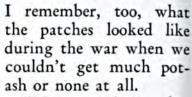
"But," he says, "I'd rather pick 10 acres of 200 crates to the acre than 20 of 100 crates."

The average yield among growers in that part of the country is 50 crates to the acre!

In 1925, Gunby picked as high as 1,400 crates from one field of six and a half acres. Last season he didn't do so well. His average was slightly under 190 crates to the acre. For one thing he had a lot of trouble with a beetle that was particularly active with the young foliage. But on the whole he maintains a good average year in and year out.

Gunby is a consistent user of fertilizer and he makes it a practice to regularly put humus into the land. He lays his high yields to this. He has found a good combination of plant foods and he has worked out a method of applying it that satisfies him as to results.

"I've had people tell me I use too much fertilizer," he told me recently when I dropped in to see him. "They say I use too much potash, for one thing. But I don't think so. I mix a good deal of the fertilizer myself and I try varying the amounts. I watch the effect, making allowance, of course, for the season and such things. And I don't agree with them.



"My experience has been that potash gives a

redder and more solid fruit. And I believe, too, that it keeps the caps from rusting."

Which, incidentally, is in line with

the practices of growers in New England, so I am told. It is getting to be generally understood that the wellfed plant resists disease better.

Mixed Fertilizers

For his mixed fertilizer, Gunby takes 1,700 pounds of bone and 300 pounds of potash (muriate). The bone is 4½ per cent. ammonia and 48 per cent. phosphate of lime. Combined in these proportions he should have a mixture that would give him roughly 3½ per cent. nitrate and 7½ per cent. potash. The customary mixture for that part of the country, which also grows a good many white potatoes, is 7-6-5. Gunby also uses 7-6-5, but not until the last application, just before picking. Practically all the growers use 7-6-5 throughout.

Where the average is about 300 pounds of 7-6-5 to the acre, Gunby uses from 500 to 600 pounds of his bone and potash mixture. This gives the plants a decidedly greater amount of potash, considering that the mixture contains about 7½ per cent.—roughly three times as much.

Gunby is a spring planter. He puts out his plants in late March or early April. His early variety is Missionaries and his late one is Gandies.

Unlike the growers a little farther south, around Norfolk where trucking is highly organized, Gunby grows no companion crops with his strawberries. So far he hasn't found this desirable.

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The

What he can accomplish in Agriculture and Business

Extension Worker

By T. J. Talbert

University of Missouri, College of Agriculture

THE agricultural college extension work sells ideas as truly as the salesman of a private corporation sells The insect control specialist goods. sells the Hessian fly control idea; the chinch-bug, grasshopper, army-worm control ideas in the same way. The animal husbandry specialist sells the purebred sire idea to a community or neighborhood, while the home economics specialist sells the modern improvement of the farm home idea to the farmer's wife. This is all done in much the same way and by methods which are not strikingly different from those used by the extension representatives of business concerns and private corporations.

The qualifications of the salesman of ideas and goods are: 1, education and training; 2, practice or experi-

ence; 3, tact and resourcefulness; 4, ability to demonstrate or show; 5, ability to close the deal by honest methods and fair dealings.

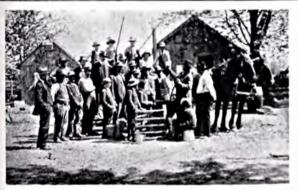
Education and training are of the highest importance for either worker. Some may succeed without much education, but the great majority will be so handicapped without it, that little progress will be made. It is also true that those succeeding without an education, would in almost every case get further ahead if they had been given the advantage of an education.

The Educated Man's Chance

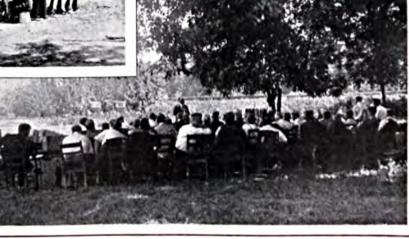
Statistics lately gathered show that among 150,000 uneducated children, only one has a chance of becoming prominent. Given a high school education, he has 87 times this chance;

elementary schooling falls between these two while college training increases the opportunity 800 times.

Formerly farmers feared that ed-



Agricultural extension leaders at work. The group of farmers above are watching a demonstration of mixing spray materials. The group at right is discussing farm problems in the shade of a big oak in August.



ucated children would feel they had outgrown farm conditions and would look toward the city, but in these days when the automobile, the radio, modern household appliances, and especially the use of farm power machinery are increasing in every rural district, the farmer may well change this fear for the one that his children, unless well educated, cannot hold a leading position in their own community. The agricultural extension worker must have a broad general education, including practical farm experience and in addition to this a thorough training in the science of agriculture.

The extension worker of the private corporation should also have a broad general training and special training in the particular line which he represents. We all do best the things which we know best, and it follows that the salesman of goods who knows his line from A to Z in about 99 cases out of 100 is a success. On the other hand, either worker who will not take the time to inform himself properly is usually mediocre or more often a failure.

Experience for the worker is as important as education and training. Practice, practice is what makes a successful football or baseball team, and so it is with our extension workers for agriculture and private corporations. Schools of instruction are frequently maintained for salesmen who are beginning work or for those who wish to brush up on new lines of work. Agricultural colleges are also offering courses in extension methods and problems for the purpose of training those desiring to take up extension work.

Men and women of no other lines of work are required to exercise so much tact and resourcefulness. Neither class of workers can be successful without the exercise of discretion and a sense of proportions in handling the difficult and varied problems which arise from time to time. For instance, the specialist in Farm Crops who would have the farmers put into practice hi teachings regarding the use of le gumes, cannot call the farmers fool and back numbers because they hesi tate or refuse to be interested in hi teachings. He cannot afford to lose his temper when some one makes sport of his ideas and work. Neither can the salesman of goods afford to be disheartened or quit because he is ridiculed by prospects or fails to close a sale with some of his best customers. Such setbacks or reverses should make each of the workers try the harder, if they are the right ones with the proper training. If they continue to fail. however, there is something wrong with the workers and not with the people with whom they work.

The Demonstration Method

The values or advantages to be derived from the demonstration method of teaching are so generally known and emphasized that it is hardly worth while to elaborate upon it. Demonstration to the salesman means showing his goods to the best advantage to the prospect. A few years ago, this method was not employed, but now the successful salesman cannot make progress without it. Generally speaking, the better the demonstrations, the better the sales for both kinds of workers.

In the case of our agricultural specialists, we rely mainly upon the demonstration to sell our idea. There is no other method so valuable or practical. The farmer learns to prune a tree by pruning under the direction of the specialist in horticulture. He learns how to destroy the grasshoppers by mixing and sowing the poison bran mash as demonstrated by the specialist in entomology, and so it is through the entire list of projects undertaken.

Salesmen of goods who go home and report that they have closed a sale, but who on cross-examination admit that the prospect did not sign the or-

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Breaking Hollandale muck soil with a 10-ton tractor hooked to two 26-inch plows that turn a furrow 10 inches deep and bury the heavy growth of wild rice and other swamp plants.

From Cattails to FERTILE FARMS

By Guy A. Peterson

Less than 10 years ago the tract of land now known as the Hollandale district in Freeborn county, Minnesota, was a swampy, frog-populated wilderness of bullrushes, flags, wild rice, and cattails. Today more than 400 farm families are living on the drained bed of the ancient lake, and the sounds that go along with intensive agriculture have replaced the croaking notes of the bullfrog.

It was at the suggestion of Dr. F. J. Alway, head of the soils department of the Minnesota College of Agriculture, and of R. S. McIntosh, secretary of the Minnesota Horticultural Society, that we drove down to Hollandale to see this reclaimed lake bed that has come to be one of the most intensively cultivated areas in the Middle West. The story of its development is indeed dramatic,

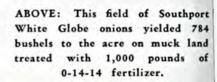
for the change from a worthless swamp to a prosperous farming community was very rapid. It took a great deal of money to develop the project, but thanks to the financial genius of the Land Colonizer George H. Payne, the funds were raised, and countless generations of farmers will harvest

crops from these 15,000 acres of land that have produced nothing but swamp vegetation through all these years.

It was back in 1918 that Mr. Payne's attention first was attracted to this marsh, and

BELOW: This field of Hollandale potatoes was treated with 650 pounds of 0-9-27 fertilizer per acre and rogued seven times, but it produced nearly 400 bushels of high quality certified seed per acre and returned a nice profit to its owner.





LEFT: A mellow muck soil treated with 650 pounds per acre of 0-14-14 fertilizer produced this beautiful crop of carrots for C. Kraay.

together with Colonel T. F. Stroud, a man of wide experience in developing

swamp lands, he made a careful examination of the tract. They crossed these fertile fields in a boat when they were still covered with water and landed on Maple Island, now peopled with more than 70 farm families who dwell in the shade of its beautiful trees and work in the level fields that surround this circular spot of high land. This island colony is patterned somewhat after the European "villa" type of land colonies in that the farmers live close together and drive out to their fields from the village. Most of their farms touch the island,



however, and none of them are far distant, for the average size of a farm in the entire tract is only 23 acres.

After Payne and Stroud were convinced of the possibility of developing the section into a market garden system of farming, the next important step was to drain the land. Something already had been done along this line back in 1907 when J. W. Dappert of Taylorville, Illinois, planned a ditch to carry the water which Turtle creek has disposed of formerly by nature's method. This creek was a small, winding stream which for ages had taken the overflow waters from Geneva and Rice lakes. Due to the opposition of the day, however, Dappert's first ditch as designed was never completed, but it removed much of the surface tin. It is large enough to handle all the drainage water.

A caterpillar type of ditcher that would travel through the eight or ten-inch deep water was then put to work. Nearly 150 miles of ditches were made with this machine, one on each quarter-mile line and connecting with the main outlet. They were made 12 feet wide at the top and seven feet deep, but as they lowered the water table in the land, large main tiles 16 to 24 inches in diameter were put in the bottom and covered up so the ditches could be cultivated. Lateral tile drains every 200 feet were then connected with these mains to provide a perfect system of drainage. After the ditches were filled and the tiles covered, the spoil banks were leveled down to become the basis for



LEFT: Mr. and Mrs. Henry Voss and their son John with a 40-pound dozen of crisp, white celery that was grown on sub-irrigated muck land that was treated with 1,000 pounds of 0-9-27 fertilizer to the acre.

RIGHT: Portion of Henry Voss's celery ranch showing rows that are boarded up and bleaching. Voss put 5,000 pounds of 0-9-27 fertilizer on this five-acre field last spring (1,000 lbs. per acre).

water and transformed these lakes into a marsh.

It was upon the site of this first ditch that Colonel Dappert, assisted by Ray N. Towl of Omaha, Nebraska, and J. H. Severson of Albert Lea, Minnesota, laid a new one in 1920 that was nearly four times as large as the original. Known as the Judicial Number Four, this ditch is 100 feet wide in places and has its outlet in the Cedar river just south of Aus-

the roads which followed.

There are now on the tract more than 50 miles of graveled roads which were built at an average cost of \$7,000 a mile, but the farmsteads are so situated in relation to them that every farmer has an all-weather highway to his door. Since the completion of the Hollandale branches of the Union Pacific and Rock Island railroads in September, 1926, the average haul to a loading depot has

been reduced to less than two miles. In passing we might add that even the railroads were laid as a result of the generalship of Mr. Payne, for it was he who secured the permit from the Inter-state Commerce Commission for the two transportation companies to lay tracks into the district. Before the completion of these roads, the vegetables were hauled to Clarke's Grove for shipping at an estimated annual cost of more than \$100,000. The saving in freight charges from the fields to the loading platform will be enormous by thus reducing the average haul from seven to less than two miles.

Two Years to Drain

It took two years for the water to drain out, but as soon as it got dry enough to work, the land was broken with big 10-ton tractors hauling two 26-inch plows that turned furrows 10 inches deep. The plows were followed by 3,600-pound concrete rollers that firmed the loose, peaty soil so as to hasten the decay of the heavy growth of vegetation that had been turned under and re-establish capillary attraction. All through the first summer, tractors hauling 32-feet sections of disc pulverizers and harrows put the soil into prime condition for cultivation, so the land was in a fine tilth before it ever came into the hands of the actual settlers. What a contrast when compared with the colonization of the timbered and cutover lands that so many pioneer settlers conquered!

An especial appeal was made for settlers of Dutch descent because in many respects the land had a resemblance to that of the dyke-protected lowland country in Europe and because only intensive farming could pay for this land that had been wrested from the water at such great expense. An American Reformed Church was organized in the spring of 1922 when three families met at the farm home of Peter Louters and listened to a sermon by Mrs. J. H.

Neyenhuis, who with her family had just moved to the district from Alton. Iowa. There were twenty-two present at this meeting and it constituted 100 per cent, attendance of the members of that denomination then living there. The growth of this congregation has been phenomenal when compared with rural congregations in the United States, for there were 76 families on the role last summer when a beautiful \$28,000 church edifice capable of seating 536 people was dedicated. The large size of the families is indicated by the fact that the communicant members of the church numbered 175 while there were 225 baptized children members. We mention the church in this article because it has been so large a factor in calling many of the best farmers to the tract. This congregation, however, has not been the only one that has grown, as many families other than Dutch came in, and there are several other thriving denominational units.

The farms are sold on the basis of a tenth payment down and the balance in 20 annual installments. To insure that these later payments will be met, the company furnishes free the services of two agricultural experts. These two men act in much the same capacity as county agricultural agents, for they are called upon to do all kinds of work in connection with the management of these farms. Many of the settlers are corn belt farmers who have had no previous experience with truck crops.

The five main staples grown here are potatoes, onions, cabbage, carrots, and celery with considerably more than half of the cultivated land devoted to potato culture. Paul N. Davis helps the farmers with their potato problems while C. W. Blocker gives especial attention to the production and marketing of the other four crops. As managers of the Hollandale Marketing Association, Davis and Blocker not only keep the wires

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A fruit experiment station is maintained in Hood River Valley.

OREGON

Experiment Station

By F. L. Ballard

County Agent Leader, Corvallis, Oregon

IN a state institution of higher learning the student should be inoculated with the idea of making a definite contribution to the commonwealth. His education is not of highest value to him if it has taught him only how to get something out of his environment and not how to give something back to it. The aim of the Oregon Agricultural College has been to build up an organization for service to Oregon, its natural resources, its

industries, and its homes."

