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Dr. Coker (left) and Mr. J. F. Clyburn examine a plot of the famous “Coker 100”

**DAVID R. COKER,**
Leader of Southern Agriculture

... His work, a milestone in the progress of Southern agriculture, Dr. Coker, scientist, farmer and plant breeder, was the Gregor Mendel of his day.

*By J. M. Baker, ’40*

PROBABLY no one has done as much toward the advancement of Southern agriculture since the days of Thomas Green Clemson as has the late David R. Coker of Hartsville, S. C. He was a farmer, scientist, and a practical plant breeder and he gave the bulk of his life to the improvement of farm conditions.

Mr. Coker was born on November 20, 1879 and after taking preparatory study at Hartsville and Society Hill, he entered the University of South Carolina, graduating there with an A. B. degree in 1891. Mr. Coker always believed that the only way in which Southern agriculture could be improved was by applying scientific information to practical farm problems. From the very beginning he was primarily interested in Scientific plant breeding, and in this line of work Mr. Coker undoubtedly found his calling because of the great success that he made as a practical plant breeder.

Mr. Coker first began plant breeding work in 1902, and by exercising the utmost patience, ingenuity and originality he developed one of the most efficient experiment stations in the South at his Hartsville, South Carolina plantation. At the beginning of his plant breeding work Mr. Coker said: “Scrub methods, scrub stock, and scrub seed are the Southern farmers’ worst trouble”, and this philosophy was certainly reflected throughout his life’s work.

One of the main features that set Mr. Coker off from others in his field was the fact that he was a man of extraordinary wide vision. Long

*Continued on page twenty-seven*
The Farmer Faces The Tariff

WENTY-SEVEN years after Hamilton's financial program incorporated the first tariff for revenue, came one for the avowed purpose of protection. Conceived in war and passed during an era of frenzied Nationalism, the protective theory was to become the focal point of contention in American political history—even to the present day. The industrial infant soon became a political giant. The protective tariff of 1816 was a concession of the then dominant agricultural interest, it was claimed a temporary measure, but in the name of national unity and welfare the farmer sold his birth right. In 1818 the protective tariff was extended. A further increase followed in 1824 and 1828 and all the political strength that the Agricultural South and West could muster could not stem the congressional graft and deception which our tariff-subsidized industries freely employed.

In desperation South Carolina threatened secession 1828. It was not until 1842, however, that John C. Calhoun so ably stated the case of broken faith when he charged that the government had, "descended from its high appointed duty, and become an agent of a portion of the community to extort under guise of protection, tribute from the rest of the community, and thus defeat the end of its institution, by converting powers, intended for the protection of all, into the means of oppressing one portion for the benefit of another."

Since Calhoun's speech, nearly a century of protection has passed, and for no extended time has the stifling economy on agriculture been relented. Long periods of high protective tariff have alternated with shorter periods of "tariff for revenue." In all periods of the latter, agriculture has been immediately responsive, and recovery has been evident.

And why does the American farmer suffer in a protective American economy? Loss of foreign markets is the obvious answer. Resorting to a period of self-sufficiency in the era of colonization, America was soon to learn that her economic development must be founded on the capitalization of her greatest natural resources—extensive, productive agricultural land. The exportation of tobacco, grain, and meat from the middle Atlantic Colonies to the West Indies was the beginning of a lucrative trade which was to establish the American farmer as the world's foremost producer of food and raw material. To the list of exports indigo, rice, cotton, and various meat products were added, and the American farmer, under free trade, enjoyed the patronage of every industrial center and a monopoly in production—for few nations approached our comparative advantage.

But nations, or individuals, can't buy if they can't sell, and, conversely, no nation can sell if it doesn't buy. Tariff is, therefore, an artificially created barrier standing between the American farmer and his buyers. Theoretically neither party should gain or lose in trade, but tariff to the customer amounts to a premium paid by foreigners for the privilege of American trade.

Through a hundred years of protection the American farmer held to his world wide market by shouldering the tariff himself. The price of exported produce was necessarily lowered to the point where the tariff on imports was set off by the advantage in prices which the farmer granted at the cost of soil fertility, slavery, a lowered standard of living, etc. The unprecedented high tariffs of the 1920's left America without a market at a time when she was geared to her highest production ratio. It was the high tariff which caused Secretary Henry A. Wallace to state in "New Frontiers" PP 43-44 "If the full truth were ever known about the way in which government influence had been used by great corporations, public indignation would know no bounds. Such legalized thievery (the tariff) is probably working more harm to the people of the United States than all other forms of robbery put together."

Even though the American farmer is in what you might call a "tight spot" at the present time because of the tariff, there is, however, one consolation that he has to rely on, and that is reciprocal trade pacts. This would mean that each country give concession on products it is eager to sell.
Cokesbury Conference Institute

... A torch-bearer in the field of education in the Old South, and a pioneer in the cultural and religious development of South Carolina.

By R. R. Leonard, '42

If measured by high Christian idealism and lasting impressions, it would be hard to find a school with a more illustrious career than the Cokesbury Conference Institute of Cokesbury, Greenwood County, South Carolina. Its reputation is not widespread; few laymen today can recount its history and in time to come even the name may pass into oblivion, for we of a dynamic society are prone to forget things of material insignificance. But former students in every walk of life cherish its memory, and one no less than the late Bishop Holland McTyeire, founder of Vanderbilt University, spoke of Cokesbury with a devotion and enthusiasm commanded by no other school.

Cokesbury Institute’s embryonic history is poorly recorded. Only the milestones in its relatively rapid ascension to prominence in South Carolina’s sectarian education, find place in the autobiographies of alumni and sponsors. The indifference of the early slave-holding planters to education retarded the development of schools here, as it did in many parts of the old South, but schools eventually came largely through the inspired efforts of the church. Certainly, is this true of the Cokesbury community; the history of the institute and old Tabernacle church is one. The church was organized prior to 1788, and a crude log cabin school was built on the church property shortly thereafter. Little is known of the school before 1820, but in this inauspicious beginning was the framework of an institution which increased in spiritual and material assets, annually, until discontinuance in 1918.

Success and continual development of the Old Tabernacle School was not brought about by chance, for many men of unusual gift and talent resided in this community. The name of one Mr. Doolittle, a New Englander by birth and an artist of some ability, stands out among the earliest teachers. It is, however, to Stephen Olin, Doolittle’s successor, that the school owes its greatest prominence.

New quarters for the church and school were built in 1820. An advertisement for a teacher brought Olin, a graduate of Middleburg College in Vermont and an aspirant to a great law career, but a man of broken health. Seeking employment and health in the South, he came to the school as a teacher in 1821, but little did he or anyone else realize his destiny. Soon after assuming his position he chanced to overhear an inquiry, “Does the new teacher open school with prayer?” Believing that he was expected to do so, he wrote prayers very carefully, read the Bible and made comments on the scripture. The scripture study soon led to self-conversion, and many pupils, moved by his chapel talks, were converted to Methodism. The idea of further law study was superseded by the conviction that God had other plans, and Stephen Olin, lawyer, became Dr. Olin, minister and teacher, to lead the Tabernacle school to a reputation of thoroughness in scholarship and spirituality in

Continued on page twenty-six
Santee-Cooper Power and Navigation Project

Furnishing power for industries, provision for playgrounds, provision for cheaper transportation and flood control, Santee-Cooper is a project for the benefit of the people of South Carolina.

By R. C. WANNAMAKER, '40

The beginning of the Santee-Cooper Project dates back some hundred and fifty years ago when Charleston business men began to think realistically of an inland water route between the coast and the interior. In 1793 work was begun on the old Santee Canal, and the first boat passed through it in 1800. This twenty-two mile canal cost about $800,000 to construct. The canal was used extensively (in the transportation of cotton, mainly) until the era of the railroad came along, and then all the traffic of the Canal was lost to the rails.

Then, about twenty-five years ago, the difference in elevation of the Santee and Cooper rivers (there is a fall of 45 feet between them) began to attract the attention of hydraulic and electrical engineers toward a power development in the Pinopolis Basin. This idea was the subject of much discussion, and a number of attempts to carry it out were made over the period of years from 1928 to 1938. In 1933 the Project was taken up as a public development, and a plan was formulated and forwarded to Washington for consideration. The South Carolina Public Service Authority was created the following year, and President Roosevelt in a letter to Senator James F. Byrnes informally approved the project. The Project, however, was bitterly fought by interested private power companies, but in May, 1938 the U. S. Supreme Court upheld an opinion of the late Judge J. Lyles Glenn, of Chester, S. C., approving the Project. Work was begun on the development shortly after this decision was issued to the Authority.

To give the reader some conception of the actual physical features of the Project: It is situated in the Coastal Plain section of South Carolina and lies in parts of five counties—Berkeley, Calhoun, Orangeburg, Sumter, and Clarendon. The drainage area is approximately 15,000 square miles, and two large reservoirs will be formed by the construction of dams across the Santee River and the Pinopolis Basin, the former covering an area of about 155 square miles with a maximum depth of 35 feet, and the latter covering an area of about 95 square miles with a maximum depth of 65 feet. The conversion and connection canal between them will have a mean bottom width of 200 feet and a minimum depth of water of at least 10 feet. This will serve both as a navigation channel and to supply water necessary for power facilities at the Pinopolis power house.

The Santee diversion dam across the Santee River will be about eight miles long, consisting of a spillway about 3400 feet long, a pump-sand filled portion about 2300 feet long on the north side of the river, and a rolled earth fill about 16,000 feet long on the south side of the river.

The Pinopolis dam will be about 2 miles long, and will be made up of two earth-filled sections totalling about 10,000 feet in length, between which will be constructed a reinforced concrete power station and navigation locks. About 26 miles of earth dykes will also be constructed around the Pinopolis reservoir to properly confine the lake waters and prevent formation of pools along the shallow areas of the shore line.

