This is our man.

He lacks size, maybe, by professional standards. But there are lots of things about him that are really big league.

His heart, for one thing. It’s almost as big as he is, and it’s jam-packed with the stuff that winners are made of—things like intrepidity of purpose, and gameness, and that precious quality that the world calls loyalty.

Then, there’s the training he’s getting now. When in a few short years he takes his place on the team, he’ll be ready. He’ll have the rules of the game down pat . . . he’ll know the priceless worth of fair play . . . and he’ll know how to handle the ball when it comes his way.

Size, you say? Oh, size doesn’t count in the big game, the one he’s training for, the one called Life. He’ll be first string—wait and see.

He’s no individual, this man of ours. He’s all the youngsters in these vast United States . . . he’s American Youth, a title that represents two big points in his favor. And we’re pinning our hopes on him.

He’s our man!
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HARTSVILLE, SOUTH CAROLINA
WATER WORKS WONDERS

Life is dependent upon water, sunshine and soil. Air and sunshine are beyond the influence of man, but the land and water resources are tremendously affected by the manner in which they are used. History records the rise and fall of empires since agriculture had its beginnings in Mesopotamia and the Nile Valley over 7,000 years ago. Palestine, North Africa, Syria, China, Greece and many other nations have paid for the misuse of their land with sorrow and the destruction of their civilizations.

In recent years, the Jews have made wonderful progress in draining swamps and reforesting the eroded hill country in Palestine. The destruction of terraces and the over grazing of hill lands by the goat herds of desert tribes had unleashed the forces of water to erode the soils off the slopes into the valleys making marshes and ruining the farm value of the hill country and the valleys for nearly 13 centuries.

Under natural conditions, water is not a destructive force because vegetative cover protects the soil from erosion. Modern industrial developments and intensive agriculture require tremendous quantities of water but tend to encourage the destruction of water conserving influences. Our homes need water for drinking, washing and cooking; the cities must have it for sanitation, fire protection and recreation. Industries must have water to produce power and light and to use as a solvent, a cooling agent, a means of waste disposal and a part of the finished manufactured products.

Actively growing plants contain 75 to 90 per cent water. The water in a plant at any one time is a very small part of the total that passes through it during development.

Photosynthesis is the process by which the carbon dioxide taken from the air and the water taken up by the plant roots are combined in the presence of chlorophyll and with the energy of sun light to form sugar.

J. P. LaMASTER

There are 3 parts of carbon dioxide and 166 parts of water vapor to 10,000 parts of air. It requires six molecules of carbon dioxide and six molecules of water to form one molecule of sugar. As a result of these relationships, great quantities of water are transpired through the leaves of plants.

The bodies of animals contain an average of 56 per cent water. Water is required daily by all classes of animals for physiological purposes such as regulation of body temperature through sweating or evaporation from body surfaces, the production of blood, internal secretions, milk, eggs and the products of reproduction. A cow drinks three pounds of water for each pound of milk produced.

Where does all this water come from? An old philosopher is quoted in a Minnesota Resources Commission bulletin as saying, "All the rivers run into the sea, yet the sea is not full; unto the place from whence the rivers come, thither they return again." Waters which the rivers carry back to the ocean represent less than 20 per cent of the rain received. Where does the balance come from? The air cannot store a great deal of water as vapor. Ordinarily there is more water in one foot of soil than in the 25 miles of overlying air. The temperature of air gets one degree colder every 325 feet up. This cooling off continues for about 7 miles and from there on the temperature is about 60 degrees below zero even in summer. Water vapor cannot exist at this temperature. Even at zero the air can hold less than one twentieth as much water vapor as it can at 80 degrees. For this reason, most all atmospheric moisture is found within one mile of the earth's surface. This moisture envelops the earth and makes human life possible. Without this blanket, the earth's temperature would be 300 degrees below zero.

Observation of precipitation on land areas and of run-off from land indicates that precipitation greatly exceeds run-off. Several research workers have calculated that run-off amounts to 30 per cent of the total precipitation falling on land. This would leave 70 per cent that must be returned to the atmosphere. Studies reported by the U.S. Department of Agriculture in 1937 indicated that the moisture for precipitation in the United States was derived mainly from the oceans and transported by maritime air masses. The dry polar air movements passing from the northwest toward the east and southeast pass off the continent with significant gains in moisture, whereas the tropical maritime air masses traveling from the Gulf of Mexico toward Canada show a considerable net loss of water. These relations explain the dry climates of the western part of the United States as compared with the more humid climate of the eastern and southern sections.

The science of hydrology is concerned with the properties of water. It is now recognized that the distribution of water in the form of a solid, a liquid or a vapor obeys a fundamental law of equilibrium. The amount of water in the world does not change. The form and location of the water supply changes. This relationship representing the balance of water between the hydrosphere (oceans, lakes, streams and underground waters), the lithosphere (the solid part of the earth) and the atmosphere is called the hydrologic cycle.

The balance between the rainfall on the land and the evaporation from that area are the significant facts about the weather and climate of that section. The sun supplies the energy for evaporation and when moisture evaporates from an object that object is cooled. The total amount of energy received from the sun each year would melt a layer of ice 140 feet thick. If it were not for (continued on page eighteen)
Preferred Breeds Compared

If you were to ask several people which is the best breed of beef cattle, you would have a good chance of getting several different answers. The reason we have so much trouble in comparing the breeds is that there are numerous qualities and points to be considered, all of which are found in no one breed. The object of this article is to give some, not all, for books have been written on the subject, of the more important characteristics of the favorite breeds, with an idea of tying in the uses of each breed with its adaptability to South Carolina conditions.

Hereford and Polled Hereford
The Herefords are the most popular beef cattle in S. C., this popularity in itself being an advantage, because bulls can easily be secured for commercial herds, and business can be carried on easily by purebred breeders.

Probably the Herefords greatest long run advantage is its ruggedness an ability to survive on scanty range. During hard winters they seem to stay in fatter condition than the Shorthorn or Aberdeen Angus breeds. Herefords are medium-sized, are blocky and low set, are good feeders, and produce fairly good carcasses. In other words, Herefords can be considered in general, the most all-purpose breed of cattle.