These words of President W. J. Kerr indicate the ideal that has held dominance in the remarkable development of the Oregon State Agricultural College throughout the past 20 years. In resident instruction, in the experiment station, in the extension service, close contact with people of the commonwealth has obtained and the program of the entire organization has been cast because of the sympa-

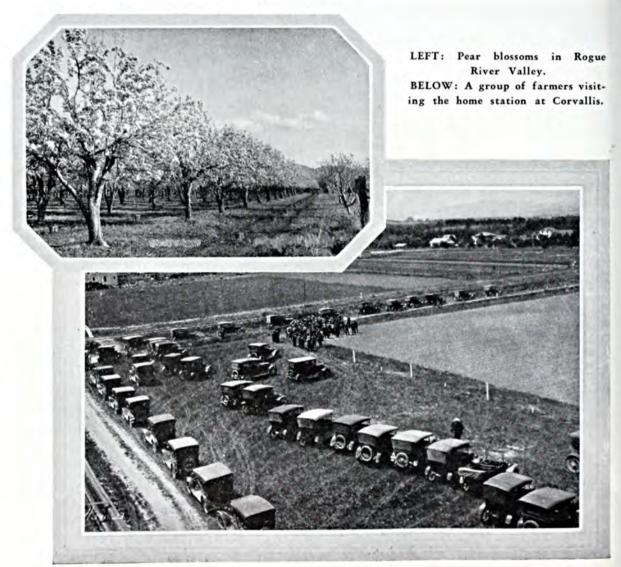
thetic appreciation resulting from such contacts, along lines of most practical service. "Science for Service," and "College and State" have been at different times titles of publications of the institution which sharply focussed thought upon its trends.

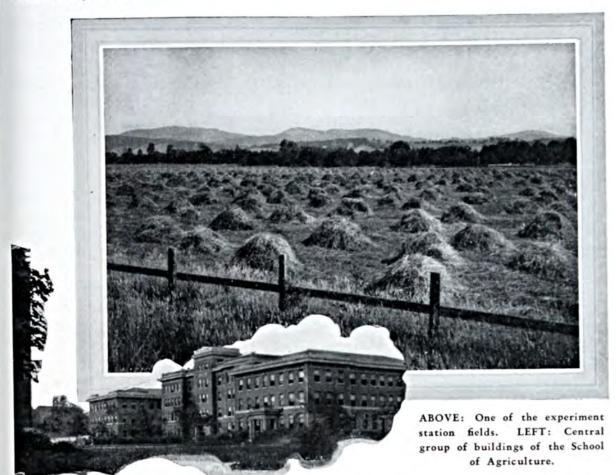
Only such ideals, supported through years by progressive fulfillments, could build an institution like the Oregon State Agricultural College in a state so sparsely populated and of such modest wealth. Standing second or third year after year in student enrollment among the institutions of its kind in the entire United States, is a mark of distinction in a state of less than a million population and only a billion dollars assessed valuation.

Activated by the will to render most vital service to the relatively new and rapidly changing agricultural conditions common to the far western territory, it is perhaps not surprising to learn that one of the first great contributions to agricultural science on the part of the Oregon Experiment Station was one which virtually saved an important phase of the agricultural industry of the state. In addition, it revolutionized orchard spraying in all parts of the world. This accomplishment was the discovery that lime sulphur would control apple scab, which, as early as 1903, was threatening the entire apple industry of the Northwest.

Washed Fruit Superior

Again in the field of horticulture, the Oregon Experiment Station officials showed their alertness in the matter of the recent crises resulting from legal restrictions on the quantity of spray residue permissible on fruit, both





for foreign and domestic trade channels.

The tolerance limit was so low that ordinary wiping processes were ineffective, and the extensive fruit industry of the Northwest faced overwhelming losses. No sooner had the development surrounding the problem taken shape than the Oregon Experiment Station was busy with trials of weak solutions of chemicals. In a few months it was found that by the use of very dilute hydrochloric acid, spray residues could be removed. Other solvents were also found effective. ther tests, however, showed that the weak hydrochloric acid had no deleterious effect on the keeping qualities of the apples and pears, under normal conditions. Another step was the collaboration with two equipment concerns in developing simple washing machines suitable for use on any farm for the needs of individual growers. Word now comes from the markets that the washed fruit is so superior in appearance that some advantage in price may well be expected for it.

A dozen years ago the Oregon Station found that the three leading commercial sweet cherries of the state are not only self-sterile, but inter-sterile, as well. This discovery resulted from careful orchard studies made in response to urgent appeals from large numbers of cherry growers whose extensive plantings were not producing commercial crops. Extensive trials in immediately succeeding brought out a fairly complete catalogue of fertility coefficients between cherry varieties. Not only did it determine which varieties must be transplanted or grafted in to insure fertility, but also particular trees of particular varieties were identified as superior pollinators, and from these cion wood for innumerable orchards was selected.

Proper Pear Picking

Twenty years ago this fall the first carload of Bosc pears was shipped from Oregon. Fifteen hundred to two thousand cars are now the crop, and the volume is increasing. Blight, the scourge of pear growing everywhere, has been held in check by the Oregon Experiment Station. Cutting methods, disinfection, and spraying have been found effective in blight control. Great interest attaches to the studies of the station on blight resistant stocks. An investigator was sent to China where for months he travelled the interior regions, collecting native stocks, which are now being developed and tested on the branch experiment station at Talent in the Rogue River valley.

Affecting the pear industry, also, and of immense practical value, is the pressure-testing apparatus devised a few years ago to determine the proper picking time of pears. About 90 per cent of the pear tonnage of the state now has the picking date determined by this instrument, and 10 to 20 per cent increased tonnage is obtained by picking at the right period. It also is being developed now for use on apples and plums. These accomplishments are typical of a large list of projects accomplished and being accomplished for the horticultural industry of the state, which, at current valuations, involves an investment of \$60,000,000 and an annual crop of \$16,000,000 to \$20,000,000.

Field crops are, of course, the state's major agricultural wealth-producing group. Of these, wheat is the headliner, with an annual farm value of \$19,000,000 to \$35,000,000. No attempt will be made in this limited space even to name the determinations of the Oregon Station that have affected field crop production.

For an example, let's touch the field of wheat production. Instead of 63 commercial varieties as 10 years ago, 11 are now considered the standard in the state, the inferior ones having been replaced by higher yielding ones and those more sought on the markets. This program carried on, together with a seed certification system in cooperation with the extension service, resulted in a decline of mixed

wheat on the Portland market of from 33 1-3 per cent to 8 2-5 per cent in seven years.

In wheat production, also, the adoption and dissemination of the Federation wheats have had marked influence on the wheat production of the state. The Federation wheats are normally They were selected spring wheats. and recommended to farmers after years of painstaking work with a collection of commercial wheats of the world. Small lots of seed were distributed to farmers in 1921. They demonstrated the superior yielding quality claimed by the station. 1924 they were planted on about 76,-000 acres and yielded an average of two to five bushels more than spring wheats commonly grown. The gain from these varieties was estimated in value at about \$300,000. wheats, however, are grown mainly in eastern Oregon. A large acreage was killed by frost during the winter of 1924-25. Farmers followed the advice of the station and reseeded about 400,000 acres to Federation, paying a premium for the seed. It made an increase in yield of two to ten bushels an acre over commonly grown varieties. Farmers' estimates of the increase were larger generally than those of the station.

Two Million Bushels

For the 400,000 acres grown, the increase was estimated at one and one-half to two million bushels, with a market value of over \$2,000,000. Farmers paid the loans advanced by the state for seed and announced that Federation wheat and the Moro Experiment Station were due a large share of credit. Federation and Hard Federation have become the main commercial spring wheats in eastern Oregon. They are proving of value in southern and central Oregon, and in other states.

Investigations are going on with some 6,000 varieties, strains, and selec-

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Telling Plants When

to Flower and Fruit

By Lewis E. Theiss

Bucknell University, Lewisburg, Pennsylvania



DW would you like to have chrysanthemums abloom in July or iris flowering at Christmas time, or spinach that produces a constant crop of edible foliage throughout the summer instead of going to seed when the hot days come? How would you like to have lettuce that remains nicely headed in August instead of shooting up a flower stalk and becoming worthless for table use? Would it be worth anything to you, as a home gardener, or a commercial trucker, or a professional florist, to

ABOVE: Tithonia, a semi-tropical species which cannot flower in our latitude because cold weather arrives before the days become short enough. These plants were photographed in July with the plant at left receiving ten hours of light daily.

LEFT: Wild aster forced into flower in June by exposure to short day.

have any of these things?

You can have any or all of them, as well as many other equally attractive "abnormalities" if you wish to take a little trouble. For Uncle Sam, through experiments made by the Bureau of Plant Industry, has discovered what makes plants flower and bear fruit, and he has also discovered how to control the time of flowering and fruition.

For uncounted centuries man was content to watch the iris bloom in June and the witch-hazel flower in November, and never ask why. But W. W. Garner and H. A. Allard, of

the Bureau of Plant Industry, began to inquire into the reasons for a plant's blooming at precisely the same period each year.

Up to the time of their investigations, it had been assumed that plant action was due largely or wholly to heat; that when it was warm enough, plants started to grow; and later, when it was hot enough or cool enough, they flowered. But these keen inquirers soon found that many plants, like the iris for instance, could be placed in a hothouse in winter, at midsummer temperature, and yet re-And the cosmos, fuse to bloom. which flowers so late in the year that it was believed its blooming was dependent upon the coolness of autumn, altogether refused to blossom in summer, even if placed in a temperature like that of fall. So it was evident that something more than the warmth of the air controls the flowering of plants.

Atmospheric Changes

Atmospheric changes are but one of the seasonal changes that occur with pronounced regularity year after year. The daylight itself varies regularly month after month in its intensity. So our two investigators turned their attention to the behavior of the sunlight.

In midsummer, when the path of the sun across the sky is at its highest, the total intensity of the light at Washington to which their plants were exposed might reach 10,000 footcandles in the middle of the day, whereas in winter the midday light intensity is scarcely half as great. So an experiment was arranged to test the effect upon plants of different intensities of light.

Specially constructed shades of cloth were used to screen a planting of soybeans from the direct rays of the sun. Cotton netting of five different weaves was employed. The reduction in the intensity of the direct sunlight at noon ranged from 30

per cent of the total for the most open meshed cloth to more than 65 per cent of the total for the closer woven netting. Though the soybeans were affected in other particulars by the shade, the date of their blossoming, as compared with that of plants grown without any shade whatever, was neither advanced nor delayed a single day. Likewise other experiments showed that Mammoth tobacco was not affected by shading so far as concerns the date of flowering.

It thus became evident that neither heat nor light intensity advanced or retarded the flowering of plants. So the investigators turned to the matter of relative length of day and night. For just as atmospheric heat alters with the change of seasons, and the intensity of the sun's light increases and decreases, so the length of day regularly waxes and wanes as the year advances. The question now was to discover if the changing length of the daylight period had any effect on flowering and fruition.

To this end a darkhouse was built, so constructed that air could enter and flow out without admitting light. Tracks were built in this house, and small trucks used to hold the different plant boxes. These could be rolled in and out at will, and thus the daily period of light could be regulated as the experimenters wished.

Many Varieties Tested

Many varieties of plants were tested. The action of the Biloxi soybean was typical of many of the plant reactions. The Biloxi normally blooms in late fall, when the days are short. By limiting the daylight period to 12 hours instead of permitting the normal 15 hours, the experimenters made the Biloxi bean, planted in May, bloom within four weeks of the date of germination. Control plants in the open, that received the full amount of daylight, did not blossom until September, or four months after germination. Of course the plants that bloomed in four weeks were very RIGHT: Biloxi soybeans which were photographed on September 13th. The plant on the right having been exposed to a ten-hour day, began flowering July 19th and bore ripe seed when photographed. The plant on the left, exposed to natural day length, began flowering on September 11th. BELOW: Klondike Cosmos (Oct. or Nov.) is easily forced into flowering by exposure to short days (10 to 12 hours).



much smaller than those that grew four months before blooming.

This and similar experiments showed that there is a class of plants, now termed "short day" plants, which blossom only when the days are short. Other tests showed that another class of plants, like the iris, flower only when the days are long. And still further tests, made by supplementing the natural light with artificial light, showed that plants of these classes cannot bloom at all unless the period of daily light is approximately what they need. That is, a plant needing 15 hours of daylight to bloom, cannot blossom if the light is limited to 10 hours daily; whereas a plant needing 10 hours of light to bloom, cannot flower if the light is extended to 15 hours daily. And even a relatively weak electric light, used to supplement the daylight, was effective in



preventing flowering or in producing it, as the case might be.

The converse of this is just as true. By artificially producing the proper period of light, the gardener can force any plant to bloom prematurely or out of season, as the iris in midwinter, and the witch-hazel in midsummer. If the summer day is shortened to 10 hours in

the lettuce bed, the lettuce will go on developing vegetatively, and make fine, big heads, but it cannot send up a flower stalk and bloom.

Some plants seem to be "middleof-the-roaders." They have a long period of bloom and will flower whether the day is long or short. But in general, most plants are either "long day" or "short day" plants. Their flowering can be artificially controlled.

The wide-awake plant grower sees at once the immediate and the future bearing of these epoch making discoveries. For instance, the florist who wants to get big money for novelties, can easily force chrysanthemums or other late fall flowers into bloom in summer. In winter he can have on sale summer flowers, like the iris, that hitherto it has been impossible to produce in winter.

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The wilt fungus lives in the sap tubes of the plant and spreads into the tubers.

Sweet Potato Wilt

By C. T. Gregory

Purdue Agricultural Experiment Station

AST spring at Vincennes, Indiana, there was a meeting of 175 of the sweet potato growers of Knox, Gibson, Sullivan, Daviess, and Pike counties. These growers were up in arms about the sweet potato wilt disease. This meeting was called to discuss ways and means of fighting the pest. They decided to strike their blow at the source of the trouble, the disease carried in the seed, by field inspection and certification.

In each community a committee was appointed to take charge of the local work. To this committee any grower could report a field that he considered free from wilt and which he wished to have inspected. This information hastened the work of in-

spection and did away with much useless traveling.

In August, the first inspection was made by a Purdue plant pathologist. At this time the first evidences of the disease were showing. Any plant having yellow leaves was examined. The branch bearing the yellow leaves was located and the skin of the stem was torn back with the thumb nail. If the sap tubes were black, this vine was carefully traced back to the hill and the entire hill was dug out. It would have been dangerous to leave any of these potatoes in the hill because they might later have been dug and used as seed. Needless to say, if the field showed more than one or two per cent of such plants it was

discarded immediately as a possible candidate for certification.

The owners of the fields passed in this August inspection all agreed to work over the field and dig out all diseased plants. They used the yellow leaves and the blackened sap tubes as their basis of judgment.

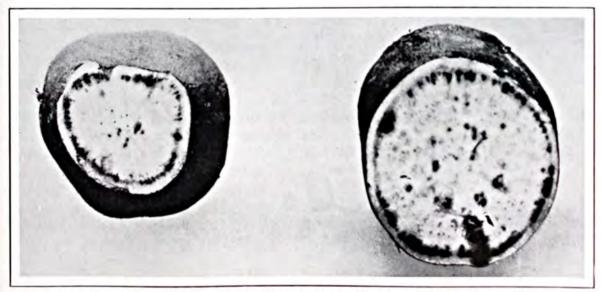
In October, a second inspection of the fields passed in August was made. There was no attempt made to dig the diseased hills at that time. It is not safe to use seed from a field that cannot maintain itself free from infection after all the diseased plants were rogued out in summer. It is evident that such fields had diseased soil, and sweet potatoes from diseased soil are unsafe so far as seed purposes are concerned. From 34 growers asking for inspection, 12 fields were passed.

