

**NORTH CAROLINA  
AGRICULTURAL  
EXPERIMENT STATION**

*the first  
60 years*

**1877 · 1937**

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**Agricultural Experimental Station**

North Carolina State College

Raleigh, N. C.

*R. W. Cummings*, Director of Research

Bulletins of this station will be sent free to all citizens who request them

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## PREFACE



I. O. SCHAUB

The materials for this history have been drawn from many sources but primarily from: reports and publications of the Station; minutes, State Board of Agriculture; minutes, College Board of Trustees; minutes, Joint Agricultural Committee; minutes, Experiment Station Council; addresses, Fiftieth Anniversary Celebration; legislation pertaining to the Department of Agriculture and the College; newspapers; and copies of correspondence.

Conversations and correspondence with individuals having personal knowledge of incidents and action.

In most instances, and particularly with quotations, the source is indicated in the text rather than by footnotes or index to bibliography.

In preparation for the Fiftieth Anniversary of the Station, Director R. Y. Winters brought together much material having a bearing on founding and development of the Station and that information has been invaluable in the preparation of this manuscript.

Many people have made suggestions and aided in many ways and that assistance is gratefully acknowledged.

The writer came to State College as a student in September, 1896 and was quite fortunate in having met and known personally all the directors except the first, Dr. Ledoux. Similarly, I have known practically all heads of departments and principal research workers.

It has been extremely interesting to compare the impressions, left on a young student by Massey, Emery, Irby, Withers, Winston and others, with that formed by getting behind the scenes and reading the official records. In some instances the stature of the man has grown decidedly, while with others, ?.

This story covers only 60 years, 1877 to 1937. Through force of circumstances and not from choice, the writer served as Acting Director from 1937 to 1941. The developments during that period and the following years are left for others not so intimately connected with the organization to evaluate.

# NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

The First 60 Years, 1877-1937

## WHAT IS AN EXPERIMENT STATION?

*"Those who can not remember the past are condemned to repeat it. Plan for the future with due regard for the past."*

Santayana

"Ever since the curse fell upon our progenitor, Adam, tilling of the soil has been the chief occupation of every nation whose name is worth remembering; the more civilized it was the more farmers it had. Every one of the long line of agriculturists from Adam down has felt in his heart, at times, the need of certain kinds of knowledge, intimately related to his work, which would help him materially did he only possess it.

"The farm, which has sent forth so many *thinking* men into all walks of life—men great in military science, literature, the legislative hall, the pulpit—could not fail to furnish men also, who, in their native-born profession—agriculture—thought over, and wondered at the marvelous forces of organic life, as shown in seed and bud and flower, whose growth we can, nevertheless, so strangely modify and influence to suit our wants.

"No calling in life deals with mightier forces, nor contends with a greater multitude of inscrutable powers.

". . . In 1869 a meeting of farmers was held in Frankfort, Germany, and passed a resolution which resulted in the establishment of an Experiment Station at Darmstadt. This resolution expresses so clearly the relative importance of the needs of the farmer, and hence the relative importance of the work of an Experiment Station, and what such a Station is, that I cannot refrain from translating it here:

*"Resolved, that we respectfully request the establishment of a Station which first above all things shall exercise a real, practical control over the sale of manures, over the sale of feeding stuffs and the sale of seeds. At the same time the Station shall be a place to which all agriculturists may direct their questions, and receive explanations and advice on all subjects which come up in their daily experience in the field; where they can obtain counsel, and be guided by the light and the results of the most recent achievements of science. This Station shall also institute any practical experiments which may be necessary to solve questions of general agricultural interest and value."*

N. C. Experiment Station Report, 1879

## THE STATION IS ESTABLISHED

"Arriving in Chapel Hill, where the Experiment Station was located by Section 12 of the law, I entered into my duties as Chemist on April 19th, 1877."

This simple statement by Dr. Albert R. Ledoux in the first report of the Experiment Station pinpoints the actual beginning of the operations of the North Carolina Agricultural Experiment Station. However, the establishment of the station, the second one in the United States, was not without much effort on the part of many individuals and organizations.

For 10 years, conditions and situations throughout the State resulted in the development of forces that brought about the passage of the law in 1877 establishing the North Carolina Department of Agriculture at Raleigh and the Experiment Station as a division of the Department of Agriculture, but located in the University at Chapel Hill.

The Civil War had left the agricultural, industrial and economic life of the State prostrate. The freeing of the slaves necessitated the development of a new social order. More than 40,000 men were lost in the war so there was a scarcity of labor. Cotton was practically the only source of farm income for the southern and eastern parts of the State and thus became almost the sole basis for securing production credit.

Rehabilitation after the war was of necessity extremely slow. It was literally a case of lifting by pulling on one's boot straps. Progress was made slowly and in a few years it was generally agreed by leaders of all professions that greater progress could be made only by increased farm production, by developing new industries, and by securing greater immigration of settlers.

Some 30 years earlier, Liebig, the great German Chemist, and other scientists in Europe had developed the theory of mineral elements as a source of plant food and this in turn resulted in the manufacture of commercial fertilizers. As processes were developed in Europe the knowledge was brought to the United States and fertilizer factories were built rapidly, particularly around Baltimore, Maryland. The response in increased yields from the application of fertilizers was so marked that farmers in North Carolina adopted the practice as rapidly as their limited funds or credit would permit.

However, with the good also came the evil. In this instance it was not only extravagant claims but genuine fraud in the manufacturing and sale of commercial fertilizers. Dr. Ledoux described the situation as follows: "In 1876, before the law providing for fertilizer control was passed, there were 108 brands of fertilizers sold in North Carolina. Some of them were miserable stuff, others down-right swindles. One, especially, with a large sale, was found to contain 60 per cent sand, and others so poor that they were condemned in Georgia, were re-shipped and sold in North Carolina."

With such situations and problems confronting them, the farmers organized themselves into associations and thus spoke with more power than was possible as individuals. The North Carolina Agricultural Society had been in existence for some 25 years but its program was not so broad as to serve all the needs of the farmers so the Grange, Patrons of Husbandry, developed rapidly in the early part of the 1870 decade. In 1875 there were 559 local Granges with a membership of 17,000. The leaders were well-known, outstanding citizens, many of whom had been officers in the Confederate Army. The Grange was a potent organization politically and otherwise and largely shaped legislation, particularly as it applied to agriculture.



Problems arise with use of fertilizer.

In 1875 a Constitutional Convention was held to amend the State constitution. Prior to that time leaders of the Grange, the State Agricultural Society and others advocated making mandatory in the constitution the establishment of a State Department of Agriculture. This provision was incorporated and passed with little opposition. The farmers now had a firm foundation on which to build. During the next two years there were many suggestions offered by individuals and organizations.

Colonel L. L. Polk of Anson County was editor of a local paper—*The Ansonian*. He was a member of the Constitutional Convention of 1875 that passed the provision in the constitution requiring the establishment of the Department of Agriculture. Colonel Polk vigorously advocated immigration, the development of industries, a live at home program for farmers, the establishment of a museum of the State's resources, and transfer of the office of State Geologist and the Geological Museum to the Department of Agriculture. He held all the high offices of the Grange during the years and to a large degree guided the Grange action in relation to the Department of Agriculture. Through his paper and addresses all over North Carolina he wielded an outstanding influence.

President Kemp P. Battle of the University of North Carolina was a lawyer by profession prior to his connection with the University. President Battle, however, was immensely interested in agricultural improvement. For several years he was President of the North Carolina Agricultural Society which operated the State Fair for many years. It was largely through his efforts that the State Legislature of 1875 passed the necessary legisla-

tion directing the State Treasurer to issue a Perpetual Certificate of Indebtedness for \$125,000 at 6 per cent interest to replace the Land Scrip Fund which went to the University. The Fund had been lost by investing in securities that became worthless in a short time.

In 1876, Dr. Battle made a visit to Connecticut where he conferred with Dr. W. O. Atwater, the Director of the first Agricultural Experiment Station in the United States. He returned with enthusiasm for the work he had observed and strongly advocated the establishment of a similar station in North Carolina. Undoubtedly he had a broader vision of the possibilities of benefits to be derived from a scientific approach to the solution of the agricultural problems than any other person in the State. He offered the laboratory facilities of the University for the location of the Station. This offer led some to erroneous conclusions for it was argued that there would be little expense to maintain the work with the University furnishing the laboratory and chemicals. Director Ledoux, only a few years later, went into detail in his first report to explain why he could not use, in common with the students in chemistry, the room and chemicals necessary in the prosecution of his work.

Dr. Battle may well be called the father of the Experiment Station for it was largely his vision and influence that resulted in the passage of the necessary laws and the character of the work undertaken.

During the period from 1875 to 1877, the Grange was very active in promoting the establishment of the Department of Agriculture. There were meetings with large attendance in various sections where resolutions were passed calling on the Legislature of 1877 to carry out the mandate of the Constitutional Convention of 1875.

President Battle took the lead in calling a conference of the leaders of various groups interested in the general movement. *The Observer* of January 3, 1877 carried the report of this conference as follows:

#### REPORT OF CONFERENCE COMMITTEES OF THE GRANGE AND THE UNIVERSITY.

"Pursuant to previous notice, and by virtue of appointment of the proper authorities, the conference of committees appointed by the several agricultural societies of the State—the State Grange, Patrons of Husbandry, with the State Geologist and a committee of the Faculty of the University—was held at rooms of the Geological Survey at 10 a. m. yesterday.

"On motion of Col. J. M. Hicks, Dr. Columbus Mills was elected chairman; and on motion of President Kemp P. Battle, Capt. C. B. Denson was elected Secretary.

"President Battle, at the request of the chair, explained that the object of the meeting was to concert measures for the improvement of the agricultural interests of the state, and more especially to take the initial steps in securing a practical experimental agricultural station for the analysis of fertilizers and soils, and of eventually adding thereto experiments in

culture and farm management. He gave facts and figures in full to show the great value of such a station to the farming community, illustrating his remarks by ready reference to the experience of Connecticut and other states.

"Prof. Redd, of the University, followed with remarks in reference to the practical details of the work of such a station, and exhibited the advantages offered by the University for its establishment at that point, with the aid of sufficient means for the payment of a permanent chemist devoted solely to such work.

"Prof. Kerr, the State Geologist, forcibly exhibited the defects of the present law in regard to the analysis of fertilizers, and related fully and satisfactorily the results of the operation of the various state laws. Among other facts of importance to the farming interest, he showed that cargoes of fraudulent fertilizers had been denied admittance to other states, and then sent to North Carolina to be sold to the damage of our farmers.

"Upon motion of Col. Heck to lay the subject before the legislature, and request the establishment of an experimental station, interesting discussion followed as to the means to accomplish the good desired by the farming community; in which Prof. Kerr, Pres. Battle, Col. L. L. Polk, Capt. Denson, Gen. R. F. Hoke, and Prof. Smith of the University, participated.

"The resolution was adopted, and the chairman appointed the following committee to mature the details of the proposition, to be submitted to a meeting of the conference today: Messrs. Kemp P. Battle, W. C. Kerr, L. L. Polk, and R. F. Hoke, to which the chairman was added.

"On motion the conference adjourned to 10 a. m., Wednesday, to receive the report of the committee.

(Signed) Columbus Mills, Chairman  
C. B. Denson, Secretary."

The results of this conference were a united front before the legislative body. There was a compromise of viewpoints but primarily on minor details. The bill was introduced by Senator W. C. Troy of Cumberland County. It was considered by a joint committee of the House and Senate and came up as a special order in the House on March 6, 1877.

#### HOUSE OF REPRESENTATIVES

Tuesday, March 6, 1877.

#### HOUSE OF REPRESENTATIVES. NIGHT SESSION. SPECIAL ORDER.

*The bill for the establishment of a Department of Agriculture, Immigration and Statistics, and for the encouragement of sheep husbandry was taken up as special order.*

*On Motion of Mr. McGehee, it was agreed to consider the bill by sections.*

*After the adoption of a number of sections, Mr. Johnston, of Washington, moved to lay the whole matter on the table.*

*The motion to table was put to a vote and failed to carry.*

*When adopted, the previous question was ordered on the demand of Mr. Roberts.*

The question recurred on the passage of the bill on its second reading, and it passed.

Under a suspension of the rules, the bill came up on its third reading.

On the demand of Mr. Roberts, the previous question was ordered. The question recurred upon the passage of the bill on its third reading. The yeas and nays were called, and bill passed, by a vote of yeas 48 nays 29.

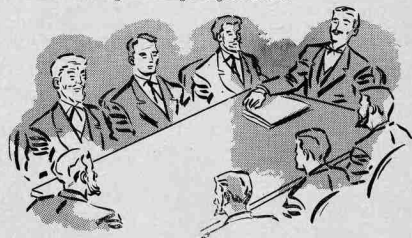
The bill had passed the Senate on third reading the evening of Tuesday, February 27, 1877. Yeas 29, noes 12.

The *Observer*, March 11, 1877 carried the following report:

"THE DEPARTMENT OF AGRICULTURE.—The bill to establish this department has become law. This we believe to be the only instance in the history of the state in which the farmers, as a body, have come before the legislature for aid and protection, and to the credit of the legislature it may be said that they promptly gave them all that was asked for, though not exactly in the shape proposed by them. The bill gives them a Department of Agriculture, Immigration and Statistics, and an experimental fertilizer station to be established at Chapel Hill. The appropriations to carry out these objects will, we think, after this year, be both ample and liberal.

"To none are the farmers more indebted for this liberal action of the legislature than to the recommendations of his excellency, Gov. Vance, and in the Senate to Mr. W. C. Troy, of Cumberland (who had charge of the bill) and to Col. T. M. Holt, of Alamance. Many others might be named; in fact, there were but few who voted against it.

"In the House, especial credit is due to General Roberts, of Gates, Chairman of the committee on agriculture, and Col. Montford McGehee, of Person, who by their untiring efforts greatly aided in its passage. All honor to them for fostering and aiding this great interest."



State Board of Agric., at first meeting March 12, 1877, named first Station Director.

"The title was, 'An Act to Establish a Department of Agriculture, Immigration, and Statistics, and for the Encouragement of Sheep Husbandry.' There were 23 sections of the bill giving the Board broad powers but specifically charging the Board to carry out many lines of investigations and other activities.

"The Board was constituted as follows: 'The Governor, who shall be ex-officio; the State Geologist; the Master of the State Grange, Patrons of Husbandry; the President of the State Agricultural Society; the President of the Agricultural College of the State; and two agriculturists (who shall be appointed by the Board so as to keep the representation of the different sections of the State as nearly equal as may be) and their successors in office.'"

The ex-officio members elected Capt. James R. Thigpen of Edgecombe and Major Jonathan Evans of Cumberland as the "agriculturist" members and then the Board appointed Col. L. L. Polk as Commissioner of Agriculture.

