Clemson's New Agricultural Center
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CHARLESTON, S. C. CHARLOTTE, N. C.
With this issue of the Agrarian we, the staff, close another successful year of publication. Next year’s Agrarian staff will be headed by Niles Clark and Ray Buck, but before placing the reins in their capable hands, there are a few last thoughts to be passed on to our readers.

This year we have tried to convey to our readers important developments that have taken place in the field of agriculture. It is not the policy of the Agrarian to act as a scientific publication for the School of Agriculture at Clemson, nor is it our policy to publish articles for light reading and amusement. We have strived to strike a happy medium between the two in an effort to please our readers and hope we have succeeded.

Our circulation reached the 4,000 mark this past year, and we are in hopes that next year’s number will be increased so that the Agrarian may be placed in the hands of every interested reader.

Last but not least, I would like to say for myself, Ed Nolley, for the staff that publishing the Agrarian has been a pleasurable experience. For my own part, I want to thank the members of the staff for their hard work and complete cooperation. It has been wonderful working with you. For myself and the staff I would like to express to the agriculture students and faculty members, whose heretofore unrecognized help has meant so much in making the publication of the Agrarian possible, our sincere thanks and appreciation.

* * *

William Reasonover, Ag Ec ’47, former editor of the Agrarian who rejuvenated its publication after World War II, has taken a new job in Bennettsville, S. C., as advertising manager of two newspapers — The Marlboro County Herald and Pee Dee Advocate.
Two familiar old faces always welcome you back to the campus.

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BAKERSFIELD, CALIFORNIA
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Buckfield Plantation

YEMASSEE,
SOUTH CAROLINA
FROZEN SEMEN

B. R. Ebner, Dairy '55

If we look back over the past 12 years, progress in artificial insemination is seen to have been remarkable. In 1940, insemination were carried out using raw semen introduced into the female by means of a speculum and pipette. By this means, possibly 20 inseminations per collection could be carried out. With the coming of diluters and the technique of introducing the pipette by controlling the uterus by way of the rectum, it is now possible, but not done, to inseminate up to 1,500 cows from one semen collection.

Within the last few years the introduction of antibiotics and sulphanilamides to the diluted semen has still further raised the conception rate.

In May, 1953 the birth of what is claimed to be the first live calf in America resulting from frozen semen was announced. The birth occurred in Jamesville, Wisconsin. The frozen semen used was frozen under a process developed by a British scientist. Several breed associations and colleges in this country and Canada are now working with this process. The procedure is to use glycerol in the diluter. The semen is then frozen and held at a very low temperature until ready for use. This semen can be held for at least one year without injury to the sperm.

Investigations in England by Parks, Polge, and Smith have revealed promising new developments in methods for freezing and storing bovine semen at —79° centigrade. Breeding experiments have resulted in pregnancies in cattle inseminated with sperm stored as long as one year at —79° centigrade. At the time of publication of this article, calves which appeared to be normal had been produced from frozen semen stored for shorter periods at —79° centigrade.

The important steps in the procedure of freezing at this low temperature are as follows:

1) Allow the semen in yolk citrate to cool to 50° centigrade in from four to six hours.  
2) Add gradually, during the next 33 minutes, an equal volume of citrate buffer containing 20% glycerol.  
3) Equilibrate the semen and dilute for 12 to 20 hours at 5° centigrade.  
4) Cool the preparation slowly from 5° centigrade to —15° centigrade at a rate not to exceed two degrees per minute. After this, the freezing can be as rapid as desired.

The technique for freezing semen now being used by the Eastern Iowa Artificial Breeding Association is as follows: The semen, immediately after collection, is diluted one to twenty-five with a homogenized whole milk diluter and allowed to stand in a refrigerator as 5° centigrade for four to six hours. The preparation is then diluted further with an equal amount of milk buffer containing 20% glycerol giving an end product of 10% glycerol and a dilution of one to fifty. Then it is put into ampules and flame sealed, one cc in a two cc ampule. The next step is to place it back into the refrigerator at 5° centigrade and let it stand 18 to 20 hours. It is then placed in an alcohol bath of absolute methyl alcohol and frozen down at the rate of two degrees per minute to —25° centigrade. A very important part of the technique is to lower the semen further down at a rate of three degrees C. per minute to —79° centigrade. This is accomplished by putting dry ice in the alcohol bath containing the ampules and watching closely the drop in temperature with a low temperature alcohol bath at —79° centigrade until used. Just how long the semen may be kept frozen successfully by this technique is not definitely known. So far, semen frozen for sixty-day periods has given just as good results as that used after being frozen for only three days. Doctor Pirie, who heads the Iowa Association believes that good results may result from semen frozen for nine months or longer.

Experiments on long storage of frozen semen have shown that the temperature of storage, —79° centigrade, is close to the danger line and semen stored above —65° centigrade will not keep for any length of time. This means that storage cabinets have to be developed to hold the semen at a safe temperature.