The value of wilt-free seed was well illustrated this year in the fields belonging to the sweet potato club boys. The plants furnished these boys were obtained from Frank Plass, a sweet-potato grower at Decker, Indiana. This seed came from a field which was examined in the autumn of 1926, and was found to be almost entirely free from diseased plants. Twenty-three quarter acre club fields were inspected. Fourteen of them were passed as suitable for seed purposes. In no case was there as much



From the diseased potato the fungus spreads into the new sprouts ready to be carried to the field.

as one-quarter of one per cent. of disease, but at the time of the second inspection the field must be free from the disease to be considered safe for seed purposes. In none of the fields (Turn to Page 63)



The wilt infested tubers have blackened sap tubes. Such tubers should not be used for seed.

Making Show the Intermediate Credit Banks are helping the farmer

Farm Credit Easy

By Edwy B. Reid

CREDIT for the farmers has formed an important part of every farm relief plan offered in Congress for the last several years. Proposals ranging from almost certain loss, on the part of the prodigal Government agency designated to disburse the funds, to safe, sane, and conservative aid, where aid is not now available, have occupied much of the attention of the solons and the public. The credit squeeze of 1920, with the steady application of the pinchers for several years following in some localities, is still a vivid picture in the minds of many a farmer. His pocketbook nerve is still emitting twinges of pain when too much pressure is exerted upon it.

Out of the credit squeeze came a law-the Intermediate Credit Actwhich created 12 banks, the capital of which is owned by the Government and the money to loan obtained through the sale of short-term bonds, which were created for the specific purpose of avoiding the repetition of the catastrophe which was forced upon so many farmers about half a decade ago. It is a system of credit based upon agricultural collateral which advances money for more than six months and up to, in the case of

breeding herds, three years.

What has happened? Have the farmers made use of these new banks as was anticipated? Has there been sufficient stringency to cause the regular commercial banks to rediscount farmers' paper? Do the banks stand ready to prevent the repetition of

such a squeeze as is still painfully remembered by many a farmer?

The ability of the Intermediate Credit Banks to function depends upon two things: (1) cooperatives who are willing and able to borrow from them, and (2) agencies which can and will rediscount their agricultural paper with them. These 12 banks established in 1923 have done a large business, taking the country as a whole, both in direct loans to farmers' cooperatives and indirect loans to agricultural credit corporations, livestock loan companies, and other lending institutions. hundred fifty million dollars, lent to farmers' cooperative associations with memberships aggregating mately a million farmers and rediscounts from 557 agencies approximating \$118,000,000, is not a small stroke of business to do for agriculture, considering the fact that the banks are now only about four years old and that they had to be set up and pioneered in a field-loans running for more than six months and up to three years in the case of breeding herds. The banks are so constituted as to be capable of serving agriculture with loans up to \$660,000,-000. Thus their resources have been taxed to only a minor extent.

It was the intention of some of those who worked for the passage of the Intermediate Credit Act that the system should function more as an emergency system than one which would constantly serve the needs of agriculture; others believed there was

need for Intermediate Credit of this character constantly and that the demands on these banks would and should grow from year to year. They have increased annually. The question is how great will they grow and how great is their need. It is impossible, of course, for them to lend bevond the letter and spirit of the Act. When they were established there were no agricultural credit corporations and now there are more than 300 functioning in various parts of the country, mostly in areas where banking conditions have not been favorable to farm loans or, to put it another way, where regular commercial banks have closed their doors in large numbers. Others have been set up because of the sheer necessity for additional funds for lending on cattle, sheep, dairy cattle, and for agricultural production purposes.

The Act made no provision for financing the organization of agricultural credit corporations. have been started in several ways: farmers have subscribed to stock, business men have subscribed, and banks have started them as adjuncts to their own banking operations. Cooperative marketing associations have found that in addition to credit on their warehoused commodities, it was necessary and desirable to finance their members during the production season. Possibly the greatest single need of the system is more agencies which will lend to the farmer in the first instance and rediscount the paper with the Intermediate Credit Banks. This business is already growing at a rather rapid rate. The livestock loan agencies have found the Intermediate Credit Banks particularly adapted to their needs. For instance, the vicepresident of the Intermediate Credit Bank at Berkeley, California, having handled sixteen and a half million dollars' worth of cattle paper, says:

"The Intermediate Credit Banks tend to stabilize the financing of livestock on a basis which assures continuity and reasonable cost. Advancing funds on livestock as collateral is a type of financing which properly belongs, generally speaking, to livestock loan companies rather than to commercial banks with deposit liabil-Such loan companies, which formerly had to market their paper with commercial banks before the esthe Intermediate tablishment of Credit Banks, have stated that they would go out of business rather than return to the old method of finding an outlet for their paper with commercial banking institutions which, when depression comes, find it necessary too often to call the loan and thereby bring upon the unfortunate stockman, in many instances, enforced liquidation such as occurred too frequently during the post-war period of deflation beginning in 1921."

Wonder is sometimes expressed that the ordinary, orthodox commercial banks do not rediscount their paper with the Intermediate Credit Banks, thus being able to extend their loans to farmers much more freely and in greater amounts than at present. Only about nine national banks and two savings banks and 139 state banks to date have utilized these facilities. One of the chief reasons is the fact that the amount which they charge for the money so loaned is limited. For instance, if they rediscount farmers' notes with the Intermediate Credit Bank they pay the bank 43/4 per cent. If these loans are ordinary agricultural loans they can charge the borrower only 63/4 per cent. these notes represent loans on livestock, they are limited to an additional charge of 21/2 per cent or a total of 71/4 per cent. This includes all expenses in connection with inspection, handling of papers, etc. the bank is charging a higher rate of interest for its own money, it naturally does not wish to be required to make loans for a lower rate.

In addition there is the question of two interest rates, provided they have a higher or lower rate on their money. This seems to be very objectionable from the standpoint of the local banker.

Further, there is the same objection which applies in the minds of many country bankers to the utilization of the Federal Reserve system. They are timid about publishing any statement of the finances of their banks which shows that they borrow from any other institution. fear that their competitors or somebody will start talking around the town and throughout the rural communities that the bank is in such shape that it had to borrow money from other institutions in order to "get by." Such feeling on the part of country bankers may or may not be commendable or good business. It is there just the same.

Then, too, there is the matter of the length of time for which the loan must run, the law prohibiting the Intermediate Credit Banks from rediscounting any paper which at the time of rediscounting has a maturity of less than six months. The commercial banks frequently do not make loans for more than six months on agricultural paper including livestock paper, therefore, they are not accustomed to the longer period.

There has been some mortality among agricultural credit corporations, particularly those having a small capital and, therefore, a high overhead in proportion to the amount of money they can lend. However, the majority have now been in operation nearly two or three years and have been able at least to break even and acquire some experience, some of them of course making a little money. Some of these corporations were set up in the first place more as eleemosynary institutions than as credit companies to do business for profit, consequently the purpose for which they were organized has been served.

The question naturally arises, if some parts of the country can organize, operate, and maintain 30 or 40 credit corporations to a state, why can not others? There is nothing in

the Intermediate Credit Act which prohibits organization or which makes organization or operation in one state more favorable than in another. For instance, we find the South going strong in the matter of agricultural credit corporations, the Columbia bank district covering the Carolinas, Georgia, and Florida having 47. In the St. Paul district serving Wisconsin, North Dakota, Michigan, and Minnesota there are 124. In the Omaha district covering Iowa, Wvoming, South Dakota, and Nebraska, associations have been served, while in the Wichita district the number is 37. Spokane has a fair start with 11. This refers to agricultural credit corporations. They lend on livestock the same as do livestock companies, but many of them also make general agricultural loans using all sorts of agricultural commodities as chattels. In addition, 13 livestock loan companies have used the Wichita Bank, 24 the Houston Bank, 5 Berkelev, and 7 the Spokane institution.

The Intermediate Credit Act, of course, did not contemplate that the Federal Farm Loan Board or Intermediate Credit Banks would organize the farmers into cooperative marketing associations in order to lend them funds on their warehoused commodities. The managers of these banks, however, have given very sympathetic aid and assistance to farmers wherever opportunity afforded. They could not go beyond the word and spirit of the Act in lending upon warehoused commodities. If the Act is not broad enough, it is the province of Congress to amend it.

However, in the last four years the Intermediate Credit Banks have lent on a long list of farm products, which include: wheat, cotton, wool, tobacco, raisins, peanuts, broomcorn, beans, rice, alfalfa and red top seeds, hay, nuts, canned fruits and vegetables, maple sirup, strained honey, dried fruits, coffee, olives, and olive oil. The list is growing as the re-

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Cutting Cotton Costs

By A. B. Genung

U. S. Department of Agriculture

DURING eight of the last eleven years the price of cotton has been relatively higher than the wages, fertilizer, or land which comprise the chief items in its cost of production.

Ever since the sharp price slump of last fall we have been thinking of cotton as a needy subject for "farm relief." But the fact is that cotton has been a relatively prosperous part of the picture for quite a while. Last fall and its 11-cent cotton have not been the rule, by any means, in recent times. During seven of the past ten years the average price of cotton-the price received by growers in the fall of the year when they are selling cottonhas been above 22 cents a pound. Almost 14 billion dollars' worth of cotton sold in the ten years prior to last season by the farmers of the South! That included 1921, too, which was a

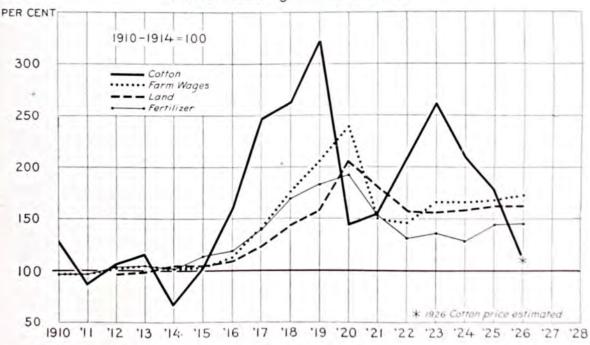
very lean year. It wasn't just an accident that the Cotton Belt grew a big crop last year. It hasn't been just by accident that cotton acreage has increased from 30 million to 48 million acres within five years. The South had a genuine background of prosperity against which to cast last season's darker picture.

During the last ten years the wage of hired labor has been relatively the highest item of cost entering into cotton production. The wage level is now generally the high cost in agricultural production.

This high wage level involves a story in itself. It is an old story of events characteristic of a period of financial deflation. It has happened before and it will presumably happen again if and when we get our price level up on another peak of inflation and then have

INDEX NUMBERS OF PRICE OF COTTON AND FACTORS USED IN PRODUCING COTTON

Cotton Growing States, 1910-1926



to go through the morning-after of deflation.

During either inflation or deflation wages always lag somewhat behind the general price level.

On the way up the mass of workers raise a hue and cry about the high cost of living, meaning chiefly the high cost of food. Their income is lagging behind the procession. Farmers then are prosperous and land values advancing.

On the way down, the wage earner is in the advantageous position for his earnings do not go down as fast as the generous price level. Then the "holler" comes from the farmers. They have to produce and exchange their products on a handicap basis.

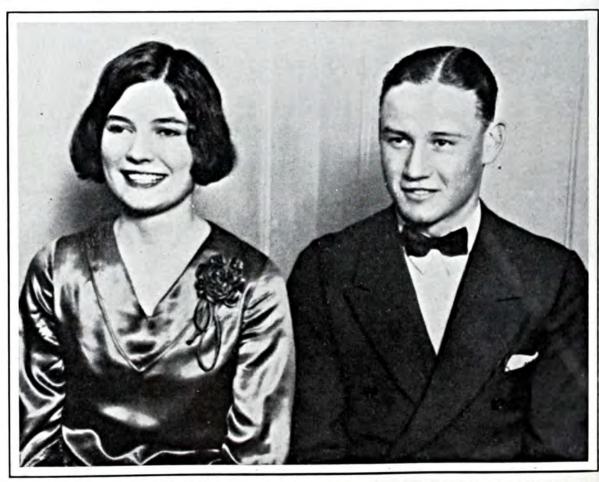
The level of farm wages is, of course, largely influenced by city wages, for in this country there is a

free and constant movement of workers between country and city. If your Georgia field hand finds his wage too far out of line with that of his cousin in an automobile factory in Detroit he pulls up and goes north. So, during the deflation period the farmer has to pay relatively high wages for help, just as he has to pay high industrial wages in the shape of the high-priced manufactured article that he buys.

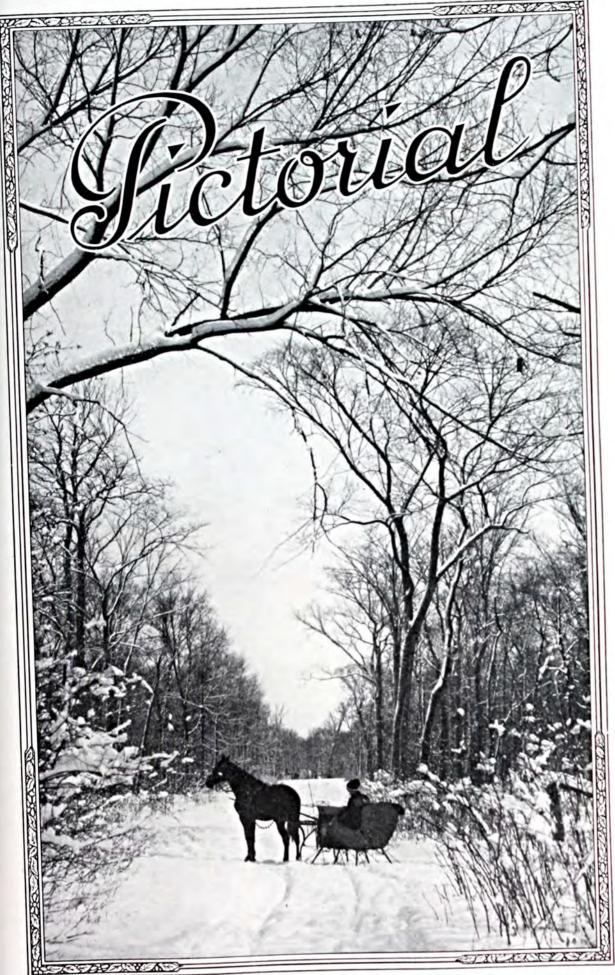
Land prices represent a medium somewhere between the price of the farm product and its direct costs of production. Farm land values readjust themselves, over a period of time, in some normal relationship to farm profits. But there is some lag in movement of land values just as there is in the movement of wages. So, during

(Turn to Page 49)

99% Perfect



Marie Antrum, of Kingman, Kansas, whose health score was 99.15 per cent and J. Fred Christensen of Blanchard, Iowa, who scored 99 per cent, in the Health Contest at the 4-H Club Congress in Chicago.







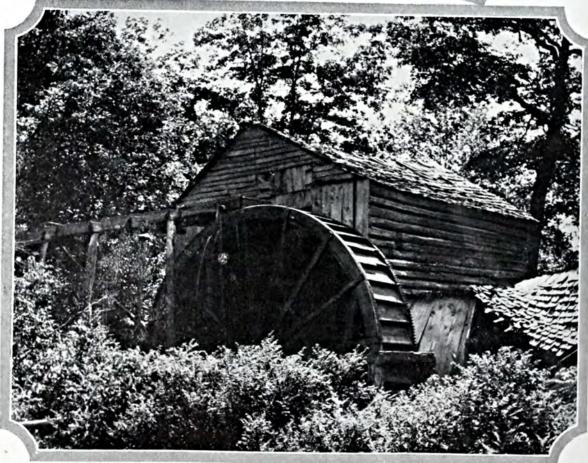
The calves in this chute are being vaccinated for blackleg as prevention against this dread disease.