WINSTON SIBLEY
Animal Husbandry 1951

Probably the greatest practical disadvantage to the Herefords is that their milk production is below that of the other breeds. Since the most popular method of beef production in South Carolina is the production of fat calves to be sold at weaning time, this is an important disadvantage. Also, Herefords are bothered a great deal by pink eye, screw worm, and foot rot.

The Polled Herefords possess the same characteristics as the Herefords; however some additional points should be brought out about them. The Polled Herefords are an up-and-coming breed in purebred circles. Good ones sell at a terrific price, but since it is a new breed, good animals are scare. As a whole, the breed lacks hind quarters and are polled only from 50 to 100 percent; however, these two factors are constantly being improved by breeders, and this room-for-improvement concept is what may bring dividends to some enthusiastic South Carolina breeder.

Up to date, the cost of Polled Hereford bulls has been a disadvantage to the commercial cattlemen, and although this breed has been popular with them, to my mind it is an expensive method of dehorning.

Aberdeen Angus
Since we mentioned popularity in the Hereford, it must also be noted that the Aberdeen Angus has the advantage of being the fastest growing beef breed in popularity. This is certainly a factor to be considered in starting a purebred herd, although stock would not be quite as easy to obtain in South Carolina as is in the case of the Hereford breeds.

Other advantages are unexcelled typeness among the beef breeds, unmatched carcasses among the breeds, and freedom from pink eye and usually from foot rot, and an abundant milk supply. This last factor should be considered in remembering that commercial fat calf production is widely practiced in South Carolina. Too, the Angus is a 100 percent dehorner.

The fact that the Angus is the smallest beef breed is an advantage in that they mature earlier, but this is a disadvantage in that many people prefer large animals. Other disadvantages are their intolerance to severe summer heat, their nervous temperaments, and, it is thought, their increased susceptibility to flies and Bang's disease over other breeds.
The chief disadvantage to the breed is that they are not thought to be as hearty or as good rustlers as the other beef breeds, but with the coming of better pastures to the South, this fault has a good chance of being eliminated.

Shorthorn

The unpopularity of this breed in South Carolina is certainly a disadvantage to purebred breeders, for animals are very cheap. However, this is an advantage in that some wise commercial beef producer, who wants to look long enough, can buy top-flight Shorthorn bulls at comparatively cheap prices.

The chief advantages to the Shorthorn are that they are the largest beef breed and give more milk than any of the beef breeds. These two factors combine to make a wonderful combination for South Carolina’s fat calf production, although the breed hasn't been “discovered” here yet. Also, the Shorthorn are reputed to have the mildest temperaments as a general rule, and fall in between the Herefords and Anguses as to rustling ability.

The Shorthorn breed is not as typey as the Angus or Hereford, being long and upstanding. Also, the fact that there is not one standard color but four,—red, roan, white, and red and white,—is a disadvantage. The Shorthorns are bothered by screw worm, foot rot, and pink eye, and since they give a large supply of milk, must be watched for udder trouble.

There is also a Polled Shorthorn breed, but since it is a new breed, top animals are scarce.

Brahman and Associated Breeds

This new breed of cattle is gaining popularity both as purebreds and crossbreds because of its ability to withstand great heat and cold, diseases, and insects. They are said to be excellent rustlers, even grazing in summer sun all day. Breeders claim their animals raise larger calves than do the other breeds of beef cattle, this being a factor of noteworthy importance. A recent advertisement showed a Charbray bull, a Brahman cross on a French breed, that weighed 1345 pounds at 11 months of age.

The great disadvantage of the breed is, of course, it wildness. In the barren country and swamps, where they are proving a very practical breed, they become very difficult to handle. Another disadvantage is the legginess and lack of best type in the Brahman, although they are reputed to produce a good carcass with a high dressing percentage.

The Santa Gertrudis, the Braford, the Brangus, the Beefmaster, and the Charbray are some recent breeds and crosses that are gaining much popularity.

I have given some of the more important strong and weak points of the leading breeds without discriminating, I hope. It should be noted that these points pertain to the breeds as a whole. To the characteristics I have mentioned there can be found many individuals that are exceptions. This whole thing of breed choice boils down to a matter of use, of conditions, and of personal preference. At any rate, we have several good breeds to choose from.
This year, more than in any recent year, farmers have had reason to doubt the claims for winter grazing programs. The recent cold snap during Thanksgiving, when state temperatures ranged between 5-10°F., in most localities, wrecked many a farmer's hopes for heavy grazing provided by small grains and some perennial grazing crops. Hay, which farmers thought they would not need in abundance, is at present a very scarce item, and even oat straw is becoming as expensive as many previous year's prices for good legume hay. It is necessary for farmers to make different plans concerning next year's feeding problem; hence, it is expedient to review winter grazing to see what can be expected of it during average winter conditions and what further practices must be incorporated in our farm management to offset an emergency, the failure of winter pastures as exemplified by this winter's crops.

Many strong advocates of winter pastures argue this is an unusual winter and that winter pasture programs are not deserving of the criticism they are receiving; however, we must take into account the fact that in searching for a winter feeding program, we are looking for practices which will be profitable during usual and unusual winters.

First, how unusual has this winter been? We can, in fact, say that this winter has been typical except for the one cold snap Thanksgiving. A cold snap of zero temperatures throughout this state occurs at irregular intervals about once every twenty years, as recorded in the 1941 Yearbook of Agriculture entitled "Climate and Man". We can then expect 5 percent of our winters to throw a vicious cold snap at us that will greatly damage our winter crops. Aside from this, we can expect about four cold snaps a year with temperatures as low as 20°F., but these are of short duration; hence, our winters are usually mild.

Our last few winters have been unusually mild, and this has made us overly optimistic concerning winter grazing.

Since our winters are usually mild, winter pastures should not be abandoned, but they must be supplemented, for there are many days that our pastures make little or no growth. Year-round-grazing in the South has given us the attitude of being able to graze readily during the cold months. Oats, rye and other cool-season crops begin growth at temperatures of 32-41°F., and do not make optimum growth until 77-88°F. The average temperature for Greenville County, for example during January is 40.3°F. How can we expect even the cool season crops to carry on abundant growth and be readily grazed at this temperature? With this in mind, our growing season is expressed by the number of frost free days between the last killing frost in spring and the first killing frost in fall. Since our growing season is an average of 240 days throughout the state, our winter pastures must be heavily supplemented during the remaining 125 days if heavy grazing is to be expected in the spring.