A cabinet now in use has a capacity of 10,000 one cc ampules of semen. The cabinet has three compartments, two for dry ice and one for the semen. The compartment for the semen is divided into several smaller compartments. The box is insulated with foamica. When the box is in a 35° Fahrenheit room it takes about 125 pounds of dry ice weekly to keep the temperature at —79° centigrade. If the safe temperature is —79° centigrade and the danger temperature in the middle sixties, some other forms of refrigeration besides dry ice must be developed, because the temperature of solid dry ice is exactly —79° centigrade. A change is especially important if semen is stored for a period of several years. There are two possible existing sources of refrigeration: 1) Electrical refrigeration or 2) liquid air as an alternate refrigerant. These sources will also have their problems, but it is believed that they would be better than dry ice.

Work with frozen semen is expected to get under way within two weeks here at the Clemson Artificial Insemination laboratory. Doctor Victor Hurst says that a box is now being completed that will store and freeze the semen. The box will be similar to the one used by the (continued on page ten)
Poisonous Horticultural Plants

W. F. Craig, Hort. ’54

In the field of horticulture much research has been carried on in an attempt to eliminate those plants which are poisonous from the edible plants. Over the past one hundred years a great number of people have been killed due to the lack of knowledge concerning poisonous horticultural crops; however, the recent twenty years of research on the subject has uncovered the greater percentage of those plants unfit for human consumption. Most all horticulturists by profession are versed to the maximum capacity on the subject, but there yet remains that great group of consumers of horticultural crops who are not horticulturists by profession. Therefore, the population as a whole knows very little concerning these poisonous crops. As a source of information, this paper contains many names and families of which there are plants poisonous to humans as well as lower animals. A broader knowledge should prevent some individual from becoming sick as results of eating poisonous plants.

Now look at the relation of plants to public health should be the question in mind. In addition to furnishing food, clothing, and shelter—the basic necessities of life—plants, in their utilization by man, have also furnished problems of public health in their production of alcohol, narcotics, allergies, poisons, and specific human diseases. The three great necessities of life—food, clothing, and shelter—and a host of other useful products are supplied in great part by plants. Plants are important also to man’s health in many other ways. Bacteria, viruses, rickesiae, and fungi cause the majority of human disease.

Altogether the multiple effects of plants on the physical health of man is best illustrated by the water hyacinth. It has been found that water hyacinth grows in such abundance that it causes run-off and increases back water resulting in flood conditions. Moreover, hyacinth has blocked streams carrying sewage with a subsequent backing of this material into populated areas. As an overall result, this hyacinth has caused a considerable amount of discomfort, and in rare cases death resulted.

There are many plants or plant products which are poisonous directly or indirectly. A majority of materials chewed or smoked have a narcotic effect due to the presence of alkaloids. Tobacco is the least harmful of these substances. However, it is a different matter with coca, cannabis, and opium which are injurious in small amounts and which, when used in quantity may cause stupor, convulsion, and even death.

A centuries old custom of chewing the leaves of the coca plant is carried on in South America by the Indians. The Indians resist physical and mental fatigue and work long periods without food or drink by using coca leaves since cocaine is a derivative of the coca plant. The leaves are chewed habitually by these Indians until physical deterioration and even death.

Onions have a similar effect to that of opium. However onions are a member of the lily family and opium another. Opium is a very old narcotic which has spread to all parts of the world. The immediate effects of smoking opium are pleasurable with dreams of grandeur and disillusionment.

Nearly all plants of history are backed by some legend or fable. Medic, a well known sorceress of mythological fame, appears frequently in the description of poisonous plants. One such plant of late winter and early spring is helleborus niger, the name referring to the black roots. Helleborus known as Christmas rose, or Lenten rose, is a very old plant. As the beautiful white flowered variety blooms, or is supposed to bloom at Christmas time, it has been symbolic of that season and has been called the birth day flower of Christ. In spite of the loveliness and purity of this Lenten rose, the roots were called the “bread of death” by people of olden times.

During the month of May when gathering a bunch of lily-of-the-valley, little do we think of other parts except the flower. The great root systems and berries that follow the pure white buds of the lily-of-the-valley are deadly poisonous.

Most all horticulturists know the great numbers of vegetables containing poisonous elements. Especially well known is hydrocyanic acid in plums, cherries, and certain peaches and genus prunus. This chemical compound is found in a locked up condition and needs an enzyme or ferment to unlock the compound. There are the members of the mustard family which are poisonous vegetables. The mustard oils are very strong irritants, and feeding on considerable ground seeds may cause chronic enteritis, and abortion.