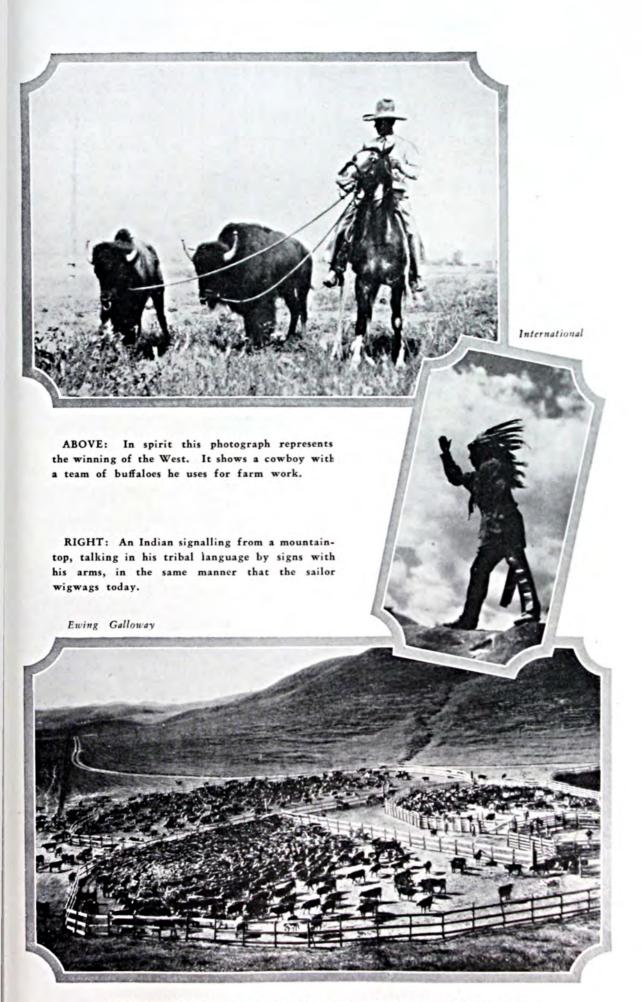
These camels are "walking a mile for better crops," taking bags of fertilizer to Egyptian fields.

CY BY COX TXVIII





An old water mill in the Ozark Mountains in Arkansas that is still in use.



Cattle corralled at the end of a big round-up on a South Dakota ranch.



A sunset at Jasper Park, Alberta, in the Canadian Rockies. This was one of the points visited by delegates to the International Soil Science Congress on their crosstour last country summer. The route included interesting points over a wide area in the United States and Canada.

Ewing Galloway



A job that winter brings-getting in a supply of ice at Cold Springs, N. Y.

The Editors Talk

In Retrospect

Prosperity is in the air and some people's bank accounts.

Retrospect

While most of such prosperity has been in cities and urban centers, the farmer has this year caught up a little with his city brethren. The gap is not quite so wide as it was, though a gap still exists. But that any progress towards better rural conditions has been made, is something to record to the credit of the year 1927.

The crop season started somewhat badly. A disappointing wheat harvest was predicted. The outlook was for a short corn crop—the smallest in 25 years. At one time a low production of cotton seemed probable. But a poor spring and mid-summer was followed by a better growing season in September and October. Crop yields recovered.

The wheat crop is the best in six years. Corn is yielding 100,000,000 bushels above last year—the price so far remains fairly good. Tobacco prices have dropped somewhat, but good prices still prevail in many areas. Potatoes are yielding a few million bushels over last year.

Thus a season that started badly has turned out to be a fairly good one, with total yields of the major crops not so high that prices have dropped disastrously, or yields so low that the total income has been unprofitable.

Various groups will doubtless be anxious to take credit for any improvement in crop values achieved in 1927. In the last analysis, however, most of the credit must be given to changes in the weather.

The weather in a large measure governs our agricultural operations. Disorderly production and distribution are the common causes of fluctuations causing the farmers' losses. Orderly production and distribution are badly needed. Fortunately, however, while we are discussing these problems and finding out how best to put them into effect, the weather this year has helped us along to a better farm income.



Country Children

There are 6,051,810 children under 10 years of age on farms owned and tenanted by white farmers in the United States.

Tenant farmers show a much larger proportion of young children than do owner farmers. The figures as shown by the Federal farm census conducted in 1925 are now being made public by the Bureau of Census. These figures show that out of an owner population of 16,079,708 farmers, there were 3,539,722 children under 10 years of age, while out of a

tenant population of only 8,165,537 farmers there were 2,512,088 children.

These figures represent one of our greatest assets and greatest responsibilities. Fortunately the last two decades have witnessed a definite effort to harmonize the child's training with rural surroundings. Agricultural schools have been established; boys and girls clubs organized; and many other activities started by trained leaders, calculated to give the child a sympathetic outlook of rural life and a glimpse of its true possibilities.

Every appropriation that is asked for to help these organized efforts train the country child should be strongly supported. An excellent start has been made. Thousands of rural teachers, county agents, and extension men are doing a good and faithful work for small returns-content to carry on because they believe in their work. Whatever else is done for the farmer, in the last analysis rural life will stand or fall on whether it keeps for itself the best brain power and the soundest character. These 6,000,000 children are the foundation of our rural life of the next generation and the bed-rock of our national civilization.

Any man or woman leader guiding and teaching this group is earning something vastly more than their monthly pay checks.



Business

The Newer The man on the street, and that means most of us, probably regards business as primarily trading and accumulating dollars-good business being a little of the first one and a lot of the latter.

True perhaps for the past, but the future will be vastly different. Business is changing; putting on a new dress. It is not simply trading and dollars any longer. Business is emerging as a profession. As a profession the newer type of business is facing vast responsibilities that it cannot escape. It is drawing up codes, studying ethics, defining new relationships and problems and viewpoints. The dress that fitted for so many years is fast growing too small, lacking in texture, quality, style, and fit.

What is the cause of this change? In few words-it is the effect of science. The offspring of science in the form of numberless practical applications have escaped from the laboratory and, journeying over the earth, are changing everything, material and mental.

As Wallace B. Donham, who has ably discussed this question in the Harvard Business Review, says, "The creative scientists have lost control of the consequences of their thinking." Having probed and worked in terms of "the law of gravitation, the laws of thermodynamics, the hypothesis of molecules, the atom, and later the electron," and given the results of their thought to the ordinary working world, rapid changes are being made in the environment of everybody. No one escapes the change.

As the author points out, "All the practical developments of scientific thinking, including power machinery and factories, railroads and automobiles, the fast mail, the telegraph, and wireless have revolutionized both our intellectual and material environment within a few decades."

The business group has, therefore, found itself in control of the results of scientific thought because the business group is in control of the mechanisms of production, distribution, and finances. Inevitably the business world is faced with new problems, new possibilities, touching many phases of our civilization.

If the business group is to survive, if it is to rise to the great demands being made on it, then as never before in the history of business, it needs to generate the long-time viewpoint, to develop broadly equipped leaders, to enlarge the contacts of business itself, to specialize less in one particular field, and develop a viewpoint that sees the part in relation to the whole social structure.

"The social responsibility of the business man is inescapable."

The multiplication of socially minded business men is, therefore, the central problem of business in the present business age. To this the scientist must contribute by fearlessly following the results of his creative thinking out into the business and working world. Only by a fundamental harmony between science and business can the forces now being generated be controlled and utilized to strengthen our present civilization.

As the author very properly puts it, "Unless without great lapse of time there is this essential coordination and socialization of business, our civilization may well head for one of its periods of decline."

To this there is no denial. Business has no time to waste.



Variability

Things and forces vary. No two things are exactly the same. Because of variation the world is full—both of progress and trouble.

In the agricultural field, farms vary in size; yields vary in different fields and different seasons; the amount of work done per man and per horse varies.

How things vary is so fundamental to our agricultural and economic progress that it has become a subject of intense scientific thought. Degrees of variation have, therefore, been given index numbers—for instance the index of variability of the heights of men is 3.83.

Compared with this, two well known agricultural economists, G. F. Warren and F. A. Pearson, tell us all the measures of farming are very variable. The per cent of land in corn is, for instance, about six times as variable as the heights of men, and yet the corn acreage is more standardized than most other factors. The farmer's labor income is highly variable.

In the biological field, coefficients of variability above 30 are not common, whereas in the economic field such a low variability is very uncommon.

Man, in his economic life, has to deal with variation—change. His success depends on how successfully he can deal with change.

The common mistake is to deal with one factor only. As these economists say, "It is a balance of all factors" rather than any one that is important to success. Single track minds are doomed to failure in this age of rapid change.

Forecasts

Agricultural The value of agricultural forecasts has been questioned, and so the Secretary of Agriculture has written a letter explaining why the Department of Agriculture inaugurated price prediction reports on various agricul-

tural products. The letter was written to the Hon. Joseph E. Ransdell, United States Senator, Lake Providence, La.

The Secretary explains that the principal reason for indicating probable prices is that "every farmer who gives serious thought to the business of farming must of necessity form some judgment as to future prices as a basis for planning his production and marketing."

The letter goes on:

"As a rule farmers are guided too much by prevailing prices in relation to those received but a short while before. They increase cotton acreage and buy more fertilizer when prices are high, expecting them to remain high; they plant too little and buy too little fertilizer when prices are very low, apparently expecting them to remain low, and the consequence is great fluctuations in production and in the price for the crop. This condition exists in the production of nearly every agricultural commodity.'

This is very true. Independent economic research has shown that there is a very high correlation between crop prices and the consumption of fertilizer on that crop the next season. The variability in fertilizer tonnage from year to year is, therefore, high-34.85 in some agricultural regions.

The farmer needs all the information he can get to make what adjustments he can to varying crop and other conditions. Change is the great problem with which he has to deal.

As the Secretary points out—"Very few individual farmers have in hand the necessary extensive information or are in position to make the necessary calculations as a basis for forming good judgments as to probable prices." Modern methods of statistical research are available. Business is able to organize such methods and get such information; 6,000,000 scattered farmers cannot get such information for themselves. Some agency must do it. As a service institution the Department of Agriculture does it for them.

The Department is doing a valuable work. No one expects any forecast, least of all do trained economists expect a forecast to be exactly correct every time. But regarded as an aid to judgment, forecasts, properly made, have a value in dealing with changing conditions that no other service can render.

The problem is adjustment to changing conditions. Such adjustments can be made better some time ahead of the change.

Because such predictions of coming changes are not exactly accurate all the time, is it better to sit down and do nothing? No! It is better that such efforts to foresee changing conditions continue so that in turn the changes themselves may be modified and the farmer have less violent fluctuations in his business. In making such adjustments information from every source should be used. As one source a scientific forecast is a useful aid to judgment. But no forecast yet devised will relieve any man from making decisions for himself. It will only help him.

By P. M. Farmer

Rust Losses Less

Because stem rust of wheat still persists in the 13 north-central states where the barberry-eradication campaign has been going on for 10 years, many persons have concluded the work against this disease is useless. U. S. Department of Agriculture reports, however, that steady progress has been made and that persistence of the rust means that there are still large numbers of the bushes to be destroyed. The department men say that losses of wheat from this pest now, as a rule, amount to only about 16,000,-000 bushels a year in the 13 states, whereas 10 years ago the usual annual loss from this cause was about 50,000,-000 bushels. More than 14,300,000 barberry bushes were destroyed in the first nine years of the campaign, up to 1926. In 1926 more than 2,800,000 bushes were eradicated, more than in any of the preceding years, a good indication that many bushes remain to infest wheatfields.

Iowa Has New Weed

A kind of cocklebur with narrow hairy leaves and with three inch-long sharp spines at the axes of the leaves has been discovered growing along a railroad in west-central Iowa. According to Dr. L. H. Pammel, botanist of Iowa State College, the plant is a native of the tropics and probably has gradually worked its way north by means of the railroads. The bur of this weed resembles that of the ordinary cocklebur but is only about half the size. The spines, in addition to the burs, make the plant more dan-

gerous to animals that may eat it, and if the pest gets into grain fields it will interfere with the comfortable handling of bundles. One fortunate characteristic of the weed is its short life. It is an annual and therefore will not be hard to kill.

A Great Crop

An Illinois agronomist says alfalfa acreage in the corn belt has increased more than 1,000 per cent in the last 10 years. The reasons given are that alfalfa is more resistant to drouth and winter-freezing than red clover and does not need renewing so frequently. The University of Illinois has some interesting figures on these crops obtained from the Davenport soil plots at Urbana. A five-year rotation of corn, oats, clover, wheat, and alfalfa has been grown for 16 years. Clover has failed six times while alfalfa has failed once, and that once because of Where limestone and manure had previously been supplied, the average yields of hay during the period were 2.6 tons of clover and 3.2 tons of alfalfa. When rock phosphate was used in addition, yields were respectively 3.1 tons and 4.2 tons. Just as conclusive figures have been obtained in other sections of the state.

Back to Hand Feeding

The self-feeder has become very popular among hog feeders, but apparently it is not always desirable. The Nebraska College of Agriculture has found it pays better to feed tankage by hand than to let the pigs help themselves. The pigs on the test got

their corn in a self-feeder and some of them got their tankage the same way. Those that had their tankage whenever they wanted it made heavier gains than those getting a restricted amount, but they ate more than they needed for cheapest gains. It was found that heavy feeding of tankage did not decrease corn consumption but increased it.

Beaver Farms

One dandy thing about raising beavers is that you can keep them in their pastures with fences on only two sides. That sounds like a violation of some natural law, but it isn't. The Biological Survey says these clumsy slow walkers rarely go more than 20 or 30 rods from their home stream so that fences extending this distance at right angles on either side of the stream will keep the stock at home. The best place for such a farm is in the States along the Canadian border in localities where the aspen tree or the poplar grow well, trees that make good beaver forage but are of little commercial value. Cut-over regions that have been burned off and have grown up to aspen and pin cherry are often good locations for beaver ranches. The Department of Agriculture has a technical bulletin on beaver raising.

Artificial Turkey

As a result of the cooperation of 800 men and women with the Minnesota Experiment Station in raising turkeys by the so-called artificial plan, it is expected that one million and a half of these birds will be produced. The turkeys are hatched in incubators and are kept in brooders for a time. Their entire lives are spent in close confinement, the yards being 4 feet wide and 40 feet long. Because of the danger from blackhead, carried by chickens, young turkeys are kept away from chicken flocks and on ground that has not been infected by them. Last year out of a lot of 33 turkeys grown at the station 29

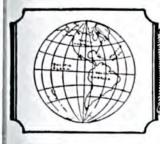
mature birds were marketed in the fall at an average of 12 pounds each and the net return over feed cost was \$3. In some of the lots there were no losses at all. A lot of 13 young turkeys were put in an old poultry house and within a month 11 of them had died of blackhead.