Only Section 12 of the Act dealt specifically with the Experiment Station but other sections did direct the chemist to make analysis of fertilizers and one paragraph was so broad that it permitted practically any type of investigation the Board might care to undertake.

*SECTION 12. The Department of Agriculture shall establish in connection with the Chemical Laboratory of the University at Chapel Hill, an Agricultural Experiment and Fertilizer Control Station; and the Board of Trustees of the University, with the approval of the Department of Agriculture, shall employ an analyst skilled in agricultural chemistry.*

*It shall be the duty of said chemist to analyze such fertilizers and products as may be required by the Department of Agriculture, and to aid so far as practicable in suppressing fraud in the sale of commercial fertilizers.*

*He shall also, under the direction of said Department, carry on experiments on the nutrition and growth of plants, with a view to ascertain what fertilizers are best suited to the various crops of this State; and whether other crops may not be advantageously grown on its soils, and shall carry on such other investigations as the said Department may direct.*

*He shall make regular reports to the said Department of all analysis and experiments made, which shall be furnished when deemed useful, to such newspapers as will publish the same.*

*Said chemist shall be subject to the rules and regulations of the University Laboratory, and the other rules and regulations of the University, and his salary shall be paid out of the funds of the Department of Agriculture.*

The Board met March 12, 1877 and elected Dr. Albert R. Ledoux as "an analyst skilled in agricultural chemistry."

Thus was established the North Carolina Agricultural Experiment Station—the second in the United States.

## CHANGES IN BOARDS OF CONTROL

During the first 11 years of the existence of the Station, the Board of Agriculture was the Board of Control. However, there was considerable evolution in the composition of the Board during that period.

The first Board from 1877 to 1882 was composed of the Governor, the President of the State Agricultural Society, the Master of the State Grange, the State Geologist, all ex-officio, and two farmers representing the different sections of the State. The two farmer members were selected by the ex-officio members.

In 1883, the Board was changed to the Governor, the President of the State Agricultural Society, the Master of the State Grange, the President of the State University, and one member from each congressional district. This arrangement lasted until 1887 when the President of the State Agricultural Society and the President of the University were dropped from the Board. This arrangement continued only two years.

In 1887, the Legislature passed the Bill creating the Agricultural and Mechanical College to be located at Raleigh and directed the transfer from the University at Chapel Hill of the teaching of agriculture and mechanic arts to the new institution. The same Legislature directed the transfer of the Agricultural Experiment Station from the Board of Agriculture to the Board of Trustees of the A. & M. College as soon as the physical facilities would permit. This took place in 1889 and was the first divorce from the Department of Agriculture.

The Board of Trustees of the College was composed of the Board of Agriculture (10 members) plus five others to be appointed by the Governor with the consent of the Senate, thus creating a Board of 15 members. It is doubtful if the bill could have passed without the support of the Republican members of the Legislature so the bill specified, "Provided that the Board of Trustees shall be composed half of each political party." Evidently some difficulty was experienced in dividing 15 so as to have half Democrats and half Republicans for this provision was eliminated at the next Legislature, two years later.

The members from the Board of Agriculture necessarily served in a dual capacity but apparently there was harmony in the Board of Trustees. There were many details to be worked out, not only on administration problems but on offices, laboratories and working arrangements. A committee representing the two groups was appointed to work out details. The committee submitted a detailed report specifying the rooms assigned the Station, the transfer of the farm of 10 acres, equipment, janitor service, and even the sharing of the water closet. When the report was submitted, the two boards met separately and approved the recommendations and then came together as the Board of Trustees and approved the report.

The Station up to this time had handled all the chemical analyses in connection with fertilizer control which had and continued to be a function of the Board of Agriculture. The transfer of the Station to the Board of Trustees necessitated an arrangement to perform the chemical work. The agreement regarding the transfer also provided that the Station would make the analyses for the Board of Agriculture and that the Board would reimburse the Station for this expense. The main financial support of the Station came from Federal funds provided by the Hatch Act passed in 1887. This was \$15,000 annually.

This Board of Trustees served from 1889 to 1895.

In 1895 the Board of Agriculture was made the Board of Trustees—the second marriage of these agencies. However, this arrangement lasted only two years.

## POPULISTS AND REPUBLICANS

In the election of 1896, the fusion of the Populists and Republicans elected a Governor and the majority of the members of the Legislature. The Legislature of 1897 provided for a new Board of Trustees for the College to be appointed by the Governor and the second divorce of the Department of Agriculture and the Experiment Station.

Until this time, while the station was a part of the College, administratively, it was only nominally under the President. The Director reported directly to the Chairman of the Board of Trustees. The majority of the members of the Board appointed by the Governor in 1897 were Republican. At the first meeting of the Board a set of 36 resolutions pertaining to the College and the Experiment Station were offered. Among other changes, several members of the Station staff, including the Director, were discharged. When the resolutions were offered, Messrs Dixon and Connor, Democratic members, withdrew with the statement that "The matter showed conclusively that the Chief Executive of the State had dictated the policy to which a majority of the Board stood pledged." There is no record to show that these two members ever attended any subsequent meetings.

The resolutions were adopted discharging a number of employees and naming their successors and salaries. This action covered not only the Director and technical staff, but also clerks and stenographers.

The Board also ordered that the administrative office (Director) be moved from the Department of Agriculture to the College.

The Chairman of the Board and of the Executive Committee was voted a salary of \$250 per year, \$50 coming from the College and \$200 from the Experiment Station. At a subsequent meeting of the Executive Committee it was voted to pay for the telephone in the residence of the Chairman, one-half from the College and one-half from the Station.

However, the life of this Board was only two years. The Democrats regained power in the election of 1898 and the Legislature of 1899 immediately provided for a new Board of 21 members elected by the Legislature. This Board made some changes in personnel, rectifying, from a political point of view, some of the actions of the Republican Board. As far as the records show this period, (1897-1899) was the only time during the life of the Experiment Station that partisan politics has affected the personnel of the Station.

This board (1899) elected a new president of the College and also made him Director of the Station. This board also took action to combine the teaching and research activities by making the professors of agriculture, horticulture, and chemistry heads of their respective fields in research.

The Legislature of 1901 again made the Board of Agriculture the Board of Trustees—third marriage.

### BOARD OF VISITORS

However, this same Legislature provided for a Board of Visitors for the College. This board was composed of 11 members appointed by the Governor and ex officio, the Commissioners of Agriculture and the President of the College. The Board of Visitors had no authority but could make recommendations to the Board of Trustees which was the Board of Agriculture.

The Board of Trustees, with a recommendation from President Winston, elected Dr. B. W. Kilgore Director of the Station and the administrative office was moved to the Department of Agriculture Building in downtown Raleigh.

Subsequently the Board of Visitors had a meeting and requested a joint meeting with the Board of Trustees. The Board of Visitors objected to moving the Station away from the College and presented argument against the move. The Board of Trustees listened to the discussion but definitely declined to rescind their former action. Thus began a period of friction, overlapping in activities, bickering and jealousy that continued for nearly 40 years.

In 1907 the Legislature provided for a new Board of Trustees of 16 members appointed by the Governor and confirmed by the Senate. This was the third divorce between the two agencies.

The effect of this legislation on the relationships between the State Department of Agriculture and the College was the most drastic of any previous actions. Two Experiment Stations were established—one under the control of the Board of Trustees, the other under the State Board of Agriculture. The Station located at the College was largely supported by Federal appropriations while the State Department of Agriculture Station and Test Farms were financed by receipts of the Department. This arrange-

ment was very confusing to the farmers of the State and the overlapping of activities and friction of the agencies and personnel was multiplied many times.

This situation could not continue indefinitely without injury to the State's agriculture; therefore, in 1911 representatives from the two boards "voluntarily" came together to endeavor to find a solution of the difficulties. An agreement was reached March 10, 1911 with recommendations to the two boards that the two agencies cooperate in research and extension work. It was further recommended that a committee of four from each board, together with the Commissioners of Agriculture and the President of the College, constitute a joint committee to work out the details of cooperation and to put the plan into effect. The joint committee passed the following resolution:

"All the scientific experimental work of the two institutions will hereafter be consolidated with one Experiment Station, under a Director and a Vice-Director and with the director's office at the College."

The committee also passed a resolution requesting the General Assembly to make this organization permanent by enacting the agreement into law. This was done during the Legislative session of 1913.

This arrangement between the two agencies argued well for the future. However, during the next 10 years the situation became still more confusing. There was a Board of Trustees of the College with specific responsibilities under Federal and State statutes for the expenditure of Federal appropriations made to the College for research. There was the Board of Agriculture responsible for the expenditure, under State law, of its own funds. And finally there was the joint committee created by State law with control through a Director of all research work. In fact there were three boards with overlapping responsibilities.

The situation was finally resolved when in 1922 the United States Secretary of Agriculture promulgated a general ruling that a Land-Grant College designated by the State Legislature to receive the benefits of Federal funds has no authority to transfer such funds to any cooperating institution or agency and cannot relieve itself of accounting for the use of such funds and for direct administration of the work.

Finally in May 1924, the Board of Trustees advised the joint committee that it was necessary to take over the Experiment Station and to transfer the Station to the College. The State Board of Agriculture approved the change in July, 1924. This was the fourth divorce, but the State Department of Agriculture continued to appropriate from its funds (alimony) to the research work for 15 years.

Since 1924 the Experiment Station has been under the jurisdiction of the Board of Trustees of the College.



## DR. ALBERT R. LEDOUX, 1877-1880



DR. ALBERT LEDOUX  
(Taken in later life)

The basic law prescribed two main objectives for the Experiment Station:

(1) "To analyze such fertilizers and products as may be required by the Department of Agriculture, and to aid so far as practicable in suppressing fraud in the sale of commercial fertilizers," and

(2) "Carry on experiments on the nutrition and growth of plants, with a view to ascertain what fertilizers are best suited to the various crops of this State, and whether other crops may be advantageously grown on its soils, and shall carry on such other investigations as the said Department may direct."

These objectives were comprehensive and basically authorized almost any type of research the Department might care to undertake. From available records it appears that the Grange and farm leaders were most concerned with the first objective while President Battle and perhaps some of his scientific friends were more interested in the long time approach as authorized in the second.

The original act provided that the Board of Trustees of the University, with the approval of the Department of Agriculture, was to employ the chemist. The next Legislature in 1879 amended the act so that the Board of Agriculture employed the chemist but with the approval of the Board of Trustees of the University.

Undoubtedly President Battle made preliminary investigations to find a chemist trained and suited to the needs of the Station for it was only two days after the passage of the act when the Board met on March 12, 1877 and elected Dr. Albert R. Ledoux as chemist. Five weeks later, on April 19, 1877, he entered into his duties.

Dr. Ledoux was a graduate of Columbia University and Goettingen University in Germany. He was a great admirer of the thoroughness of the German scientists and while in Germany became well acquainted with work of the many German experiment stations where the first government aid station was founded in 1851. His observations and knowledge gained in Germany largely guided him in his development of the work in North Carolina.

He was a man of outstanding courage. Had he been of faint heart he probably would have given up in despair at the magnitude of his job. He

outlined in his first annual report the broad field of operations confronting him.

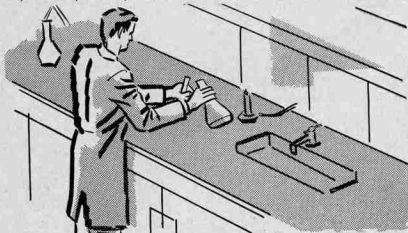
"The law requires of the Station analyses for the Department of Agriculture proper, analyses for the Geological Survey, analyses for the State Board of Health, and analyses in cases of suspected poisoning. The Board of Agriculture, moreover, has the power to order any work begun or discontinued, to order investigations of any character or experiments in any direction which they deem necessary.

"Thus it will be seen that to carry out the requirements of the law, to meet the expectations of the people of the State, hard work must be done in more than one direction; and I can safely affirm that in no one Experiment Station in Europe, or State Chemist's Laboratory in America, is so much and so varied work required."

Instead of despair he saw opportunity and, concluded with the statement: "Nowhere is there offered a broader field for labor."

There was so much to do, and yet so little in the way of equipment! He describes the situation thusly: "I was given a table in the quantitative analyses room among the students, and gas, water, balances, reagents, bottles, and some apparatus were placed at my disposal. Although the equipment of the laboratory was sufficient to enable a student to acquire a general knowledge of chemical analyses, yet my especial work required special apparatus and reagents. Moreover, it was necessary that no one else should use the reagents employed by me. In analyses, to whose accuracy a chemist must be able to testify, it is absolutely necessary that no one else should use his apparatus and reagents. On this account the Board of Agriculture authorized me to purchase such chemicals and apparatus as were necessary to begin prosecuting fertilizers and other analyses at once."

Dr. Ledoux was a man of action. He realized that he had the responsibility, not only to carry out the mandate of the law, but to also translate



"Watch dog" analysis of feed and fertilizer was the Experiment Station's first work.

the language of the scientist into that of the farmer whom he was employed to serve. Accordingly "while waiting for the supplies to arrive, I prepared a circular on the Analysis and Valuation of Fertilizer, explaining as simply as possible what was meant by 'analysis,' and how commercial values are deduced from analyses."

Dr. Ledoux realized that farmers in general were not familiar with the functions and duties of an Experiment Station so he endeavored to enlighten them in his first annual report. After enumerating the stations in Germany and an outline of the work they were doing he exclaims: "No wonder Germany is cultivated like a vast garden, with such incentives and such production and aid as her 75 experiment stations afford."

As soon as Dr. Ledoux secured his equipment he began his fertilizer analyses. Early in June, 1877 he published the analyses and valuations of 23 of the 29 brands then sold in the State. He had an immediate response for he states: "This publication created a great stir among manufacturers and farmers." Several men in the trade hailed control as relieving them from competition with "frauds and deceivers." Only one company made any serious complaint and this led to the first field experiments in North Carolina under the direction of the Experiment Station. These tests were made in 1879.

The Poppleine Silicated Phosphate Fertilizer Company of Baltimore, Maryland was the company making the complaint. Dr. Ledoux had in his regular routine analyzed two samples of Poppleine Silicated Phosphate. Both samples contained phosphoric acid and potash but neither sample contained any ammonia. In placing a commercial value on any brand, Dr. Ledoux made his calculations on the basis of the amount of phosphoric acid, potash and ammonia in the sample. In this instance, there being no ammonia his valuation was low—\$20.00 on one sample and \$23.00 on the other. The company claimed, "In the composition of our articles, we eliminate altogether artificially supplied nitrogen or ammonia, substituting therefore what we believe to be a necessary and valuable ingredient—Infusorial earth or Diatomaceous Silica."

The company argued that the silica in their product should be given a commercial value and in support of that viewpoint advised that in Pennsylvania and Delaware a value of five cents per pound for the soluble silica was allowed. There was considerable correspondence but Ledoux stood his ground and as a result the company agreed to supply four tons of the fertilizer for a test under field conditions, but under Dr. Ledoux's supervision.