The most practical way to supplement grazing is the use of hay. Farmers usually have a surplus of summer grazing and should store up all hay possible. Grass hay is as valuable as good legume hay if cotton seed meal is fed along with it, for the c-s-m, or any other good pro-

(continued on page eighteen)
MR. AMERICAN FARMER

By JOE W. O’CAIN
Agronomy ’54

With the appointment of four faculty members from Clemson College to a South Carolina Regional Committee to administer the Hoblitzelle National Award in Agricultural Sciences for this area, the hunt for the “Man of the Past Two Years in American Agriculture” is under way.

The South Carolina Regional Committee, appointment of which was announced by Dr. C. L. Lundell, Director of the Foundation, is made up of a group of leaders in the state’s agricultural and educational systems. Dr. W. R. Paden, Agronomist at the South Carolina Experiment Station, Clemson, heads the Committee as Chairman.

Other members of the Committee, all of Clemson College, are as follows: Dr. G. M. Armstrong, Head of the Department of Botany and Bacteriology; Dr. M. D. Farrar, Head of the Department of Entomology and Zoology; Dr. W. A. King, Professor of Dairying, and Dr. O. B. Garrison, Professor of Horticulture.

According to a recently issued release by Ross T. Fitzgerald, Science Editor of the Texas Research Foundation, the following information is made known:

“The Award, which will be made biennially, will begin in 1951, through the Karl Hoblitzelle Agricultural Laboratory of the Texas Research Foundation at Renner, carries a $5,000 cash prize and a gold medal. These will go to the person who has made the most important contribution to American agriculture within the preceding two-year period.”

There are 39 Regional and three Territorial committees set up by the Texas Research Foundation. In this find-the-man campaign which is being conducted on a nation-wide basis, virtually every scientific finding of importance to agriculture which has been published within the past two years is being scrutinized, although only research of which the results has been published between July 1, 1948, and July 1, 1950 is being considered. The research may have been earlier, but publication must have occurred between these two dates.

This capable committee representing South Carolina, together with the members of the other 41 Regional Committees, is entrusted with the job of combing the nation for suitable scientific contributors to agriculture who may rate consideration for this already widely covered Award. Its provisions and purposes have already been generally compared with those of the Nobel and Pulitzer prizes, in their fields.

The creator of this Award is Karl Hoblitzelle of Dallas, who is a top-ranking business leader, capitalist and philanthropist of the Southwest.

(continued on page seventeen)
October 1800—A soft breeze sends yellowed leaves earthward while an autumn sun sinks low over the mountains sending long shadows across the forest floor. Only the noisy creek disturbs the evening’s quietness as it rushes madly down the narrow cove and over the cascades to the wooded valley below. Here and there a small chipmunk can be seen darting with short, swift movements from one tree to another in search of seeds for his winter’s food supply. High in a beautiful yellow poplar a brown canary of seeds is suddenly disconnected by the breeze and falls to the ground where it is seized by a small rodent. Stuffing his cheeks with part of the cane, he scampers to a small hole under a nearby root and there deposits his load which is then covered with leaves and bark. But one small seed drops on the ground outside the storehouse. Brown leaves fall and cover the little seed.

April 1801—The mountains are covered with a misty rain obscuring the sun, and making the sharp ridges only dull outlines against the leaden sky. A brown thrush hops merrily through the damp woods as it searches for an early worm. The little creek, filled with melted snow, is now a mighty mountain torrent crashing over the huge boulders lining in its path. Nearby two small goldfinches are seen peeping up. The sun slowly seeps through the mist and warms the humus from which the little plant emerges.

June 1810—A mountain trout drifts lazily in a cool clear pool; his fins fanning the stream just enough to keep himself balanced. High overhead, a hawk circles warily as he scans the forest for some unlucky rodent. Up on the ridges, the Red Spruce has put forth new branches, and farther down there are bright new leaves on the maples and oaks. The dense thickets of rhododendron are covered with white blossoms around which the bees work busily. Down near the stream, a beautiful arrow-like tree pushes its way up from beneath the underbrush. Although it is only ten years old it already measures eight inches in diameter having grown swiftly in the rich soil. With its bright green leaves and smooth grayish colored bark it is a beautiful tree.

September 1850—The air is still and the leaves hang limply in the humid atmosphere. No sound is heard except the harsh cawing of a crow as he hurriedly flies to his nest. All wildlife has sought shelter. A squirrel can be seen cautiously peeping out of his hollow tree. A brown thrush huddles in her nest. A low rumbling is heard in the distance as a slight breeze stirs the tops of the tall poplar near the stream. A long streaked flash of lightning followed by a strong clap of thunder is seen over the ridges. The breeze increases in velocity as the storm approaches with its rain and lightning. A curtain of rain engulfs the mountain cove as the high ridges are swathed in lightning. Suddenly there is an ear splitting crash as a bolt of lightning splinters an ancient chestnut and sets it ablaze. As rain has passed down the valley, the wind sends sparks and flaming sticks into the underbrush. Soon a wave of flame races along the ridge top and then starts down the cove. It travels down the mountain leaving burning stumps and brush in its wake. Pushed on by the wind the fire soon reaches the stream where it is stopped before gaining any strength. A dry stump near the tall poplar catches fire and the green tree’s bark is seared by the hot flames. As night comes the fire gradually burns itself out, leaving charred stumps and a blackened forest floor.

October 1950—It is a crisp morning. Two men are seen walking up the logging trail which is parallel to the stream bed. ‘The boss said to start cutting on that stand he marked yesterday,’ says one as he points to some tall poplars near the stream. Soon they reach a large tree which measures over one hundred and fifty feet in height and six or eight feet in diameter. Since a white blaze appears on the trunk they prepare to fell the tree in such a way that it will not be injured by the crash. After ten minutes work with a power saw a hundred and fifty years of nature’s labor came roaring down so that another house can be built. All that remains is another ugly stump where once stood a tall, graceful tree.