Rabbits Jump Ahead

The rabbit industry seems to be going ahead with leaps and bounds. In the West, particularly around Los Angeles, the production of rabbit meat has become a sizable industry. California is said to have more domestic rabbits than any other state. Now the Department of Agriculture has established an experimental rabbit station at Fontana, San Bernardino county, California. The work will be carried on by the Biological Survey of the Department in cooperation with the National Rabbit Federation and the Fontana Farms Company. The purpose of the station is to develop, for rabbit breeders and those contemplating raising rabbits, reliable information on the best methods of breeding, feeding, and housing to produce meat and fur of high quality.

Weevils Beware

A new fumigant, the most effective weapon yet devised against pests of stored products, has been developed by scientists in the Bureau of Chemistry and the Bureau of Entomology. It is made up of three parts by volume of ethylene dichloride and one part by volume of carbon tetrachloride. The report of the new discoverers indicates the new mixture will fill a need long felt by handlers of grain and various products as well as by householders who wish to protect rugs, other fabrics, and furniture. It is said to have the following qualities to recommend it: It is cheap; is non-inflammable; is not injurious to furniture or fabrics; is simple to use; and is not dangerous to human life when used as recommended.



Foreign and Intermational Agriculture



The Use of Mineral Substances for Fertilization in Former Centuries

By Dr. O. Nolte, Berlin

Translated by G. Brate

A scan be seen from the statistics on the consumption of artificial fertilizer, the use of mineral substances for the fertilization of agricultural crops has increased considerably through the acquaintance with the theories of J. v. Liebig and the economic development in the most important civilized countries. However many centuries prior to that, a number of mineral substances often were used practically in order to increase the yield of the field.

The wide-spread occurrence of limestones had the effect that natural carbonate of lime, as well as burnt lime or occasionally gypsum, were used for fertilization in early times and in many parts of the civilized world. For instance the Bible contains remarks on the addition of marl to stable manure in order to increase its quantity and quality. The Roman writers cite many examples of its utilization on the field, and on their invasions to other peoples they transmitted their knowledge of its fertilizing effect. It is, therefore, a matter of course that it also was used frequently later on in many parts of the world and is still the basis of the fertilization with minerals.

Considerably scantier particulars as to other fertilizing materials are laid down by agricultural writers of ancient times. According to one of the oldest informations, by Plinius, in some districts of the Roman Empire straw ashes or wood ashes were applied on the field in order to supplement its nourishing power. The effect was known, and occasionally the application was used in medieval times.

When during the Renaissance the classic writings once more became known, the knowledge of the Ancients as to mineral fertilizers was spread also. Elaborate discussions on the theory of the fertilization with ashes as a necessity in order to prevent the exhausting of minerals are to be found in a book by B. Palissy written in 1563.

The invention of the gun powder at that time induced the production of calcium nitrate which together with wood ashes was converted into potassium nitrate. The residues obtained in this process contained varying quantities of potash, lime, and nitrogen, and were used very often in the neighborhood of the saltpeter works for the fertilization of the fields. As the price of saltpeter, as well as of the wood ashes or straw ashes, was comparatively high, these materials were often used only for soaking the seeds in order to provide them with the necessary foodstuffs.

In the course of the following centuries the number of materials that were used as fertilizers increased. For instance in the 17th century soot, horn-raspings, and soap residues were often used besides ashes. As it was only little known that soot was effective particularly through its ammocompositions, and this was ascribed often to its organic substance. coal was frequently used for fertilizing purposes, without always having, of course, the expected result. fore, in the 18th century the argument whether stable manure was effective mainly through its minerals or through its organic substances played an important part in the fertilizer question. Already at that time, many exponents of the fertilizer theory ascribed its chief effect to the contents of organic salts.

Apparently also in ancient times the potash in the wood ashes or the residues of their manufacture into potash or soap were very favored, as many elaborate articles have been written on their application and effect. It is stated that they had a particularly favorable result on the papilionaceous flowers and in connection with the control of moss and similar weeds.

As a means to fertilize the field the burning of the soil, whereby particularly its potash and phosphates became more available, was also used to a great extent.

It can be seen from travelling reports from the more remote parts of the world that the fertilizing quality of mineral substances was widely Russia reports frequently known. about the fertilization with wood ashes and straw ashes. In China salt and bones in addition are favorably In the 18th century in mentioned. Central Europe also the use of salt, particularly the residues of the saltworks containing potash and magnesia, increased considerably. works Friedrichshall near Heldburg (Germany) alone delivered within two years 15,000 cwt. of salt ashes to the Besides its favorable result farmers. as to fertilization, it is stated that also the destruction of some vermin, as snakes, was effected.

Towards the end of the century, England recommended the use of bones for the fertilization of the meadows and fields. On account of its good results, this practice spread within a short time over the most important civilized districts of the continent. This led in the middle of the past century to the production of superphosphate, the result of which was the commencement of the modern fertilizer industry. A very interesting writing by W. Pampadius enumerates all the materials which were known as fertilizers at that time, and none of the important materials which are used nowadays is missing.

While before that time the favorable result of saltpeter could only be utilized on some important crops, this was remedied by the discovery of the saltpeter deposits in South America so that from that time on the fertilization with nitrogen increased considerably. At the same time the supply of potash was limited, only being available in the form of wood ashes or in residues of its further manufacture.

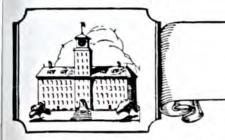
Eager endeavors therefore were made at that time to utilize the sea water for this purpose. Shortly before the realization of this project, the discovery of the potash salts in Central Germany suddenly solved this difficult problem. The development of this new industry from small beginnings up to its present importance in a few decades characterizes the importance of potash fertilization.

An American was fined for being drunk. When he paid his money he asked for a receipt which was refused.

"Judge," said the man, "do you believe in a day of judgment?"

"Yes," replied the Judge.

"Well," said the other, "on that day it will be said to me, 'Jabez Smith, you got drunk.' 'Yes,' I will answer, 'and I paid my fine.' 'Where's your receipt?' it will be said: and do you think it reasonable, Judge, that I should be obliged to lose my time by going down to look all over hell for you and your clerk?"—London Opinion.



REVIEWS



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Commercial fertilizers are essential for the production of flue-cured to-bacco. This is the outstanding result of fertilizer experiments with this type of tobacco, conducted by E. G. Moss at the N. C. Tobacco Branch Station. The valuable results of this work are published in The Bulletin of the N. C. Department of Agriculture.

Of the three fertilizer elements, phosphoric acid is essential for all soils of the flue-cured district. The following quotation shows the im-

portance of potash:

"Potash is perhaps the most important single constituent of the fertilizer mixture for growing tobacco from the standpoint of quality of product. This is indicated by the low average value per 100 lbs. when this constituent is absent from the fertilizer."

The ammonia supply is important. It must be under the control of the grower to produce best results. Mixed sources of organic and inorganic ammoniates gave somewhat better results than did any of the sources used alone.

Where "Sand Drown" is prevalent, magnesia must be supplied. For the most profitable amounts of fertilizer materials per acre, sources of fertilizer materials, etc., this bulletin will prove a valuable guide.

No potash salts are now on the market which contain a harmful amount of borax. This is an important finding of six years of experimental work by S. D. Conner, Purdue Agricultural Experiment Station,

Bul. 307. Borax is dangerous to use with corn over ½ pound per acre. The harmful effects are confined to the early stages of growth.

The form of potash, sulfate or muriate, gives the same average yields. Because of the lower cost of muriate, the author recommends muriate for the corn crop. That potash is very necessary for corn on many soils is shown by the photograph of the Rensselaer experimental field. No potash—no corn. On certain soil types potash is very essential for profitable yields of corn.

Tobacco on old tobacco soils that have been heavily fertilized with phosphates, does not respond to addiapplications of phosphates. Long continued applications of phosphates build up a surplus more than These and sufficient for the crop. other interesting results have been obtained from five years of experimental work at the Windsor (Conn.) Tobacco Experimental Station. Phosphorus is necessary for the growth of tobacco, but as very little leaches away large quantities have accumulated in many tobacco soils.

The practical conclusions of the author are that growers may reduce the phosphate content of fertilizers for old tobacco fields for many years without harm, as the available phosphorus does not revert to forms unavailable to the tobacco plant. In terms of dollars, at least half the money paid for phosphates for tobacco in New England can be saved.

Georgia State College of Agriculture has issued a very practical little circular on new fertilizer materials, especially the newer sources of nitrogen. It provides a handy table that gives at a glance the plant food content of these materials. The circular is No. 135.

"The Stimulation of Plant Response on the Raw Peat Soils of the Florida Everglades Through the Use of Copper Sulphate and Other Chemicals," Agr. Exp. Sta., Gainesville, Fla., Bul. 190, Sept., 1927, R. V. Allison, O. C. Bryan, and J. H. Hunter.

"State Laboratory Fertilizer Report, Seed Report, Jan.-June, 1927," State Board of Agriculture, Dover, Del., Vol. 16, No. 4.

"The Effect of the Constituents of Alkali, Fertilizers, and Soil Amendments on the Permeability of Certain Fine-Textured Soils under Irrigation," Agr. Exp. Sta., State College, N. M., Bul. 160 (Tech.) Feb., 1927, C. W. Botkin.

Soils

The Soils Department of the Iowa Agricultural Experiment Station has recently completed soil surveys for O'Brien, Green, Des Moines, Benton, Grundy, and Floyd counties.

In presenting the results of these surveys, a vast amount of interesting data concerning the geology, agriculture, and use of commercial fertilizers has been discussed.

Of particular interest is the discussion regarding the use of potassium fertilizers. While the amount of potassium in these soils is high, it is made clear that in order to have it available in amounts desirable for highest crop yields, considerable care as to cultivation and drainage, correction of soil acidity, and the use of farmyard and green manures is necessary. Furthermore, it is recommended that tests with potash fertilizers be tried on a small scale and if profitable be used more extensively.

The general use of complete commercial fertilizers is not recommended except for truck and garden crops. On these crops its use may frequently result in a distinct profit. Farmers are urged to test recommended brands of complete fertilizer against acid phosphate. If profitable yields are secured, then by all means, they should use it. After all, it is entirely a question of profit secured from the treatment which counts.

"Soil Temperature Studies with Cotton," Agr. Exp. Sta., Gainesville, Fla., Bul. 189, Sept., 1927, A. F. Camp and M. N. Walker.

"Soil Sterilization for Seedbeds and Greenbouses," Agr. Exp. Sta., Fort Collins, Colo., Bul. 321, May, 1927, Walter G. Sackett.

"A Classified List of Soil Publications of the United States and Canada," U. S. D. A., Washington, D. C., Bibliographical Contributions No. 13, June, 1927.

Crops

interesting publication, most "The Development of Bul. 451, Agriculture in New Jersey, 1640-1880" came this month. Carl Raymond Woodward in this work has set down the agricultural history of this commonwealth in a style which makes for easy and entertaining reading. Well illustrated with cuts of some of the earliest agricultural publications of this country, the volume is one which should find a place of value in all agricultural libraries to complete their records of the great indus-While confined agriculture. largely to the development of New Jersey, much that pertains to early colonial agriculture can be found in the publication.

A number of other interesting bulletins this month covering current problems in almost every section of the country can be found in the following list:

"Range Grasses of California," Bul. 430, Agr. Exp. Sta., Berkeley, Cal., Sept., 1927, Arthur W. Sampson and Agnes Chase.

"The Kadota Fig, Part 1; and "Kadota Fig Products, Part II," Agr. Exp. Sta., Berkelev. Cal., Bul. 436, Oct., 1927, Ira J. Condit and W. V. Cruess.

"Permanent Pastures," Col. of Agr., Athens, Ga., Cir. 136, Vol. XVI, July, 1927, Paul Tabor.

"Suggestions for Improving Corn Yields," Col. of Agr., Athens, Ga., Cir. 137, XVI, July, 1927, Paul Tabor.

"A Year's Progress in Solving Farm Problems of Illinois," Agr. Exp. Sta., Urbana, Ill. "Annual Report for the Year Ending Dec. 31, 1926," Ext. Div., Col. of Agr., Lexington, Ky., Cir. 208, May, 1927, T. R. Bryant.

"Alfalfa in Nebraska," Agr. Exp. Sta., Lincoln, Neb., Bul. 222, July, 1927, T. A. Kiesselbach and Arthur Anderson.

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Pages From A Field Note Book



Here and There

By H. T. Maddux

Atlanta, Georgia

ORE than 70 bushels of corn per acre on 150 acres of land is the record which J. B. Seay of Spartanburg county, South Carolina, established in 1924, a very dry year. His soil was a Cecil sandy loam to clay loam. The fertilizer used was 400 lbs. per acre of a mixture analyzing 10 per cent phosphoric acid, 5 per cent nitrogen, and 6 per cent potash, with 50 lbs. of nitrate of soda as a top-dressing. Practically the same yield was obtained in 1925, another relatively dry year, with the same fertilizer.

David C. Strother, manager of the Fort Valley Cotton Oil Company, Fort Valley, Georgia, uses 15 per cent potash in his fertilizer mixtures for peaches on his own orchard. Mr. Strother has stated that he cannot afford to jeopardize the firmness of his fruit and its shipping quality for a few cents worth of potash per tree.

A number of farmers around Trenton, South Carolina are applying 1,000 lbs. of 20 per cent manure salts per acre as a top-dressing for asparagus each year in addition to their regular fertilizer of two tons of a 7-5-5 mixture. This development in the fertilization of asparagus has come through the efforts of F. W. Miller, manager of the Trenton Fertilizer Company. The farmers of that section have found that the application of manure salts returns big profits.

County Agent A. E. Gibson of Dawson, Terrell county, Georgia has carried on fertilizer tests for several years with cotton on Coastal Plain soils. In 1928 he plans to use a minimum of 5 per cent potash on red soils and 7 per cent on gray soils. In a recent interview Mr. Gibson emphatically stated that his tests showed that high amounts of potash did not delay the maturity of cotton, and that in some cases it hastened maturity.

Three hundred and fifty-seven pounds of seed cotton per acre for one 200-lb. bag of kainit, used as a top-dressing, is reported by E. G. Iones of Wadesboro, N. C. demonstration was conducted this year with two plots of one acre each on a Norfolk sandy loam soil. Both acres were fertilized with 600 lbs. of 8-3-3 and 100 lbs. of sulphate of am-The kainit acre produced monia. 1,628 lbs. of seed cotton and the regularly fertilized acre 1,271 pounds.

Ed Clary, of Gaffney, S. C., has found that top-dressings of kainit applied to oats, either in the fall or early spring, at the rate of 300 to 600 lbs. per acre, completely control rust and give greatly increased yields. The kainit also stiffens the straw of the oats, making harvest easy. Mr. Clary's soil is a Cecil sandy loam to clay loam.

On a four-horse farm in 1927, Holloway Norris, of Meansville, Ga., produced about \$7,500 worth of cash crops, in addition to vegetables and minor food products. His record is 49 bales of cotton from 46 acres, 800 bushels of oats, 700 bushels of corn, 30 tons of peppers from six acres, and 25 market hogs. Mr. Norris is a firm believer in diversification and liberal fertilization.