He arranged for the tests to be made by a number of leading farmers in the vicinity of Chapel Hill. In this way the product was tried upon soils of different character and upon different crops. "The question," as stated by Dr. Ledoux, "was to determine whether a fertilizer containing soluble silica, but no ammonia could hold its own with, or excel a non-silicated but ammoniated fertilizer."

Poppleine was tested in comparison with several grades of Peruvian guano and also different brands of commercial fertilizer carrying ammonia and regularly used by the farmers. The results reported by the farmers were not too conclusive although in most instances the fertilizers carrying ammonia outyielded the Poppleine. Dr. Ledoux reported the results in detail and then left it to the farmer to "satisfy himself—this time from a farmer's, not a chemist's standpoint." As far as the records show he never agreed to placing a commercial value on soluble, silica, and he was definitely convinced that silica could not replace ammonia as plant food.

Fertilizer analysis was seasonal so during the intervals he was busy answering letters and preparing articles for the press, bulletins for the printer, and making chemical analyses of many kinds as required by law.

As the work expanded and to make the station as useful as possible, the Board of Agriculture approved his employing Mr. W. B. Phillips as Assistant Chemist. This was the first expansion in personnel, in addition to the Director, of an agricultural experiment station that was destined during the next 75 years to grow into a staff of several hundred people.

Following the employment of Mr. Phillips the laboratory work was directed to the analyses of sugar beets.

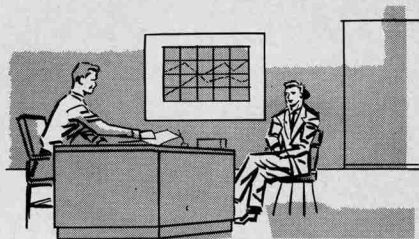
The development of new industries was one of the objectives in establishing the Department of Agriculture and as a possibility along that line the Board procured sugar beet seed and made distribution to 100 farmers in 34 counties. The beets analyzed were samples from 21 of these farmers and representing 10 counties. The sugar content was disappointingly low in most instances. The analyses were published, however, in a 50 page bulletin giving instructions on planting, fertilizing, cultivating and harvesting.

During the winter of 1877-78 there were many analyses of soils, marls, mineral waters and others. During the first year of the station, 132 analyses were made as follows:

- 70 analyses of fertilizers
- 22 analyses of sugar beets
- 10 analyses of soils
- 6 analyses of marls
- 5 analyses of mineral waters
- 10 analyses of miscellaneous



First fertilizer report creates stir.



The first Experiment Station stenographer was a man trained in science.

Dr. Ledoux's correspondence increased so rapidly that, as he stated it, "fully one-half my time was taken up in answering letters, and laboratory work necessarily went very slowly." The Board of Agriculture, recognizing the situation, authorized his employing a secretary. He obtained the services of Mr. J. C. Taylor, a graduate of the scientific course of the University who had a knowledge of chemistry, "but could write rapidly in short hand from dictation." Thus was recorded the first stenographer employed by the Station.

The first report of the Station covered the first two years of work and was a document of 198 printed pages. It was not simply of the work performed in the laboratory but prepared to increase the general knowledge of farmers.

Fourteen pages were devoted to seed examination, including reports of samples tested for purity and germination. Dr. Ledoux cautioned that the seed situation was as critical as that of fertilizer. The following quotation from his report indicated the possibility of fraud: "There are factories in Europe, notably at Prague and at Hamburg, where seed are *manufactured out of quartz*. The quartz is ground and sieved and stained with various dyes to imitate almost exactly in size and color almost any kind of seed, especially clover. These artificial seeds are sold to seed dealers in England (and possibly America) at \$3.50 per cwt. As much as 15 tons have been purchased at one time by an agent of an English house! Specimens of these colored stones are among the collection of the Station and the most practiced eye would fail to detect a sample of clover seed adulterated 25 per cent with the artificial article."

Twelve pages were devoted to a discussion and analyses of the cowpea. While the cowpea had been known and grown for a long time, it had not

been studied scientifically at that time, (1879). Dr. Ledoux states: "Comparatively little has been written (or if written, accessible) in our agricultural journals about the cowpea, nor has it ever before been carefully analyzed, so far as I can learn."

However there were many theories as to why the cowpea was a valuable crop for soil improvement. Ledoux divided its beneficial effects into two classes—mechanical and chemical. He argued that its mechanical benefit was due to its "covering the soil" and quotes from one Cuthbert Johnson: "An English farmer inadvertently left for some months a door in his fallow field; for several years after, the crops were particularly luxuriant where the door had been lying, so much so that one would have said that some rich manure had been applied to that spot."

From a chemical standpoint he showed comparable analyses of cowpeas with other crops.

We should remember that the relationship between legumes and bacteria on the roots through which the plant secures nitrogen from the air had not yet been discovered.

Many other analyses were published in the report and interesting comments on various topics not necessarily technical make this report interesting reading. A discussion of one product sent in for analyses indicated that "cure-alls" are not new discoveries. The product was called "Vitative Compound" and was sold in "pretty little boxes" containing about two ounces at \$1.00 per box. It was claimed that it would destroy insects or parasitic enemies of the plant, protect the seeds from birds, furnish ingredients so generally deficient in the soil and "a perfect protection for the seed and shoot against wire-worms, cut worms and grubs." From the analyses Dr. Ledoux determined that the "compound" was a mixture of sugar of lead and sulphate of zinc. He concludes his discussion as follows: "Three things are true concerning it.

- "1. It has no fertilizing value whatsoever, and can not replace manure.
- "2. It costs 24 times as much as it is worth.
- "3. It is most decidedly poisonous to animals—as the circular says."

The third year of the station was a continuation of the lines of work developed during the first two years but on an expanding scale.

Ledoux stated, "We entered our third year with almost no opposition and a largely increased interest in our work, as shown by the greatly increased correspondence from nearly every county in the State."

The correspondence of the Station "has grown to almost unwieldy proportions." He published in the report 12 pages of correspondence "on matters of general interest to farmers." These covered various subjects such as why clover pasture "salivates" horses; when to turn under green crops; insects attacking rutabagas, which Dr. Ledoux identified as plant lice and recommended spraying with whale oil soap and tobacco water; composting

peat and shad fish for manurial value; a "reptile" playing havoc with gardens—this was a cut worm; how to make a good fertilizer for \$11.00 per ton; etc.

Seed examination for purity and germination increased materially. He was proud to point out that American seedsmen were honest and upright and that "our grass seed is cleaner than the European, and its vitality is greater." But there was much room for improvement. He mentioned that the first experiment with a regular sprouting apparatus in the United States was within less than four years. He advocated the establishment of many Experiment Stations where seedsmen and farmers could have seed tested. Such stations "would have saved a former United States Commissioner of Agriculture considerable annoyance. He bought and distributed throughout the country tomato seed, which unbeknown to him had been cooked at a Baltimore canned goods factory."

In a talk to a New York Agricultural Society Dr. Ledoux chided those in attendance. "If it were not for the proverbial majesty and protection of the laws of this city (New York) I should hardly remind the New York gentleman here tonight of the way a Mexican sold them—judges, bankers, botanists, preachers, and all—sold them okra seeds which cost him 15 cents per thousand, as the seeds of a rare and wonderful plant—cocaltel-Lily of Mexico or some such name—at the rate of three for a dollar. This happened not three years ago."

In closing his New York address he was almost prophetic—"Though scarcely three years have passed since I was called to the "old North State," I have had ample means of knowing her planters and farmers. I have also had the honor of meeting most of her leaders of public opinion; and I assure you, gentlemen, that no political strife or bitter memories can longer retard the steady march of improvements which has begun at the South."

Dr. Ledoux resigned after his third year and returned to New York to establish a private chemical laboratory.

In the short period of three years he had established the station in the good opinion of the people of the State and his devotion to the work, his honesty and courage in the face of criticism, and his intense desire to help the farmers of North Carolina have served as inspiration to his successors.

## DR. CHARLES W. DABNEY, JR.

1880-1887



DR. CHARLES W. DABNEY, JR.

Dr. Ledoux was succeeded as Director, November 1, 1880, by Dr. Charles W. Dabney.\* Dr. Dabney had just graduated from Goettingen University in Germany, the same institution Dr. Ledoux attended a few years earlier. Dr. Dabney was from Virginia and a graduate of Hampden-Sydney College and the University of Virginia. His observations and study in Germany influenced his activities as Director and Chemist just as was true of Dr. Ledoux.

Fertilizer analysis was still the primary objective of the Station so Dr. Dabney directed his activities during the first few months to this routine work. The use of commercial fertilizers was rapidly increasing, having grown from less than 40,000 tons prior to the establishment of the Station to 80,000 tons in 1880. Dabney also records that the average composition of fertilizer sold steadily improved and that the average cash price decreased.

In his preface to the report for 1881, Dabney states, "The Experiment Field was undertaken in the spring." This first attempt to operate field tests under the direct control of the Station was at Chapel Hill but apparently came to naught for he states "a terrible drought disappointed all our hopes in the experiments inaugurated."

In the meantime the Legislature of 1881 directed that the laboratory be removed from Chapel Hill to the Department of Agriculture Building in Raleigh. This transfer was made in August and from that time until December practically the entire time of the Director and staff was given over to "arranging" the laboratory. With the laboratory completed the Station "enjoys greatly improved advantages in its new home. Besides the ample space and the admirable equipment which it has gained, the facilities for transacting business are much improved."

Dr. Dabney gave the University due credit for its contribution to the Station in the following language:

\* It is not clear from the available records as to the exact date Dr. Ledoux left. Several statements in subsequent reports indicate that he served until November, 1880. However, in the report of the Station ending April 15, 1880, there is a preface statement signed by Dr. Ledoux, June 17, 1880 giving his address as New York City. He stated in this preface that he had resigned.

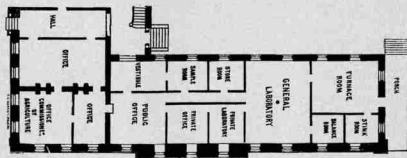
"The Station, which is in a great degree the child of the University of North Carolina, and to which it is indebted for sustenance and support during the trying times of its infancy, cannot omit at this time to acknowledge its great obligation to the Trustees, President and Faculty of this institution. The University allotted the Station apartments in her laboratory and supplied it with water, fuel, and in a large part apparatus, during its residence there. But it owes the University far more for the personal labors and enthusiastic support of its President and Faculty. The relation has been severed with the entire approval of the University. It recognized its time of tutelage was passed, and that its child could now be more useful in their other location. It has sent it out accordingly with its God-speed."

The Station people were quite happy with their new quarters. They had moved from semi-basement quarters at Chapel Hill to occupy "ten apartments in the new building. There were two offices, a receiving room, a sample and store room, a dark room for spectroscopic and other such work, a small and a large laboratory, a balance and instrument room, a furnace and assay room, and a room for noxious gases (stink room). Among other articles of apparatus may be mentioned two of Becker's best balances, a Bunsen polariscope, a good microscope, a springer pump and a muffle furnace."

"It is estimated that each Chemist can do one-third more work," said Dabney.

About 85,000 tons of fertilizer were purchased in 1881. Dabney estimated that less than 10 per cent was paid in cash. The remainder was paid for in November by delivering 300 pounds of middling cotton for a ton of acid phosphate and 425 pounds for ammoniated superphosphate. The price of cotton was about 11 cents per pound. This was equivalent to \$33.00 per ton for acid phosphate and \$46.75 for ammoniated goods.

For several decades following the Civil War, farmers were generally short of ready cash and naturally turned to economical sources of plant food. To that end making of compost and home mixing of commercial



From Chapel Hill the Station moved into these spacious new quarters in Raleigh.

fertilizers became quite a common practice. Dr. Ledoux encouraged and gave specific recommendations and Dr. Dabney continued to advise the best practices. Some 60 pages of the report for 1881 were devoted to these matters.

Dr. Dabney used several pages of his 1881 report for an academic discussion of the cotton plant and cotton seed. The crushing of cotton seed was in its infancy. He stated that there were only 70 mills in the whole South and that less than 200,000 of the 3,000,000 tons of seed produced in 1881 were worked and that \$12.50 per ton was paid for seed. He made some critical accusations of the crushing industry. He charged the industry of being "in the hands of capitalists who formed rings to keep the price of cotton seed down." He advocated small mills for neighborhoods or possibly for individual farms. "A huller upon each farm would thus make the farmer perfectly independent of the oil-mill ring and would enable him to put his cotton seed into a merchantable state and still use the hulls." His recommendations along this line failed to materialize.

Both Ladoux and Dabney recognized the real need for field experiments to supplement their laboratory work but were unable to expand along that line because they had no land under their control. However, in 1881, Dabney outlined two "schemes" for fertilizer tests and invited farmers to undertake the work. Scheme No. 1 was a simple experiment to ascertain whether dissolved phosphate, muriate of potash, or sulphate of ammonia would repay best for their application in moderate amounts. Instructions were given as to preparation and cultivation. All plots were manured except three which were to serve as "standards" of comparison. Each plot was to be one-tenth acre and gave the following diagram to illustrate the scheme.

10. Nothing
9. Ammonia  
Potash
8. Phosphoric Acid
7. Phosphoric Acid  
Ammonia
6. Nothing
5. Phosphoric Acid  
Potash
4. Potash
3. Ammonia
2. Phosphoric Acid
1. Nothing

Results from only one farmer, Mr. John A. Mitchener of Selma, were reported. The phosphoric acid plots gave best results. The no fertilizer plots averaged only 18½ pounds of seed cotton while phosphoric acid alone gave a yield of 57 pounds. The season was very dry and Dabney cautioned against jumping to a conclusion from one experiment.

The second scheme was more complicated with a series of 20 plots and varying amounts of the various ingredients. This was the plan used in the field test at Chapel Hill the previous year and which was considered a complete failure due to drouth. This scheme appeared too complicated for the farmers to try and no results were reported.

## ACADEMIC FARMER

Dr. Dabney was a trained Chemist but only an academic farmer. When called upon for recommendations of fertilizer he usually turned to recommendations made by other Chemists. When asked by Mr. Silas McBee of Lincoln County to give him the "richest formula for a complete manure, which had ever been recommended by good authority and tried with success in the field," he gave him a formula recommended by Ville, called "Normal Homologous Manure, No. 1, A." It consisted of 1,140 pounds of superphosphate, 200 pounds muriate of potash, and 345 pounds sulphate of ammonia. Mr. McBee carried out the instructions "with admirable thoroughness and close attention." The season was unusually dry "when it did not rain enough to wet the soil well from May until September." The results were naturally disappointing making only about 450 pounds of seed cotton where the full formula was used and about 500 pounds where only one-half the formula was used. Mr. McBee estimated that only one-third of the blooms matured, otherwise he would have made two bales per acre.