The Act creating the Project went beyond the original utilitarian purposes of power generation and of navigation. It was made a definite condition that its authorization is "in all respects for the benefit of all the people of South Carolina" and "for the improvement of their health and welfare and material prosperity." This authorization and these qualifying conditions are inherent and inseparable. The Project's administration is governed by, and must adhere to them absolutely. This eliminates the possibility of private gain and makes definite the broad essentials of the Project—ITS OPER-
ATION FOR THE BENEFITS OF ALL THE PEOPLE.

The special objectives which the Authority expects to attain upon completion of the Project are: (1) Stimulation of industrial development of the Coastal Plain for the taking up of the economic slack caused by the agricultural depression there. (2) Provision for deepening the inland waterway between Charleston and Columbia, and Charleston and Camden and, thereby, probably causing a reduction in rail freight rates to and from interior towns and cities. (3) Provision for flood control which will include the reclamation of thousands of acres of alluvial bottom lands. (4) More sanitary and healthful conditions in the Coastal Plain through malarial control and through improvements (environmental and otherwise) which affects the welfare of the people. (5) Provision for a playground with extensive recreational facilities through the creation of two large lakes available for boating, fishing and hunting. (6) Reforestation of large areas in the basin and adjacent territory.

Will Provide Incentive And Furnish Power for New Industries

Primarily inclusive in the objectives of the Project is the industrialization of the Low Country as a balance to agriculture. This can be done since all of the elements needed are at hand—adequate local and world transportation, plentiful raw materials, mild climate, abundant labor, and low priced power. Within a radius of 100 miles of Pinopolis there are enormous undeveloped plant and mineral resources, and this supply of raw materials will encourage the building up of great chemo-electrical, thermo-electrical and wood working industries. Should there be built in this area just one plant for finishing each of the various products which may be processed from these mineral and plant resources, there would be needed something like one billion, one hundred million kilowatt hours of prime power each year. Some of the industries and manufacturing enterprises which may be established upon the completion of the Pinopolis power plant are: cement plants, calcium carbide plants, cyanamid plants, phosphoric acid plants, carborundum plants, newsprint mills, furniture and woodworking plants, Kraft paper mills, tobacco factories, canneries, refrigeration plants, textile mills, and a peat plant for production of ammonia—potential industrial units with a huge annual power consumption, and which would produce so many things our people need and cannot purchase now because of high prices resulting from costs of shipping from afar. The South Carolina Public Service Authority (administrator of the Project) says that, when the Project is completed, the power generated at the Pinopolis power plant will be made available to the people of South Carolina at the lowest rates ever to be quoted in this region.

Adverse Criticism Answered

Critics of the Project who say that the demand for power in this state is not sufficient to warrant this huge development have been answered by Dr. Clark Foreman, Director of PWA's Power Division, thusly: "That has been said about every single power project built under this administration. It has proven untrue in each instance. People still say it in the face of all experience . . . Go to TVA where they are producing more energy than will be produced here. The same thing was said there, and now they have a greater demand than they can supply. TIME magazine of November 6, 1939, in an article on the power consumption of industry says: . . . . "Another reason for the need of new generating capacity is the relatively small recent investment in utilities plants. In 1929 the utilities invested over $900,000,000 in new plants, topping a six-year average of about $800,000,000. The depression practically stopped all utility investment, and in 1937 new utility investments (exclusive of TVA and other government spending) recovered to only $450,000,000. One reason for expanding power sales is that today every installation by industry of high-powered modern machinery adds huge wholesale loads to electricity consumption. With a possible boom at hand and more than half of the machinery still well over ten years old (and not using as much

Continued on page twenty-eight
The History of Condensed Milk

By H. A. JOHNSON, '40

CONDENSED MILK is the child of the nineteenth century. It has had a rapid development in contrast to the long history of cheese and butter, and it occupies an important place in the dairy industry.

Appert, a French research worker, found, as early as 1810, that milk could be condensed and preserved by the use of heat. Milk tablets were made by him in 1811. The vacuum pan, which is so important today in the condensation of milk without exposure to air, was invented by Edward C. Howard, an Englishman. A patent was issued for this apparatus in 1813. It was first adapted to milk by William Newton, who received a patent for his preservation process of milk in England, 1835. It remained for Gail Borden, however, to first successfully initiate the manufacture of condensed milk in commercial quantities. He was truly the inventor of the process of milk condensing which started that great and successful industry which we know today. He is said to have experimented for ten years before he finally decided that a semi-fluid state produced by the removal of water would be the best way to preserve milk. Borden applied for a patent in 1853, but it was three years before the Patent Office saw enough originality in his discovery to grant the patent. In his application Mr. Borden said:

"I am aware that sugar and various extracts have been and are now concentrated in vacuo under a low degree of heat, to prevent discoloration or burning. I do not claim concentrating milk in a vacuum pan for such a purpose, my object being to exclude the air from the beginning of the process to the end to prevent incipient decomposition. This is important, and I claim the discovery."

Evaporated milk, as unsweetened condensed milk is called, has been a great boon to the civilization of mankind. It has gone many places—from the tropics of West Africa to the South Pole with Admiral Byrd. It has lent itself to the adverse conditions of adventurers' travels and exploring parties, because it possesses those characteristics which men are looking for in a food, whether it be a necessity or a banquet. In 1904, 110,000,000 pounds of milk were used in the evaporated form in the United States. In 1931 1,400,000,000 pounds of evaporated milk were consumed by the people of this country. These figures in themselves are the history of the American housewife's discovery of an inexpensive, convenient whole milk supply.

The War between the States was one of the factors which gave the evaporated and condensed milk industries one of the greatest boosts any new industry could hope to get. It was the beginning of the realization of the necessity for cleanliness and the armies of both sides were demanding canned milk. The nation was setting a new pace. Railroads were opened in the Western Territory. Farming in the west caused the poorer lands of New England to be abandoned, and the farmers moved to the cities. Between 1880 and 1890, the population of the nation increased by twelve million. The great cities of the machine age had begun. Families were now close together. There were great, roaring factories and large cities where there had formerly been a small urban community. No longer could the farmer peddle his goods, nor could the city dweller find time to go to the farm to buy things from him. Hence it was that the small original milk evaporating plants suddenly found themselves growing into immense corporations. By 1914, evaporated milk had reached such heights of popularity that 10 million cases were produced that year. That was of little significance in comparison to what happened during the First World War. Millions and millions of pounds of evaporated milk were exported from America to the allied armies and even more millions to the civilian populations of England, France, and Belgium. So many of their cattle were slaughtered during the war that even after the armistice, great quantities continued to be shipped to these countries, as well as to Germany and Austria.

Certainly, evaporated milk has placed within the reach of everyone a safe, dependable milk supply with the advantages of low cost, digestibility, and improvement in quality of food consumed by many, plus the advantage of not having to keep the milk refrigerated before use. The can of milk as we know it and purchase it from our grocer is a symbol of achievement in the handling of food so as to meet the peculiar and exacting requirements of life of civilized man as it exists at the present time.
Eating Your Cake and Having It Too

By BURNET R. MAYBANK,
Governor of South Carolina

GUEST EDITORIAL

THE PERIOD, just prior to the last Great War, was not the most prosperous in American history nor yet the most depressed. This period is noteworthy in that during it agriculture and industry were generally "in balance," and prices which were received by producers in each of these great fields were commensurate with prices which they paid for commodities used in production. The war, however, had a disturbing influence both on prices paid and prices received. For four years beginning about 1916, farmers received relatively more for their cotton, grain, eggs, meat, butter, etc., than they were required to pay for farm machinery, fertilizer, equipment, hired labor, etc., so that agriculture was generally prosperous, and many people were led to believe that a new era had dawned on the farm. There was a great rush to plow up every available acre and to buy more land with which to produce more high-price farm commodities. The price of land, too, was greatly increased, and in 1920 South Carolina farm real estate was selling, on the average, for nearly two and one-half times its 1909-1914 price.

Since 1921 there has not been one single year when a farmer could take his produce to market and exchange it for as much of the things he needed as was true, on the average, during the period just before and just after the war. The reasons for this are complex and not readily understood. It is significant, however, that during the recent depression, industrial production declined nearly 50 per cent and industrial prices about 25 per cent, while farm production remained practically stationary, and farm prices fell 55 per cent.

The farmer simply cannot readily adjust his production to demand and is, therefore, the loser in practically every dislocation of prices. This being true, it would seem to be the part of wisdom for every farmer to make himself as independent of price changes as possible by produc-

ing on his own farm a maximum of his own requirements. This does not necessarily mean subsistence farming. It does mean, however, a determination to avoid the ruinous practice of exchanging a dollar's worth of farm produce for eighty cents worth of the commodities commonly used in production.

The farmers of South Carolina, as a result of the research, teaching, and extension activities of Clemson College, and of the United States Department of Agriculture, have made great strides along these lines and will not easily be turned aside by temporary price advantages which might follow the present European struggle. As a matter of fact, because of present surpluses of most agricultural commodities, it is unlikely that farm prices will advance anything like as rapidly as during the last war, if at all. Be this as it may, however, farmers are urged to hold fast to the gains which they have made, to guard against excessively high costs and expenditures for any purpose, and to utilize such gains as might be made for the payment of existing obligations and the improvement of present standards of living. In this way farmers may eat their cake and have it too, since freedom from debt, lower interest charges and reduced costs of production together with such material and cultural advantages as can be afforded, themselves tend toward a happier and a more prosperous life.

In conclusion, it is the writer's opinion that the farmers should, more than ever, intensify their efforts in diversification and use their every means to make themselves absolutely self-dependent, in order that we may not have another collapse in land and commodity prices, such as occurred in the twenties. Farmers should, also, make every available use of rural electricity, reforestation and every other facility which tends to make their business more stable and themselves more secure against the varying trends of business.
Dave Holmes -- Master Farmer

By B. W. ANDERSON, '41

Mr. Dave Holmes was selected as one of the six master farmers of South Carolina because he has practiced diversified farming ever since he began his career as a farmer. Even when cotton was forty cents a pound Mr. Holmes did not utilize his entire crop land for the sole purpose of raising cotton as many other farmers of the South did. As a result he is now reaping the benefits.