Increased Yields

By James Graham

Batavia, New York

DURING the seasons of 1925 and 1926, Henry C. Wolfe, Hardys, New York, ran tests on potatoes, using straight acid phosphate and a mixture analyzing 0-10-10. He used 1,000 pounds of acid phosphate on one plot, and 500 pounds of 0-10-10 on another, the money value being the same.

The difference in yields obtained where the acid phosphate and the 0-10-10 were used was quite apparent. The rows where the 0-10-10 was used could be picked out easily, and the yield was increased from 50 to 75 bushels over the yields where acid phosphate only was used.

Making Farm Credit Easy

(From Page 28)

quests from commodity associations for loans increase and the commodities can be proved from the standpoint of keeping quality and standard grades of the commodity offered.

Some farmers, of course, are not benefited by this type of loan. members of cooperative marketing associations can borrow directly from the Intermediate Credit Banks and they borrow through their associa-The requirements governing loans of this character vary somewhat according to the problems encountered in producing, processing, warehousing, and marketing the commodity loaned upon. However, no cooperative marketing association which could come within the provisions of the Act has been refused a loan. The Board does not insist upon Federal warehouses, although many loans upon which Intermediate Credit money has advanced represent stored in them, neither has the Board always insisted upon state licensed In fact, some of the warehouses. state warehousing laws are so poor as to be almost worthless, either from the standpoint of the law itself or the way it is administered.

The fact that the law limits the amount which may be advanced upon products so warehoused and secured by warehouse receipts is a matter of constant agitation among some people who believe that the 75 per cent mentioned is not adequate and that the farmer should be able to borrow a higher percentage of the current value of the product. That, however, is a matter which is entirely in the hands of Congress.

Some people believe that so long as the Federal Intermediate Credit Banks have to depend upon the sale of debentures to the investing public for their funds that more than 75 per cent is not desirable; that that might have the effect of raising the interest rate on the debentures and therefore to the farmer; that 75 per cent gives the cooperative opportunity to pay the producer for the majority of his crop at the time that he delivers it; and that the farmer should be satisfied with that amount.

Others, however, say the cooperative should pay as high as 90 per cent or more still, and some advocate that the full market price be advanced when the products are delivered to the cooperative's warehouse. Of course, the latter provision would make it possible for them easier to

compete with spot cash buyers, but it is questionable whether 100 per cent could be advanced if the Intermediate Credit Banks depend upon the money from the sale of their debentures. An alternative plan might be evolved whereby the Intermediate Credit Banks could continue to advance 75 per cent and the balance could be obtained elsewhere. ever, the last 25 per cent would doubtless cost the cooperative a much higher rate of interest than the rate charged on the 75 per cent because of the probable fluctuation in the selling price and the possible vanishing This plan of the lender's collateral. of lending 100 per cent does not seem to be altogether practicable.

The service which the Intermediate Credit Banks have rendered to date, however, can not be measured entirely by the amount of money which they have loaned. A number of cooperatives have found that after the Intermediate Credit Banks had agreed to lend them money and thereby give their stamp of approval on the loan as being safe and sound, that other banking agencies were willing to supply the money. In many instances the commercial banks have furnished loans for short periods and the Intermediate Credit Banks have loaned for six months and longer.

Congress provided the 12 banks with a potential lending power of \$660,000,000. They have lent about \$500,000,000 in four years and now have outstanding about \$80,000,000 to \$90,000,000. The system is flexible; responsive to the demands of the cooperatives; and beyond a doubt would reach its maximum service quickly should the short-term commercial banks find themselves overstocked with slow-moving agricultural paper as they did a few years There is no doubt but what the need for intermediate credit is a real one and that its services will be extended as the demand increases.

Cutting Cotton Costs

(From Page 30)

the deflation period, southern farm land values have moved along on a level, at first above but in late years below the wage level.

The cheapest of these three principal items in the cost of cotton production since 1920 has been fertilizer. Land, labor, fertilizer—and the lowest of these is fertilizer.

It is fortunate for that part of the Cotton Belt which lies east of the River that this is so. The Old South is up against the economic battle of its history. It is facing substantially the same kind of readjustment as New England faced two generations ago when the West took over her cattle, sheep, and grain industries.

The West is making a bid for cotton supremacy now. If the eastern belt wants to go on making cotton it has got to sluff off some of its ancient system and meet competition with improved methods. New England replaced her grain and meat industries with a more intensive system of dairying, fruit, poultry, and vegetables. The Old South will have to meet the cotton situation with a similar intensifying of production methods. That means especially using the better land, using more fertilizer on it, and cutting down the labor cost by the use of machinery.

Cotton braced up in price this spring. The world is going right on using cotton. Somebody is going right on making a living growing cotton. Texas and Oklahoma have learned the trick. The eastern belt can stay in the game but only by a system which cuts the cost of production to the minimum.



The Extension Worker

(From Page 12)

der, are ridiculed by their associates. A sale that is not closed is not a sale, it is only a likely prospect. Closing the deal by honest methods and fair dealings is what appeals to both the salesman of goods and the salesman of better methods in agriculture.

To the agricultural extension worker, however, closing the deal means something a little different than it does to the salesman of goods. At the close of a farmers' meeting or demonstration, those farmers who give the specialist their names and addresses, stating that they expect to put into operation the farm practices or methods recommended, are as truly closed with as prospect or customer who purchases merchandise or goods by signing the order blank on the dotted line. Such farmers become bona fide cooperators or customers and the extension worker may continue to sell them ideas regarding better farm practices just as the salesman may continue to sell his customers more modern and useful merchandise.

Relation of Work

As public institutions the College of Agriculture and the private corporation, by perfecting and continuing their relationships, will come more and more to know the satisfaction which always goes to the seller who has furnished the buyer with that which he really needs and which will give him service. To both, therefore,

will go the support and praise of all the people with whom they work.

There is also another striking relation between the two kinds of work, which has more to do with keeping men in the service than any other factor. When either of these workers has performed a real service to the farmer or the merchant, he is stimulated with a sense of satisfaction in that he has been of a real service to others in addition to earning his bread. He, therefore, works for the love of work, not necessarily because it is required in order to make a living. Both kinds of workers are imbued with the missionary spirit or a desire to serve.

Sales Are Required

Much of our extension work is of such a nature that a sale of some sort is required in order that the farmer may put into practice the teachings recommended by the college specialist. For example, the horticulturist may emphasize the necessity of spraying, pruning, and cultural practices in making the commercial orchard a paying proposition, but unless the farmer buys a spraying outfit, spraying chemicals, pruning tools, and such other materials and implements as he needs, the specialist has not sold his orchard improvement idea. Neither will the fruit grower make a success of his orchard operations until he does invest in these necessities.

Likewise, no matter how forcefully or eloquently the home demonstration agent may teach and demonstrate regarding home improvement, unless the farmer purchases a water system, electric lighting plant, and the other equipment needed to make the improvements required, we will not get very far with our teaching. much of the work in agriculture as agents of all the people, representing a public institution, stops, the work of the business or private corporation begins, and one or many sales may be required to complete the cycle. It is, therefore, of paramount importance that the workers of both groups cooperate to the fullest extent if they are to be of the greatest service to those with whom they work and to the institutions which they represent.

Due to a lack of knowledge regard-

ing the place, work, and need of the Colleges of Agriculture and business establishments and private corporations, there has not been as free and as hearty cooperation between them in the past as there should have been. In recent years, however, great progress has been made toward the development of better relationships and both organizations should make more rapid and worth while advancement in the future.

As long as agricultural workers and business salesmen continue to sell ideas and goods which are honest, sane, safe, and practical, both are builders and real factors promoting progress and development. It must also be said that they are of great value and our people cannot make rapid advancement if they are lacking.

Telling Plants

(From page 23)

The horticulturist will see at a glance that he can synchronize the blooming of various plants which formerly bloomed at different periods of the year. For instance, he might make an early spring bloomer and a midsummer bloomer flower together. That would give him pollen for cross breeding. So will be created new kinds of plants that hitherto it has been utterly impossible to create, since the flowers did not bloom at the same time.

The possibilities are staggering. It will be decades before we begin to realize largely upon these possibilities. But in the meantime all of us can profit by these discoveries. All one needs for home experimentation is a darkhouse and an electric light. Doubtless a tight, ordinary box is the simplest form of darkhouse. It would need bent pipes top and bottom for ventilation. A darkened coldframe would be easy to make. Or one might darken the tool house and run potted plants in and out on

a wheelbarrow. At almost no expense and with very little labor one could test out the possibilities in one's own garden.

Surely those who love fall flowers would find it worth while to have a few of them in summer, when blooms are relatively scarce. It would be worth while, too, to have lettuce stay in head instead of shooting up to flower. Also, it would be worth while to deck the dinner table with iris in January. All one needs to do is to hang an electric light bulb by the iris pot and turn on the light when the sun sets, burning it until perhaps ten or eleven o'clock.

There are mighty interesting possibilities here for the home experimenter. For those who would like to pick up a few dollars there are also likely openings. The day will probably come when the darkhouse is just as essential a part of the florist's equipment as the hothouse is now. The pioneers in this new method of handling flowers will profit largely.

From Cattails to Fertile Farms

(From Page 16)

hot in search of the best wholesale markets, but they see that plenty of cars are on the tracks at loading time so a minimum of spoilage results.

At the time we were there Blocker was attending the vegetable growers' convention at Syracuse, New York, in the hope of finding new ideas along market gardening lines. We were able to talk with Davis although he was rather busy as he had to attend to Blocker's work as well as his own. He told us that there is little need for government aid for farmers in this day and age where you will always have a market at a good price if you produce quality products.

The Hollandale Brand

"Potatoes here are grown on disease-free ground," he said. are all treated for disease during the growing season, and much of our tonnage is certified seed. Clean seed on clean ground, properly fertilized, and adequately cared for makes for good

"State and government officials inspect the potatoes right on the loading platform before they can go out under our brand. If they do not come up to grade, the farmers have to take them back and they may not sell them in sacks stamped with the Hollandale brand. We have a standard pack and are always able to find a Even in 1924, which saw market. the biggest potato crop the United States has ever had, you could buy potatoes in many places for 15 cents a bushel but we averaged \$1.15 a hundred on over 250 carloads. inspectors have very little to do now because the farmers realize that only good quality stuff may be shipped through the association, but the fact that a car bears the government O.K. gives a buyer more confidence in the load. All the farmers have their own

box graders which are set at the standard inch and seven-eighths size. They sell most of their culls to truckers and usually realize a fair price even on these seconds, for they are pretty good. The average potato yields are around 350 bushels per acre with very

few poor ones produced."

In the search for markets for certified seed potatoes, the association shipped an entire carload to the Henry C. Hollman Produce Company of St. Louis, Missouri, for free distribution among the potato growers in the southern territory. These potatoes were grown under the supervision of Minnesota's agricultural department, field inspected by state inspectors not less than three times during the growing season, rogued in some fields as many as seven times for purity and disease, treated for disease before planting, sprayed for blight while growing, and were graded according to the strictest state requirements when they were harvested. This free seed distribution in 1924 resulted in the sale of 397 cars of certified seed to the Hollman company alone in 1925 at a premium of 70 cents a bushel above the price of first-class table stock.

Fertilizer Practices

Davis said they are unable to supply the demand for this seed and he attributes this to the quality of seed High quality and large yields on muck lands are so dependent on the correct use of fertilizers that we asked Davis to give us some of the more outstanding successful fertilizer practices in the district.

"Our Hollandale soils," he said, "were formed by the falling down of sedge, cattails, wild rice, and other heavy vegetation. This has made a soil that is composed almost entirely of humus or organic matter and which

is very rich in nitrogen but is very low in phosphate and potash. Therefore, although the soil is naturally fertile, it has been necessary to add these two elements for the vegetable crops that are being raised. Fertilizer recommendations for this soil were received from Dr. F. J. Alway of the University of Minnesota, and extensive experiments were then made with fertilizers for the various crops.

"At the present time it has been found that the 0-9-27 fertilizer applied under the rows for potatoes has been giving the best results. Potatoes on this soil will produce from 100 to 150 bushels to the acre without fertilizer, but by using the 0-9-27 mixture the average yield has been increased to nearly 350 bushels and individual yields of more than 500 bushels have been obtained. The quality for table or seed purposes, too, has been very greatly improved as has the resultant price per bushel.

Frost Resistant

"It has also been found that fertilized plants resist frost to a much greater degree than unfertilized ones. This year we found stretches in fields where the fertilizer attachment had clogged. The first heavy frost last August mowed the plants in these stretches right to the ground while only the tip leaves on the rest of the plants were nipped. Residual effects of fertilization could be noticed, too, for there was far less damage from frost on fields that had been heavily fertilized three years in succession than on new ground that had been fertilized only once. I think the reason for this is that the fertilizers increase the mineral concentration in the sap so they make the plant more resistant to frost. It works the same way when you add salt to water to form brine. The salty water will not freeze so quickly as the fresh.

"Six hundred pounds to the acre of 0-9-27 fertilizer seems to give the best results for cabbages and carrots. Celery growers too apply this mixture broadcast at the rate of 1,000 to 1,500 pounds to the acre. Some growers apply sodium nitrate in addition at the rate of 400 to 500 pounds to the acre along the celery rows in four applications during the growing season."

"We have found that onions need a larger percentage of phosphate than other crops in order to hasten maturity and make good hard bulbs. growers apply 1,000 pounds to the acre of 0-14-14 fertilizers, but some of them use a 2-14-14 mixture in addition, as a little soluble nitrogen has been found helpful to start the plants off before the natural soil nitrates be-From 200 to 300 come available. bushels of small onions per acre can be grown here without the use of fertilizers but by the use of the aforementioned application the average production per acre is from 500 to 600 bushels of fine large quality onions and many growers get from 800 to 1,000 bushels to the acre.

"The residual effects of all these fertilizers is quite marked. The crops the following year show very plainly that some of it remains unused in the If grain is planted on a field which had an application of fertilizer along the potato rows the previous year, the grain stands much higher and heads earlier in these rows. It is believed at present, that after a few years of heavy applications of fertilizers to these soils that the amount may be reduced without lessening the vields or impairing the quality. The experiments at Hollandale, however, have proved that no matter how rich a soil one may have, it is usually deficient in some of the elements needed for optimum plant growth. Experiments will show just which elements are needed to make a proper balance and will show which fertilizers will give the best results.

"The chemical analysis of a soil in general is not very satisfactory as an indication of the crop that you can raise from the land, for one cannot tell just how much of this food will become available in any one year. There seems to be quite a misunderstanding among a great many farmers throughout the United States in regard to the use of fertilizer. Many of them believe that its use will put the soil into some condition that will necessitate the use of increasing amounts every year. So far as I know, and certainly so far as our Hollandale trials indicate, there has never been any data to prove that this belief is correct. The application of fertilizer is nothing more or less than the addition of necessary plant food."