As mentioned before there are members of the rose family which are definitely poisonous at times along the shores of New England at hay harvest. The variety is known as the “brake fern.” Certain varieties of lilies are poisonous and children have at times been stricken from eating bulbs. Another poisonous plant is a member of the iris family called “Wild Iris” or “Blue Flag.” It was found in habitant in meadows in eastern North America, the substance which act upon the gastro-intestinal tract. Orchids are poisonous. Showy-lady-slipper has definitely been found to be poisonous—located in bogs and swampy places in eastern North America, the poison has been found to be a fatty acid. Osage-orange, a member of the mulberry family contains toxic substances to the human. It is a native from Arkansas to Texas, and the osage-orange is largely planted for hedgerows in the north eastern states where it has become established. Results of its toxicity are skin diseases or dermatitis. In recent years beans of the modern varieties have produced considerable stomach trouble. However, “Wild Beans”, “Blue Peas”, “Indian Beans”, and the sort are poisonous. Also Holly varieties (continued on page twelve)
Feeding Experiments on Fattening Swine

By N. C. Clark, Jr., AH

In their quest to produce a better product for less money, the Clemson Animal Husbandry Department has recently completed a three year feeding test on fattening hogs. These tests were conducted to compare (1) Animal and vegetable protein supplements; (2) Feeding values of low-gossypol cottonseed meals prepared by different methods; (3) Feeding values of cottonseed meal and soybean meal, and (4) The effect on the rate and economy of swine gains when supplements supplying Vitamin B₁₂ and antibiotics were added to supplements containing low-gossypol meal. Untreated cottonseed meal contains a high level of free gossypol which is toxic when consumed in large amounts by swine.

Eighty-five pigs, averaging eighty pounds in weight, were fed until a final weight of 200 pounds was reached. Purebreds of the following breeds were used: Poland-China, Duroc-Jersey, Hampshire and Beltsville No. 1.

The pigs were self-fed, in individual pens, a carbonaceous base ration of yellow corn in amounts sufficient to balance their rations according to Morrison’s feeding standards. Also included in the base ration was one percent oyster-shell flour and one-half of one percent salt.

Pigs fed a check supplement consisting of 50 percent Menhaden fish meal, 25 percent alfalfa meal and 25 percent cottonseed meal made daily gains of 1.96 pounds during the feeding period. Feed consumed per pound of gain was 3.75 pounds. The cost per hundred pounds of gain attributed to feed was $14.20.

Lot 2 pigs, which were fed a supplement of 25 percent alfalfa meal and 75 percent low-gossypol cottonseed meal (low temperature processed), made daily gains of 1.56 pounds and consumed 4.17 pounds of feed per pound of gain. Feed cost per hundred pounds of gain in this lot amounted to $14.60. The low-temperature cottonseed meal used in this lot was obtained from the Southern Regional Laboratory at New Orleans, and was a low-gossypol product prepared in an expeller-type mill at a temperature of approximately 210° Fahrenheit.

Lot 3 pigs were fed a supplement consisting of 25 percent alfalfa meal and 75 percent low-gossypol cottonseed meal (solvent extracted). This cottonseed meal was obtained from the Augusta Plant of the Buckeye Cottonseed Oil Company. Pigs of this lot made a daily gain of 1.71 pounds and required 3.92 pounds of feed per pound of gain. Feed cost per hundred pounds of gain was $13.72.

Lot 4 pigs were fed a supplement of 25 percent alfalfa meal and 75 percent soybean oil meal. They made daily gains of 1.69 pounds and required 3.91 pounds of feed per pound of gain. The feed cost in this lot was $13.69 per hundred pounds of gain.

Lot 5 pigs were fed a supplement consisting of the same ingredients as that of Lot 2 plus Aureomycin. a commercial antibiotic concentrate put out by the Lederle Company. Aureomycin contains 1.8 grams of aureomycin and 1.8 milligrams of Vitamin B₁₂ per pound. This antibiotic was mixed with the feed at the rate of 10 pounds of Aureomycin per ton of feed and resulted in each pound of feed containing 9 micrograms of Vitamin B₁₂ and 9 milligrams of aureomycin. The pigs fed this supplement made daily gains of 1.82 pounds and required 3.74 pounds of feed per pound of gain. The feed cost per hundred pounds of gain was $14.02.

Lot 6 pigs were fed a supplement consisting of the same ingredients as those fed in Lot 2 plus MK 45, a commercial antibiotic concentrate put out by the Merck Company. MK 45 contains 15 grams of penicillin and 12.5 milligrams of Vitamin B₁₂ per pound and was mixed with the feed at the rate of 1.44 pounds per ton of feed. This resulted in each pound of feed containing 9 micrograms of Vitamin B₁₂ and 10.8 milligrams of aureomycin. Pigs on this supplement made daily gains of 1.96 pounds and required 3.47 pounds of feed per pound of gain. Feed cost was $13.01.

As can be seen, the hogs fed the check ration made faster gains than those receiving either of the vegetable supplements without antibiotics and Vitamin B₁₂. Also, the check-lot hogs ate less feed per pound of gain than those receiving the unaugmented vegetable protein. Adding Vitamin B₁₂ and aureomycin or penicillin to the cottonseed meal ration resulted in a significant increase (continued on page sixteen)
Culling and Selection of the Laying Flock

Heber N. Padget. Poultry '54

Culling out the non-producers is one of the most effective ways of increasing the profits of a poultry flock. Culling of poultry of all ages, to a limited extent, should be a continuous process because diseased, crippled or otherwise defective birds should be removed from the flock as they are detected. This reduces feed costs by eliminating birds that have ceased to lay. In addition to this it gives the remaining birds in the flock a better opportunity by allowing more room.