Mr. Holmes lives in Edgefield county near the town of Johnston, S. C., and most of his farm land is located in the "ridge"—a section of the state just above the fall line.

Mr. Holmes began his career as a tenant farmer and soon afterwards purchased a few acres of land himself. Now he owns 1,700 acres of Edgefield county farm land all of which he bought himself except 125 acres which he inherited from his father 12 years ago. He bought a large percentage of the land during the depression because he saw that by successful farming he could pay for it at an advantage.

His acreage is clear of debt and he has 800 acres in high cultivation, 150 acres in cleared bottom land pastures, and 150 acres more being cleared. By hard work, and proper farm management combined with excellent business ability Mr. Holmes has risen from a tenant farmer to the owner of one of South Carolina's best farms.

Mr. Holmes does not have the worry of looking for new tenants each year because he has work for them to do all the year round. After the crops have been harvested there are peach trees to be pruned, manure to be hauled from the barn, work to be done in the wooded areas, and repairs to be made around the house. And in return for much of this work the tenants are paid extra. "You won't lose anything, and incidentally you won't lose your hands if you give them something to do the year round to feed themselves," Mr. Holmes said.

Mr. Holmes' cash enterprises include cotton, peaches, asparagus, and beef cattle. His "Live at home" products include hogs, chickens, beef cattle, sweet potatoes, vegetables of all sorts and dairy products.

"A dozen years ago," says Mr. Holmes, "I saw the need to get away from all cotton depen-
dence and I wanted to try peaches. At first I was not encouraged by my neighbors who thought I was ruining my cotton land. Soon Clemson College and the United States Department of Agriculture helped me to get started with my first orchard which is now eight years old."

He now has 150 acres of trees of various ages which yield an excellent production. Last year thirty acres of Elbertas produced forty-eight carloads of United States number one's, two or more inches in diameter. He has built from lumber off his own farm a large, well equipped peach packing shed which provides for proper packing of the crop. Mr. Holmes sells his peaches through the South Carolina Peach Growers Association under the "Palmetto Queen" brand. Mr. Holmes employs from fifteen to twenty hands each day during the year in his orchard and general farm work. "As a winter cover crop for orchards I use rye altogether," says Mr. Holmes.

In his orchard management Mr. Holmes is in constant touch with extension horticulturists getting up-to-date information and suggestions as to proper pruning, spraying, cover crops, fertilizers, and marketing. He has devised a special wire support for trees heavily laden with fruit. This device consists of forty or fifty feet of number ten wire caught in forks of limbs and encircling each tree. Although the wire is expensive it more than pays for itself in saving trees and fruit, and is more convenient than wooden props.

It is also easy to see that Mr. Holmes is skillful in the production of cotton by the fact that on 158 acres now grown he makes around 175 bales per year. This is done through his insistence on purebred seed treated against disease, legumes and proper crop rotation—no cotton following cotton; proper fertilization with intelligent attention to plant food needs.

Asparagus is one of Mr. Holmes chief cash crops because his farm is located on "The Ridge" area, long famous as the center of South Carolina asparagus crops. On 70 acres of "grass" he produces 60 to 100 crates per acre annually. Special care is taken to put out a quality product. That is the reason he makes money out of this highly specialized truck crop. The Holmes asparagus crop is marketed through the Ridge Peach and Vegetable Association, a Co-operative marketing group.

Proper crop rotation is brought about by planting corn and other small grains which provide feed for livestock and also food for the "live at home farmer." Usually 200 acres of corn are planted, yielding thirty to fifty bushels per acre. For livestock feed there is oats, the yield varying from 40 to 50 bushels per acre.

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Agriculture's Related Industries

AGRICULTURE
AND ELECTRICAL ENGINEERING
By S. C. HUNT, '40

The Rural Electrification Administration is sponsored by the federal government and differs from other government agencies in that it is a cooperative.

The R. E. A. project, as it is called, is conceived and planned by those farmers interested in its benefits, and the government furnishes technical and legal advice. The government supervises the project only as a protective interest in its investment.

These electrification projects are made possible by new developments in the electrical field. The improvements have taken place in the physical construction of the lines such as wider spaced poles, wires of higher tensile strength, smaller yet efficient transformers, the abolition of cross arms, and a revolutionary system of transmission wiring. The electrical power for these lines can either be supplied from private concerns or by the establishment of the cooperative's own generating plant. The federal government has been instrumental in securing these private contracts and by lending money for the station. Then generating stations at Santee-Cooper and Buzzard Roost will furnish cheap power to some of the lines in South Carolina.

The availability of cheap electrical energy has greatly reduced the manual labor required on the farm. Design engineers have made possible new equipment such as well pumps, irons, washing equipment, milking equipment, refrigeration equipment suitable for the electrified farm. Lighting and heating power is available. Communities have banded together, buying electrical refrigerating equipment and establishing community refrigeration centers. These have proved very economical in preserving the farmers produce and meats. The whole system is founded to benefit those farmers who live in a locality where private lines could not be economically installed.

The country farmer, with the aid of the government and the electrical engineer, now has city conveniences through the use of the Rural Electrical Cooperative.

AGRICULTURE
AND CIVIL ENGINEERING
By G. C. COMMANDER, '40

At first glance one would be inclined to think there is no relationship between agriculture and civil engineering. However, after a little thought one can readily see that the two subjects are closely connected in several ways. The more important of these are: transportation of farm products, irrigation, and soil conservation.

In the early eighteen hundreds civil engineers were responsible for the construction of navigable waterways, the principal means of transporting farm products at that time. Soon however, water transportation was out moded by the advent of the railroads putting the transportation of these products on a larger scale. It was not long before the movement of the population to cities increased the demand for low cost farm produce. The railroads could not solve this problem. The solution, however, came with the building of super highways and truck routes, making it now possible to take care of the tremendous demand for the farm produce, and making truck-farming one of the major industries of the country.

The Federal government allotted several millions of dollars for Boulder Dam, an irrigation project covering the area around the Colorado River—without the aid of the civil engineer this project could never have come into being. It is impossible to conceive the benefits that have already been derived from this engineering feat. The farmer who formally had tried to cultivate the desert land failed because of poor soil and lack of rain. Now farmers in that area enjoy fertile soil as well as rural electrification. This has been a great advance in the reclamation of waste lands by irrigation, and betterment of community life.

The closer the connection between the farmer and the civil engineer, the greater is the net return to each. Thus if the south is to remain one of the greatest agricultural regions in the world, agriculture with civil engineering and related subjects must go hand in hand.
The Man, The Land and The Future

By R. L. ARIAIL, JR., ’40

In the South, and especially this section, soil erosion is a phenomena that almost every person is aware of, yet it is dealt with quite casually. We read and hear about it often, but very few of us realize the terrible significance of the facts that lie behind these two words. We trip lightly over the term and pass it on as a problem that something ought to be done about, yet boast of the richest and most powerful nation in the world little dreaming that with the close of every day some 8,500,000 tons, on the average, of our precious nation has slipped away forever. Each year not less than 3,000,000,000 tons of soil is lost from the croplands of America by water and wind erosion.

As a matter of fact, the erosion problem is of vital importance to every person in this country whether engaged in agriculture or not. It affects, for instance, lawyers, aviators and manufacturers as well as the farmer. This problem is not to be dealt with casually, as the very future of our country, or of any country, depends upon the conservation of its soil.

That may seem a very bold statement, but, never the less, it is true. What is more, the relationship between soil production and the prosperity of the people is so closely connected that the history of mankind, to a considerable extent, can be interpreted in terms of the soil and what has happened to its as the result of human use. The hand of man, rather than the ravages of nature, probably caused once rich and populous regions to be reduced to poverty and even complete abandonment.

The shifting sands of the Sahara and Gobi deserts now cover the remains of once large and populous cities. Parts of Palestine and Mesopotamia were once very rich and supported great populations, but, as a result of neglect and abuse of the land, they are now quite barren. Civilizations are rooted in the soil. Destroy the soil and you destroy the civilization.

If this has been the case so often in the past, why, then, do the American people pay so little attention to the destructive process going on in this country today? The reason is simple though the cure may not be. This nation has developed very rapidly and our resources were so vast and the chances to “get rich quick” so great that mistakes did not seem to count, and we did not take time to think about such seemingly trivial things as soil conservation. The American civilization is still a young one, relatively speaking, and the American people have a lot to learn. We can benefit much from the mistakes of the older civilizations. Another fifty years may be too late.

Henry A. Wallace, Secretary of Agriculture, has said: “The earth is the mother of us all—plants, animals and men. The phosphorus and calcium of the earth build our skeletons and nervous systems. Everything else our bodies need except air and sun come from the earth. Nature treats the earth kindly. Man treats her harshly. He overplows the cropland, overgrazes the pastureland, and overcuts the timberland. He destroys millions of acres completely. He pours fertility year after year into the cities, which in turn pour what they do not use down the sewers into the rivers and the ocean—This terribly destructive process is excusable in a young civilization. It is not excusable in the United States in the year 1939.”
The Purina Experimental Farm

By L. R. ARRINGTON, '10

EACH year the Danforth Fellowship is awarded to an Agricultural junior in nearly every Agricultural College in the United States. This Fellowship is awarded jointly by the Ralston-Purina Company of St. Louis, and William H. Danforth. It includes a month's study, two weeks of which are spent in St. Louis and at the Purina Experimental Farm, and two more weeks in leadership training in the American Youth Foundation at Camp Minivance near Shelby, Michigan.