A Bright Future

About the time we reached this point in our interview, a large potato buyer came into the office and it happened that Davis and he were boyhood friends who had played football on opposite elevens in their college days. Sensing the coincidence as one that would develop into an extended conversation over "old times" we went on our way to see some of the beautiful fields that lay on either side of the excellent gravel highways.

We drove over to Henry Voss' celery farm where this Holland-born lover of beautiful crops, with his wife and son, was packing celery. Voss got some early training in growing vegetables when he worked on a government experiment farm in Holland, but he had never seen any celery until he landed on his future father-in-law's place at Kalamazoo, Michigan. was in 1900. He has been specializing in celery ever since. He says that he has never grown such crisp, white, tender stalks as he cuts at Hollandale. He has not found the use of a nitrate top-dressing to be profitable, but he gives his five-acre field a heavy application of barnyard manure once every three years in addition to a yearly application of 1,000 pounds to the acre of 0-9-27 mixture.

From Voss' beautitful home we drove over to have a talk with Peter Van Erkel and C. Kraay, two ambitious young gardeners who once lived and worked together near Doorn, Hol-

land, where the former Kaiser of Germany now resides. They were storing an 800-bushel per acre crop of fine white Southport onions in Van Erkel's These two farmers follow the same fertilizer practices. They own all their machinery in common as each of them has only a 20-acre farm and they both have practically the same acreages in each crop. They exchange work at planting and harvest time, and Van Erkel does the chores for Kraay on days that the latter must be away late with their jointly owned truck. They both use 650 pounds per acre of 0-9-27 fertilizer for potatoes and carrots, which is slightly more than the average as given by Davis. Then, too, they find a 1,200-pound application of 0-14-14 fertilizer on onions to be more profitable than a 1,000-pound application. An additional 200-pound application of 2-14-14 mixture is broadcast at planting time, too, since they believe that it pays to hurry the young plants along with a good start.

Although Van Erkel and Kraay have farmed near each other in Holland, Iowa, and here, they find their little Hollandale farms to be the most profitable ones that they have operated. Van Erkel is a bit of a traveler. He has helped his father in a trading position in South Africa. He has crossed the ocean seven times, but he says he enjovs his beautiful, flower-decorated Minnesota home better than any he has lived in. Perhaps this enjoyment comes from the fact that he has sold between \$6,000 and \$8,000 worth of crops from the little farm every year since he came there.

We saw dozens of prosperous looking farms and many beautiful fields of onions, celery, potatoes, cabbage, and carrots all through this section and would have enjoyed visiting with more of the farmers. However, it was getting near time to go home, and so we passed them up. Our guess for the future of this section is that it will be bright if the same care is practiced in marketing only high quality stuff.

Reviews

(From Page 46)

"A Preliminary Study of 127 New Mexico Ranches in 1925," Agr. Exp. Sta., State College, N. M., Bul. 159, Jan., 1927, A. L. Walker and J. L. Lantow.

"Abstracts of Papers not Included in Bulletins, Finances, Meteorology, Index," Agr. Exp. Sta., Orono, Me., Bul. 335, Dec., 1926.

"Ringing Applied to the Commercial Orchard," Agr. Exp. Sta., Wooster, Ohio, Bul. 410, Sept., 1927, J. H. Gourley and F. S. Howlett.

"Varieties of Apples in Ohio, II," Agr. Exp. Sta., Wooster, Ohio, Bul. 411, Oct.,

1927, C. W. Ellenwood.

"The Formation and Development of the Pistillate Flowers of the Pecan," Agr. Exp. Sta., Stillwater, Okla., Bul. 163, Feb., 1927, D. V. Shuhart.

"The Influence of Crop Plants on Those Which Follow, III." Agr. Exp. Sta., Kingston, R. I., Bul. 210, Sept., 1927, Burt L. Hartwell, John B. Smith, and S. C. Damon.

"Small Grain Experiments," Agr. Exp. Sta., Clemson College, S. C., Bul. 242, Oct., 1927, T. S. Buie, W. B. Rogers, J. D. Warner.

"Crop Rotation in the Blackland Region of Central Texas," Agr., Exp. Sta., College Station, Tex., Bul. 365, Sept., 1927, E. B. Reynolds and D. T. Killough.

"Strawberry Varieties in the United States,"
U. S. D. A., Washington, D. C., Farmers'

Bul. 1043, Geo. M. Darrow.

"Origin and Distribution of the Commercial Potato Crop," U. S. D. A., Washington, D. C. Tech, Bul. 7, July, 1927, J. W. Strowbridge.

"The Jerusalem Artichoke as a Crop Plant," U. S. D. A., Washington, D. C., Tech. Bul.

33, Oct., 1927, D. N. Shoemaker.

"Report on the Agricultural Experiment Stations, 1926," U. S. D. A., Washington, D. C., Sept., 1927.

Department of Agriculture Immigration of

Virginia, Bul. 238, Oct., 1927.

Department of Agriculture Immigration of

Virginia, Bul. 239, Nov., 1927.

"Filbert Culture," Experiment Station, Puyallup, Wash., Bul. 6-W, New Series, Oct., 1927, H. D. Locklin.

American Potato Journal, Washington, D. C., Vol. IV, No. 10, Oct., 1927, Ellwood Douglass.

Diseases

It is one thing for a farmer to recognize diseases in his crops. Far more important is it that he be able to identify the disease and know how to treat it. Bul. 313, "Common Diseases of Colorado Truck Crops," by L. W. Durrell and E. L. LeClerg, presents this information in text and splendid illustrations. More publications of this type from different experiment stations would be of great service to farmers in the production of their crops.

"Suggestions for Control of Root-Knot of Tobacco," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 401, Sept., 1927, W. B. Tisdale. "Treatments for Wheat, Oat, and Barley Smuts," Col. of Agr., Athens, Ga.; Cir. 138,

Vol. XVI, Aug., 1927.

"Powdery Mildew of Peas," Agr. Exp. Sta., State College, N. M., Bul. 163, June, 1927,

R. F. Crawford.

"Spraying for Prevention of Apple Blotch and Apple Scab," Agr. Exp. Sta., Wooster, Ohio, Bul. 413, Oct., 1927, F. H. Ballou and I. P. Lewis.

"Spraying for the Control of Fig Rust," Agr. Exp. Sta., College Station, Texas, Cir. 47, July, 1927, W. B. Lanham, R. H. Wyche, R. H. Stansel.

Insects

A report of the present status and method of control of "The European Corn Borer," has been published in Farmers Bul. 1548, U. S. Department of Agriculture. D. J. Caffrey, Entomologist of the Department, and L. H. Worthley, Administrator in Corn-Borer Control, are the authors. To corn growers, the news in this interesting and well illustrated bulletin will be valuable.

"Insecticidal Control for Sugarcane Borer," Agr. Exp. Sta., Baton Rouge, La., Bul. 201, Aug., 1927, W. E. Hinds and Herbert Spencer.

Economics

The growth of cooperative marketing has been accompanied by many different plans and methods of selling. No one particular method is satisfactory for all commodities. There are special and individual problems to be solved for each commodity and each locality.

"Some Economic Problems Involved in the

Pooling of Fruit," H. E. Erdman and H. R. Wellman, Agr. Exp. Sta., Berkeley, Calif., Sept., 1927.

Bulletin No. 432, analyzes some of the economic problems involved in the pooling of fruit. The advantages of pooling fruit as compared with selling on the individual growers' accounts are: (1) pooling gives the individual grower better insurance against the risks of marketing; (2) pooling facilitates the transfer of the control of the product from the members to the management; (3) certain costs may be reduced by pooling.

Some of the important factors affecting the pooling plan are: (1) the accuracy with which the fruit can be graded; (2) existence of normal seasonal variation in prices of the fruit; (3) importance of market

risks.

Report of the Secretary of Agriculture

Agriculture has regained more than three-fourths of the buying power lost per unit of its products in the post-war price decline.

This is the important note in the report of Secretary of Agriculture W. M. Jardine, for 1927, just off the

press.

After analyzing the situation of each crop district and each branch of the livestock industry, the Secretary concludes that in general the showing for

the year is good. Yet much remains to be done before the position of the farmer will cease to constitute a problem.

In order to achieve higher net infor agriculture, advance is necessary along several lines. farmers themselves are reducing their costs of production through increased efficiency, public agencies should cooperate with them in effecting a better adjustment of production to demand. Also efforts should be made to diminish waste, to lessen margins between producers' and consumers' prices, to reduce transportation and distribution costs, and to lessen the farmer's overhead charges by lowering or redistributing tax burdens and by improving agricultural credit facil-Farmers should be encouraged to enhance their bargaining power through cooperative marketing, and the responsibility of the public in helping to reduce price fluctuations due to unavoidable gluts and shortages of agricultural products should be recognized in a practical manner.

Overemphasis on the fairly satisfactory results of a single year may cause us to forget the existence of underlying causes of farm difficulty, and therefore to neglect practicable means of affording relief.

The report is a very comprehensive and encouraging survey of the year's agriculture.

Oregon

(From Page 20)

tions of wheat under the same painstaking systematic study. Improved strains look promising to meet weaknesses of older ones. Two new selections of Hard Federation will be distributed to farmers for trial in 1928. For western Oregon, Jenkin wheat is proving nearly as outstanding as Federation for eastern Oregon.

In western Oregon the introduction of Hungarian vetch has been an outstanding accomplishment in the field of forage crops. This is an aphidresistant vetch, equal in seed quality to common vetch, but suited to soils too wet and cold and poor for ordinary vetches. The first seed was released to farmers only about six years ago, and the crop is now widely distributed. Introduction of alfalfa into the Willamette valley, where for a generation it was thought that the crop could not

be grown, was another revolutionary accomplishment.

No discussion of the Oregon station would be complete without mention of its nationally recognized accomplishments poultry In breeding. 1908, when the experiment station adopted a definite program in poultry improvement, there was not commercial

flock in the state, nor was there a trap nest, and the farm flocks were very ordinary. Poultry productions were being shipped into the state; now, 20 years later, the poultry industry of Oregon holds a high place. High quality eggs are marketed in hundreds of carloads on Eastern markets. Annual production is now estimated at \$10,000,000. Commercial flocks averaging 200 eggs per bird per year are common, and the state is known as a center of poultry breeding.

A Profound Influence

That the station accomplishments have had a profound influence on this development, there can be no question. Thousands of eggs from the high laying fowls developed at the station, as well as many breeding birds, have been shipped throughout the state to become foundations for farm flocks. Many breeders make a large point in their advertising of the fact that their flocks have been built upon foundation stock from the station. On the station the breeding stock from which the start was made produced as fol-White Leghorns, 106 eggs; Barred Plymouth Rocks, 86 eggs per Within five years the White vear.



Leghorn flock producing above a 200-egg average and the 300 - egg first in the hen world, a White Leghorn, had been produced. More than 100 articles were about written this hen. In 1922 the station published the following conclusions:

"(1) High fecundity is inherited.

"(2) Selecting breeding

stock on the basis of annual trap nest records regardless of prepotency or tested qualities is a certain method of

increasing egg production.

"(3) Some hens and some males have the power of transmitting high fecundity; others have not this power. More rapid progress will be made in increasing production of the strain if only those hens and those males be used in the breeding pens that have shown by the egg records of their pullets or by the progeny test that they possess the power of transmitting high egg production."

In the field of soil fertility, perhaps the greatest accomplishment of the experiment station has been the discovery of the value of sulphur as a plant food. On 100,000 acres of alfalfa land in the state applications of 40 to 50 pounds of sulphur annually increase the yield of hay obtained a ton to a ton and a half per acre, and the cost is nominal, running less than At this time, about 30,000 acres of alfalfa are thus treated. a similar manner it has been determined that phosphate fertilizers are the basis of restoration of fertility to the worn-out grain lands of the Willamette valley, cropped continuously for a generation.

Oregon is a state of marked topographical differences. Divided into six major regions, some of these differ as widely as do the widely separated states of North Carolina and Montana, for example. In the counties breasting the Pacific Ocean there are regions of 80 to 100 inches of rain-East of the Cascade mountains there are deserts where five or six inches of rain is the annual average. Extensive agricultural operations prevail along the heavily watered coast, and, likewise, extensive agricultural operations are carried on under an annual average precipitation of 11 inches. Properly to serve the agricultural industry in these districts of widely diversified conditions, seven branch experiment stations have been established under the administration of the director of the Oregon Experiment Station. Each of these is locally in charge of a resident superintendent and a staff, which force is augmented by the scientific men of the central station at Corvallis.

The oldest of these branch experiment stations is at Union in the Blue Mountain region. This station, established in 1901, gives particular attention to the livestock industry, which is predominant in that region, with some minor attention devoted to field Extensive experiments in the wintering of stock cattle, fattening of steers, and handling of range sheep, have been carried on. The value of silage in fattening Northwestern steers has been established, as has the fact that an ambitious outlay for buildings is unnecessary under range conditions, the stock wintering with only fair shelter having equalled in gains, and at times exceeded the stock more carefully cared for. Likewise, it has been determined that since the most economical gains are made on the range during grazing, growing rations during the winter season are an important factor in the economical production of beef.

To serve the dry land, wheat-pro-

ducing areas of the Columbia Basin where the summer fallow method is standard, a branch station was established at Moro in 1909 in cooperation with the United States Department of Agriculture. Perhaps no phase of the Oregon Experiment Station work has been adopted by a greater percentage of the persons affected, than is the case with the results obtained at Moro. As a direct result of this station's work, wheat-growing practices in an area producing 12,000,000 to 15,000,-000 bushels of wheat annually have been revolutionized; for example, 13 years' experience at Moro shows that an average of a bushel per acre per week is lost for every week plowing of summer fallow is delayed after mid-April.

Harrowing Impracticable

Harrowing of spring grain, formerly a standard practice, has been found impracticable over an average of 10 years or so, although now and then it may return the cost of the opera-Time and rates of seeding, tion. depth of plowing, and methods of weed eradication developed at this station have been almost uniformly adopted. Varieties of wheat from all parts of the world are tested for years. Early Barrt, Turkey Red, and other standard varieties were proved adapted to eastern Oregon conditions at this Promising new varieties are being developed; namely, some smutimmune varieties and crosses between the Federations and more hardy varieties, in an effort to produce a wheat of winter habit with the yielding character and other excellent qualities of the Federations.

In 1909, also, there was established in cooperation with the United States Department of Agriculture, a branch station at Hermiston where cropping experiments, soil moisture experiments, and some livestock-feeding work, are conducted under irrigated conditions, and the results have wide application.

In 1911, the southern Oregon Branch Experiment Station was established, in cooperation with Jackson county, at Talent. Here the discovery of sulphur as a fertilizer for leguminous crops was made. However, this station is largely given over to studies in the field of horticulture, mainly in pear production, as the Rogue River valley is famous for its fruits.

Also in 1911, a branch experiment station was established at Burns in a region fairly typical of more than one-third of the area of the state, commonly termed central Oregon. Experiments with cereals, forage crops, and irrigation methods in this district have largely been directed toward the determinations of varieties and practices particularly adapted to the territory served.