One of the best times to select layers for a flock is when the pullets are from four to six months old. If they are in a thrifty condition at this time, it is not hard to select the best potential layers. The desirable pullets will be well-developed with bright combs. The undesirable birds will lack body and comb development. When the flock is in the flush of laying — in other words, when about all are at work, any culls or non-layers can be spotted readily.

To determine whether a hen is laying or not is based on several factors: (1) The comb and wattles — The comb and wattles of a laying bird are generally red and waxy, especially if the bird has been in production only a short time. If the comb is shriveled, hard, dry, and covered with loose, grayish scales, one can be fairly sure that the bird has ceased to lay. (2) The eye. The laying bird will more frequently have a bright, sparkling eye than will the hen not laying, although many poor birds have fairly bright eyes when they are in good physical condition. The bird is usually in poorer physical condition just after production ceases than at any other time of the year and hence at this time the usual brightness of the eye is often lacking.

(3) The face. The face of a laying hen will be free from excess fat and generally will be bright red in color. A bird that has laid intensively, especially undersized birds, may have pale faces. A hen not laying that has been out of production for some time will have a tendency toward a fatty face, especially in the heavier breeds.

(4) The vent. The vent of a bird in dormant condition will usually be contracted, small in size, round in shape, and yellow in color. The yellow color of course will be found on the yellow skinned breeds only. The amount of color will depend also upon the amount of yellow corn and green feed that the flock is receiving. On the other hand the vent of a hen laying heavily will be dilated, crescent in shape and bluish in color.

(5) The skin. The skin over the abdomen of a bird not laying will be tight and rigid with layers of fat underneath, whereas in a laying hen the skin will be soft, loose, and pliable. Also the abdomen will be expanded in the laying hen due to the slightly enlarged intestines and the greatly enlarged oviduct. In a bird not laying this expansion is not evident except in rare cases where internal tumors or heavy accumulation of hard body fat are present.

(6) The pubic bones. The pubic bones may be close together and the distance between the pubic bones and rear end of the keel bone may be very small in case of birds out of production. These two measurements will depend to a large extent on how long the bird has been out of production. In a laying hen these bones will, as a rule, spread apart and be

(continued on page twelve)
Is The Small Farm Doomed?

By Edwin E. Sompayrac

In this paper I will not say that the small farm is doomed. Neither will I say that there will always be small farms. But, I will say that we do have them now and will continue to have them in the immediate future.

Farming has long been considered a family-sized operation. In agriculture, at least three-fourths of the farms can be classified as family farms. We have one farm, as classified in the census, for every 38 persons in the country.*

Before I go further, let me say that, in my estimation, there are two distinct types of small farms. First, the small farm suits some people who are near retirement age and want to take life easy, or who may not need high farm earnings, or who would rather take a lower but more stable earning, with more time for living. Second, there is a small farm that is operated by the incapable, uneducated manager. The use of inefficient and outmoded methods of farming and the lack of necessary financial resources, or the local scarcity of other work that the operator can do are all direct reasons why it is a small farm. Generally these farms are most numerous in thinly populated rural areas where technological changes in farming have been slow and alternative employment opportunities limited. As a result of these, their contribution to agricultural or other economic production is much reduced. These farms are gradually decreasing. In a study made at Michigan State College in 1949, to find which size farms are increasing and which are decreasing, the following results were recorded:*

Farms under ten acres in size decreased 6 percent in number.
Farms fifty to ninety-nine acres in size decreased 14 percent in number.
Farms 150 to 259 acres in size increased 10 percent in number.
Farms 260 to 379 acres in size increased 16 percent in number.
Farms 380 to 499 acres in size increased 15 percent in number.
Farms over 500 acres in size increased 23 percent in number.

We might ask what is causing this decrease in number of small farms. About half of the decline in number of farms was due to combining farms, made possible by mechanization and modern technology, and to discontinuance of production on many small units which are now classed as rural residents and not farms. Also, there has been a change in the definition of a farm which tended to eliminate some farms.

What can we do about this decline in small farms? The question may be raised — Are the technologists and researchers doing as much for the small farm as they are for the large ones? I believe they should lay more stress on some of the newer developments in farming which the small farmer can take advantage of at low cost or which would reduce his costs. Instead of purchasing the large machinery, perhaps he can hire the job done, or buy the smaller, less expensive machinery, which is best suited for his acreage. Perhaps the small dairyman can cut costs by using artificial insemination, and raising only his best heifers. Maybe some labor-saving techniques and thriftiness and other ways would make the work easier and increase net returns. Also farmers on small acreages could do a better job of the selection of plant varieties, disease control, and the like.