The days spent on the Purina Experimental Farm are, probably, more interesting and educational to agricultural students than any other phase of the Fellowship work. This 360 acre farm is located forty miles west of St. Louis at Gray Summit, Missouri, and is one of the largest and most completely equipped research farms in the country. The Purina Company operates it exclusively as a testing ground for the numbers of livestock and poultry feeds which it manufactures. Specialists in the field of poultry, animal husbandry, and nutrition are in charge of the work, and in all there are approximately 100 employees on the farm.

There are large numbers of practically every kind of farm animal and fowl on test there the year round. In round numbers, the number of animals is: 10,000 chickens, 2,000 ducks, 2,000 turkeys, 100 dogs, 600 hogs, 225 beef cattle, 100 dairy cattle, 125 silver foxes, 500 mink, and great numbers of pigeons, rabbits, and coons. Tests with the foxes and mink are run to try to find a dry substitute feed which will take the place of fresh meat and at the same time not affect the quality of the pelt of the animal. Experiments with the other animals and poultry are made to determine the best feeds for production, and at the same time make it an economical feed.

It is interesting to see just how a new type feed is made into a standard brand for sale on the market. First, the nutrient requirements of the animal are carefully determined in the chemical and biological laboratories. When these have been found, several trial mixes, each fulfilling

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The Government and the Land

By C. M. AULL, '39

FOR many years there has existed the question of the right of the State to interfere with private business. Whether this right should exist or not, is not important. The fact that it does exist is irrefutable and makes argument useless. It is now a question of how far the State will carry the rights which it has.

Land is peculiarly affected by this question of property rights, in that land is very different from other types of property. The fact that land is indestructible may be an excuse for increased governmental control over it, since the land will exist for society after its present owner has ceased to enjoy life. If however, that individual had so depleted the land as to make it worthless it would be a liability instead of an asset to society, and could easily create a great social problem. Another important characteristic of land is its immobility. Land cannot be so placed as to enjoy an economic advantage of location as some business might be. In general land values are increased by the building of roads, or towns or some other form of public activity, which is carried to the land. Profit to the owner, or unearned increment, as it is known to the economist, is created by this rise in values. The fact that this profit was created by a public venture, offers a sound reason for the public to attach some of this profit by tax. This may be regarded as further interference with private business whether warranted or not.

The space and extent of land is another characteristic peculiar only to it. The fact that there exists only a limited amount of land, that land cannot be created, makes it more valuable. With increased population more demands will be made on the limited supply, and it would seem advisable that some agency provide for the conservation and improvement of our soil resources. If this is not done by private industry, then it would seem to be the task of government. However, it could not be done without lessening private property rights.

Land has always varied greatly in quality, but the ravages of time and use have increased these graduations in quality immensely. Lands of the world range from the fertile valleys of the Nile river to the worthless wastes of the Sahara desert. It is this great difference in quality that often marks a wealthy nation from a poor one.

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Better Seed to Plant

By R. C. Wannamaker, '49

The farmers of the United States today have available to them the most complete and the most useful body of information based on research findings than the agriculturists of any country have ever had. The wise planter is taking advantage of newly discovered better-methods and new inventions which have been proven by research men to be money-saving. The development of various seed treatments is one of the most valuable of their entire works.

Some studies of the effect of cottonseed treatments on seedling emergence and survival under field conditions in South Carolina were carried on in the early 1930's. Then, in 1936 in an attempt to discover a method of control of the seedling disease known as "damping-off", and, also, to determine methods for getting a better per cent emergence, experimental fields were planted in various sections of this state. For a study of the effects of seed treatments, one-acre plantings were made at Smoaks, Kathwood, Florence, Pontiac, Chester, Woodruff, and Clemson—thus every section of cotton-growing South Carolina was represented. The results of this experiment proved that treatment with ethyl mercury chloride (Ceresan) increased the yield of seed cotton per acre very appreciably (it has been shown that in years favorable to disease and when diseased seed are prevalent this increase may be as high as 40-45 per cent, but in years when conditions do not favor the causal organism and seed are generally healthy, the increase may be nil or so slight as to be unappreciable). In the experiment of this particular year natural seed treated with 2 per cent Ceresan showed an increase in yield of as high as 33 per cent in some cases over untreated check plots, delinted seed plus 5 per cent Ceresan showed a greater increase in most cases, and delinted seed which had not been treated (except with the sulfuric acid used in delinting them) showed a remarkable increase in yield—this seems to indicate that our most important and most costly cotton diseases are probably seedborne. The anthracnose fungus was found to be chiefly responsible for "damping-off." It is borne on the seed mainly, but it is also residual in the soil, and crop rotation helps in controlling this phase of the causal organism. Also, if seed are stored for 2 years or more the fungus seems to die out or lose its vitality to a certain extent. Two year old seed are not helped nearly so much by treatment as new seed are, because they are more disease-free to start with. However, research men and others who have been specializing on this one thing advise farmers to treat (and delint if possible) all seed which they have for planting.

Cotton Seed Treatment Brings Large Profits

The South Carolina Extension Service says: "Seed treatment pays—farmers of South Carolina are more than a million and a half dollars better off by having treated seed during 1937 . . . the increase during 1937 was worth $6.24 per acre, during 1936, $9.08 per acre, above cost of treatment, based on results of demonstrations.

Continued on page thirty
M. G. Mann Here

Recently, Mr. M. G. Mann, General Manager of the North Carolina Cotton Growers Cooperative Association at Raleigh and, also, of the Farmers' Cooperative Exchange, visited Clemson where he conferred with Dean H. P. Cooper and various departmental heads relative to the participation of Clemson College in the determination of the most economical feeds in South Carolina. While here, he also spoke to the marketing classes on cooperative marketing of cotton.

Mr. Mann instigated the forming of a rapidly growing cooperative purchasing agency several years ago, which handles open-formula chicken and stock foods which are prepared by State Agricultural school formulae. The organization plans to extend its activities into South Carolina. The North Carolina association has withdrawn from the National Association, and under the leadership of Mann, offers an optional contract whereby the growers may offer their cotton to the cooperative, which cleans it and makes a cash offer, but allows the grower to shop around for other bids and to accept the best offer he receives. The North Carolina Cooperative Association is reported to have greatly expanded its purchases through these optional contracts and is said to be rendering a real service to North Carolina farmers.

Mr. Mann's organization is expanding the cooperative movement by means of essay contests among rural schools, and he also conducts a training school for high school and college graduates who wish to promote cooperative organization.

Dairy Club Shows Interest in Old Grads

The Dairy Club meets every two weeks. Programs alternating students and outside speakers are conducted. At present the club is sponsoring a survey in attempting to contact all Dairy graduates of Clemson, finding their present and past positions, and addresses.

F. F. A. to Present Play

The officials of the F. F. A. recently attended the State Fair in Columbia, S. C., to help with the teaching there. Among the club activities scheduled for this year are plans to sponsor a judging contest to be held here next spring, and also plans to present a play, "The Farmer Meets the Tariff."

Fifteen Seniors of the Vocational Agricultural Education class will present the play at the State Teacher's Meeting in Greenville in the Spring and again here for the Agricultural students' benefit. If, as is expected, the play is sufficiently successful, it will be given in high schools throughout the State.

One purpose of the club is to train Vocational Agriculture teachers in their duties as local advisors of the F. F. A. in high schools. Membership is open to all Agricultural upper-classmen. Officers are selected twice a year, and, in addition to other activities this year, members are studying parliamentary procedure and F. F. A. ceremony and work.

Research Director Speaks

Mr. Harry G. Davis, Director of Research for the Farm Equipment Institute of Chicago, was a recent visitor of the Agricultural Engineering Department of Clemson. Mr. Davis was making a tour of the colleges in the South and mid-West which offered an Agricultural Engineering course. While here he made an informal talk to the Junior Agricultural Engineers on the rise and improvements of farm machinery during the last decade.

A. S. A. E. Taps New Members

The A. S. A. E. recently initiated a number of new members. Among the club activities scheduled for this year is the work for the trophy which is presented annually by the Farm Equipment Institute to the most active chapter of the A. S. A. E. Also, the club will sponsor the annual Farm Machinery Day next spring.
FURROWS

Judging Team Made Trip to Chicago

Clemson’s Animal Husbandry Club is rapidly getting into its schedule of activities. The club at Clemson was started in 1932 and is associated with the National Block and Bridle organization which is in all leading Agricultural schools. Membership is open to all boys who are especially interested in Animal Husbandry.

This year the club plans to have thirty-five members and some decided changes are in line. Three main social activities are scheduled, and among the aims of the organization is the “encouragement of the members in public speaking.”

Possibly the most important activity of the club is the sponsorship of a judging team. This team is open to all interested and is coached by Mr. Hauser of the Animal Husbandry Department, who ranks high in National competition. Already they have participated in contests at the State Fair and at the Spartanburg County Fair and a number of other trips are planned. Recently they visited Governor Morrison’s farm in Charlotte, N. C., where some of the finest beef cattle in the South are found. The team also entered the contest at the International Livestock Exposition in Chicago, December 2-9, and while in Chicago were entertained by the Exposition officials.

New Professor at Clemson

Mr. W. N. McAdams has recently joined the staff of the Agricultural Engineering Department. Mr. McAdams finished at Clemson in 1938 and took graduate work at the University of Georgia, where he has been teaching since then.

Mr. McAdams succeeds Mr. J. B. Richardson, an alumnus of Mississippi State, who is now with the Extension Service at North Carolina State.

Alpha Zeta Active

Clemson’s chapter of Alpha Zeta, National Honorary Agriculture Fraternity, recently sponsored a social for the freshmen enrolled in Agricultural subjects. This was designed to help the freshmen become better acquainted with the Agriculture faculty.

New members recently inducted into the fraternity, were chosen for scholastic standing. Among the club activities for this year is the publishing of a news letter which is to be sent to Clemson alumni members of Alpha Zeta.