Dabney made specific manure recommendations for different crops. His corn recommendations are interesting in the light of Station recommendations 70 years later. Again he based his recommendations on the work of others and in this instance quotes Prof. Atwater of Connecticut: "Phosphoric acid took the leading place often, potash occasionally, and nitrogen very rarely."

"The results warrant the inference, that as corn is commonly grown, nitrogenous fertilizer in any considerable quantities would be rarely profitable." His suggestion was a mixture of:

- 800 pounds dissolved bone or 1,000 pounds acid phosphate
- 100 pounds muriate of potash
- 1100 pounds rotted stable manure or rich earth.

He recommended 500 pounds per acre in the hill.

During 1881 only seven farmers sent in seed for testing for impurity and germination. Dabney was very much disappointed that so few farmers were interested in good seed.

The work of the Station in 1882 was primarily routine, analyzing fertilizers for the control work, minerals and marls for the Geological Survey, and waters and other things for the Board of Health.

The Director seemed to be apologetic for not doing more scientific work. Most of the report was devoted to discussion of finely ground phosphates or "floats," kainite which had been introduced into the State about three years

earlier, bi-products of the rice industry, cotton seed and its products and soja beans. Soja or soy beans had just recently been introduced into the State and a number of farmers reported favorable impression. Dr. R. H. Lewis of Raleigh reported that he made three times as many bushels of soja beans to the acre as of cowpeas.

Again in 1883, Dabney was apologetic regarding his scientific work, There was always something interfering and this time more than in previous years.

It will be recalled that one of the objectives in establishing the Department of Agriculture was to secure increased immigration into the State. To that end the Board decided to exhibit specimens of North Carolina ores, minerals, building stones, woods, etc., at the American Exposition at Boston and the Station was charged with the details. Three of the five members of the staff spent practically the whole time from June to November on this assignment. However, there were many benefits derived from these efforts in increased knowledge of the agricultural resources of the State, especially regarding soils, marls and other agricultural products. One discovery, in particular, led to much work on the part of the Station during the next few years and raised hopes for the development of a new fertilizer industry in the State.

In collecting ore and mineral specimens one rock specimen was brought to the laboratory by Dr. Thomas D. Hogg of Raleigh. The specimen came from his farm at Castle Hayne in New Hanover County. A few days later another sample was received from Mr. George C. French's farm eight miles northeast of Castle Hayne. These rocks proved to be phosphate of lime and aroused the curiosity of Dr. Dabney. He immediately went to Castle Hayne to make an inspection. What he found led him to report to the Board that he deemed the subject worthy of thorough examination. The Board made a



Phosphate of lime was discovered in several southeastern counties in 1883-1884.

small appropriation and directed Dr. Dabney to give the matter such time as he could find in the intervals of other work. The results were given publicity and "people commenced hunting phosphate everywhere."

A few months later the Board instructed Dr. Dabney to get someone to assist him in the field work. He employed General W. Gaston Lewis who spent several weeks in the southeastern counties. By March 1884, phosphate rock had been found in Sampson, Duplin, Onslow, Pender, New Hanover, Bladen, Columbus and Brunswick counties. Many samples were analyzed and Gen. Lewis arranged for excavating some of the deposits in quantity.

The deposits were usually found a few feet below the surface of the ground and along the banks of ditches and streams. The deposits were in pockets varying from small quantities to many tons. The mining operations were crude and mostly done by hand labor with picks and shovels. This made the operation costly. Under Dabney's direction, some of the rock was dried, ground and manufactured into superphosphate by the Navassa Guano Company of Wilmington.

The interest and enthusiasm for North Carolina phosphate continued through 1884 with further exploration, and development of mining operations. Finally a company called The North Carolina Phosphate Company was formed to put material on the market.

In the meantime, 20 tons of this superphosphate were distributed to 130 farmers all over the State for trial. Most of the farmers reported on their results, and in the main were well pleased.

Much of the Station report for 1884 was devoted to the exploration, analyses and field trials of North Carolina phosphate. But the hopes and aspirations for a new industry developing around phosphate deposits were not to materialize.

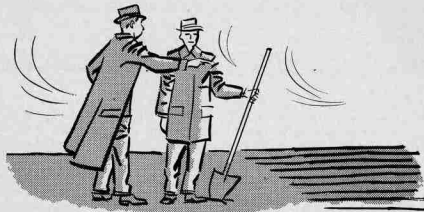
### UNPROFITABLE VENTURE

The deposits were too limited, mining operations too expensive, and most of the rock mined was too low grade to make the venture profitable. Less and less time of the Station personnel was given to the work and in a few years North Carolina phosphate deposits fade from the Station reports.

Most of the work during 1884, other than the phosphate investigations, was of a routine nature. Again the Director mentions interruption due to instructions from the Board to prepare exhibits for a State Exposition and a World's Industrial and Cotton Centennial Exposition at New Orleans. Four months of the time of the Director and several of his assistants were given to this assignment. This he stated "prevented the undertaking of investigations requiring much time to complete."

The year 1885 was to mark a milestone in the history of the Station.

Dr. Ledoux had mentioned the need of land for field tests and Dr. Dabney had each year during his administration urged the Board to provide such facilities. The demand for funds to support other activities of the Department seemed to always take precedent. However, at the December meeting in



35 acres of land available in 1886 gave Station complete facilities for first time.

1885 the Board finally answered these requests by purchasing 10 acres of land at \$50.00 per acre adjoining the State Fair Grounds while the State Agricultural Society, which operated the State Fair, gave the use of about 25 additional acres. Dr. Dabney was exuberant. "This experiment farm makes this institution for the first time the complete thing which the Act of 1877, establishing it, contemplated."

"The soil is poor and thirsty, but it is in many respects well adapted to the purposes of experiment," he stated. This was certainly better than no farm at all.

Evidently Dr. Dabney was afraid the farmers of the State would misconstrue the purpose of this farm. He was afraid it would be looked upon as a "model farm" rather than as a laboratory. He went into detail to explain the difference prior to the beginning of operations for no work was started until the next year.

This approximately 35 acres was on the north side of Hillsboro Street and is now known as Wilmont, a sub-division in the city of Raleigh. Brooks Avenue is on approximately the western boundary of the original 10 acres.

The main activity during 1886, from the Station standpoint, was the development and organization of the work on the new farm. The field work had to be planned, buildings designed and constructed, land cleared, plots laid out and different crops planted, all in a very limited time.

One of the first needs was to get a capable superintendent. Milton Whitney was employed but he did not go to work until April 1, 1886. What he was able to accomplish in a few months is most remarkable and indicates a man of determination and drive that only a comparatively few people possess.

"When we took charge of the farm, a greater part of the land was covered with a dense growth of scrub oak and blackjack, with one place some dwarf pine. It was said the land had not been under cultivation for from 15

to 18 years. The front of the land facing Hillsboro Road was very much cut up by wagon tracks, which had washed out a foot or more at places." What a dismal outlook to a man who was expected to get this land seeded to experimental crops that season! But he did it. Within 10 days he had arranged with the authorities of the State Penitentiary to supply prisoners for putting the land in shape. In all "we are charged in Col. Hicks' report with 1,275 days' work of the convicts." Mr. Whitney states further that April and May were extremely wet months and this delayed the work.

The land facing Hillsboro Road and extending back about 70 feet was considered too uneven to be used for plot experiments with fertilizers so this was used to show side by side 15 of what was believed to be the most valuable grasses and clovers. The plots were one-thirtieth of an acre each.

Beyond the grass plots  $1\frac{1}{2}$  acres were used to grow 10 varieties of tobacco but without manure or fertilizer. Since the tobacco was planted late "the crop did not amount to much."

### PERMANENT PASTURES

On another tract one-twentieth acre plots "were put down in permanent pasture under different methods of preparing the land and different fertilizers and manures." These were seeded with a mixture per acre of 10 pounds each of red clover, orchard grass and tall meadow oat grass; 5 pounds each of red top, Italian rye grass, meadow fescue and Kentucky blue grass; 3 pounds each of sweet vernal grass and yellow oat grass, a total of 56 pounds per acre. The mixture was selected to ripen at different times and thus give a longer growing period.

Another area was planted to five most highly recommended varieties of cotton. The cotton was planted late and a good portion of the bolls failed to open "so that the total yield is of little value."

On other land, different forage crops, upland rice, and Sea Island cotton were grown with varying results.

Another area, "an average 'poor soil' of the State" was used to test "The improvement of poor or worn out soils by peas." The object was to test two methods of improving such lands: "Green manuring against commercial fertilizers and at the same time test the different ways of treating the manuring crops." It should be remembered that while it was generally recognized by farmers and scientists that legume crops improved productivity, the real reason for such benefits was not discovered until years later.

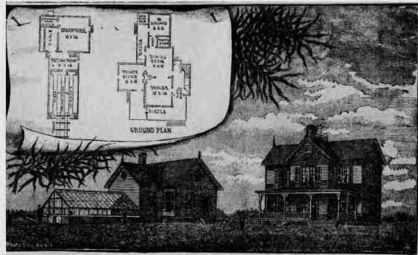
Whitney made close observations of his pea crop throughout the season. Until now, scientists had made only a limited study of the plant so when two months after the crop was planted a heavy rain resulted in "extensive root-washing, exposing in all a section of the roots of 24 plants and the soil, to a depth of about eight inches, contained a perfect mass of roots." Whitney undertook a detailed study of the root system of peas and later cotton and tobacco. His capacity for detail is illustrated in his cow-pea studies on roots. He wanted to determine the amount of roots, stubble, etc. per acre and

also their chemical composition. To that end he attempted to remove all the roots from the soil to a depth of 10 inches. A trench of this depth was dug just outside of the plot, running across the rows, and the soil was dug up, a spadeful at a time and the roots carefully picked out by hand. The work was so tedious "that 125 square feet required the steady work on one man for more than a week." The roots were weighed, dried and analyzed. In his report he discussed the results of his study and various theories of soil improvement through manure crops versus commercial fertilizers.

Whitney realized that field experiments required much time and that "the public, however, are very impatient of any such slow but accurate work." He made every effort to supplement the field trials and in the spring of 1886 began the first pot culture work undertaken at this station. He used one-gallon candy jars and attempted to determine the plant food requirements of North Carolina soils for a maximum crop. He also tried to determine the amount of water evaporated by the cotton plant. For various reasons the results of the pot work was, as he stated, "in a measure unsatisfactory."

Hydroponics, or production of plants in water culture is not new. Whitney grew tobacco by water culture in 1886 with varying amounts of nitrogen in solution.

Mr. Whitney came to North Carolina from the Connecticut Station and while there made some studies of the physical properties of soils. Here, however, he began new studies, especially regarding temperature and moisture. Dr. Dabney stated, "North Carolina deserves the credit of having given him the facilities for making the first really important investigations



The Governor laid cornerstone on this first laboratory (left) on the Station farm.



## DR. H. B. BATTLE, 1887-1897

on the subject made in this country, the investigations which caused him to be called to the Department of Agriculture where he was to carry out a complete study of the physical properties of soils of the United States, the largest piece of work of this kind ever done in the world."

There were no buildings on the experimental farm so one of the first needs was the design and construction of such facilities. The plans called for a cottage, a plant house and laboratory, and a barn and machinery shed. These were built under contract and were "so far completed that at the meeting of the Board of Agriculture on July 22nd the corner-stone of the laboratory and work-rooms was laid by the Governor, assisted by the Grand Master of Masons, with appropriate ceremonies."

From our vantage point now, such an event would not even get mention in a paper--nor would there be even a formal corner-stone. We should not forget, however, that then and in the light of subsequent developments, that was a real event in the development of North Carolina's agriculture.

Another significant event took place on December 1, 1886. This was the establishment of a state weather service as part of the Station. Mention has been made of Whitney's work on soil temperatures. After a few months observations it seemed desirable to expand the work to include weather. This would require a full time worker. The Board in its July meeting passed a resolution requesting the U. S. Signal Corps to establish a weather station at the farm. Gen W. B. Hazen, Chief Signal Officer, gave a prompt reply and agreed to furnish an experienced weather observer and the necessary equipment on condition that the Station would distribute the weather warnings throughout the State. These conditions were agreed to and Mr. W. O. Bailey was assigned by the Signal Corps. Weather reports were soon distributed by all railroads to their stations and in addition many volunteers scattered over the State made weather reports and displayed weather flags.

This weather service remained a part of the Station for 10 years.

Dr. Dabney resigned September 1, 1887. His last report was dated March 15, 1887 and covered the work for 1886 and up to March.

Dr. Dabney left North Carolina to become President of the University of Tennessee, an Assistant Secretary of Agriculture, and later President of the University of Cincinnati. He engaged in many other activities and was author of a number of books. While in Raleigh he was a member of the Watauga Club which sponsored the establishment of an industrial college. The efforts of the Watauga Club combined with that of farmers' organizations resulted in the establishment, by action of the Legislature of 1887, of the North Carolina Agricultural and Mechanical College--now State College. Dr. Dabney actually wrote the bill which was introduced in the Legislature by Augustus Leazar of Iredell County.

Dr. H. B. Battle became Director of the Station on September 1, 1887. He had joined the staff as Assistant Chemist January 1, 1881 so he was familiar with the activities of the Station when he became Director. His 10 years as Director covered a period that was marked by several developments of great significance in the future life of the Station.

The first of these developments really took place in March before Dr. Battle became Director in September. This was the passage by Congress of the famous Hatch Act which made an annual appropriation of \$15,000 to each State for the establishment and maintenance of an Agricultural Experiment Station. This Act passed Congress on March 2, 1887. It was only five days later when the North Carolina Legislature, on March 7, accepted the provisions of the Federal Act and directed that the funds received, "shall be devoted, under the direction of the Board of Agriculture, to the maintenance of the aforesaid Agricultural Experiment Station under the laws of the United States and this State." Dr. Dabney had kept up with the progress of the Hatch Bill through Congress and it was largely through his efforts that the North Carolina Legislature responded so promptly.

However, the difficulties were not yet over. The U. S. Treasurer questioned whether the Congress had actually made the appropriation in 1887 and the matter was not cleared until the session of 1888. Even then the funds which were to be paid the State quarterly did not come, so in March 1888 Director Battle went to Washington. He explains what happened as follows: "For some reason, however, the first quarterly payment of \$3,750, when due, was not promptly paid, nor could correspondence unravel the difficulty. This extended also beyond the time for the second payment, and so it seemed desirable for a personal visit to Washington. You will believe it or not, but I can testify of the truth, that with all of the red tape of official regulations, unnecessary requirements, etc., that in six hours after I arrived in Washington I walked out of the Treasury Building with a check for \$7500 in my pocket payable to our State Treasurer, and the next morning it was safely in his hands and placed to the credit of the Station. What influence helped me? I need mention only one name and you have the answer, and that name is Senator Ransom. A few words from him to the proper man of what he wanted, helped by two of my personal friends, fortunately in the Treasury Building, caused me to turn the trick. I venture to say that such a thing has never happened before nor since."