It has been well established that the size of the farm business is an important factor in determining farm profits. With the exception of years when prices were unusually low (earnings on large farms fluctuate more widely than on small farms), farm business reports have implicated that the large farm business makes higher average labor income than do small farm businesses.*

Still the question "Is the Small Farm Doomed?", has not been answered. By analyzing the facts, I am sure of one conclusion—the number of small farms may be decreasing, this decrease is caused mainly by the before-named reasons, but the ones remaining are mostly farmers who are experienced and have the “know how”, or they may be the small farms who are operated by the minority, but still important, retired or “satisfied” operators. There will always be these farms. The small farm that is operated by the inexperienced, uneducated operator can’t make much money because of its pattern of operation and if something comes along better — which usually is almost anything — he will quit farming. I believe that these types of farms are doomed.

Farm production over the years has been steadily increasing — since World War I, it has increased 40 percent — and the prices received by the farmers have increased. With technological improvements and mechanization setting a fast pace, the small farm operators will have to acquire the knowledge of successful operation to keep up with the large farms. Those who are lucky will survive, those who aren’t— are doomed.

Farm Economics Bulletin 31 "Should All Farms Be Large" Pt. 2 P. 592-593 F 49.


MAY 1954
Now! TWO Great New
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That slogan made history in 1935, the year the first ALL-CROP Harvester was introduced as the "successor to the binder."

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It was the first harvester to be equipped with air-tired wheels for faster and easier operation in the field; first to be adapted for power take-off; first to employ the principle of wide-flow feeding and threshing with its 5-foot spiraled bar-type cylinder; first to use patented rubber shelling contacts on cylinder and concaves; first to introduce the quick cylinder speed-changer; first to introduce air-blast separation and cleaning; first to use silent, variable-speed V-belt drives.

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Get more power, more production... more profit! For More Acres... More Crops... More Profit.
BETWEEN THE FURROWS

ALPHA ZETA INSTALLS NEW OFFICERS AND SELECTS DELEGATES TO NATIONAL CONCLAVE

At a recent meeting of the South Carolina Chapter of Alpha Zeta, honorary agricultural fraternity, installation of officers for the coming year was made.

James K. Henderson, Dairy senior of Clemson was installed as the new Chancellor, Robert J. Donaldson, Horticulture senior of Mt. Pleasant, S. C., was installed as the new censor.

Other officers installed are as follows: Niles C. Clark, Jr., rising senior in Animal Husbandry—Scribe; Ray M. Buck, Jr., rising junior in Animal Husbandry—Treasurer; and Bryan L. Walpole, Agronomy senior—Chronicler.

Faculty Advisors reelected were Dr. C. M. Jones, Professor A. W. Snell, and Professor T. L. Senn. Professor A. W. Snell was named chairman of the Faculty Advisory Committee.

Delegates to the National Conclave which is to be held in Detroit, Michigan, September 8-10, were selected. W. E. Smith, II, Ag. Engineering rising junior was named delegate. The alternate delegate selected is Clyde E. Woodall, rising junior in V.A.E.

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DAIRY CLUB

The members of the Clemson Dairy Club elected officers for the 1954-55 school year at the regular meeting held April 27, 1954.

At this meeting Rawl Culclasure was elected president of the Dairy Club. Rawl, a rising senior from St. Matthews, is majoring in dairying. Chauncey Smith, also a rising senior, was elected vice president. Chauncey is a dairy major from Spartanburg. William Bailes was elected secretary-treasurer. William, a rising junior from Union, is majoring in dairying. Charles Maloney was appointed by Chauncey Smith, vice president, to assist Chauncey in serving refreshments at regular meetings. Charles is a rising senior from Adel, Georgia. The faculty advisor for the Dairy Club will be elected at the first regular meeting in the fall.

The Dairy Club plans to end its meetings this year with a picnic on May 25. The picnic will be at Boscobel. A number of the members are working on an entertainment program for the occasion.

G. H. BAKER APPOINTED DISTRICT 4-H CLUB AGENT

George Homer Baker, who for the past four years has been assistant county agent in Sumter county, has been appointed district 4-H club agent for the Clemson Extension Service effective May 1. He will serve also as director of Camp Bob Cooper, one of the state's 4-H club camps. Mr. Baker succeeds J. T. Rogers, who is now Florence county agent.

Mr. Baker is a native of Williamsburg county and is well qualified to serve on the state 4-H club staff. For five years he was an outstanding 4-H club member and excelled in crops and livestock projects. He held all offices, including president, in his local club and was an officer of his county 4-H council.

He entered Clemson in 1942, but his college career was interrupted by three years' military service. Following this service, he re-enrolled at Clemson and was graduated in January 1950 with a degree in agronomy.

"Because of his sincere interest in working with youth, his experiences as a 4-H club member, and his 4-H leadership as assistant county agent, we are fortunate to have Mr. Baker join the state 4-H club staff," says L. O. Clayton, state boys' 4-H club agent.

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BLOCK & BRIDLE CLUB ELECTS OFFICERS

At the May 11 meeting of the Block & Bridle Club, Niles C. Clark, Jr., of Waterloo, S. C., a rising senior in Animal Husbandry, was elected President of the Clemson Chapter.