By R. E. FARMER
Pre-Forestry ’52

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The recent announcement by the U.S. government that this state had been chosen as the site for a new, multi-million dollar H-bomb plant was greeted with mixed emotions by South Carolinians. Most rejoiced at the news, but many were openly bitter. Among the most outspoken against the plan, and rightly so, were those farmers living in the area that is to be used. For these people the H-bomb plant meant the loss of their jobs and their farms and homes, many of which have been in the family for a hundred years or more. Yet, on the whole, South Carolinians seemed to be in favor of this new government project.

We might do well to stop and think just how this project will affect our state economy in relation to agriculture. Will the farmers prosper, or will they suffer as a result of the H-bomb plant? What are some of the advantages and some of the disadvantages that it will bring?

The immediate effect of the new plant is that it will take 225,000 acres of farm and forest land out of that which is available to South Carolina farmers. Many large and prosperous farmers, along with wage hands, tenant farmers and share-croppers will be forced to move. The probability is that most of the prosperous and better farmers of the area will relocate and begin farming in other areas, while the poorer and unsuccessful farmers will take jobs in textile mills or industrial plants. This will have the definite advantage of weeding out some of the more backward farmers of our state.

Another advantage that the H-bomb plant will bring is that of an increased demand for agricultural products. The many workers that come with it will have to be fed and clothed and they will, we hope, be fed on South Carolina produce and clothed in South Carolina cotton. The area surrounding the new plant is primarily agricultural and, in this new industry, it will find a ready outlet without shipping costs, preservation expenses, and needless middle man profit for its produce. Yet, not only the area surrounding the project, but, also the entire state will benefit as a result of this new market for its agricultural and industrial products.

The greatest advantage that the new plant will offer is that of increased capital. One of the factors that has long been limiting South Carolina agriculture is the lack of sufficient funds for agricultural investment. This will prove an advantage to all businessmen in the state. There will have to be carpenters and bricklayers, engineers, and foremen, plumbers and electricians to build the plant. But the building of the plant will only be the beginning. After the plant is built there must be apartment houses and houses for those persons that will work at the project. There must be stores and filling stations to satisfy their demands. There must be transportation available to them. And, through all of this, runs the farmers welfare. The workers must be fed; the laborers must be fed, and the products that they buy will be purchased from government paid salaries. In short, there will be a tremendous influx of capital into our state. But we can let this prosperity slip through our fingers. For if we do not seek to balance our farm program, much of this capital will have to be sent out of the state to purchase the agricultural goods that we are not producing. Let's balance our farm program with dairies, beef cattle farms, truck crops and row crops in order to keep this new wealth within our state.

Yet, there is a darker side to this rosy picture. Every blue sky has it's clouds, and the cloud that the H-bomb factory will bring to South Carolina, is the drain that it will place on our farm labor. One of this state's outstanding agricultural advantages in the past has been its readily available source of cheap labor. Farm wages in South Carolina and the South as recorded in the 1944 census was less than half that of any other section of our country. But now, there will be hundreds of high paying jobs open to laborers. To meet this competition for his labor, the farmer must become more skillful in trade labor management and farm management. He must learn to utilize white labor in addition to colored labor. He must grant to his laborer better wages, better houses, better food and better health conditions. He must arrange

(continued on page thirteen)

THE AGRARIAN
Healthy fields mean profitable yields! One good way to get the most out of seed and labor is through a sound program of insect control with toxaphene insecticides. Approved by the U.S.D.A. for grasshoppers, and by leading cotton-growing states for the control of all important cotton pests, low-cost toxaphene dusts and sprays are also being used effectively against an increasing variety of insects that attack other crops. This collection of books on insect control includes detailed recommendations on specific insects and a summary of latest federal or state recommendations. Write today for your free copies.

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MAKERS OF TECHNICAL TOXAPHENE FOR AGRICULTURAL INSECTICIDES
THE AGRARIAN STAFF BANQUETS

The Annual meeting of the Agrarian staff, in honor of the senior members and retiring staff, was held at Seigler's Steak House in Walhalla, on Monday evening, January 15, 1951. After a delicious steak, the senior members were awarded the "Agrarian Key" by John Pitts the presiding officer. Jack L. Sims, horticulture senior from Orangeburg, S. C., was awarded a cash prize for selling the most Christmas cards during the card sale before Christmas. Selling Christmas cards is one of the main sources of financing the Agrarian. The retiring staff members were: John Pitts, editor, senior agronomy major from Clinton, S. C.; Hans Paul, assistant editor, senior botany major from North Charleston, S. C.

John and his staff were highly commended for their splendid work, devoted time and interest spent in publishing the Agrarian. The new staff included Harry M. Lightsey, editor, senior agronomy major, from Columbia, S. C.

Prof. Ben E. Goodale, the staff adviser, made a brief talk on the work done in the past and how to make the Agrarian even a better magazine. Professor Goodale was the staff adviser in 1938 when the Agrarian was founded. Harris L. Beach, now V.A.E teacher in Smoaks, S. C., was the first editor. With Professor Goodale's sound advice and complete co-operation, the Agrarian has become one of the most popular school magazines on the campus.

NEW STAFF MEMBERS

Dr. T. C. Peele, soil scientist, and Dr. Maurice Phillippe, associate agronomist, have been added to the Agronomy Experiment Station staff. Dr. Peele was formerly with the Soil Conservation Research located at Clemson. He returns to Clemson from Mobile, Alabama, where he has been associated with the Pearson Laboratories.

Dr. Phillippe was formerly with the Fertilizer and Inspection Analysis Department at Clemson. He has just received his doctor's degree from Purdue University.

PROF. G. B. NUTT IS ALPHA ZETA SPEAKER

The local chapter of the fraternity of Alpha Zeta at its last regularly scheduled meeting on February 22 heard a very interesting talk by Prof. G. B. Nutt, head of the department of agricultural engineering. He spoke on subjects related to foreign agricultural practices and job opportunities abroad. Mr. Nutt placed special emphasis on Asiatic countries of the Near East. Mr. Nutt has recently returned from a tour of Egypt, Iraq, Iran, Lebanon, and Syria as a representative of the U.S. Government.