Kappa Alpha Sigma Pushes Ahead

Kappa Alpha Sigma is the Clemson College Student Chapter of the American Society of Agronomy. It was organized in 1929 and its aim is to bring agronomy students and professors closer together so that current agricultural problems may be informally discussed from time to time.

At a recent meeting of the fraternity, Dr. G. H. Collings, Professor of Soils, and advisor for the organization, made a suggestion that the local chapter send a Christmas news letter to every person that has ever graduated in agronomy from Clemson College. This suggestion was unanimously approved by the members of Kappa Alpha Sigma, and a committee was immediately appointed to write the letter which will be mimeographed and distributed a few days before Christmas.

Ag. Ed. Seniors Attend Social

On the weekend of October 28, the Winthrop Home Economics girls and the Agricultural Education Seniors of Clemson, met together at the 4-H camp at Rocky Bottom. A joint program discussing the cooperation and relationship between home economics teachers and agricultural teachers in rural schools was held. Afterwards there was a campfire, stunts, and dancing. The State supervisors of Agricultural Education and Home Economics, and the entire Education faculties of Winthrop and Clemson were present. The camp was conducted by student committees.
What of The War in Europe and Our National Economy?

By E. W. COOLER, '41

Cash on the "barrel head" and carry your own goods is America's invitation to belligerent European nations. Through the nullified Embar- go Act America's vast store of war munitions becomes potential agents of destruction somewhere in Europe. Reasons for the reversal of popular opinion as evidenced in the recent action of Congress are multiple, but few regarded the avowed purpose, to stimulate American industry in the fashion of the first world war, as imperialistic as the Soviet Union promptly branded our action. In Europe's misery and des- pair America envisioned recovery and lasting prosperity.

Enthusiasm is already tempered by the deliberate manner in which the belligerents have placed their orders, and Americans are now thinking rationally for the first time since speculative activity in early September forced war goods to a new high in the exchanges of this nation. Economic fallacies embodied in our present "war boom" legislation will become more obvious with time. They are already plain to even the amateur economist, who reasons—who takes time to think.

Warring Europe is in no position to pay. The cash terms imposed by the modified Embar- go Act suggests the necessity of greater exporta- tion of European products, or the sale of bonds and securities or greater taxation of the popu- late, or, as we are led to believe, a flow of European gold to the American Market. None of these alternatives are economically sound.

Europe in normal times experiences great difficulty in trading with America on a long- time barter basis, for our superior resources require few of the commodities which continental Europe can supply, and we furthermore, are sold on the self-sustaining theory. During a state of war, with internal industries transform- ed to feed a war machine, and colonial, or any international trade, crippled by marine warfare, Europe can scarcely trade on a reciprocal basis.

America, in dealing in stock and security of belligerent nations is definitely outlawed by the recent legislation, and, consequently, the most practical means of financing a war is not a pos- sibility. Few nations of Europe have American credit unmarred by the first war, and the John- son Act of 1934 closes the American market to securities of these nations.

Taxation has reached the breaking point in every belligerent nation. The proverbial "last straw" would be added by further taxation to overcome the cash disadvantage in the Ameri- can Market. Taxation has reached a new high in England where thirty-five cents of every dol- lar goes for direct taxes. Then, too, war is not a popular cause in any nation today. There is no shouting and playing of drums in this war. Instead there is only gravity, and the men march to battle solemnly, knowing that all is not a great and grand experience in war. Further taxation will serve to lower the morale.

England and France reputedly have close to 4 1-2 billion dollars of liquid, or easily liquidated, assets in America. It was supposed at the onset that this would become allied buying pow- er. But they are reluctant to see further in- crease in America's rapidly growing stock, nor would that be desirable even so far as America is concerned. The United States already has 50 per cent plus of the world's gold reserve, which is over-valued for any other purpose than money. And to acquire more may mean that other nations may relinquish the gold standard, and leave America holding the bag.

What is the weakness in the argument that embargo repeal heralds a return of prosperity? Simply that war time demand is not a normal demand anymore than war time industries are normal industries. Until the latter part of this month the chief orders from European belli- gerents were as follows: $8,000,000 worth of ordance shells and torpedoes from an East Coast manufacturer; about $750,000 worth of sub- machine guns from Thompson Automatic Arms Corp.; 6,000 horses from the Midwest com- mission firms; 200,000 2 1-2 pound army blank- kets from two eastern textile manufacturers; 6,000 trucks from Studebaker, White Motor and

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MORE PRAISE FOR THE FARMER

DOCTOR yearns to discover a new cure for some fatal disease, a school teacher fancies himself a college president, a lawyer desires a judgeship. These are pinnacles to be attained. What then does a farmer, a man who works harder than most of these men for less monetary return, hanker for? Some say a better living, but as a rule farmers live well. They have comfortable, spacious homes, adequate clothes, and they probably eat better than the average person engaged in some other occupation. What the farmer does not have, and which the doctor, lawyer, and college president do have when they attain their goals, is praise, and the farmer, like any other human, likes to have his labors recognized. That is why many farmers set their ambition to win the title "Master Farmer." By that title they are set apart as one who has not only made a living from the soil, but has done this job in an efficient, business like manner that leaves no doubt that they have not gone about their work in a shoddy, hit and miss way, and that they have planned their every move, taking full advantage of new developments and new methods in their field. These are the men who have had the courage to break away from obsolete, inefficient methods of seeding, tilling, and harvesting handed down by their forefathers. These are the men who have had the foresight to plant new crops, using more and efficient methods of cultivation. These are the men who have had the stickability to carry on their work through discouragements and obstacles that would have beaten down many a less hardy soul, and to emerge as a recognized leader in their work.

Its much hard work and little praise that the farmer gets, so let's give a hand to those few who have achieved a rarity in their field.

The ant heap is the food bank of the ant, but the silo is the reserve bank of the stock farmer. It is not even necessary for a farmer to have money in the bank, since fat and healthy stock on the farm throughout the year represent ready cash.

WHAT'S IN A NAME?

In the interest of our readers we will attempt to clear up a question that has been asked us time and again: What does AGRARIAN mean? Referring to the dictionary we find that Mr. Webster says... "of or pertaining to fields or lands, or their culture." The word suggests, then, that anything related to the land and its culture can be spoken of as agrarian, as for instance, agrarian life, agrarian problems, and agrarian country.

The South has been truly spoken of as an agrarian country, for here are located about half of the farms and farm population of the whole nation. Any problem that arises in the South is bound to be either directly agricultural in nature or closely anchored thereto. When the South prospers, the farmers are prospering too.

South Carolina is one of the most agrarian of all the agricultural states, and Clemson College is an institution that was founded for the promotion of agrarianism; hence, the very appropriate name of this magazine.

AG FAIR FOR CLEMSON

In the October issue of The N. C. State Agriculturist we noticed that the Ag students of North Carolina State College put on an agricultural fair lasting from the 10th through the 14th of that month. Its purpose was to offer solutions to the farm problems of the many visitors who attended from all over the state.

Many exhibits were presented and judging contests of livestock, crops, poultry and dairy products were held. The Alpha Zeta sponsored an information booth. In short, the fair was a great success, and gave the students a chance to show their ability. As they express it, "this is one thing on which we do our own creative thinking—no stuff from the 'prof'。”

The Agrarian is wondering if something like this could be started at Clemson. The engineers already have their "engineering day". Why can't the "aggies" have an "ag day"? Maybe the members of the Alpha Zeta and Alpha Tau Alpha could get together and hatch up something.
CALF WINDOWS

By H. A. JOHNSON, '40

The physical structure of the stomach of the cow is entirely different from that of any other farm animal except the goat and the sheep. The cow has a stomach of four compartments which are called the rumen or paunch, reticulum or honey-comb, omasum or many-piles, and abomasum or true stomach, in order of passage of coarse feeds. The rumen of a mature cow is a large organ capable of holding as much as fifty gallons. The rumen was probably intended by Nature to initiate the digestion of the roughages or other coarse foods consumed by the cow. In addition it serves as a place of storage for the consumed feed before rumination takes place. After regurgitation and mastication, the food passes into the reticulum, which is another cavity and is smaller, holding not more than 12 or 13 quarts. From this compartment the food enters the omasum where the water is mashed out of the material by the peristaltic action of the organ. Some of the water is absorbed by the walls of the omasum, but most of it passes into the abomasum. The food passes directly from the omasum into the abomasum or true stomach. This compartment has a breaking-point capacity of twelve quarts. It is here that the real digestion of food takes place. From here on the digestive processes of the cow are similar to those of non-ruminants.

In the raising of dairy calves many difficulties are encountered. The most common is a disturbance of the digestive tract. In order to discover some of the causal factors, an experiment designed to determine the route followed by milk when consumed by calves has been conducted at Clemson College by Drs. G. H. Wise and G. W. Anderson of the Dairy Department.

An unusual experimental technique was used in this investigation. Previously, most of the experimenters had slaughtered the animals after they ingested milk and subsequently carefully opened the stomachs to locate the milk. This was not the method used in performing this experiment. To observe the path traveled by milk when it was consumed by a calf, an opening, commonly known as a “window”, was cut in the left side of the experimental animals. The wall of the rumen was sewed to the skin and, after healing, did not in any way retard the growth of the calves. Thru this opening the rumen and reticulum could be observed while the calf was consuming the milk either from an open pail, or from a nipple pail.

Nearly every cattleman knows that calves which nurse from the cow are usually free from many of the ailments commonly observed in calves fed from an open pail. This fact led the experimenters to believe that the passage of the milk into the wrong section of the animal’s stomach was one factor causing much of the trouble. Though Nature provided the bovine stomach with compartments, it seems that she intended for the first three “rooms” to remain rudimentary until the young animal begins the consumption of coarse feeds. The normal path, then, for milk to take when ingested by a calf is directly into the abomasum, or true stomach. When a calf drinks from an open pail, it takes such large gulps that the milk frequently passes into the rumen where it is likely to remain for some time, undergoing abnormal decomposition, thus disturbing the digestive processes.