Other officers include: Arthur G. Neil, Jr., of Waterloo, S. C., a rising senior in Animal Husbandry—Vice President; James C. Rogers, a junior in V.A.E. from Pelzer, S. C.—Secretary; Thomas E. Hayden of North, S. C., a rising junior in Animal Husbandry—Treasurer; Frederick J. Rivers of Chesterfield, S. C., a rising senior in Animal Husbandry—Sgt.-at-Arms.

Dr. R. F. Wheeler and Dr. W. C. Godley, both professors in the Animal Husbandry Department, were chosen for Faculty Advisors for the coming year.

Plans were discussed for the annual banquet which is to be held at the Clemson House on May 25.
FERTILIZERS
that build
better crops

INSECTICIDES
that assure
crop protection

PENDLETON OIL MILL
PENDLETON, SOUTH CAROLINA

What it takes
NACO's
got!

FROZEN SEMEN
(continued from page three)
workers in Canada. The box will be
some fifteen inches wide, fifteen
inches long, and thirty inches deep.
It will have about eight inches of
insulation. The box will contain
three drawers which will have racks
in them to hold the ampules of
semen. The ampules will be placed in
an alcohol bath. The purpose of this
bath will be to keep the semen at a
constant temperature. This is very
important. Doctor Hurst explained
that they will use dry ice to freeze
and store the semen. This will keep
the semen at —79° Centigrade. The
system used for diluting and freez-
ing the semen will be the same as
that used by British researchers.
Doctor Hurst stated that he expects
to have inseminated several cows
with the frozen semen by the end
of this summer or before. The prob-
lem of shipping the semen to the in-
seminator and storing it after it has
arrived will have to be solved before
it can be used in the South Carolina
County breeding program.

At the present time, The Ontario
Veterinary College of Canada is
shipping frozen semen from Canada
to England. The semen, which is
enough for three hundred services,
is packed in dry ice which keeps the
semen at —79° Centigrade. The box

used for shipping is insulated with
a special foam plastic that has a high
insulating value. The semen is ship-
ped by air.

Advantages of frozen semen are:
1) Fewer bulls will be needed.
2) Banks of frozen semen can be
built up in the less active seasons
and retained in storage for use in
rush periods.
3) The number of offspring per
bull can be greatly increased. It has
been estimated that one bull could
sire over 100,000 offspring.
4) A wider selection of bulls, be-
cause the semen can be kept until
needed and used with less waste to
take care of more cows.
5) Semen can be shipped long
distances and less often, with better
chances of its being fertile when it
arrives.
6) Instead of flying or mailing se-
men to inseminators three times per
week or every day, it could be ship-
ped once a week or possibly one day
each month.
7) Semen could be stored from
young bulls which are being used
just heavily enough to prove them.
When the proof was in, you would
have a bank of semen from those
bulls that transmitted high pro-
duction.
8) The surplus semen from good
bulls could be saved until there is a
need for it.
9) A purebred breeder could set
up a long-time breeding program,
using his own select bulls — whose
semen would be kept in banks to
use when needed.
10) Service of aged bulls can be
extended for many weeks or perhaps
even months after he is dead.
11) Improved efficiency in man-
gagement of the bull stud.

The disadvantages of frozen semen
are:
1) Expensive freezing equipment.
2) Higher cost for services.
It is believed that for the time be-
ing the technique of using frozen
semen will be used for these three
purposes—
1) Providing nominated services.
2) For the convenient distribution
of minority breed semen.
3) For the export of semen abroad.
It is possible that by the time fro-
zen semen comes into great use, most
or all of the disadvantages and prob-
lems can be ironed out.

TEN
THE AGRARIAN
insects
YOU SHOULD KNOW
How To Identify
These Crop Destroyers

BOLLWORM
*Heliothis armigera* (Hbn.)
A major cotton pest, the newly hatched bollworm feeds on leaves and then attacks squares and bolls. Greatest loss is caused by tunneling into and destroying bolls. Color varies from pink, green, to almost black. The full-grown worm is about 1 1/2 inches long. The female lays about 1,000 eggs, particularly on growing tips, squares and bolls.

POTATO LEAFHOPPER
*Empoasca fabae* (Harr.)
This leafhopper is one of the alfalfa producer’s greatest enemies because all stages of the pest suck juices from alfalfa plants, stunting growth and reducing yield. They are also the cause of “hopper burn” on potatoes. A tiny, pale-greenish insect, this leafhopper is not found in Northern states during winter, probably flying in from the South, where they breed during the entire year.

ARMYWORMS
*Pseudaelia unipuncta* (Haw.) and *Laphygma frugiperda* (A. & S.)
Armyworms are a major pest of cereal and forage crops, their damage sometimes totaling millions of dollars. Armyworm invasions commonly follow cold, wet springs. The tiny, newly hatched caterpillars feed near the ground. Fully grown, they have enormous appetites, the noise of their feeding making a rustling sound in the fields.
POISONOUS PLANTS
(continued from page four)

are poisonous. Gray winterberry, or Black-alder are native to swamps in eastern North America.