The above check covered the period beginning July 1, 1887 and marked a complete change in the financing of the Station. For 10 years the expenses of the Station had come entirely from the State Department of Agriculture and the primary function of activities had been the fertilizer control work with a secondary emphasis on research. The Federal funds could not be used in fertilizer control consequently the full amount of \$15,000 yearly was to be used in research. The State Department of Agriculture no longer



DR. H. B. BATTLE

made appropriations for research but did pay the expenses for fertilizer analyses, which the Station chemists continued to handle for some years.

From July 1, 1887 the reports of expenditures of the Station include only the money received from the Federal Treasury.

The second major development was the passage of an Act of the Legislature on March 7, 1887, establishing an Agricultural and Mechanical College (now State College). This was the same date on which the provisions of the Hatch Act were accepted by the Legislature. The Hatch Act

located the funds for the State to the Land-Grant Colleges in each state. Until this date the University at Chapel Hill had been the Land-Grant College but the Act creating the Agricultural and Mechanical College transferred the benefits of the Land-Grant to the new institution so that it became the Land-Grant College and thus entitled to the Hatch funds. The new institution did not open for two years, however, so during this interval the Station was under the control of the Board of Agriculture.

The Board of Trustees of the College was composed of the Board of Agriculture plus five other persons appointed by the Governor with the consent of the Senate. This created an interesting situation in that the Board of Agriculture was composed of 10 members while the Board of Trustees had 15 of which 10 were from the Board of Agriculture. The Act directed the transfer of the Station to the College but as regards lands, buildings, laboratories or other properties, the Board of Agriculture could make such transfer "as in their judgment may be thought proper."

This was the first of a series of situations created by the Legislature regarding relationships between the two State agencies which would plague the State for more than 50 years.

In this instance, however, the transfer was worked out satisfactorily. A committee representing both boards was appointed to study the problem and make recommendations. The report covered, in detail, all contingencies, as is shown by the minutes of the Board of Trustees.

DECEMBER MEETING BOARD OF TRUSTEES  
North Carolina College of Agriculture and Mechanical Arts  
Raleigh, Dec. 5th, 1889.

"The Board of Trustees of the N. C. College of Agriculture and Mechanic Arts met, pursuant to the call of the President, in the Building.

"There were present, Messrs. W. S. Primrose, President, H. E. Fries, W. F. Green, R. W. Wharton, W. E. Stevens, J. S. Murrow, J. F. Payne, A. Leazar, Burwell Blanton, C. D. Smith and N. B. Broughton.

"The Secty. was ordered to read the minutes of last session, which, without objection, stood approved.

"President Primrose made an oral report touching some features of the opening of the College and the progress made since that time.

"On motion of Mr. Leazar, it was agreed that when the question of transfer comes to a vote, that this Board adjourn and that each Board vote on the question separately.

"The report of the Joint Committee was read by Mr. Leazar as follows:  
*Resolutions concerning transfer of N. C. Experiment Station from Board of Agriculture to Board of Trustees of the A. and M. College.*

*Whereas: The Land Scrip Act passed by the Congress of the U. S. in 1862 in Section 4, provides a college "to teach such branches of learning as are related to Agriculture and Mechanic Arts," and in Sec. 5, condition 4 requires a report, "recording any improvements and experiments made with their cost and results;" and whereas: The Hatch Act Sect. 1, says: "That in order to aid in acquiring and diffusing among the people of the U. S. useful and practical information on subjects connected with Agriculture, and to promote scientific investigation and experiments respecting the principles and applications of agricultural science, there shall be established under direction of the College or Colleges, a department to be known and designated as an Agricultural Experiment Station," and in Sec. 2 says: "That it shall be the object and duty of said Experiment Station to conduct original researches or experiments on the physiology of plants and animals, etc., etc.," and in Sec. 8 says: "The Legislature of such state may apply in whole or in part the appropriation by this act made to such agricultural college or school," and whereas the State law of 1887, Chapter 410, Sec. 6 says:*

*"The Agricultural Experiment and Fertilizer Control Station shall be connected with said College, and the Board of Agriculture may turn over to the said Trustees in whole or part, for the purpose of said College any buildings, lands, laboratories, museums or other properties which may be in their possession, as in their judgment may be thought proper." Therefore resolved First:*

**Resolution No. 1**

*That we, as a Committee, representing the Board of Agriculture and the Board of Trustees of the Agricultural and Mechanical College, recommend that the Board of Agriculture "turn over" for the use of the Trustees of the*

A. and M. College, the following: N. C. Agricultural Experiment Station and its equipments.

**FIRST: CHEMICAL DIVISION**, including offices, embracing entire number of rooms located on first and basement floors of the north wing of the Agricultural Building, City of Raleigh, now occupied by the laboratories, offices, engine room, store and other rooms of the N. C. Agricultural Experiment Station, including: one ante-room, one general office, an inner office, one mailing room, one sample room, one chemical store room, 5 rooms for chemical work, engine room, coal room, cellar store room, and outside wooden shelter store and other rooms, and all portions of the first floor north wing of the Agricultural Building now occupied by the portions of the N. C. Agricultural Experiment Station, together with all office, laboratory and other fixtures, libraries and appertinences, reagents, pipes and tanks, and all other property now in use daily or permanently by the said experiment station.

**SECOND: BOTANICAL DIVISION**. One room in the Agricultural Building, with all fixtures, instruments, apparatus, collections and reagents in use by the botanical division, and other fixtures in use by said division, and other botanical collections of the flora of the State, previously collected by the present botanist of the Experiment Station.

**THIRD: METEOROLOGICAL DIVISION**. Room on second floor of the Agricultural Building, together with fixtures, instruments and other articles now in use by the said Meteorological Division, together with shelter, platform and other like fixtures on the roof of the Agricultural Building and approaches thereto.

**FOURTH: BUILDING PRIVILEGES**. All privileges now exercised by the Experiment Station, to officers and employers; approaches to the various portions of the Division of the Experiment Station, water closet privileges and approaches, thereto. Also one room now used by the night watchman (who is paid by the Experiment Station), also privilege for said watchman to enter every room of the Agricultural Building or cellar to guard against fire.

**FIFTH: DIVISION OF THE AGRICULTURAL EXPERIMENT FARM**. The property now occupied by the farm of the Station, consisting of ten (10) acres of land, west of the land of the State Agricultural Society, and all of the buildings on said ten acres, plant house, residence, dairy house, two barns, shed and other buildings. The livestock, vehicles, implements, instruments, apparatus, growing crops and other property now in use and in possession of this division, and the property of the Experiment Station.

**SIXTH: OTHER PROPERTY AND PRIVILEGES**. All of the other property and privileges in possession and in use by the said Experiment Station not included in the above enumeration.

**Resolution No. 2**

That the Board of Trustees of the A. and M. College "receive" the above and all moneys receivable under the Land Scrip and Hatch Acts as a dona-

tion for their use as they are empowered to do under Section 6. Chapter 410, Laws of 1887, "The said board of Agriculture shall have power to accept on behalf of this State, donations of property, real or personal, and any appropriations which may be made by the Congress of the United States to the several states and territories for the benefit of Agricultural Experiment Stations, and they shall expend the whole amount so received for the benefit of the aforesaid Agricultural Experiment Station, and in accordance with the Act or Acts of Congress in relation thereto." Also, in Chapter 409, Sec. 7, laws of '87, is the following: "And all the grants of money, which may be made to this state by an Act of Congress of the U. S. entitled An Act to establish Experiment Stations, etc., Are hereby accepted on behalf of this state, and the same shall be devoted under the direction of the Board of Agriculture to the maintenance of the aforesaid Agricultural Experiment Station under the laws of the United States and this state."

**Resolution No. 3**

Resolved that the Trustees of the A. and M. College consider the above as an endowment for a specific purpose, viz: a department to be known and designated as an Agricultural Experiment Station. See Hatch Act. Sec. 1. And that inasmuch as Sec. 2, Hatch Act clearly defines the object and duty of Experiment Stations, and such duties can be performed only by trained chemists and scientists it is resolved:

**Resolution No. 4**

That the Experiment Station shall be under the control of a Director who shall be considered responsible to the Board of Trustees for the entire Station and its work. He shall be subject to the same rules and regulations made by the Board of Trustees concerning the Faculty of the College, provided said rules and regulations do not conflict with his duty under the State or U. S. laws.

**Resolution No. 5**

Resolved that the Director be required to work in harmony with the President of the College and the Faculty, observing due care that the students of the College are not permitted to interfere in any way with important experiments.

**Resolution No. 6**

Resolved that the Director of such of his assistants as may be required to carry out the provisions of the Hatch Act, viz: the Agriculturist, Botanist, Assistant chemists and others be paid from the Hatch Fund, but when engaged in analysis of fertilizers and other State work from fund set apart as per Sec. 9 of this agreement. But whenever in the establishment of new departments it is practicable for the President of the College and the Director to use a person in common for station and College work, then such person shall receive his pay from Station and College funds as the Board of Trustees may apportion. The Director and all his Assistants are to be elected biennially by the Board of Trustees.

**Resolution No. 7**

*Resolved that all farm experiments shall be made on farms used for such purposes, and all chemical analyses in the laboratory of the Station. The College Farm and laboratory shall be separate from that of the Station, but the Farm and laboratory of the Station shall be free to the students of the College upon such restrictions as may be agreed upon between the President and Director.*

**Resolution No. 8**

*Resolved that the Director is empowered to purchase a limited number of books and periodicals, the same to be placed in the College library unless needed for constant reference, and that all books on agriculture now in the Agricultural Department, not in constant use, be transferred to the College Building.*

**Resolution No. 9**

*Resolved that as the Station has for years been making free analyses for the people of the State and analyses of fertilizers for the Department of Agriculture, the Board of Agriculture hereby distinctly reserves the right to control, as heretofore, the use of all the property above enumerated for the purpose of the analysis of fertilizers and other analyses provided for and required by the laws of the State. The Director shall report to the Board of Agriculture upon this work, whenever they shall require.*

*In consideration of the work done for the State, the Board of Agriculture agrees, in addition to the use of the property of the Station above transferred to the A. and M. College, to contribute two thousand dollars annually for the maintenance of the same.*

(Signed)

A. Leazar                    ) Committee  
J. F. Payne                 ) Board of  
R. W. Wharton             ) Agriculture

*in behalf of  
the entire Committee  
of the Board of*

H. E. Fries                 ) Trustees and upon  
                                  ) instruction from  
                                  ) Messrs. Carr and  
                                  ) Alexander.

"On motion of Dr. Smith, the report was received. Col. Green moved that the report be considered in Executive Session, by sections. The motion was adopted, and the Board went into Executive session.

"The first, second, third, fourth, fifth and sixth Resolutions were read and passed without objection.

"On motion of Dr. Smith, dinner having been announced by President Holladay, the Board took a recess until after dinner.

"The Board promptly reassembled in executive session. The seventh, eighth and ninth resolutions were then read, and after some discussion were passed without objection.

"On motion of Mr. Leazar, the Board of Trustees took a recess for the purpose of allowing the Board of Agriculture to meet and pass upon the resolutions of transfer and to reassemble upon the call of the President.

"President Primrose, after the recess, called the Board of Trustees to order, and Mr. Fries presented the report of the joint Committee on the transfer of the Experiment Station from the Board of Agriculture to the Board of Trustees of the A. and M. College.

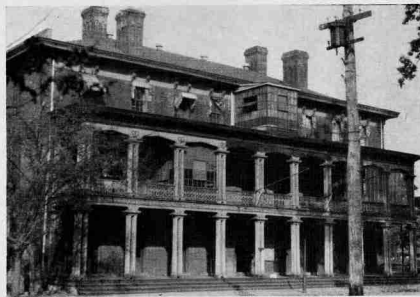
"On motion the report, as a whole, was adopted.

"Mr. Fries offered the following, which was adopted:

"Resolved that the Director of the Station and his force of Assistants excepting the Agriculturist and first assistant chemist, be elected to fill the unexpired term from this date to April, 1891."

"Mr. Fries offered the following, which on motion was adopted:

"Resolved that in future, the experiments, analyses and other work to be done by the Station shall be designated by a council composed of the President of the College, the President of the Board of Trustees, Director of the Station, one member of the Board of Trustees and one member of the Board of Agriculture—the members of the Boards to be designated by the President of the Board of Trustees and the Chairman of the Board of Agriculture, and that the Council meet quarterly at the expense of the Hatch Fund."



For some years Station was housed in old Department of Agriculture building, Raleigh.

#### Appropriation For Greenhouse and Barn

"Mr. Fries moved that \$400 from the 5 per cent of the Hatch Fund available for the building purposes be set aside for the purpose of building a greenhouse, and that an exchange be made of the heaters, provided such exchanges can be made without detriment to either the College or Station Greenhouse. The motion was adopted.

"On motion of Mr. Fries, the remainder of the 5 per cent of the Hatch Fund available for building purposes was appropriated for the purpose of building a barn on the College farm for the accommodation of cattle. Adopted.

"On motion, the Board adjourned to meet tomorrow at ten o'clock, A.M., in the Department of Agriculture Building."

#### Friday Morning Session

"President Primrose called the Board to order at the appointed time, and announced that the report of the Director of the Experiment Station was the first business before the Board.

"Dr. Battle read his report, which, on motion of Dr. Smith, was received.

"Mr. Stevens moved that the rules heretofore made by the Board of Agriculture in relation to the conduct of the Experiment Station, and alluded to by the Director in his report, be continued, with such modifications as may be made by the Station Council. Adopted.

"On motion of Mr. Broughton, the Director was instructed to have codified all the rules now in force, in relation to the Station. Adopted.

"Mr. Fries offered the following, which was adopted:

"Resolved that a Committee be appointed to prepare and present to the Secretary of Agriculture, through the Director of the Station, a paper setting forth the need of National legislation concerning the examination of field and garden seed, and a request that the law be so framed as to be made operative through officers employed under the Hatch Act, and a further request be made, that the quarterly payments of the Hatch Funds be made at the beginning instead of the end of each quarter."

"The President of the Board appointed on this Committee Col's. Wharton and Green, the Director and President Holladay.

"Mr. Fries moved that the Finance Committee be instructed to make such arrangements as may be necessary to enable the work of the Experiment Station to be carried on without interruption, and this has reference only to the existing loan of \$2,000—should this two thousand dollars be called for by the President of the Board. Adopted.

"Dr. Smith moved a reconsideration of the vote by which certain officers were elected on yesterday. Adopted.

"Mr. Fries offered the following, which was adopted:

"Resolved that the Director of the Station be elected to fill this unexpired term from date to April 1891; and that the assistants of the Station be elected to fill them from date to June 30, 1890."

"On motion the Board went into Executive Session."

#### Executive Session

"It was moved that Dr. Battle's salary be increased \$300. The motion prevailed.

"On motion Mr. Kilgore was appointed to fill the unexpired term of first Ass't. Chemist at the salary of \$1200.