Since it was desirable to duplicate Nature’s method of feeding calves, a nipple pail was used. This consists of a rubber nipple fixed in, and pro-
truding from, the bottom of an ordinary pail. The pail was then either hung on the wall or held at the normal height of a cow’s udder. By this method it was found that the milk rarely entered the rumen (an average of 2.2% of the observations) and never in large amounts; whereas when the milk was consumed from an open pail, the frequency of entrance averaged 36.9%, ranging from 0 to 78%. The amount of milk entering in each case was far greater than the amount entering when nipple fed.

It might be interesting to note that when water is fed by the above mentioned methods it escaped into the ruminal and reticular cavities more frequently and in greater quantities than did milk. It is perhaps, just as abnormal for a calf to drink milk from a pail as it is to suck water from a nipple.

It has been found by previous investigators that milk is only digested in the abomasum; therefore, the detrimental effects of milk entering the rumen and other cavities is two-fold; namely, nutritional and physiological. When milk enters the rumen, the nutrients are not readily assimilated by the body. This fact is important because in the growing calf the nutrients are needed and must be provided almost constantly to insure optimum growth and to maintain a thrifty condition.

Furthermore, the passage of the milk into the rumen is responsible for the digestive disturbances resulting from the abnormal decomposition of the milk while it remained in the ruminal cavity. This disturbance is commonly manifested in the form of diarrhea.

Apparently, the older the calves become the greater is the frequency of entrance and the larger the volume of milk which passes into the rumen; yet physiological disturbances are very rare in older calves if they are receiving a normal ration of grain and roughages. When a calf is restricted to a whole milk ration over a prolonged period of time, the curd, which frequently accumulates in the rumen, will become putrified and together with other decomposition, cause marked disturbances in the physiological functions of the body. From these facts it can easily be seen that the nature of the ration fed with the milk plays an important part in determining the magnitude of the harmful effects of the milk passing into the rumen.

This is a discussion and condensation of an article printed in the September issue of the Journal of Dairy Science, and is printed here with the consent of the authors.

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More Electrical Equipment for the Farmer

As electric service has been extended to more and more customers a constantly increasing number of appliances and implements have been developed for the use of this service to the convenience, the comfort, the health and the profit of those who have such service available.

One of the most interesting phases of the power industry recently has been the development of equipment for the particular use of the increasing thousands of farmer customers to whom electric service is being made available.

Dairymen are turning by the wholesale not only to automatic water systems and refrigeration equipment, but to automatic electric sterilizers and water heaters. Commercial poultrymen have long been using electric lights, but now increasingly they are using electric brooders, electric water warmers in winter, and other electric equipment.

Dairymen, poultrymen and other livestock operators can now secure feed grinding equipment that will do an entirely satisfactory job for from $111.70 to $260, depending upon size of mill and of motor. These mills grind from a few hundred to 1800 pounds of grain per hour, depending upon the fineness or coarseness of the screen. And they grind ear corn and roughage as well as the cereal grains and shelled corn.

Electrically operated corn shellers are also on the market now, with which a small electric motor will do the work in an hour that would require hours to do with hand operated shellers.

Electric service promises to do for the agricultural community about the same sort of miraculous job that it has already done for the industrial community.

DUKE POWER COMPANY
GENERAL OFFICE
CHARLOTTE • NORTH CAROLINA
PROFITS FROM FARM MANURES

By R. L. HEARON, ’40

TODAY, when farmers in all the South are casting about for every available means of making the largest economical yield per acre, they should look to one of their items on the expense side of the ledger, namely, their fertilizer bill. There is no getting around the use of compounds which increase the productivity of the soil, especially our southern soils which have been in a state of cultivation since the early settlers came to this country, and the importance of plant and animal residue as a supplement to commercial fertilizers has been ignored by Southern farmers until lately, relatively speaking.

Barnyard manure is an excellent fertilizing material. Hamilton states in his 1932 bulletin, No. 92, Farm Manures, “The horse, mule, cattle, and hog population of South Carolina produces annually solid and liquid manure containing the nitrogen, phosphoric acid, and potash equivalent of 211,400 tons of nitrate of soda, 77,344 tons of 16% acid phosphate and 52,236 tons of muriate of potash. At current prices for these fertilizer compounds, the annual production of manure in South Carolina has an equivalent value of nearly $12,000,000. It is probable that $9,000,000 of this amount is lost.” Today South Carolina farmers are using more and more of this valuable by-product. Those who are uncertain as to the practicability of its use should be convinced of its value.

Manure helps to produce economical yields in the following ways: (1) It carries a considerable quantity of elements necessary for plant growth, mostly nitrogen and potash, the per cent of each varying with several factors which will be discussed later; (2) It increases the bacterial content of the soil; (3) It adds organic matter to the soil; (4) Hall states that manure also improves the texture of the soils, to sands it gives cohesion and water retaining power, while it renders clay more porous and friable.

As previously stated, the composition of the manure depends upon several factors, which are: the kind of animal, the kind of bedding used, the age of the animal, the foodstuff consumed by the animal, and the methods of storing the manure. In a Maryland Experiment Station Bulletin, Taliaferro and Patterson show that solid excrement from hens and sheep is very high in nitrogen and potassium, but since very little manure is used from these sources in this state, we will not go into any detail about them. Our main sources of manure are cows, horses, and pigs. This same bulletin shows that a cow may produce about 20,000 pounds of solid excrement per year, which contains about 0.30 per cent nitrogen, and about 0.10 per cent potash. A cow also produces about 8,000 pounds of liquid excrement which contains about 0.80 percent nitrogen and 1.4 per cent potash. A horse produces about 12,000 pounds of solid excrement per year which contains 0.50 per cent nitrogen, 0.25 per cent phosphoric acid, and 0.30 per cent potash. This animal also produces 3,000 pounds of liquid excrement which contains 1.2 per cent nitrogen, a trace of phosphoric acid, and 1.5 per cent of potash. A pig produces around 1,800 pounds of solid excrement and 1,200 pounds of liquid excrement per year. The solid excrement contains 0.60 per cent nitrogen, 0.45 per cent phosphoric acid, and 0.45 per cent potash, while the liquid excrement is composed of 0.30 per cent nitrogen, 0.12 per cent phosphoric acid, and 0.2 per cent potash.

It may be seen that manure is not a well balanced fertilizer, that it is especially low in phosphorus, and since many soils need phosphorus, the value and efficiency of the manure can be increased by the addition of phosphate fertilizers.

Bedding is a very important factor to consider in determining the value of the manure. The compounds in the liquid excrement are uric acid, soluble phosphates, and potash salts. These compounds are either ready for plant use or else they need very little change, whereas the solid excrement must undergo quite a change before it becomes available. Since it is the bedding which absorbs the liquid excrement, we see that it is very important to use a straw that has very high absorbent qualities and that will also add both organic matter and nitrogen to the soil. Wheat and oat straw are both considered excellent for these purposes. The bedding should not be of coarse material, such as cornstalks, for this coarse material will prove troublesome when spread in the field.

Caring for the manure between the time it is collected and the time it is placed in the field
is of great importance due to the tendency of the manure to ferment and leach. Thorne, in his book, Farm Manures, states that after 5 months exposure in an open yard, the total weight of the manure was reduced by 57 per cent, the nitrogen was reduced by 60 per cent, the phosphorus by 47 per cent, and the potassium by 76 per cent. This indicates that the manure should be hauled to the field as soon as it is collected to prevent these losses, but if this is impossible, the manure should be stored carefully, preferably in a tight bottom shed and on a straw bedding. If no shed is available, the next best method is to store it in a covered concrete pit. While in such a pit, the manure should be kept packed to prevent fermentation, and sufficient moisture should be supplied to prevent excessive heating. If neither a shed nor a concrete pit can be secured, and the manure must be exposed to the weather, an excavation should be made where the manure is to be piled, with the drainage toward instead of away from the pile. The sides of the pile should be steeply sloped so as to shed water rapidly, and in dry weather the pile should be moistened so as to prevent burning.

The manure should be applied at such a time when it will not interfere with other farm work. If the fields are too wet for application in the winter, the manure may be applied to grass crops once in rotation, or it may be used as a top dressing for small grains. The farmer should be careful not to apply manure to grain which is planted on land having a high nitrogen content as it will cause lodging, or falling of the grain. Fresh manure is not advocated for potatoes as it increases scableness if the disease already exists in the soil or in the potato plants.

The amount of manure applied per acre varies with the type of crop to which it is applied. On truck crops heavy applications may prove profitable, but in general farming, light applications usually give higher returns per ton of manure than heavy applications. In the book, "The Operation, Care, and Repair of Farm Machinery," published by John Deere, it is stated that 20 tons of manure applied on one acre, the manure being valued at 34 cents per ton, gave a $2.50 crop return per ton, whereas 20 tons applied on 2 acres, the manure being valued at 42 cents per ton, gave a $3.60 crop return per ton, which is a 40 per cent greater return per ton from the lighter application. In an experiment carried on at Clemson College on 45 plots over a period of 13 years, the 45 plots received different fertilizer treatment. One of these plots, which received 8 tons of stable manure and 300 pounds of acid phosphate, gave better results than any other treatment used. In fact, the manure-acid plot's average yield per acre was 304.2 pounds of seed cotton greater than the next highest 13 year average yield, which was obtained from a treatment of 600 pounds of 3-8-3 fertilizer.

One of the major reasons for the wastage of manure is the great amount of hand labor required to get it spread evenly in the field. The introduction of the manure spreader has remedied this problem. The mechanical spreader not only spreads small amounts of manure evenly over large areas, but the beaters in the spreaders shred the manure and straw, thereby reducing the possibility of large clods being left in the field.