SOUTHERN AG. WORKERS' MEETINGS

The association of Southern Agricultural Workers' meetings will be held in Memphis, Tennessee, on February 5, 6, and 7. About twenty-five members of the staff of the Experiment Station and the college will attend these meetings.

DUKE WINS SEARS-ROEBUCK SCHOLARSHIP

Mr. Robert W. Duke of Kingstree, S. C., has been awarded the Sophomore Sears-Roebuck scholarship. Mr. Duke receives this scholarship as a result of having stood highest among the 20 candidates in his class for this award. His grade point ratio for the school year 1949-50 was 8.6. The scholarship is for $200.
MR. R. A. McGINTY, VICE-DIRECTOR PASSES

Rupert Alonzo McGinty, Vice-Director of the South Carolina Experiment Station, died at his home in Clemson at 2 p.m. February 28, after several months of declining health.

Mr. McGinty was born at West Point, Georgia, on May 2, 1886. He received his B.S. degree from Alabama Polytechnic Institute in 1913, his A.M. degree from Washington University in 1919, and further graduate training at Cornell University. He began his teaching career in horticulture at Colorado Agricultural College where he spent 14 years and achieved the rank of associate professor.

In 1928 Mr. McGinty came to Clemson as professor and head of the horticultural department and except for two years spent at Oklahoma Agricultural and Mechanical College his service to this institution has been uninterrupted. During 1934-36 he served as Acting Dean of the School of Agriculture and Acting Director of the Experiment Station. Since 1936 he has been Vice-Director of the Experiment Station.

Mr. McGinty was particularly interested in the breeding of crops adapted to southern conditions and was tireless in his endeavor to expand plant breeding facilities in the South. Through his efforts and that of other leaders, the U. S. Regional Vegetable Breeding Laboratory was established near Charleston, S. C.

One of his major research accomplishments, in collaboration with a colleague, was the development of the Clemson Spineless variety of okra. Clemson Spineless okra was introduced in 1936 and received a silver medal award in the 1939 All-America Selections of the American Seed Trade Association. Since that time it has become the most popular variety of okra in the South.

He has served as chairman of the Experiment Station Directors of the Southern Region, has been a member of the experiment station committee on organization and policy of the Land Grant College Association, a member of the Committee of Nine under the Research and Marketing Act, a member of the Society of Horticultural Science, regional secretary of Phi Kappa Phi, and a member of Sigma Xi, Alpha Zeta, and Phi Eta Sigma.

Mr. McGinty was a devoted member of the Fort Hill Presbyterian Church, actively engaged in all phases of church work, and currently serving as chairman of the board of deacons. His interest in religious life on the campus included membership on the Y.M.C.A. advisory board.


AGRARIAN PHILOSOPHY

(continued from page ten)

for a better balanced farm program so as to give his labor steady employment, for once labor is left unemployed, it tends to leave and not come back. The farmer must also beware of the unions and group organizations that industrial labor bring with it. Already, Northern labor has tried to unionize the farmer. So far, it has failed, but we must prepare for much more expensive and intensive union campaigns. The farmer must never lose sight of the fact that he is a capitalist. He must never succumb to union promises and persuasions.

These are some of the advantages and disadvantages that the H-bomb plant brings with it. To my way of thinking, the many great advantages outweigh the one real disadvantage that the plant will bring. Yet, these advantages and disadvantages are not limited to the H-bomb plant alone. They apply to all industry. As such, let us, the farmers, welcome industry and make the South Carolina of the future a state in which industry and agriculture meet in order to pursue their aims to the just end and to the common benefit of all.
CLIMATE VERSUS PESTS

WEATHER AND CROP DISEASES

By H. F. PAUL
Botany 1951

Throughout historical records set down by man, one may find that
diseases and pests were great factors in the take of man’s food resources.
More than once the records reveal that entire nations were threatened
with famine from this cause. Less than a century ago, late blight so
blasted the potato crop of Ireland as to spread starvation throughout the
island. Many Irish-Americans trace their descent to emigrants who were
forced to leave the “ould sod” by this disaster. This country also felt
the effects of the disaster from plant
diseases. In 1904, 1916, 1935, 1937,
and 1938, this country and Canada
experienced rust epidemics in grain
that were widespread and devastat-
ing in their severity.

Centuries before man recognized
the true causes of rusts, smuts and
mildews, he attributed such maladies
to the whims of the gods. The Ro-
mans believed the god Robigo had
the power to protect wheat from
rust, and they held sacrificial feasts
to gain his good will. Later, people
attributed plant diseases to the va-
garies of the weather. Finally, in
the middle of the eighteenth cen-
tury, Tillet proved that wheat bunt
is transmitted through its “black
dust”, which we call spores.

Since Tillet, knowledge in this
field has grown enormously, and we
now know not only the causes of
most of the serious plant diseases
but also the true relationship of
weather to their incidence, spread,
and effects.

Weather influences plant diseases
in many different ways. Some re-
quire moist, humid conditions for
infection and development; others
are more serious when it is relatively
dry. Some are favored by cool
temperatures; others require warm
weather. In some cases, the princi-
pal effect of weather is not on the
disease producing organism itself
but on the host plant or even on an
insect carrier of the disease, when
such a carrier is necessary to cause
infection of the host plant. Many
examples of these different relation-
ships might be cited, but only a few
can be given here.

The late blight of potato is favor-
ed by excessive humidity and moder-
te temperatures, conditions nec-
essary for the spread of the parasite.
Warm, cloudy, moist weather makes
the apple and pear more susceptible
to bacterial blight, gorging tissues
with sap so that they are more read-
ily invaded by the organism; hot
dry weather checks the progress of
the disease. Moisture and wind are
important in the formation and
spread of spores of the apple scab.
The spread of peach brown rot is
similarly controlled by the rain and
wind. Severe dry spells tend to
curb curly top of sugar beets by kill-
ing off certain annuals upon which
the leaf-hopper which carries the
curly top virus to the beets depends
for summer survival. Scab of wheat
and other small grains is always
prevalent when warm, moist weath-
er occurs during the period from
heading to maturity.

Among the most important of all
plant diseases affected by the weath-
er are the cereal rusts.