"On motion the Second Ass't. Chemist was continued at the salary of \$1100.

"On motion the salary of the 3rd Ass't. Chemist was fixed at \$800. On motion it was determined to elect an Assistant Professor of Agriculture, who shall also be the Agriculturist of the Station, and who shall be paid a salary of \$1000, from the Hatch Fund, said Assistant to be appointed by the Executive Committee, until next meeting of the Board.

"It was moved that the dwelling house and other buildings on the Experiment Farm be placed under the control of the Executive Committee. Adopted.

"It was moved that Professor Massey be elected Horticulturist of the Experiment Station, and that he receive \$500 additional for this service from the Hatch Fund.

"On motion, the typewriter's salary was increased to \$300.

"On motion the salary of the Botanist was fixed at \$1000.

"The rest of the salaries, as reported by the Director, were approved.

"On motion it was ordered that Mr. Skinner sell one or both horses at the Experiment Farm and in case both are sold, that he purchase another for the use of the College.

"On motion the estimates of the Director of the Experiment Station, as amended in regard to salaries, was accepted and approved.

"On motion it was determined that all contingencies arising about limitations in office is referred to the Executive Committee.

"The President of the Board of Trustees appointed Mr. Elias Carr member of the Station Council. (And the Chairman of the Board of Agriculture appointed Col. Wharton to represent that Board.)

(Signed) T. K. Brunner, Sec'y."

#### EXECUTIVE COMMITTEE MEETING Department of Agriculture Building, Dec. 27, 1889

"The Executive Committee of the Board of Trustees of the N. C. College of Agriculture and Mechanic Arts, met upon the call of the President, at 10 o'clock A. M. There were present Messrs. W. S. Primrose, President, H. E. Fries and N. B. Broughton.

"The President called attention to the necessity of taking action in regard to the appointment of the Assistant Professor of Agriculture and Agriculturist to the Station.

"Mr. Broughton moved that the Executive Committee meet to elect this officer on Thursday, the 23rd of January, 1890. The motion was adopted.

"Mr. Broughton suggested that the President of the Board be requested to correspond, with the view of finding a suitable person to fill the position of Ass't. Prof. of Agriculture and Agriculturist, which was assented to.

(Signed) H. B. Battle, Director."

#### EXECUTIVE COMMITTEE MEETING

Department of Agriculture Building, Raleigh, April 8, 1890

"The Executive Committee of the Board of Trustees of the N. C. College of Agriculture and Mechanic Arts, met pursuant to the call of the Chairman, at ten o'clock A.M. There were present Messrs. W. S. Primrose, (Chairman), W. F. Green and H. B. Broughton. A letter from Mr. H. E. Fries regretting his necessary absence, was read. Dr. H. B. Battle, Director, was invited to appear before the Committee and state his views in regard to the work to be conducted at the Experiment Farm and the advisability of the conduct of such work, whether by either of the professors of agriculture or horticulture, in the College, or by a new man especially chosen for that peculiar work. He favored the latter plan. On motion of Mr. Broughton the election of an Agriculturist to the Experiment Station and Assistant Prof. of Agriculture in the College, was postponed until the next meeting of the Board of Trustees, at 10 o'clock, A. M., on Friday, May 2nd, 1890, and that they be requested to make the salary of the Agriculturist and Assistant Prof. of Agriculture \$1500, if necessary. The motion was adopted.

(Signed) T. K. Brunner, Sec't."

It is interesting to note that while the Station was transferred as a department of the College, yet by resolution No. 4, the Director was "responsible to the Board of Trustees for the entire Station and its work." The President of the College does not seem to have had any authority as regards the Station but the Director in resolution No. 5, was "required to work in harmony with the President of the College and the faculty . . ."

At this meeting of the Board of Trustees a motion was passed creating an Experiment Station Council charged with designating the "experiments, analyses and other work to be done by the Station." This council was composed of the President of the College, the President of the Board of Trustees, Director of the Station, one member representing the Board of Agriculture and one representing the Board of Trustees. The Council was to meet quarterly. No doubt the Council functioned but no records of its activities have as yet been found.

#### PART OF THE COLLEGE

The Station thus became an integral part of the College and from that date the primary function was shifted from fertilizer analyses and control to experimental work in crop and livestock production. For several years, however, the chemical laboratories remained downtown in the Department of Agriculture Building.

This change also brought about a change in financial support. From the establishment of the Station in 1877 to 1887, the station was supported entirely from the Department of Agriculture fund. After the change, practically all these funds were withdrawn and for many years the Hatch Fund of \$15,000, plus some relatively small receipts from sale of crops and livestock, was the sole financial support of the Station.

During 1887, the program of the Station was largely a continuation of that underway in 1886. In the chemical laboratory, fertilizer analysis was the main activity. There were some analyses of marls, limestone minerals and waters of various kinds. There were a considerable number of analyses of various kinds but none with specific objectives. The Station made analyses free of charge so various requests came from the citizens of the State.

The farm which had been started in 1886 represented the main activity we would now class as research. Milton Whitney was still superintendent. He had an inquiring mind and abundant energy. The previous year he had initiated studies on soil moisture and temperature and this was continued in 1887. He recorded an immense amount of data but with the responsibility of the supervision of other field studies and without other help it is quite evident that he worked before the advent of the five-day or 40-hour week.

Work with cotton including variety studies, thickness of planting, earliness of maturity and percentage of lint was continued. Variations in yield, attributed to soil conditions, were so marked that there was very little faith in the data secured.

One interesting experiment was to see how much cotton per acre could be grown. The Board had directed this study. One-tenth of an acre of rich strong land in good "heart" was selected. It was plowed deeply, four tons per acre of compost added, then plowed twice with a single plow and 1,000 pounds per acre of an ammoniated superphosphate added. The yield of 861 pounds of lint was a disappointment since the same variety planted on poor land made 807 pounds of lint per acre. Whitney in his report observed, "The question arises; was the limit of productive powers of the plant nearly reached among the varieties, so that an excess of food, as in the case of an animal, would not give increased development, or was the limiting cause some other factor of plant growth above or below the surface of the ground."

Work with varieties of grasses and clovers was continued on very small plots located along Hillsboro Road. However, funds were reduced in 1887 so that labor could not be hired. The weeds took the land and the plots were abandoned.



Experimental field work began in 1886.

Whitney reports the yield on his 1/20 acre permanent pasture plots seeded in 1886 with varying fertilizer and soil preparation treatments. The plots were in duplicate, separated as far as possible in the limited area. The yields showed wide variations even with the same treatments. One manure plot gave a yield of 1094 pounds per acre while another gave 2808 pounds. Similar variations are reported for other treatments. Whitney said he was forced to conclude that the soil was far from uniform. He almost exclaims, "It seems almost hopeless to draw conclusions of positive value from the work." In his discussion of the experiment, however, he is continually asking, why?—why?

Whitney had started some plot experiments in 1886 but does not mention them in 1887. Evidently a reduction in the budget forced the suspension of certain lines or work.

Whitney resigned at the end of 1887 and later headed a Division of Soils in the United States Department of Agriculture where he directed outstanding investigations, especially in the field of soil physics.

The research work of the Station during the winter of 1887-8 sank to a low ebb; in fact, was practically discontinued. The Legislature of 1887 had accepted the provisions of the Federal Hatch Act and it was anticipated that funds from that source would finance the Station for work other than the fertilizer control which was financed by the fertilizer tax. However, as has been previously related the Federal funds did not materialize until March and April of 1888. Any program of research and payment of salaries and expenses had to be based on hope that funds would ultimately come through. The salaries of the chemists while making fertilizer analyses could be paid from the agriculture fund but not the field work. Accordingly the operations on the farm were suspended at the end of the 1887 season.

Whitney offered his resignation to the Board at a meeting July 13, 1887, to be accepted "in the near future." The next day, July 14, the Board accepted Whitney's resignation to become effective September 1, and then passed a resolution instructing the Director to employ a practical farmer to run the farm at a salary not exceeding \$400 per year. There is nothing in the minutes of the Board or in the Director's report indicating that a farmer was employed. At any rate, at a meeting of the Board of December 9, 1887, the former motion was rescinded. Mr. Leazar, a member of the Board from Iredell County, offered the following resolution which was adopted.

"The Board of Agriculture regrets the necessity of suspending scientific experiments at the farm. This necessity arises from the fact that our income is reduced about one-half. It is our purpose to keep the property in good condition, in the meantime, to make it self-sustaining, and to re-institute scientific work as soon as we can procure the means either from Congress or otherwise."

Mr. Leazar also moved that the Commissioner take charge of the farm and to plant such crops as would most nearly defray expenses.

This meeting also ordered the Director to do departmental work first and then such other work as he thought advisable.

Whitney was succeeded by J. R. Chamberlain but with the title of Agriculturist. It is not clear as to the exact date he began but certainly after the Hatch funds were received in April and probably much later in the year for Chamberlain's report only covered a description of the barns on the farm and does not mention any field work.

## DAIRY EXPERIMENTS

Director Battle in his report makes some interesting observations regarding dairying and its outlook.

"Likewise, in regard to dairy experiments, there has been erected a well arrayed building for this work, which will be equipped with the best implements and machinery for experimental work. The dairy interest in this State is yet in its infancy, but is as vigorous and healthy in this infancy as can be hoped. It will grow at first more quickly nearer the larger towns and cities, where the products can be more easily disposed of; yet it is certain that it will extend to more interior points in a short time. In the vicinity of Raleigh, through the means of energetic citizens, this work is growing surely. This year there will be in the neighborhood of 20,000 pounds of first-class butter made and sold to supply the home demand. A much larger quantity is imported to this city from other states (somewhat over 50,000 pounds), so that it will be some time yet before our home dairies can supply over the Raleigh market, before shifting to other localities."

Botany work as a distinct activity began October 1, 1888 with the employment of Gerald McCarthy as Botanist. Mr. McCarthy had previously been employed by the National Museum at Washington. He was sent to North Carolina in the spring of 1888 to collect specimens of plants in the western area. He met with the Board and offered to collect extra specimens for the Station at \$8.00 per hundred. His offer was accepted and later the minutes show approval of a bill for \$80.00.

The equipment of the laboratory of that date as compared with requirements 65 years later is indicative of the developments in that field. Then the laboratory consisted of one room with the following apparatus:

1. A collection of labeled seed samples.
2. A collection of dried plant specimens.
3. Two microscopes with accessories.
4. A seed sprouting apparatus.
5. An analytical chemist's balance.
6. A reference library.

McCarthy stated: "All things considered, we believe we have one of the best equipped botanical laboratories in the country."

Now, (1953) the State has recently invested over one million dollars in buildings and equipment and there is a pressing demand for more. Botany, however, has broadened into the general field of Biological Science.

Battle and the former Directors had realized the need of tests under farm conditions. The board authorized Battle to spend \$15.00 per county where farmers applied for such tests. He arranged with 21 farmers to conduct tests during 1888. The objective was to test varying amounts and combinations of acid phosphate, cotton seed meal and Kainite against no fertilizer or stable manure. The crops to be grown were Spanish peanuts, corn, and potatoes. The fertilizers were mixed, weighed and shipped, properly labeled to the grower. Each plot was to be 363 feet long and planted to three rows four feet apart—exactly 1/10 acre. The farmers were very much interested for most of them reported rather detailed field notes during the growing season and yields for each crop.

Profit or loss over the cost of the fertilizer was calculated for each plot. All the tests were east of Raleigh and weather conditions were generally unfavorable. There were but few tests on peanuts and potatoes and these were without much significance.

The work in 1889 was quite similar to that of the previous year. The results secured on the Station farm were so irregular (attributed to soil variation), it was decided that the field was not suited to plot work with crops involving fertilizers, and plans were made to turn over most of the land to horticultural activities. Some grass tests, however, were continued at this location for several years.

In the barns feeding tests were started. The first work of the Station along this line was feeding a few oxen on an exclusive diet of cottonseed hulls and cottonseed meal. The hulls and cottonseed meal were weighed for



Feeding test with oxen in 1889 is first livestock work of Experiment Station.

each feed and the animals weighed once each week. The description of the animals used may seem amusing to modern day animal husbandmen.

No. 1—Black ox, about six years old, poor type for good feeder. Long legged, light hips.

No. 2—Bob-tail, about eight years old, good feeding form.

No. 3—Scrub, about 12 years old, hard looking specimen.

The experiment ran for about 2½ months. The animals neither gained nor lost any appreciable amount.

The field experiments initiated the previous year were continued but this year were extended into the Piedmont and mountains. Also, some tests were made with wheat varieties and fertilizers on tobacco.

The Botanist tested many samples of seed for purity and germination. As a general rule the seed tested was fairly pure but the germination showed a wide variation.

There were several important changes in personnel during the year.

Mr. Chamberlain, the Agriculturist, was elected Professor of Agriculture in the College but continued supervision of the Station farm until the end of the year.

B. W. Kilgore joined the staff as Assistant Chemist and later served as Director of the Station for many years.

W. F. Massey was elected Professor of Horticulture in the College and Horticulturist to the Station.

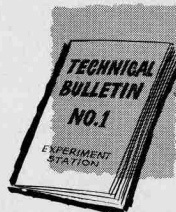
It will be noted that it was during this period that the lines of work were beginning to form that were later to become departments in the administration of the Station. At this time they were called divisions.

The first of a series of technical bulletins was issued October 15, 1889 and entitled *Seed Tests*.

The year 1890 was the first full year the Station was a Department of the College. This shift made practically no difference in the work. The offices and the laboratory remained in the Department of Agriculture building in downtown Raleigh so that in effect the change was in name only of the Governing Board.

The Director's annual report dropped in number of pages from 121 for 1889 to 21 covering 1890. Similar short reports continued for several years.

F. E. Emery succeeded Chamberlain as Agriculturist. He was appointed at a Board meeting in May but did not take up his duties until October. Not having an Agriculturist to look after the work, the field tests which



The subject was "Seed Tests."



had been made for the two previous years were suspended as well as most of the field work on the Station farm.

Massey, the Horticulturist, began extensive tests comparing many so-called varieties of fruits and vegetables. These included over 40 varieties of tomatoes, 20 of Irish potatoes, 13 of sweet potatoes, nearly 50 of garden peas, 25 of turnips and many others. Most of these seed were furnished by seedsmen so that "varieties" were most likely catalog names rather than species. A house for grafting work was started. It was Massey's idea to cross French and Asiatic varieties on native "sorts."

Massey built up extensive correspondence and published many bulletins and circulars. He was profuse in promises of work to be done but apparently lax in execution as will be pointed out later. He was an engineering graduate but his natural interest was in horticulture.

During the remainder of Dr. Battle's administration, the work of the Station followed the same general lines as already mentioned. However, there were a number of interesting things that should be mentioned.