The John Jacob Astor Experiment Station was established in Astoria in 1913. Its purpose, as outlined in the bill establishing the appropriations, was "to investigate and demonstrate the conditions under which plants, grains, and fruits may be grown on

grains, and fruits may be grown on tide lands, reclaimed swamp lands, and logged-off lands, and to determine the kinds of plants, grains, and fruits best adapted for growth on said lands." The functions of this station have been expanded to include experimental work on typical soil types generally farmed in the coast regions, and the results of this station's findings are applicable over an area of country roughly 75 miles wide and extending from the California line to the Columbia river in Oregon, and into much of the state of Washington.

The Hood River Experiment Station was established in 1913 for the purpose of investigating horticultural and pathological problems in the famous fruit-producing district.

All of the branch experiment stations are adequately supplied with land for carrying out investigations planned at the time of their establishment.

James T. Jardine has been director of the Oregon Experiment Station since 1920. He is a native of Idaho, a graduate of the Utah Agricultural College, and was for several years connected with the United States Forest Service, in charge of grazing investigations.

Strawberries

(From Page 10)

Just before planting, he puts on his first application of fertilizer. This is with his bone and potash mixture. He spreads it over the whole field, usually, with a wheat drill, at the rate of about 300 pounds to the acre.

His object in using the mixture, of course, is to give the plants a supply of food that will be slowly available, for it is not until the second year that he gets his crop. With a quicker acting fertilizer, used in a like amount, he finds the new plants are likely to run vines.

"You can't afford to skip any places in putting this application on," he told me pointing to a very noticeably poor spot in one patch. "I knew at the time that the drill was empty, but I didn't take the trouble to go back over it. I watched it though. And the plants there burnt up very badly. Didn't get their share of water, because they didn't have the fertilizer to make it available for them."

Then in midsummer, about July 10 to 15, he gives the Gandies a top-dressing of the bone and potash mixture at the rate of about 300 pounds to the acre. He doesn't top-dress the Missionaries, because he finds that they make good enough growth at that season without it.

The land is kept clean of all grass and weeds. Filthy land prevents a

good job of top-dressing.

"I always like to see a nice rain after the top-dressing," says Gunby.

The following spring, late March or early April, Gunby gives the patches their third application of fertilizer. This time it is 7-6-5 at the rate of about 500 or 600 pounds to the acre, on the Gandies. Not so much on the Missionaries.

The picking season lasts about four weeks, two weeks for the Missionaries and two for the Gandies. There is no intermission. Sometimes the last picking of the earlies is made after the first of the late berries.

For humus, Gunby puts in cowpeas. He plans to leave out strawberries for two years, changing off to potatoes or tomatoes. He finds it pays best to break up his patches after the first crop and not to keep them over for another year. It costs too much for one thing to keep out grass and weeds. When the cowpeas have been plowed in, he usually sows the fields to rye or oats, preparatory to putting in the potatoes or tomatoes.

In general the farm practices of Somerset county are the result of long experience. The various operations have been nicely adjusted to the local soil and the climatic conditions peculiar to the Eastern Shore, a comparatively narrow strip of land with large bodies of water on both sides.

The farmers generally understand very well the qualities of the different types of soil found in the county, and they select their fields accordingly.

America's Markets

(From Page 7)

been similar striking developments in production to meet the greatly increased demand for food products. Great commercial producing have been developed and expanded, in some cases several thousand miles from These include consuming markets. the Rio Grande valley, the Imperial valley, the Rocky Ford area in Colorado, the Florida citrus and truck areas, the Eastern Shore of Maryland, Delaware, and Virginia, the Petaluma, California poultry and egg-producing areas. Production in areas within a day's motor haul to market centers also is being stimulated.

One naturally concludes in a tour of the markets that somebody must be making money in this vast business of producing and distributing the nation's food supply. Railroads are not hauling food for the love of work, nor are wholesalers, jobbers, and retailers in business for their health. Are great commercial producing areas being expanded without profit? Competition is terrific all along the line from pro-

ducer to retailer. But the producer who is using modern production and market methods is making money, as is also the distributor, whether wholesaler, jobber, or retailer, who is honest and capable in his business dealings.

This tour of the markets discloses the use of improved production and marketing methods which are placing better produce on the consumer's table. Greater use is being made of grade standards and market news. won't find the glutted or famine markets of former days. Prices seem to be on a more stable basis. Shipping point and receiving point inspection are forcing higher standards of busi-There doesn't seem to be ness ethics. the former volume of inferior products in market receipts which resulted in such heavy financial loss to shippers before the days of scientific harvesting, packing, and shipping.

Distribution costs have practically doubled in the markets since pre-war days, due to increased wages, higher rents, and generally larger costs of doing business. Whether these costs will ever be reduced short of a general let-down in industrial prosperity, is more than this writer can forecast. Indeed, the indications point to increasing costs of distribution as population increases and the distributive machinery becomes more complex. Certain physical functions in distribution must be performed whether by producers, producers' organizations, or independent wholesalers, jobbers, and retailers. The question is who can perform them best.

Many growers are attacking the distribution problem through cooperative organizations which are performing many of the distributive functions of private operators. The California Fruit Growers' Exchange, for example, maintains its own salaried agents in approximately 60 markets and reaches practically every city in the United States and Canada that is large enough to purchase citrus fruits in car lots. Before the organization of the exchange, the smaller cities were supplied, irregularly, from the larger markets in less than car lots. The cooperatives are making direct sales to chain stores, and endeavoring to induce retailers to adopt better methods of displaying fruits and vegetables.

Distribution Costs

An illuminating study of distribution costs was made recently in the New York City market, in which it was learned that 26 wholesale firms included in the survey had gross sales of fruits and vegetables for the year 1924 amounting to \$34,802,309.98, or an average per firm of \$1,338,550.38. Out of this total, \$31,214,461.19 or 89.69 per cent was paid for the produce up to the point of city terminal delivery, leaving a balance of \$3,587,-848.79 to pay for cartage from rail points to the wholesale markets, storage charges, costs of distribution and salaries and profits of proprietors.

The salaries and profits of proprietors were calculated at \$416,162.24 for the 26 firms, or an average of \$16,006.24 per firm. There were 65

managers, partners, or proprietors in the 26 firms, who received an average salary of \$5,304.96 for their year's work, or about \$100 per week. If the principals had received all of the net profits above interest in addition to their salaries, each principal would have received \$6,402.49 for this year's work, or about \$123 per week.

Wages of employees stand out clearly as the most important item of cost of distribution in the New York area. In distributing \$35,000,000 worth of produce, these wholesalers \$1,203,648.48 for wages of employes, or nearly 39 per cent of all costs of terminal distribution. An additional \$416,000 went for salaries of proprietors, and net profit. Other items of cost include \$316,000 in commissions paid country agents for soliciting and handling consignments at country points, and in brokerage paid city brokers in the same or other markets for services in disposing of cars of

Bad debts accounted for \$215,000; bags, barrels, crates, and stencils, \$152,000; rent \$132,000; traveling expenses \$129,000; telephone and telegraph charges \$117,000; interest on investment \$107,000; miscellaneous expenses \$81,000, and lesser amounts ranging from \$58,000 on down for depreciation and repairs, office supplies, advertising, insurance, taxes, interest on borrowed money, heat, light and power, legal fees, audits, auto expense, collection service, market news service, and inspection.

The place to get into the food game seems to be at the distribution end of the line. And yet, all is not golden even there. While the average figures indicate that a net profit was made by the 26 wholesale firms, there were actually 18 firms whose books showed a net profit, and 8 who had a net loss. The highest net profit made by any one firm, in addition to salaries of proprietors, was \$24,390; the largest loss by any one firm was \$25,308. These firms, also, are probably of higher grade than the average produce firm.

Generosity

(From Page 4)

until you have a bank roll to use as a leverage to a place among the easymark immortals than it is to wade right into the stream of life and be a fisher of men.

Yet do not despair. We have with us an innumerable company of big and little folks who do throw away the bait and can jump into the current to catch them by hand.

For true spiritual generosity, note such fine examples as Jane Addams of Hull House, Chicago; Dr. Wilfred Grenfell of Labrador; Maud Ballington Booth, of the Salvation Army—and perhaps some good neighbor of yours who speaks the soul language loud enough for you, if not the world, to hear.

To the most of us, who are of the proletariat, the heroine of fiction that typifies spiritual generosity in our own language is Mrs. Wiggs of the Cabbage Patch.

She personifies the harassed, self-sacrificing parent—and parenthood is, or ought to be, the graduate school of generosity. Not the yielding, sticky soothing-syrup kind, but that quality that can box ears with one hand and wipe away tears with the other. It is this sentimental stamina in parenthood that brings wonderful lives out of the densest tenement district or nurtures strength of character and leadership in the alfalfa.

I know of no time or place more fitting to speak of this quality than at the advent of the winter solstice in the north. A keen climate certainly has a tendency to test one's store of spiritual, patient generosity. Your tropical mammas and papas can knock down a few cocoanuts in a pinch, have no fuel troubles, and can take a siesta when home events begin to warm up.

Your temperate zone paterfamilias and his hectored spouse have lately entered the lists once more for a battle against Conditions and Circumstances. They know the truth of the adage: "It is a fact and not a theory that confronts us."

This is the battle, blow by blow:

Round One—Coats, mittens, overshoes, coal, shoes, groceries, more overshoes, insurance, more coal, gas and light bills, shoes—First Round ends; time out to check the balance.

Round Two—Rubbers, doctor bills, insurance, groceries, new shoes, coal, dentist bill, gas and light, Christmas presents!—Second Round ends; Home Defenders groggy until New Year's.

Round Three — (Principals enter smiling with holiday greetings, but ready to turn over a new leaf—in their check book.) Groceries, shoes, insurance, underwear for everybody, coal, gas and light, caps and mittens, community welfare subscription campaign, church dues, lodge dues, and real estate and income taxes. The Home Guard weakens, Mother's silk hose dream fades, Dad forgets he wants a new pipe, but the kids are clamoring to see Reginal Rinaldo in The Last of the Mazumas!

The thing that keeps you and me plugging along through a grill like that is the memory of how we once sat on the side-lines and saw another pair of household heroes try hard to be generous against even worse odds—just to keep us fat and sassy!

It's in the brood and in the blood, and so in this manner spiritual generosity becomes hereditary.

And isn't it a blessing that it is hereditary? Try to think of a single quality of heart and mind you would more generally wish to see perpetuated than well-balanced spiritual generosity. You don't have to go to Corinthians for the answer, even though it says therein that "the Lord loveth a cheerful giver."

Pessimists lament the fact that the growing generation of children are becoming either Goops or Gimmies. Caution in generosity may not be required in many cases as an admonition to parents, but where is there a sadder sight than the parent who answers "Here you are" to each and every "Give me"?

If generosity is the ace in the parent's deck, then thrift is trumps! That's the kind of tricks to teach! Without it, half the pack are jokers and you'll have no right to ask for a new deal. Better a trace of Scotch than a race of gamblers!

While philanthropic generosity is building libraries and colleges, reckless generosity is filling our poor houses. Strange to say, that's another "close

race."

Thus far we have considered only the verb "to give." Generosity covers more ground than that. Consider the most important element of generosity, which is generosity of thinking. If there is anything in which Americans are niggardly about, it is in thinking. Probably if we had to pay our taxes at the polling booth we would do more thinking about statesmen and their policies, and less about golf and pinochle. If we were more generous in our thoughts—give and take—then the bloc, the klan, the union, and the clique would melt away into a pleasant period of understanding.

And so now we have come to December. It is twelve o'clock on the year's dial. Do we approach it like a spendthrift counting his last coins, or as one who considers it as a bit of interest on the principal sum invested in happiness, tolerance, and good will?

As readers of these casual lines, you have indeed been generous to me, and I think of you as I thumb the last frayed leaf on my calendar. In the words of Tiny Tim, who was poor and generous, I say in closing:

"Merry Christmas! God bless us everyone!"

Sweet Potato Wilt

(From Page 25)

that were refused certification were there found more than 10 wilted

plants.

Sweet potato wilt is transferred almost entirely by the seed potatoes. When the diseased potatoes are bedded, the fungus that is resting within the sap tubes becomes active. It spreads rapidly into the new sprouts, but may not give any outward signs of its presence. When the diseased plants are set in the new fields, the fungus continues to act, turning the sap tubes brown and the leaves yellow. These early infected plants are usually killed in a short time but they may linger for some time, often producing fair sized potatoes. This is the serious danger of the disease because seed taken from this field will serve to propogate the disease still further.

Another serious danger is that the fungus spreads into the soil from the diseased plants. It is capable of living there for five or six years. If sweet potatoes are grown continually in the soil, it will not be long till the soil becomes so badly infected that a crop failure is practically certain.

There are but few such fields in the Indiana sweet potato region and the growers are putting forth their best efforts to fight off the inroads of

the pest.

Father—"How would you like a cow for a wedding present?"

Daughter—"Oh, a cow would give more milk than we would need for two. A calf would be just right."



MAKINGS OF A SPHINX

Traveller — "Who's the closemouthed individual over in the corner? He hasn't spoken for ten minutes."

Village Wit—"Hy Blackmore! He ain't close-mouthed. He's just waitin' till Pete comes back with the spittoon."

Cohen placed a ladder against the side of the house, and then called his son, Abie, aged seven, and made him mount to the top.

"Now jump," commanded Cohen.

"I'm frightened," replied Abie.

Cohen held out his arms.

"Do as papa tells you—jump—papa is here."

Finally Abie did jump. Cohen stepped aside, and Abie fell with a bump.

"Let that teach you a lesson never to trust anybody," said Cohen.—The

Humorist.

TRIPLICATES

A local politician was called up at his office recently and notified that his wife had presented him with triplets. He was silent for a moment, and then boomed forth: "I demand a recount."

"He tried to cross the railroad track Before a rushing train; They put the pieces in a sack, But couldn't find the brain."

House Manager—"Here it is Monday. Tomorrow will be Tuesday, and the next day Wednesday. The whole week half gone and nothing done yet."

TAKE A DARE

Futility—Trying to sell a copy o "Ask Me Another!" to the father of five small boys.

A few days after Harry's mothe came home from the hospital with a brand new baby, Harry fell and brokehis arm.

As the family doctor was lifting the little fellow out of the car to take him into the hospital, Harry asked the doctor if he must go in there.

"Yes, but don't worry, laddie; the hospital's a nice place and we'll soor fix you up," replied the physician.

"All right, doctor, but if I have to go to the hospital, I want a pup—don't want a baby."—Kablegram.

MORE THRIFT

A New Yorker met a Scotsman, just back from the Florida golf courses struggling up Broadway dragging ar alligator.

"What are you doing with that alli-

gator?" he asked.

"The son-of-a-gun has got my ball,' replied the Scotsman.

COVERS IT ALL

The Snagtown Torchlight has coined a new heading which was formerly captioned: "Births, Marriages and Deaths." The caption now reads. "Hatched, Matched and Dispatched."

The easier it is to get a man to talk the harder it is to get him to quit.

BELLER GROPS

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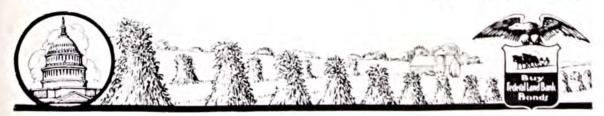
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