In observations made from early
1900 to 1930, it was found that in
Minnesota and the Dakotas epide-
mics of stem rust did not occur in sea-
sons when the average temperature
during the critical period was below
61 degrees F. In some seasons, as in
1910, even when the average tem-
perature was relatively high, there
was no rust epidemic, largely be-
cause of deficient rainfall.

In 1915, the United States pro-
duced one of its early record wheat
crops — 1,009 million bushels. The
average summer temperature for
that year in Minnesota and the Da-
kotas ran more than 4 degrees F. be-
low the normal of 62.5 degrees.
There was no rust epidemic. The
season of 1916 in the spring-wheat
states started off even more promis-
ingly than did that of 1915. July
1916, however, was characterized by
relatively high temperatures and
fairly abundant rainfall. The result
was a widespread devastating epi-
demic of rust.

Humidity is second only to tem-
perature in promoting cereal-rust
epidemics. Dew or other free mois-
ture on the wheat plants is neces-
sary for the germination of rust
spores. If conditions prevent rain
or the condensation of dew, there
need be little fear of an epidemic,
even with an abundance of spores.
A succession of overcast nights or
continuous night winds which pre-
vents dewfall during the critical
period for rust infection will prevent
the spread of rust, even though the
average temperatures are favorable.

The important thing in the de-
velopment of a rust epidemic is that
the favorable conditions must oper-
ate at the same time. There must
be (1) favorable warm temperature;
(2) abundant moisture; (3) abundant
spores to infect the plants; and (4)
a susceptible grain and alternate
host. More than once, when the
stage has seemed set for a destruc-
tive rust epidemic a change in one
or another essential factors has pre-
vented its development.

Weather variations in any one lo-
cality are not the only important
climatic factors that control epi-
demics of the cereal rusts in the U.S.
The climatic weather complex of
the entire northern and southern
midcontinental area of North Amer-
ica also plays an important role.

FOURTEEN
52 AIDS TO INTERESTING PROGRAMS AND LIVELY LECTURES... NO CHARGE!

MOVIES—all 16 mm., in full color and sound! "Soil and Life" is on soil conservation. "Win Against Water" tells about terrace building. Ten others.

BOOKLETS—based on above films, with same or similar titles. Several additional booklets, independent of movies. All profusely illustrated, clear, interesting.

SLIDE FILMS—with accompanying phonograph record or narrator's script—teach safety, conservation farming, proper use and care of machinery.

POSTERS—and charts, 24 by 36 in., easily read on classroom wall. Include machinery cross-sections, conservation farming methods, farm safety, etc.

OUTLINES—help teach class or club the essentials of building a pond, of contour farming, of grassland farming. Each member can have his own copy.

MORE COMING UP! Other movies, booklets, and additional teaching aids are now in production. Look to Case for visual education materials on advancing farm practices.

Films are loaned and printed matter provided without charge to agricultural colleges, student clubs, extension workers, county agents, vocational agriculture teachers, etc. Schedule movies through your nearest Case dealer or branch, or write to Educational Div., J. I. Case Co., Racine, Wis.
CO-OPS AID THE FARMER

By ROBERT T. WARD
Agricultural Economics '52

During the past few years, farm cooperatives have been the object of bitter attacks by private business organizations. Before trying to explain the reasons for these attacks, let us review briefly the history of cooperatives.

Most cooperatives adhere to certain fundamental business principles. Briefly, they are as follows:

1. Open membership
2. One vote per member
3. Limited returns on capital with a maximum of 8 percent
4. Payment of patronage refunds on the basis of the amount of business done with co-ops

Despite all the advantages they furnish the farmers, co-ops have still been the object of attacks. Their most bitter critic has been the National Tax Equality Association which was organized primarily to fight co-ops.

The N.T.E.A.'s argument is based on the opinion that farm co-ops, which are tax exempt, should "pay off" like other businesses. This attack is made against all co-ops, but in reality the charge is aimed at large co-ops such as the California Fruit Growers' Association. It is the large co-ops and not the small operators that the N.T.E.A. hopes to eliminate as a threat to all-out profit business in the U.S.

The N.T.E.A. has launched four main charges against co-ops.

1. Private businesses in the same field cannot compete due to the heavy taxation to which they are subject.
2. Co-ops, with their free and easy capital, are rapidly expanding into businesses not related to farming.
3. Co-ops will eventually, if allowed to expand unhindered, eliminate the profit system.
4. Through co-ops, the communists and reformers are seeking to destroy the American way of life.

In answer to the first charge, co-op leaders and others believe that the tax question is illogical since taxes are levied only on the net income after all expenses and officers' salaries are deducted.

Co-op leaders, in answer to charge two and three, contend that cooperatives are not a threat to free enterprise. Prices on goods are usually at the level of most retail prices.

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MR. AMERICAN FARMER
(continued from page seven)
He has also set up two other similar prizes of $5,000 each, and gold medals, which will go for contributions to Texas agriculture and rural life respectively, and are open only to Texans.

The purpose of the National Award is defined as follows:
"1. To encourage and promote scientific investigations for the solution of prevailing unsound agricultural practices, and the conditions growing out of those practices.
2. To develop well-balanced, efficient agricultural systems, adapted to the soils and climate of the respective regions.
3. To center the attention and interest of scientists and others, through the stimulus of this national search for outstanding agricultural contributions, upon the importance of agriculture in the nation's economy. This, in turn, may bring a resultant up-swing in basic agricultural research, for the long-range betterment of rural life."

The Regional Committee members are instructed to consider contributions in the following scientific fields: agronomy, bacteriology, biochemistry, biology, all phases of botany, chemistry, entomology, forestry, genetics, nutrition, soil science, veterinary science and zoology.

According to the news release other information is quoted as follows:
"The Committee has discretion to go outside these fields for a nominee if they consider it desirable to do so. Also, they are not confined to nominations within the geographical borders of their own region. The 'regional' nature of their personnel is to make sure that all parts of the country are covered, in the manhunt for the scientist meriting the Award.