One of real interest, in the light of developments more than 50 years later, was a series of plots with a large number of varieties of grasses and clover. There were "108 plots, each 4 x 17 feet with spaces of 1½ feet between." On one of these, in April 1891, was seeded "Giant Broadleaved White Clover. Tri-folium refers, var. Lotus." This is now known as Ladino Clover. The seed came from Fratelli Ingegnoli, Milan, Italy. "The plant is much more robust and has larger leaves than the common species, but produces very little seed. If it is seeded more freely it would undoubtedly supersede the common white clover, as it gives more than twice as much herbage and seems as hardy as the others."



First Ladino clover plot sown in 1891.

The notes kept on the plots covering a period of three years are as follows—"Plot sown April 7, 1891. By May 7 a good stand was obtained. Grew fast, and June 1, was thick and fine, with much higher and broader leaves than common white clover. By June 15, plot showed presence of dodder and was sprayed with a solution of sulphite of lime, which scorched the foliage badly but did not kill any plants. No apparent effect upon the dodder, which was soon afterwards removed by hand. The clover flowered very sparingly and for some reason did not mature seed. Plants did not recover fully from the sul-

phite of lime before the advent of cold weather. Plants stood the winter well and started early the next spring. By March 1, was best of all legume plots. Grew well throughout the summer, attaining a height of six to eight inches, but bloomed very little and set no seed. During 1893, the plot behaved much as in the preceding year, but became considerably infested by Bermuda grass. The clover still, however, holds the ground well and it is spreading by runners into adjoining plots."

"Upland—not tried."

According to all records, this was the first trial of Ladino in the United States. Apparently from the reports, the plots here were plowed during the winter of 1893 and it was more than 50 years before this clover was again tried in North Carolina with almost miraculous success. Apparently its failure to produce seed was the stumbling block.

It is interesting to speculate as to what agriculture would be in 1953 in North Carolina had the people in 1893 recognized the value of Ladino and had they learned to grow the crop successfully. Would we have developed into the great tobacco state in which we find ourselves, or would we have turned to livestock as our main enterprise? "Of all sad words of tongue or pen, the saddest are these, it might have been."

Cooperative field experiments were renewed in 1891 but these proved unsatisfactory in the main because the farmers did not carry out the instructions carefully so the plan was later abandoned.

## BOTANIST AND ENTOMOLOGIST

From his first appointment the Botanist handled disease and insect work but it was not until 1891 that the title Entomologist appeared in the reports and then he was listed as Botanist and Acting Entomologist. In 1892 his title was Botanist and Entomologist. The Station was continually looking for new crops that might be grown in the State. In 1892, Massey secured a supply of tea seed. One man at Fayetteville agreed to plant two acres and cultivate according to the directions of Professor Massey. Massey also planted some on the Station farm and distributed plants rather widely to many people.

In 1890 the Station began sending press bulletins to newspapers and magazines. These seemed to meet general approval and in 1893 these press releases were sent on a monthly schedule.

During this period the Station issued many bulletins on various subjects. Most of these dealt with information rather than on results developed by the Station. The total income of the Station was \$15,000 and for several years 10 to 15 per cent of this fund was used for printing and distribution of publications.

One interesting publication was prepared specifically to aid the Waldesian Colonists who had recently settled near Morganton in Burke County.

They requested aid from the Station and Professor Massey was sent to visit them. He had to talk through an interpreter. On his return he prepared a bulletin on wheat, corn, potatoes, cabbage, etc. This was printed in English and their native language alongside. It was hoped that the bulletin printed in this manner would not only give them instruction but aid them in learning English.

Also, for a period the Agriculturist had a column in the *Biblical Recorder*, a Baptist Publication which Emery felt reached many people not otherwise contacted.

In 1893, Dr. Battle took a leading part in promoting better roads. The Chamber of Commerce of Raleigh was quite active and as a result the Governor called a Congress on roads. Some 300 people from all sections of the State attended. A bill was proposed and approved by the delegates but it failed to pass the Legislature. The effort did stimulate interest in better roads but it was 30 years before the State really began getting out of the mud.

In the fall of 1895, the Station started its first poultry work with Mr. F. E. Hege, a commercial poultryman from near New Bern, as superintendent.

Also in 1895, cooperative horticultural work was started near Southern Pines in Moore County. This resulted from a request made by the North Carolina State Horticultural Society for aid. The work was financed largely by the German Kali Works, a German corporation promoting the sale of potash.

The objective was to ascertain the relative proportion of nitrogen, phosphoric acid and potash needed by fruits and vegetables and to study the adaptability of these infertile soils for the production of fruits and vegetables. Nine kinds of fruits and eight vegetables were tested.

Professor Massey also moved much of the work he had underway at Raleigh to Southern Pines.

This work was continued for several years and then abandoned.

The year 1895 marked the beginning of veterinary work with Dr. F. P. Williams serving as Consulting Veterinarian. The main work was the preparation of a bulletin on tuberculosis with suggestions on preventing infection and spread of disease.

Then as now the Station experienced many minor problems. The well on the farm went dry so a storage tank to catch rain water was constructed. The labor on the farm, whether college students or others, was not reliable and this was considered a serious handicap in securing reliable data on the experiments. Dogs killed some of the sheep. Emery records that, "This is not likely to occur again soon, because of mortality among roving dogs, induced by this attack."

There was a problem then that still exists to a degree--apportioning time of research workers between teaching and research. Several of the

men, after the Station became a department of the College, taught part time. Some stated that teaching activities interfered with their research.

Dr. Battle's services came to an untimely end on June 30, 1897. As was pointed out in a previous chapter, a new political administration in North Carolina came into power the first of January, 1897 and the Legislature provided for a new Board of Trustees to be appointed by the Governor.

This new Board met on June 19, 1897, and among other things, provided that after June 30th, Professor W. A. Withers of the College should serve as Acting Director of the Station at the pleasure of the Board.

Dr. Battle served during one of the most interesting decades in the history of the Station. The passage of the Hatch Act and the transfer of the Station from the Department of Agriculture to the new Land-Grant College were to have profound effect on the policies and work of the Station. Dr. Battle served well and faithfully during a trying period.

## DR. W. A. WITHERS (ACTING)

1897-1899

As a result of the political turnover in the State administration in 1897, a new Governor was elected and a Populist-Republican combination controlled the Legislature. A bill was passed transferring the administration of the College and the Experiment Station from the State Board of Agriculture to a new board appointed by the Governor and confirmed by the Senate. The majority of the new board were Republicans but some Democrats were included. One of the most active members was J. S. Chamberlain who was Agriculturist for the Station when it was first made a part of the College.

At the first meeting of the Board on June 10, 1897, Chamberlain offered a set of 36 resolutions, most of which dealt with the Station. Two Democrats, Dixon and Connor, walked out of the meeting and so far as the records show never attended again. As indicative of the detail of Administration exercised by the Board and especially the Executive Committee the following pertaining to the Station are quoted:

"First—The Station Council shall be composed of the following members: Professor of Agriculture, Professor of Horticulture, Professor of Chemistry, together with the Director of the Experiment Station and President of the College who shall be Chairman.

"Third—In order to unite the Experiment Station more intimately with the College and to make the Department more efficient, and at the same time save funds, the following consolidations are ordered: Professor of Chemistry shall be a chemist of the Station; Professor of Horticulture and Botany shall be horticulturist, botanist and entomologist of the Station.

"Fourth—The position of Agriculturist of the Experiment Station shall be held by the Professor of Agriculture.

"Fifth—The position of Botanist and Entomologist of the Experiment Station shall be under the charge of the Professor of Botany and Horticulture of the College.

"Sixth—The Chairman of the Board and of the Executive Committee shall have a compensation of two hundred and fifty (\$250) dollars per year, and shall hold his office during the pleasure of the Board, fifty dollars to be paid by the College and two hundred by the Experiment Station.

"Ninth—Professor of Chemistry, W. A. Withers, with a salary of eighteen hundred dollars, of which eight hundred dollars shall be paid by the College and one thousand by the Experiment Station.

"Eleventh—Professor F. E. Emery, with a salary of two thousand dollars—one thousand to be paid from College funds and one thousand from the Experiment Station.

"Eighteenth—Assistant in Chemistry, J. H. Bizzell, with a salary of five hundred and fifty dollars to be paid—two hundred dollars to be paid from College funds and three hundred dollars from the Experiment Station.

"Twenty-fourth—The Board elects Mr. E. G. Butler to perform the duties of the Secretary of the Board of Trustees and Registrar of the Faculty and of Bursar and of Assistant Professor of English, with a salary of fourteen hundred and fifty dollars of which three hundred dollars shall be paid by the Experiment Station, and eleven hundred and fifty dollars to be paid by the College.

"Twenty-fifth—The duties of the Director of the Experiment Station now and heretofore performed by Dr. H. B. Battle shall be exercised temporarily after June 30, 1897 by Professor W. A. Withers, who shall act until the further orders of this Board, and his compensation for services shall be hereafter fixed by the Board. The Executive Committee is hereby empowered to appoint a regular Director of the Experiment Station and to fix his compensation.

"Twenty-sixth—Chief Chemist to the Fertilizer Control Station shall be C. B. Williams, at a salary of twelve hundred dollars to be paid by the Station. Second Assistant Chemist to the Fertilizer Control Station, Ceburn D. Harris, at a salary of seven hundred and fifty dollars to be paid by the Station.

"Twenty-seventh—The place of 3rd Assistant Chemist to the Fertilizer Control Station now held by S. E. Asbury, is left vacant to be filled at the discretion of the Executive Committee."

There were several more resolutions regarding clerks and assistants. Two other resolutions were adopted at this meeting as follows:

"Mr. B. S. Skinner is elected Superintendent of the Farm, Purchasing Agent, and keeper of the buildings and grounds at a salary of twelve hundred dollars to be paid by the Experiment Station."

"The Budget of the Experiment Station is referred to the Executive Committee as made by Dr. Battle for their action except as to salaries already fixed by this Board."

At a meeting of the Executive Committee on June 29, 1897, the following motion was passed:



DR. W. A. WITHERS

"The Administration office of the Experiment Station shall be at the College: Fix and Moore, Secretary and Clerk of the Station, will report to the Acting Director at the College and he will assign them their duties. Such of the books and records, shelves, dishes, etc. not used and required by the Fertilizer Control Division of the Experiment Station shall be transferred to the College as early as convenient and practicability will permit, and the Acting Director is authorized to carry out this order."

The actions of the Board and the Executive Committee were drastic and deserve comment.

The Board was in control and acted in an arbitrary manner down to the last detail. President Holladay was a member of the Board but the records do not indicate any activity on his part during the meeting. Director Battle and a number of other members of the staff were summarily discharged as of June 30, and their successors named.

Professor Withers stated in a subsequent report that he had no "knowledge on his part that such action was contemplated" when he was named Acting Director. It appears that the Board intended that the Executive Committee would name a Director but this did not develop and Withers continued as Acting Director during the two-year life of this board.

The Board was quite free with Station funds, making arbitrary allocations and division of salaries with little regard to work activity of the recipient. It should be pointed out, however, that the Board of Agriculture contributed \$10,000 per year for the fertilizer control analyses so that not all of the allocations from the Station budget were derived from the Federal Hatch fund.

It is significant that the Executive Committee ordered the Administrative headquarters moved from the Department of Agriculture building to the College. It had been eight years since the Legislature made the Station a part of the College, but there was no physical transfer and since the Director reported directly to the Board, the union with the College was largely in name only.

It was under these conditions that Professor Withers took the Administrative helm on July 1, 1897. Although, in one of his official reports he stated he was "highly appreciative of this distinguished mark of confidence," he must have summoned much of his great store of courage and nerve to undertake his assignment. He was a man of small physique and because of his nasal twang was affectionately called "phoney" by his students, but not in his presence.

## STATION COUNCIL

The Board appointed a Station Council under which the research work was to be guided. Fortunately the minute book (cost 50 cents) of the council, is still available. At its first meeting July 7, 1897, a number of matters were discussed and action taken. The functions of the divisions of Agri-

culture; Horticulture, Entomology and Botany; and Chemistry were outlined. It was decided that "original investigations of the Station would be carried forward under the direction of the Council" and the bulletins of the Station would be printed by order of the Council on recommendation by formal letter of transmittal.

Leave of absence for less than one day could be granted by the head of the division but for a longer period the Director had to approve on recommendation of heads of divisions. Records of such absences were to be kept.

All letters were to be sent to the Experiment Station and then referred by the Director or a clerk to the heads of divisions who were to answer but bring a copy of the reply to the central office for filing.

Subsequent meetings of the Council dealt largely with minor details similar to those acted upon at the first meeting. There were some serious matters, however, arising from time to time. The matter of finances arose more than once for expenses each year were greater than income. This problem was usually solved by reducing the allotments for supplies during the last few months of the fiscal year.

## EMERY VS. MASSEY

There were clashes of personalities, especially between Emery, the Agriculturist, and Massey the Horticulturist. As the second meeting of the Council, Massey moved that the land (10-acre farm) previously used by horticulture be turned over to agriculture. This was done, but in March 1899 Massey, who had been asked to prepare an estimate of expenses for the last four months of the fiscal year, replied: "I am compelled to say it is impossible for me to make an estimate at present. Having no land nor facilities for field experiments, it is useless for me to plan for work that I may be unable to do. If the Station is allotted to my department, and it is the only suitable land that is available and I am given control of team to do the work I shall need--"

Emery evidently took violent exception to Massey's request for in a bulletin (No. 168) published in June, 1899, he castigated Massey with the following: "The improvement in the land has been the most notable feature. When it came under this management all experiment work had been abandoned, except a little variety testing, and this by the Horticultural Division was soon abandoned.

"When the farm was projected here it was the opinion of the Commissioner of Agriculture at the time that the land was 'fit' for nothing but ballast!

"These years of cattle raising and cropping has not only raised the condemnation for barrenness, but within the past year the same Horticulturist, who abandoned the place as unfit for experiments, has concluded it is the only fit place for his work. He has also been extolling the system used to bring up this land which was so severely condemned, and which we

honestly believe is well worth the earnest interest of thousands of North Carolina farmers."

Massey took the matter later to the new President, Dr. Winston, but no record has been found of any disciplinary action.

The land in question is located just north of Hillsboro Street and east of Brooks Avenue.

It should be recorded that Emery was Secretary of the Council.

At a meeting in September Withers proposed a system of weekly reports from each division on work completed, work in progress, work proposed and recommendations. Objection was raised to the increased routine so a compromise was reached by making them monthly. Massey's reports seemed to become shorter from month to month. For two months, the minutes record "no written report from horticulture," and finally April 19, 1899, "Massey says 'there is nothing to report.'"

Undoubtedly, this situation reached the Board for at a meeting in August, 1898 the minutes show "moved that the salary of Professor W. F. Massey be referred to the Executive Committee with the direction that the President notify Professor Massey that the Board expects more work and better results from his labors in the future."\*

At one meeting of the Council, there was a discussion regarding staff members and under employees getting authority to do things directly from the President of the Board of Trustees but without consulting the Director. Apparently no motion was adopted but it is pointed out that President Holladay could probably go to the President of the Board and settle the matter "once and for all."