Another poisonous plant is the prickly poppy. These prickly poppies occur as single plants or in large groups anywhere in the state of Florida. It has been a hazard to livestock farming; moreover, mechanical injury occurs frequently from the prickly fruit. Boxwood, a much used plant in ornamental horticulture and landscape gardening, is definitely poisonous. All parts of the plant are considered toxic, and small amounts of the plant have an emetic or purgative action; large amounts induce abdominal pain resulting in convulsions followed by death. The hydrangea plant which is grown by many amateur propagators is toxic to humans. Glucosides which yield hydrocyanic acids have been found in abundance in the tissues of the plants. Sometimes people have been poisoned by cherries of the wild varieties; however, the cases of poisoning have been quite infrequent. On the other hand, the toxicity is found in the leaves and branches and occasionally some of the sap is acquired from the leaves or displaced onto the berries. The members of the cherry family toxic to man are black cherries, wild cherries, wild black cherries, and Rum Cherries. Easter lilies are toxic to humans, much to surprise. Nearly all people buy this ornamental plant during the Easter season, but few have knowledge of its toxicity. The bulb is the poisonous portion of the plant, and it has an extremely acrid taste. Another point which is sufficient to the wise, there is no definite treatment or antidote for poisoning from this plant.

POULTRY CULLING
(continued from page six)
come somewhat flexible on the end, whereas in a bird not laying they are more likely to be close together, stiff, and sharply pointed or else covered with layers of fat, causing them to feel blunt and hard. The pubic bones of the heavy breeds are naturally larger and more blunt than the bones of the light breeds, this especially being true of the meat varieties.

It is not a matter of breed as to whether a hen is a good layer or not. The matter of type, capacity, and constitutional vigor enters into the picture. Most breeds have a type of hen which converts most of the feed she consumes over body maintenance to the production of eggs. This we call the “typical egg type.” Second, there is a type hen which converts a high proportion consumed over maintenance for the production of eggs, the balance going to make flesh. This is called the “dual-purpose type”, as this hen performs two functions that are considered necessary in the economy of Nature: the production of eggs and the production of meat on a commercial scale. Third, there is a type where practically all the feed consumed over bodily maintenance goes to make flesh. This hen we call the “meat type”, for the reason that

(continued on page fourteen)
Spring is for...the Young in Heart

Spring is for turning the soil, for putting seeds into the ground. Spring is for setting to action the plans made when snow covered the fields.

Spring is for youth—and for all who are young in heart. Give them high purposes and good tools with which to work, and young and old alike will do a good job.

Such philosophy applies to farming, particularly soil conservation farming. Many an experienced, successful farmer has changed to soil-conserving methods—and been even more successful. The young farmer—on the other hand—simply begins farming the conservation way, because he wants his land to be good while he’s farming it—and good enough to be worth leaving for someone else when he’s ready to quit farming.

All of us, working together, can make a lot of soil conservation progress with young farmers—if we teach them young and teach them well.
POULTRY CULLING
(continued from page twelve)
practically all her energy is used in producing meat.

The poultry flock if it could be caught as easily as a cow or horse would be culled more often than it is now. A flock can be caught with the least disturbance by the use of catching crates. Time and material spent in the building of catching crates are paid for many times during the year.

There is one right and there are several wrong ways of removing a bird from the catching crate and holding her for inspection. When removing from the catching crate one or both wings may be grasped close to the body and the bird lifted quickly from the crate. When removed in this manner there is less possibility of fluttering and the bird getting away. If the bird is grasped by one or both legs and pulled out feet first, the wings spread and are prone to catch on the crate. A bird is more subdued and helpless without the use of the wings than it is without the use of the legs.

In culling, the birds with the scaly comb, dry, yellowish colored vent, and tucked-up abdomen should be culled. Birds in the late summer months that have ceased to lay as indicated by these characters will not, as a rule, come back into production for several months. Occasionally birds that have been mismanaged will, when placed under favorable environmental conditions, come back into production. However, it rarely pays to retain non-laying birds at any time of the year, especially when they are to be sold later. Any profit made on hens kept beyond the first laying year may easily be lost in the lower meat value obtained when the birds are finally disposed of as cull hens. The same policy applies equally well to disposing of broody hens that are slow coming back into production.

The characters outlined above indicate whether a bird is laying or not at the particular time the culling work is being done. Only to a small degree will they indicate how long the bird has been in or out of production. In looking over a flock of birds in the late summer or fall, par-
they just can't seem to collectivize hands that touch the soil

Behind the iron curtain today a lot of commissars are saying, "ЭТО ПОСЛЕДНИЯЯ КАПЛЯ!" We would say, "That's the last straw!"

You see, it has been the commissar's job to "collectivize" the farmers... to put the state between the man and the land. But, reports tell us, the collectivizing job is going badly. The muzhiks (little farmers) and the kulaks (big farmers) are just not falling in line.