If you are convinced of the importance of this money saver which may be wasting on your farm, begin taking advantage of it and saving it now. The more that you use the more will be your savings.
POET'S LOVE
By T. E. GOODSON, '40

I struggle oh so hard to put my thoughts to rime,
To say in beauty and poetic grace of time
What lies embedded here within my fleshy core,
Within the heart, and sleepin 'fore my soul's own hallowed door.

A psalm I sing for pow'r to change these moods of mine
To words arranged and writ by fingers made divine;
For they must catch and freeze love's own sweet tinted sigh,
To armor it against pernicious time and draw your eye.

This love, it makes life's very essence quake
With tender joy: and strange new moods each freshly wake
To thrill the changing hour, to make me ever wonder
At myself, and force the dreadful thought of such pure love asunder.

What subtle god controls and charms the heart and brain
To make all kneel, the proud, the humble, rich and vain?
In reverence now one bows before his choice,
Confessing all and finding peaceful rest from love's new voice.

DRINK —

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DAVE HOLMES — MASTER FARMER
Continued from page eleven

Rye, a crop which Mr. Holmes finds very profitable, yields 20 to 25 bushels per acre. During 1938 10 acres of rye produced 300 bushels and Mr. Holmes usually plants 30 acres of wheat which yields from 20 to 25 bushels per acre and is made into home grown flour for landlord and tenants. The 4,000 to 5,000 bushels of cotton seed from the yearly cotton crop is traded for cotton seed meal, another important source of livestock feed.

Ever since he has been farming Mr. Holmes has been an advocate of purebred stock. He has three brood sows, two of which are registered, a registered boar, and two brood mares. On the 300 acres of bottom pasture lands he grazes from 75 to 150 Herefords, of which 15 heifers and one bull are registered. In 1938 from a corn crop of 6,000 bushels, he ground 5000 bushels with cob, shucks, and corn which he later fed to the cattle.

Mr. Holmes believes in protecting his soil and building it up with legumes and intelligent use of fertilizer. The entire farm has been terraced during the last two years under an agreement with the Soil Conservation Service, and he says this work alone has been worth more than $10,000 to him. Most of his cultivated land is planted to legumes every year and as a result of this his land is always in a high state of productivity. Fertilizers are mixed on the farm to meet plant food requirements as experience and Clemson experts have proven profitable.

His farm equipment consists of two tractors used for the purpose of breaking land and to cultivate orchards. He also has various other farm implements which are too numerous to name. This farm equipment is well housed and cared for when not in use.

Mr. Holmes' sharecropping system consists of from 15 to 20 farm families, both white and colored. Tenant houses are substantial and painted, and farm service buildings are good and conveniently placed.

Mr. Holmes has not devoted his entire time to his farm but has taken an active part in many civic activities. He was once a school trustee, church official, foreman of the grand jury, and at the present he is president of the Tri-State Livestock Association, Director of the Edgefield Soil Conservation Association, the South Carolina Peach Growers' Association, and the Tri-State Advertising Association.
The Revival of the Sweet Potato Industry in South Carolina

By P. D. Seabrook, '41

The year 1936 marked the beginning of a new era in the commercial sweet potato production in South Carolina. Outstanding factors responsible for this new development were the introduction of a Louisiana strain of the Porto Rico sweet potato, and a realization on the part of the growers of the necessity of using improved cultural practices, rigid grading and attractive packing.

In the spring of 1936 the Extension service of Clemson College secured six hundred bushels of seedstock of an improved strain of the Porto Rico variety from the Louisiana Agricultural Experiment Station. These seedstock were distributed among 287 growers representing nineteen counties. These growers reported that this strain was far superior to native strains in yield, shape, color and other characters. At the present time practically all of the commercial growers use this outstanding strain.

Many growers did not fully appreciate the necessity of constant selection of seedstock nor the importance of careful handling, strict grading and attractive packing. Previous to this time the general opinion among the farmers was that the growing of sweet potatoes was a comparatively simple matter. No care was taken in the selection of seedstock and, as a consequence, the native strains of sweet potatoes were greatly deteriorated. As has been learned through experimentation, bruising from handling makes potatoes susceptible to storage rots and, consequently, lowers their market value.

Successful farmers today are using great care in selecting seed for future plantings. Seedstock should be selected from high producing hills and those which have desirable shape and color. All bruised, rotted, or black spotted seed should be discarded and the remainder be closely examined for skin and flesh color. Most potatoes in commercial planting are now raised from vine cuttings. This method of planting is recommended as a control measure for disease. In the past the prevalence of diseases has been one of the main detrimental factors in the production of sweet potatoes in South Carolina. Because of the general attitude previously taken toward the growing of sweet potatoes, it has been extremely difficult to establish a good reputation for our sweet potatoes as a commercial product.

The vine cuttings are planted in May or June preferably on a well drained sandy loam soil. The land should be hoed thoroughly and cultivated often enough to keep down weeds and grass. A fertilizer high in potash is recommended, a 3-8-8 or 3-8-10, to be applied at a rate varying from 800 to 1000 pounds per acre. A safe method of fertilizer application is to apply half of the fertilizer at the time the beds are prepared, and the remainder as a side dressing after the plants have set.

Potatoes should be harvested in warm weather. Experience has shown that potatoes harvested in warm weather will keep better in storage than those harvested in cold weather. The proper curing temperature for sweet potatoes is 80-85 degrees Fahrenheit for a period of ten days, and the recommended storage temperature is from 52-58 degrees Fahrenheit. At this temperature range the potato possesses its highest sugar content. At temperatures above 85 degrees Fahrenheit the sugars are used by a high rate of respiration. A high humidity in the storage house is also desirable as it reduces shrinkage to a minimum and helps to thicken the potato skin. A humidity varying from 75-80 degrees is recommended. Before storing, however, the potatoes are graded in the field. In grading for the market it is best to use only two grades. The requirements for these grades should be very rigid if we are to build up a reputation for marketing high quality sweet potatoes.

The leading county in South Carolina for the production of sweet potatoes is Orangeburg. Lee and Kershaw counties are also outstanding. These counties have adopted the Louisiana Unit One strain, which is the primary reason for their leadership. This strain has a more desirable color—copper red skin and salmon pink flesh. It is a better yielding strain than the seed stock of any native strain found on the average South Carolina farm.

It is a definite aim of the Clemson College Extension Service to make the farmers in South Carolina more “sweet potato minded.” With the improved strains and cultural practices sweet potato growing will definitely be made more profitable than it has previously been.
COKESBURY CONFERENCE INSTITUTE

Continued from page five

religion. His stay was short but his impartations were lasting. After a few short years of teaching he was succeeded by a Mr. Tilden, also a northerner, who was soon replaced by one of Olin's students, Adam Crawford.

Settlers came in increasing number to upstate South Carolina, after 1820. Preference for the higher altitudes led the patrons and trustees of the church and school to select a new site, two miles north of the original one. A town was carefully planned on Mount Ariel, and the school was given a favored position. Lots were offered for sale and were readily purchased by planters seeking a more healthful environment and the fellowship of congenial, Christian people. The school was opened at the new location in March 1826 with a rush of students from all directions. The increase in enrollment was so rapid that the trustees hastened to erect larger buildings. Rev. Joseph Travis, former Presiding Elder of the Ogeechee District headed the new school, and it flourished under his administration. Teachers for female students were employed from the beginning of the Mt. Ariel school, and eventually a separate female school was headed by Dr. Joseph Cottrell. Both schools were apparently prospering when they were turned over to the South Carolina Methodist Conference in 1835.

In 1832 the South Carolina Conference became participant with the Virginia Conference in Randolph-Macon College. The benefits of that institution could not be enjoyed by many South Carolinians because of the then excessive distance, and the need of at least a preparatory school was felt by the Methodists of the state. As a consequence, a resolution was passed in 1833 providing for the selection of a site for such a school in this conference. Mount Ariel, in the opinion of the committee on site, was ideally situated. For long the community had been a gathering place or rallying point for Methodism, and, in addition, an atmosphere of culture and refinement prevailed. The people of Mount Ariel agreed to give $6,000 including the two academies and the lands connected with them, if the conference school would locate here. The offer was accepted and, in January, 1835, the trustees of the Tabernacle School ceded the school property to the trustees of the conference school. Buildings and a new campus were not completed until 1836, but classes were conducted in available buildings during 1835. The official name of the conference school was, The Dougherty Manual Labor School, so named in honor of George Dougherty, to whom the South Carolina Conference owes the first inspiration for educational ambition. The village name was changed with the advent of the conference school, to Cokesbury, honoring Bishops Coke and Asbury.

Manual Labor Schools enjoyed an era of prominence during the years between 1830 and 1840. In addition to solving a disciplinary problem, student labor offered a partial means of financial support to communities desiring educational institutions. The Cokesbury institute required three hours of work per day of all students and was, thereby, able to hold educational expenditures to a minimum. Financial difficulties constantly harassed the school, and portions of land were frequently sold to remove deficits. Student aversion to work brought considerable criticism upon the manual labor system, and it was eventually discontinued with a consequent increase in tuition fees.

The session of 1854 opened with little of the original plant in order. The main building had been condemned and torn down, and without dormitories a central boarding place was impractical. A little chapel with two class rooms was being built.

Enthusiasm for education did not wane despite adverse circumstances. Day students enrolled in considerable numbers and graduated with the usual reputation of thoroughness in education. The war years reduced the enrollment to a pitiful ten and depleted the endowment of eighteen thousand which George Hallway had created in 1846, but with peace the school revived. In 1875 the consent of the South Carolina Conference was obtained to make an exchange of the property of the conference school for that of the old Masonic Female Collegiate Institute, which was established at Cokesbury in 1854. With better facilities the school once more went forward and in 1882 was opened to girls, but if they ever enrolled there is no record. Public education in South Carolina was coming into its own by this time, and the heyday of private schools had passed. However, the Cokesbury Conference School was not discontinued until 1918. At that time the building was sold to Greenwood County and has since been used as a public school.