"After all the nominations are in, the South Carolina Committee will screen them, and obtain and sift any additional supporting evidence that may be pertinent to the claims. It then will make, not later than February 15, a report listing its top three contenders for the Award, to the Advisory Committee of the Texas Research Foundation. The Advisory Committee will further narrow the choices of all Regional Committees to nominations which are recommended to the Awards Committee for selection of the recipient of the Award.

"The Awards Committee is to be named by the trustees of the Hoblitzelle Foundation, and consist of nationally recognized scientists, agricultural leaders and laymen. The Award will be made next May at the annual Open House of the Texas Research Foundation."

*RESULTS BUILT THIS HABIT...*

* Survey of Iowa soybean growers showed 91% inoculated every seeding. Among those expressing preference, NITRAGIN led all other brands 3 to 1.
* Elmer Chestwood, Georgia, made this two-acre test. One acre's corn followed inoculated cover crop—on other acre no cover crop was used. 56.3 extra bushels of corn came from acre following inoculated lupine cover crop.
* Walter Latham, Ohio, proved how NITRAGIN inoculation prevents wasteful land use. Acre not inoculated was a failure. Inoculated section, a lush success. Second cutting exceeded the first.

- When you work valuable land and plant expensive seed, you want results. Failures cost in time and money... lost crops ruin planned grassland rotations. To help assure legume success, wise farmers inoculate every planting. Inoculated legumes produce better growth of protein-rich hay... abundant seed yields. That's why most agricultural authorities agree—and farmers insist on regular practice of legume inoculation. It costs so little—pays so much. For more than 50 years, more farmers have used NITRAGIN than any other inoculant. They buy it with confidence because NITRAGIN gets results. If you want bigger, better legume yields... if you want your soil to have more production power—always inoculate all legumes with NITRAGIN. Get the habit that gets results. Get NITRAGIN from your seedsman... in the orange-colored can.

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PASTURES MAKE PROFITS
(continued from page six)
protein supplement, adds the lacking protein. Even the hay that has been rained on while curing should be kept. All roughages should be salvaged. They will save the expense of high-priced feeds.

Reserve permanent pastures are another solution coming into recognition. The crimson clover-bermuda grass rotation is an excellent example. In the fall, after the first killing frost, the bermuda will die back. The remaining litter, when fed with a protein supplement, will keep the animals fat, for a 40 percent supplement, fed at the rate of 1 or 2 lbs. per head per day, makes the litter two or three times as valuable, and the animals need roughage and energy to offset the cold. The animals can be kept away from the small grains, or ladino-fescue, or other winter grazing crops for a longer period of time. More reserve permanent pastures and hay plus the protein supplement seems to be the answer. Incidentally, the supplement should be purchased early in the season before the price rises. If excess hay is had at the end of the winter, it can be fed to the animals during the early spring, leaving more of the grain and clover acreage for seed production.

We still have a much shorter period in which we have to supplement our winter grazing than do other sections of the country. We must, nevertheless, be respectful of old man winter and make allowances for him in order that our winter pastures will not be over-grazed and will flourish again in the spring after the severe period has passed.

CO-OPS AID THE FARMER
(continued from page sixteen)
As to the fourth charge, no reliable information is available to show that communists are in the cooperative movement. This charge is obviously sheer propaganda.

At the present time, it is difficult to predict the eventual outcome of this battle between cooperatives and private business-sponsored organizations; but should co-ops fall under these attacks, their fall will mean the destruction of something as American as our own backyard.

WATER WORKS WONDERS
(continued from page three)
The fact that water is heaviest at 39.2 degrees, that it becomes lighter as it cools and expands about 10 per cent when it freezes, ice would form first on the bottom of lakes and streams and life on the earth would be completely changed.

The rate of evaporation from bodies of water and from the soil and surface of vegetation after rains depends upon the temperature, dryness of the air and the velocity of the wind. Evaporation doubles for every 18 degrees increase in temperature. Usually evaporation is high when

(continued on next page)
WATER WORKS WONDERS
(continued from preceding page)

rainfall is low and vice versa. Every inch of water lost by evaporation during a dry summer is as detrimental as an inch less of rainfall received.

Transpiration represents the water that plants use. Evaporation depends upon heat. Transpiration depends on heat, sunlight and, of course, available moisture. Dense forests do not produce heavy rainfall but heavy rain produces dense forests. Most plants lie dormant until the sun has warmed the air to 42 degrees. The amount of water required to produce one pound of dry matter varies from 200 pounds for pine trees to 600 pounds for deciduous trees, grains, potatoes and sugar beets and 830 pounds for clovers and alfalfa. This means that it requires 1,495,800 pounds or 747.9 tons of water to produce one ton of alfalfa hay. All the water transpired by plants comes from the soil through the plant roots. When soils are fully saturated, about 5 inches of water is held per foot of soil. Gravity moves water downward; capillary forces move water up or down or sidewise toward the drier areas with a force more than a thousand times as great as gravity.

Infiltration is the term used for that portion of rainfall that is absorbed by the soil. The ground water provides all the moisture used by plants, the domestic water supplies of farm families and the water for small cities and for many industries. The run-off of rainfall may be greatly influenced by soil conservation practices. The maintenance of a vegetative cover of trees or pasture plants is the most useful methods for decreasing run-off on sloping lands.

The soil conservation research laboratory at Clemson has found great differences in the run-off and soil losses on bare plots and plant covered plots in 1935. Soil erosion and heavy run-off are no special conditions of the South. The Soil Conservation Service Experiment Station reports run-off results for five rainy days in 1934-35 on plots in corn, clover and blue grass at their LaCrosse, Wisconsin Experiment Station.

The Piedmont region of South Carolina and Georgia is located in one of the heaviest rainfall sections in the United States. The close cultivation of cash crops during the summer months with bare soils in winter has about ruined our farms. Improved summer and winter pastures used under controlled grazing practices can make this warm climate and heavy rainfall our greatest assets for profitable dairy and livestock enterprises. The run-off will be converted to infiltration to eliminate the effects of summer drouths, raise the water table of the area, and clear the mud from streams to make better opportunities for industries and more prosperous farms.