Even in curtain countries, folks who live by the land have inherited the freedom of the soil. The knowledge that a man should be free to make his own decisions seems to rise from the furrows to make its indelible mark.

Throughout history, serfdom has never produced good farmers. That's easy enough to understand...

Can you imagine a farmer who no longer makes his own decisions letting the moist, spring-warmed earth fall through his fingers? Can you picture a state-controlled farmer rubbing out kernels of wheat in the palm of his hand... blowing away the chaff and sampling the grain? Can you see a party farmer terracing his land, seeding waterways, or walking through the "south 40" with his sons? Can you picture such a farmer buying Modern Machines to boost his production and better his lot, or a farm-equipment dealer playing a prominent part in community affairs, taking a real interest in modern agriculture?

Hardly!

It takes free men to work the soil!

MANUFACTURERS OF MM VISIONLINED TRACTORS, THE uni-FARMOR, MODERN MACHINERY FOR THE FARM

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Irrigation
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"One of the best in the South... ultra-modern... ", says

Fred L. Zink, Jr., Manager
On East Edge of Clemson, S. C. On U.S. 78, 128 & State 28

POULTRY CULLING
(continued from page fourteen)
ticular notice should be taken to
tose birds having deep yellow
shanks and beaks. During the sum-
mer months birds that are deeply
colored with yellow pigment in the
vent, beak, and shanks should be
culled. Sometimes the comb may be
well expanded and red in color.
These birds as a rule are individuals
that have broken down in the repro-
ductive organs or are taking on male
characters. Save those birds that
are well bleached in the beak and
shanks and are also in good physi-
ical condition. This is a good indica-
tion of long, continuous production,
and sustained vigor.
All birds regardless of their skin
color lose their plumage and grow
a new coat of feathers annually. Dur-
ing the summer and early fall
months cull out the hen that sheds
her body, tail, and wing feathers.
She is an unprofitable bird to keep
in the laying flock. Occasionally a
good bird will lose a few feathers
from time to time, especially on the
neck and in the wing, and still con-
tinue in production, but birds that
molt out their body plumage and
tail feathers as well as their wing
feathers usually quit laying about
the time or just prior to the time
they begin to molt. This matter of
production as indicated by the molt
can always be checked by means of
those characters indicating laying
conditions. Early molters are un-
profitable birds because the time re-
quired for the renewal of the plu-
mage is much longer than it is with
the late molters. Hence their laying
period is cut short. A bird usually
can be quickly and easily classified
by the molt when she is either a
very high or a very low producer.
The bird that is on the border line
may require a close examination be-
fore a correct decision can be made.
Poor management such as a radical
change of feed or infestation of ex-
ternal parasites will often force good
hens to molt their plumage prema-
turly. If noticed in time and the
cause removed, these birds can be
checked in their molt and brought
back into laying.

FATTENING SWINE
(continued from page five)
in the rate of gain and a significant
decrease in the feed consumed for a
pound of gain. There was no great
difference in the rate of gain or feed
per pound of gain for the penicillin
—or aureomycin-augmented supple-
ments.
The pigs used in this experiment
were slaughtered and measurements
were made of the back fat thickness,
cut-out percentage and the specific
gravity of the carcasses of the differ-
ent lots. Carcass data were taken to
determine whether the different
feeds caused a significant variation
in the proportion of fat to lean meat.
These data are still being analyzed
and are not available for release at
this time.

Information obtained through the courtesy
of E. G. Godbey and L. V. Starkey, Clemson
College Animal Husbandry Department.

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

Exclusive opposed-action shoe prevents straw-blocked sieves in the NEW McCormick 141 HARVESTER-THRESHER.

Over 35 new grain saving features include 60 hp engine, complete redesign to save more of the last 10% of the crop.

In the IH opposed-action shoe, the chaffer goes forward when the shoe sieve moves backward. This eliminates any tendency for the straw particles to bridge and lodge between shoe and sieve. The shoe's full area is always clear to thoroughly clean heaviest yields.

OTHER MAJOR IMPROVEMENTS of the McCormick 141 include:

- redesign of cutting mechanism for more positive feeding of straw
- quick, easy adjustment of cylinder speed and cleaning air blast to meet changing conditions
- improved visibility with faster, easier control for greater operator comfort

IH engineering teamwork produced the added grain-saving features of the new McCormick No. 141 harvester-thresher. IH research, engineering and manufacturing men are constantly pooling their time and talent to solve farm problems—to provide equipment that makes farm work easier and the farmer's time more productive!

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Motor Trucks...Crawler Tractors and Power Units...Refrigerators and Freezers—General Office, Chicago 1, Illinois
How the stars got started......

William Holden says:
"My Dad, a chemist, wanted me to follow in the business. But I got the play-acting bug in school and college. I was in a small part at the Pasadena Playhouse when they picked me to test for 'Golden Boy'. I never worked so hard in my life! But the success of the picture made it worth it!"

I'm for CAMELS!
I've found they give me everything I like in a cigarette — genuine mildness, real flavor. You'll like Camels, too!"

William Holden
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