Cokesbury was never a college, but Methodist boys of the state went there to receive preparation for life without any thought of further education. The curriculum was never broad,
but the intensity with which study was pursued is commendable. Students entering college from Cokesbury seldom encountered difficulty and numerous are the successful alumni. Ministers, physicians, dentists, lawyers, teachers and journalist of great renown are on Cokesbury’s Alumni roll.

This school, under whatever name—Tabernacle, Mount Ariel, Dougherty, Manual Labor, or Cokesbury Manual Labor School, deserves a prominent place in the educational history of South Carolina. Arising in an age of educational insensibility, Cokesbury prospered and set a standard during a great era of private schools to eventually give way to an improved public school system.

DAVID R. COKER, LEADER
OF SOUTHERN AGRICULTURE
Continued from page three

before the boll weevil came to this part of the country David R. Coker had already laid plans to combat it; and how? By developing an early maturing variety of cotton that would be made before the Boll weevils ravages later on in the season. But Mr. Coker was not satisfied with just this, so his next step was to develop a system of poisoning that would further combat the boll weevil, and at the time of his death in 1938 he was striving hard to effect a southwide program for poisoning with governmental aid.

David R. Coker is known today primarily for his work in cotton but, nevertheless, he did valuable research in other crops, and in the future it is very probable that this latter work of his will prove to be of as much importance to agriculture as that done with cotton. At the time Mr. Coker began his plant breeding work many farmers contended that small grains could not be profitably grown down South, but Mr. Coker believed otherwise, so he began experimental work along this line. As a result of this work Mr. Coker developed wheat and oats that were resistant to the diseases and pests which formerly checked the normal development of these grains, and he also developed new varieties of corn, potatoes, melons, fruits and green vegetables which were adapted to Southern farm conditions.

As Mr. Coker succeeded in developing new varieties of economical crops more and more attention was paid to his work. In later years thousands of farmers, as well as Scientists, Socialists and high governmental officials from this country and abroad, were attracted to his seed farm annually to observe the methods he used to develop new varieties of Staple cotton, small grains and vegetables. Shortly before his death Mr. Coker said: “Nothing is so important in the production of farm crops as knowledge of the quality of the planting seed and their ability to produce both quantity and quality.”

In the passing of Mr. Coker, this State and Nation has lost one of its foremost if not the foremost leader in the realm of plant breeding. He was the Gregor Mendel of his day and his name will go down in history as a landmark in the field of agricultural progress. A former governor of this state has very well summed it up by saying: “What South Carolina needs is more David R. Cokers.”

THE AGRARIAN
The Clemson Soy Bean

The Clemson soy bean originated as a result of some work done by the South Carolina Agricultural Experiment Station in cooperation with the United States Department of Agriculture. The seed of this bean was introduced into our country from China some years ago by the United States Department of Agriculture and was sent to the Sandhill Experiment Station, Pontiac, S. C., for trial as a possible improved variety for this state. This bean was tested for about eight years at the Sandhill Experiment Station, and it made such a good showing that it was given a name. As Clemson College was the center of Agricultural activity in South Carolina, this bean was given the appropriate name—Clemson.

After the Clemson soy bean was acclimated for about eight years at the Sandhill Experiment Station, it was brought to the local station at Clemson College, being grown there first in 1938. This bean was found to be well adapted to Piedmont farming conditions, as is well shown by the fact that it ranked highest in yield of twenty-four varieties grown in 1938 at Clemson. This crop is being grown at Clemson College now largely to demonstrate its value in Piedmont Soil Conservation Programs, but the fact that it is also adapted to Coastal Plain conditions has been demonstrated by the experiment stations located in that part of the state.

By growing soy beans on a soil and then turning them under as a green-manuring crop, a three-fold effect is obtained—the growing crop tends to minimize soil erosion; organic matter is added to the soil; and as this crop is a legume, Nitrogen is added in appreciable quantities. In addition to its soil-improvement qualities, it should be added that this crop makes very high quality hay when used for that purpose, and this is well manifested by its ever increasing popularity in every section of this state as a hay crop.

When the Clemson soy bean is used for hay, however, it is advisable to cut it early with a mower, then dry it, and thresh it with a grain thresher instead of using other methods of harvest, because this bean has a tendency to shatter in the field under unfavorable climatic conditions. Another method which has also proven to be satisfactory is to harvest this bean with a combine as soon as the first beans begin to shatter in the field.

SANTEE-COOPER POWER
AND NAVIGATION PROJECT

"juice" as new units), if industry begins to modernize on a big scale the utilities may have to step lively to keep up.”

In the carrying out of the idea of malaria prevention and setting up adequate sanitation facilities, the Authority has provided for a health and sanitation division of highly trained and experienced experts, and these experts are experimenting with a revolutionary system of malaria control, using a biological method. In other words, this method, if perfected, will eliminate biological and botanical conditions favorable to malaria-carrying mosquitoes through the mopping up of their breeding places and by eradication of certain vegetation upon which these mosquitoes feed and the conditions under which they breed. It is believed that by the successful inauguration of this new method the Santee and the Pinopolis basin areas will be freed of a disease which has menaced them during the past two hundred years and will be made as healthy as any region in the Southeast. Upon the carrying out of this idea, the Authority, in collaboration with the State Forestry Service, proposes to make this disease-freed land one of the fine playgrounds of the Old South with hunting, fishing and aquatic sports predominating.
Agrarian Personalities

R. L. ARIAIL, JR.


P. H. BRYANT


R. L. HEARON


R. C. WANNAMAKER

THE PURINA EXPERIMENTAL FARM

Continued from page fourteen

the requirements are made, labeled with a number and sent to the farm for feeding trials. The feeders at the farm know absolutely nothing of the composition and feed it according to directions. If, after a period of time, a mix proves satisfactory and profitable, it is fed for a period of three years to the specific age and type animal for which it is intended, and under various conditions. If, at the end of this period, it has proven profitable and economical without any exceptions, it is made into a standard mix and put in the checkerboard bag for sale on the market.

The conclusions reached from the experiments on this farm are not published as the Agricultural Experiment Station bulletins are. It may seem to some that no contributions in the field of nutrition could be made from work on this farm, but, actually, many valuable conclusions on the value of different feedstuffs in animal nutrition are reached.

THE AGRARIAN

BETTER SEED TO PLANT

Continued from page fifteen

One acre out of every 6, or 250,000 acres, planted to cotton in South Carolina in 1937 was planted in seed treated with a mercury dust known under the trade name of Ceresan.

"It is conservatively estimated that 400,000 acres, or approximately 30 per cent of the 1938 cotton acreage in the state, were planted with treated seed, and on the basis of results obtained from demonstrations this brought about an increase of around $2,000,000 in the value of the state's cotton crop," says W. C. Nettles, S. C. Extension entomologist. "During 1939 equally outstanding results were secured by seed treatment. The survey as to the number of bushels of seed treated in 1939 indicates that around two-thirds of the state's cotton acreage benefited by this practice."

While this 2 per cent Ceresan (ethyl mercury chloride) has proven a great boon to farmers, and has made millions of dollars for them, it may be due for a decrease in usage—but only because another product which research men and manufacturers believe is equally as effective, and probably more so, is being put on the market.

This is NEW IMPROVED CERESAN (ethyl mercury phosphate), which has been used in treating various grains for some time. Workers in the research department have, through scientifically conducted experiments and demonstrations areas all over the Cotton Belt, found that NEW IMPROVED CERESAN is just as good, or even better for cottonseed treatment than regular Ceresan. When farmers begin using it on cottonseed it will simplify the seed treatment problem considerably, because this one chemical can be used for treating cotton, oats, wheat, rye, and possibly some other small grains. This seems to be a method of seed improvement which every farmer can use—in fact, can't afford not to use.

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WHAT OF THE WAR IN EUROPE
AND OUR NATIONAL ECONOMY?
Continued from page eighteen

Yellow Truck and Coach; 11,000,000 bushels (7 1-2 per cent of the U. S. crop) of soy beans. The principal buyers are, in order, Russia, Turkey, France, Holland and non-belligerent nations. So, one can readily see that the orders, although not large, are mostly for war materials—shells, etc. This is diverted demand. Men will flock to these industries for work, but when the war is over, these industries will collapse, and these men will have nothing to do. Unemployment will be even greater than ever.

What are the immediate results? 130 vessels of 860,000 tonnage, and thousands of seamen are idle; there is an increased interest in the South America market, which is already a serious threat to American Agriculture; there is a loss of England's normal demand of $150,000,000 for staple products, for these can be bought in nations granting credit; there is an increase in wage levels in war boom industries with which others must compete for labor, but cannot compete for market. As a result many industries may have to close down because of their inability to meet the wage level set by the war time industries. Mal-adjusted production will become even worse than ever, and more unbalanced it becomes, the longer it will take us to balance things up again.

The final result will be that America will become the "Shylock" in the eyes of other nations. Temporary prosperity will collapse with even more biting effects than in 1929.

Imagination was given to man to compensate him for what he is not, and a sense of humor was provided to console him for what he is.
THE GOVERNMENT AND THE LAND

Continued from page fourteen

World peace is menaced by the desire of one nation for another's land. It would seem that one of the most important problems today is the improvement and conservation of existing land resources. It is hardly likely that it will be profitable for private capital to attempt a program of conservation since this involves a long-time viewpoint. This program must be a part of the public activity.

It would appear, therefore, that the government must incorporate in its land policy certain measures, which, although they may interfere with private property rights, are to the advantage of general public welfare.

Any John Smith, whether he be a farmer or a government, who can find joy in the prospect of losing only half as much next year as he is losing this year has mastered the sublime art of being happy though broke, perpetually.

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