---

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CLIMATE VERSUS PESTS
(continued from page four)
In the northern part of the United States and in Canada, the grain and
grass rusts produce red spores capable of infecting growing grains and
wild grasses up to the end of the growing season. At the time of the
red-spore stage, grain, both volunteer and fall-sown, has started, and
grass has begun to “green up” in southern Kansas, Oklahoma, and
Texas. The spores and grain would seem to be far enough apart so that
“never the twain shall meet.” Climate and weather bring the two to-
gether.
Dependent as it is on climatic and weather conditions and forces be-
yond man’s control, the situation at first glance seems entirely uncon-
trollable. Like many other problems, however, it becomes less awe-inspir-
ing when reduced to its simplest terms. The four primary elements
that must coincide to induce a devastat-
ting rust epidemic have been noted.

Temperature and moisture, elements of weather, are beyond control; no-
things can be done except talk about them. The amount of inoculum and the acreage of susceptible host plants,
on the other hand, are vulnerable and subject to attack. Substantial
progress already has been made in curtailing their menace. The stem-
rust-resistant spring wheat, Thatch-
er, bred in cooperative experiments
in Minnesota occupied in 1940 some
17,500,000 acres in the hard red
spring wheat areas of the United
States and Canada. The new rust
resistant wheat developed by the
cooperative research in Texas is
used to eliminate over-wintering in-
fec tions in the South. This not only
protects the Texas wheat crop but
will cut off inoculum from susceptible
varieties grown to the north and
east. Similarly, new stem- and leaf-
rust-resistant varieties of oats and barley are being introduced that will
insure these crops against the new
biological races of rust.

EGGS FROM THE
AG. HOUSE
Lady: "You should clean up your
column."
Columnist: “Lady, you should
clean up your mind—or quit reading
it.”

1st: Take one artist. Then take an-
other. What do you have?
2nd: I don’t know.
1st: A pair of drawers.
An old timer used to say—It’s heck
to lose your gum in a chicken house.

“What do you do all day?” asked the
tourist.
“Hunt and drink,” replied the na-
tive.
“What do you hunt?”
“Drink.”
Little Willie, cute but dumb.
Gouged his eye out with his thumb.
“Mercy on us,” screamed the mother.
“Hell,” said Bill, “I got another.”

TAKES TIME
Farmer: “This is a tobacco plant
in full flower.”
Young thing from the city: “And
how long will it be before the ciga-
rettes are ripe?”

These new synthetic stockings
made out of coal, wood and rubber
are going to be mighty confusing
for women. When they get a run,
they won’t know whether they’re got
a clinker, a splinter or a blow-out.

SAME FOR ALL
“But, Doc,” argued the sailor, “I’m
only here for an eye exam. I don’t
have to take off my clothes for that.”
“Strip down and get in line,”
shouted the pharmacist’s mate.
The sailor obeyed, but kept on
grumbling. The chap in front of him
finally turned around and said,
“What are you kicking about? I only
came here to deliver a telegram!”

SHOULD BE PUNISHED
Then there was the mamma kan-
garoo who reached into her pouch,
withdrew her two youngsters, bump-
ed their heads together and said,
“How many times must I tell you
not to eat crackers in bed?”

THE AGRARIAN

Armour Quiz . . . Test your knowledge
How many of these questions on the livestock and meat packing industry can you answer?

Questions
1. How many meat packers buy farm livestock?
   □ 4 □ 400 □ 4,000
2. Who are the cleanest people on earth on the basis of soap usage?
   □ Dutch □ Americans □ Chinese
3. About how many pounds of meat did the average American eat in 1950?
   □ 130 □ 145 □ 170
4. How many people own Armour and Company?
   □ 350 □ 3,500 □ 35,000

Answers
1. Armour and Company is one of 4,000 packers competing for supplies of meat animals.
2. Americans use the most soap—25 pounds per person per year. (Dutch, 24 pounds; Chinese, 20 ounces). Americans are fortunate in having plenty of soap as a by-product of animal agriculture and meat packing.
3. The average American ate a little more than 145 pounds of meat last year.
4. There are approximately 36,000 Armour shareholders.

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TWENTY
How 700 Factory Tests help keep
McCormick Drills
"First in the Field"

A report to you about men and machines that help maintain International Harvester leadership

Seeding test makes drills prove accuracy. See the wheat these fluted feeds are measuring into individual boxes. It's carefully weighed to make sure all feeds sow uniform quantities of grain. The total weight of this grain must check with seed index settings. This is one of over 700 tests and inspections that safeguard the dependable field performance of McCormick grain drills.

Feeds are checked 14 different ways. Here are the gauges that IH inspectors use to insure peas-in-the-pod sameness of McCormick fluted feeds. The feed cup, fluted roll, shut-off block, and dump bottom are individually checked. Every fluted feed must pass this tough 14-point inspection. This is in addition to many visual inspections at every step of manufacture.

Openers must be perfectly aligned. Single-disk openers are assembled on a fixture that holds all parts in proper relationship. Undercut and angle of draw are built into each assembly. No further adjustment is needed in the field. Three gauge points provide visual proof of perfect opener alignment. All gauges that uphold IH standards are frequently measured against master gauges.

Three thousandths of an inch is too much! Here is a workman measuring the diameter of a wheel hub. It can't vary more than two thousandths of an inch from IH standards. Rigid inspections like this constantly measure quality, but good workmanship maintains it. This pride in a job well done has made the IH trademark a symbol of extra value for over a century.

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Motor Trucks Crawler Tractors and Power Units Refrigerators and Home Freezers

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Campus Interviews on Cigarette Tests

NUMBER 4...

THE PANDA

"Let's get down to bear facts!"

The sudden rash of quick-trick cigarette tests may have caused panda-monium on the campus—but our scholarly friend was unperturbed. He pondered the facts of the case and decided that one-puff or one-sniff tests

...single inhale and exhale comparisons are hardly conclusive. Proof of cigarette mildness doesn't come that fast! And that's exactly why we suggest...

THE SENSIBLE TEST—the 30-Day Camel Mildness Test which simply asks you to try Camels as your steady smoke—on a pack after pack, day after day basis. No snap judgments needed. After you've enjoyed Camels—and only Camels—for 30 days in your "T-Zone" (T for Throat, T for Taste), we believe you'll know why...

More People Smoke Camels than any other cigarette!