At this same meeting there was a discussion of the place of the Station Council in the Station and College organization. "Is it merely advisory? or authoritative?" No decision was made at that meeting, but the matter was left open for written views at the next meeting.

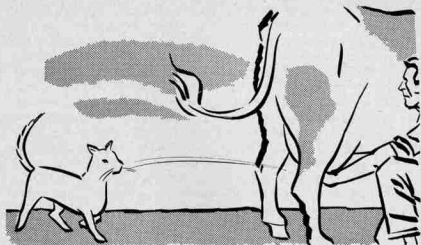
From minutes of the next meeting, "Professor W. F. Massey first read his paper and this was followed by one by Professor F. E. Emery. Both papers are in the hands of the president.

"After some further discussion defining more fully and in some greater detail, the need, or uselessness, of continuing the office of Director, President Holladay took the matter in hand for further study and this meeting adjourned."

Apparently the President kept the matter in hand for nothing further regarding the incident has been found.

The research work during the period from 1897 to 1899 was quite limited. Perhaps, under the circumstances, not much could be expected. Some limited tests in the field and in the barns were made, generally along the lines of previous years. In chemistry the work was largely routine

\* The writer was a student under these four professors and while he knew nothing about the controversies at the time, he finds it quite interesting to review the personalities of these pioneers of 50 years ago.



"The student milker has been found capable of doing any convenient thing. . ."

analyses of various kinds, and generally related to the field work of horticulture and agriculture and to the feeding tests of livestock and poultry.

During this period, the work at Southern Pines, where most of the horticultural work had been transferred, was discontinued and as we have seen, the Horticulturist had no land to use for outside activities. Massey reported that he had a "vast amount" of correspondence. He spent considerable time in Farmers Institutes and this helped to build up his correspondence.

Emery reported that much of his time was spent in teaching, "Hence some experiments well under way failed of results."

He stated further that the feeding experiments were left to the foreman and milker. "The student milker has been found capable of doing any convenient thing which suggested itself at the moment, and one needs to be conversant with the facts to give any weight to his words.

"—the result is worth little or nothing experimentally."

Hege, the poultryman, resigned during the summer of 1898 and his work was assigned to Emery. He endeavored to determine the amount of feed consumed by the chickens but met much difficulty. One of the chief obstacles was the "swarm of English sparrows which hung around and fed with the fowls."

Several methods of getting rid of the sparrows were considered. "To poison sparrows is out of the question as the sparrows falling in some yards will be eaten by the fowls. Whiskey, in baited pans, has several times been tried but we have not caught any birds though they have eaten the soaked grain put out for them."

Mr. Ford's invention that largely eliminated sparrows came several years later.

About 1896, tuberculosis developed in the Station herd. The U. S. Bureau of Animal Industry cooperated in testing all the animals. At a second test in May 1897, six animals reacted and these were destroyed. A separate herd maintained by the College was tested at this same time and a number of reactors found.

It was during Dr. Withers administration that the Fertilizer Control Station was made a division of the Station and thus marked the beginning of a complete separation of research and control activities. As a result of this division of work the chemical research work was moved from the Agricultural Building in Raleigh to the College. This laboratory was located in Holladay Hall in the room now occupied by the Chancellor.

Dr. Withers served as Acting Director until early in August 1899.

He labored manfully under many handicaps. He was appointed without his knowledge and never knew when the Executive Committee, which had the authority, might appoint a new Director.

One cannot but admire his vision of possibilities to serve the State through an adequately financed and well-staffed Station. In a letter addressed to the President (Holladay) dated June 1, 1899, he reviewed the history of the Station and made definite recommendations regarding administration and organization which to a large degree were adopted in the coming years. Parts of his recommendations were included in the printed annual report of the Director but not as full or as personal as in the typed copy. He knew that a new Board was to take charge and could anticipate a new Director in the near future.

## RECOMMENDATIONS

Because of his vision and subsequent developments some of his observations and recommendations are here recorded.

He pointed out that at that time, 1899, there were 54 stations in existence. Some states had more than one.

"While North Carolina in point of age and from the character of her work maintains a leading position, yet it is somewhat painful to say that it seems to be true that July 1, will find us the only Station in the United States in existence before the passage of the Hatch Act, which does not supplement the Federal appropriation by funds from the State Treasury or elsewhere. The only way the North Carolina Station can maintain her high place in the sisterhood with her more limited means is to employ better men than the other Stations can get."

(It was nearly 40 years before the Legislature saw fit to appropriate and support from the State's General Fund.)

As regards the location of the Station at the College he stated. "It is difficult to see how there could have been any wiser plan adopted. There is no atmosphere so good for original investigations as that of a College, and of all kinds of colleges the Agricultural College should be the best for agricultural investigations. . . . Teaching and experimental work are some-

what closely connected and yet each worker is liable to turn his energies more largely to the one side or the other. There is probably no objection to this as far as the individual or his work is concerned but it seems desirable that the work as a whole should be arranged so that the teaching nor the experimental work should be neglected."

He outlined the organization of the Station as consisting of "the Executive Division, the Division of Agriculture (including livestock); the Division of Horticulture, Botany, and Entomology; the Veterinary Division, the Division of Chemistry; and the Fertilizer Control Division."

And the "Recommendations: I would respectfully recommend that the Board of Trustees be requested to define the duties, or at least the scope of work of the different divisions of the Station.

"I would recommend that the Station Council be dissolved or that its duties be defined.

"I would recommend as to the titles of the members of the Staff that after the President and Director's titles which are in general use throughout the world and are well understood, that in the list of the Station Staff, the teaching title be given to each member or that simply the subject of his special work be given. . . . Either of these plans would remove from the public mind, the idea that any individual held a multiplicity of offices when in reality it was only one. . . .

## AGRICULTURAL DIVISION

"The Agricultural Division includes the work in field crops, livestock, and poultry. It seems to me too broad a field for one whose time is taken up somewhat largely in teaching unless some skilled assistant is employed. . . . If the present Agriculturist is retained, I would recommend that an additional assistant be given whose time is to be taken up very largely or entirely, with experimental work. If the present Agriculturist is not retained, I would recommend the establishment of two divisions, in place of one, viz: Field Crops and Animal Industry (including poultry). The horses, mules, milk cows and other cattle, sheep, swine, chickens, turkeys, geese and ducks in North Carolina are worth about twenty six millions of dollars. It seems to me that the time of one man is not too great to give to such vast interests. Especially is this true in North Carolina where there is so much need for development along these lines. The annual crop of cotton, corn, wheat, oats, hay and rye amounts in North Carolina to about forty million dollars annually. With our soils becoming impoverished, it seems that we should at least have one man to make a study as to new or improved crops or methods of culture. While the practical farmer must consider together these two grand divisions, yet the principals underlying the growth of each are very different. In fact, if our Station had twice or three times the funds it has, I should recommend the employment of a specialist in dairying, another in sheep and swine husbandry, and another

poultry, and I would even divide the work in field crops." (Note that tobacco is not mentioned.)

"The Horticulturist complains of the lack of land for his work. I would respectfully recommend that if suitable land is available for his purpose, that it be assigned him. Otherwise, I would recommend that he be instructed to give his attention to such horticultural investigations as may be maintained in the greenhouse or in small garden plots.

## HORTICULTURE, BOTANY AND ENTOMOLOGY

"The Division of Horticulture, Botany, and Entomology appears to me too broad in its scope for any specialist to perform the duties successfully. The fruit, garden, and trucking crops in the State are immense. It is quite probable that the annual crop of apples and peaches is worth about seven millions of dollars and we all know the indifferent care given to these crops. It seems to me that the field of horticulture is sufficiently wide for a specialist.

"It seems to me that the Station should have the services of a specialist in Biology and I do not mean by this that he should cover the whole range of Biology. Indeed, that is too broad a field for any specialist. Our work it seems to me, would more profitably be given to the study of the various plant diseases and pests and our work therefore would be in bacteriology and entomology, but both from an economic standpoint.

"The investigations in animal diseases seem to involve so many difficulties and such great expense that I am not sure as to the desirability of our attempting any work along this line except as may be accomplished by our specialist in Animal Industry."

Dr. Withers comments regarding the scope of work of the Station are almost prophetic.

"Upon examining the Hatch Act, we find authority for only two kinds of work, viz: the conducting of original research and the diffusing of useful and practical information. There cannot be any doubt that Agricultural Research or investigation is contemplated by the Act. It is held by the Agricultural Department and by the leading stations that this is the principal object for which the Station was established. Experimental work means simply finding out something and telling it and as so little has been told about agricultural work, there may still be a great deal of telling with but very little effort at finding out, and yet the information may be of the greatest value. It is a popular idea that the farmer scorns information conveyed to him in books. If this idea were correct, we should not see such a great demand for the educational bulletins of this Station, the farmers' bulletins of the United States Department of Agriculture, the agricultural newspapers and the very excellent text books on the subject which are getting to be fairly numerous. When, however, the language of agricultural science assumes a written form as well as a spoken one, the farming

public will demand in the bulletins and in the newspapers new information and not a rehash of the old. At present, however, there is great need for educational bulletins. These must not, however, be considered the principal work of the Station, for if so, the only equipment necessary for the prosecution of its work would be the well known equipment of the editor, viz: the tripod, shears and glue pot.

## INFORMATION

"It has been suggested by some that the diffusing of information may be construed to include teaching in the College, on the ground that it will prove of value. I do not think this point can be maintained for a moment. When the first Morrill Act was passed, many well meaning people were of the opinion that the ideal course for a farmer was included in the old classical curriculum and such a plan was actually followed in some of the States. A joint construction of these two ideas would mean that the Hatch Fund could be used for teaching Latin and Greek or anything else. The Federal Congress has enacted two different laws making appropriations for the teaching in the College and if it had been the desire of Congress to use the Hatch Fund for teaching purposes, it would have made this purpose as plain in this as in the other two Acts. But besides all that, the Secretary of Agriculture has made a ruling that the Hatch Fund cannot be used in whole or in part to defray the expense of teaching, and as the approval rests with him, it seems that the matter is effectually settled. To attempt to do so would mean a loss of prestige among our sister Stations. I hold it as correct that we should beware of a physician who does not stand well in his profession, of a lawyer not respected by the Bar, or of a teacher whose Colleagues do not think well of him and his work. I see no reason why the principle may not apply to all lines of work including that of the Experiment Station. It seems to me that all the energies of the Station should be directed toward an economic study in the field, stable and laboratory, of plant and animal production. I consider that other work, no matter how great its importance, has no place in an Experiment Station."

To some present day administrators and investigators, Dr. Withers' philosophy may seem academic but we should remember that he served during the formative period of guiding policies and his thinking as regards organization and functions was far ahead of most of his contemporaries.



50th Anniversary, April 17, 1927.

Bottom row, left to right: S. C. Clapp, Supt. Swannanoa Test Farm; H. C. Evans, Auditor, Extension Service; Charles Dearing, Supt., Willard Test Farm; Fred Miller, Asst. Director, Test Farms; W. A. Graham, Commissioner of Agriculture; H. B. Battle, Director, 1887-1897; R. Y. Winters, Director, 1925-1937; I. O. Schaub, Dean of Agriculture, N. C. State College; Clarence Poe, Editor, Progressive Farmer; C. W. Dabney, Jr., Director, 1880-1887; B. W. Kilgore, Director, 1901-1907 and 1912-1924; C. B. Williams, Director, 1907-1912.

Second row: E. H. Hosteller, Animal Husbandry; F. W. Sherwood, Chemist, Nutrition; Robert Schmidt, Horticulture; R. E. Currin, Supt., Edgecombe Test Farm; S. G. Lehman, Plant Pathology; Frank Meacham, Supt., Statesville Test Farm; M. E. Gardner, Horticulture; C. F. Williams, Horticulture, A. F. Bowen, Treasurer; Un-

known (head facing right); R. F. Poole, Plant Pathology; Z. P. Metcalf, Entomology; B. W. Wells, Botany; E. G. Moss, Supt., Oxford Test Farm; B. F. Kaupp, Poultry.

Third row: T. B. Mitchell, Entomology; J. L. Rea, Supt., Blackland Test Farm; F. H. Smith, Animal Nutrition; Jerre Moore, Plant Breeding; G. W. Forster, Agricultural Economics; W. A. Anderson, Rural Sociology; Carl Taylor, Rural Sociology.

Fourth row: W. F. Pate, Soil Fertility; Frank Jeter, Publications; R. J. Saville, Agricultural Economics; A. S. Cline, Agronomy; Roy Dearstyne, Poultry; Herman Wilfong, Poultry; S. J. Jackson, Agronomy.

Top row: G. W. Randall, Horticulture; C. D. Matthews, Horticulture; J. O. Halverson, Animal Nutrition; and L. G. Willis, Agronomy.



## DR. GEORGE T. WINSTON

1899-1901

The Democrats gained control of the State administration in the November election in 1898 and the Legislature which met in January, 1899 provided for a new Board of Trustees of the College, which of course was largely Democratic. The new Board moved immediately to countermand some of the actions of the Republican-Populist Board. To that end a committee was appointed on investigation and reorganization of the College. This committee met April 18, 1899 and invited each head of a department and the President to appear before the Committee the next day to explain the work of his department and to answer questions. Following this personal appearance, each head was "requested to prepare within a week from this date, a statement showing the duties performed by the head of the department and of each assistant. The statement should include the names of persons and salaries attached to each office; also any recommendations which in the opinion of the head of said department will make the work more efficient and without increase of expenses or equipment for the next year."

The minutes of the Committee show that all heads appeared before the Committee and written reports from all except Emory have been found. Perhaps Emory felt that a written report from him would be useless since the Committee recommended following his personal appearance, "that the chair of Agriculturist of the Station be declared vacant."

This action, later approved by the full Board, displaced Emory, who had succeeded Irby under the old Board. Irby, who had been in business selling farm supplies was reappointed after 11 ballots, to take Emory's place, but two years later his position was to be declared vacant.

Professor Massey submitted a three-page, single-spaced report and also wrote a one-page, single-spaced statement to Mr. W. J. Peele, a member of the Committee. Massey was critical of the administrative organization and was bitter regarding the action of the former Board in appointing C. W. Hyams as his assistant. He had recommended another man for the place, but the board had appointed Hyams "in my absence." He pointed out that Hyams was paid \$1,200 per year, while he, Massey, received only \$1,000 from the Station. He recommended that Hyams be discharged with the statement, "but as I have remarked, this work is of too little importance for the College or the Station to afford \$1,200 per annum for the doing."

According to Massey, during his personal appearance before the Committee, he was asked whether he could operate the farm at a profit? "I can make it pay beyond a doubt," he stated in his written report. He criticized the former manager (Emory) for keeping more animals than the farm would support. They are "eating their heads off."

He also complained that he had no land for horticultural work and requested that the 10-acre experimental farm, then used for poultry, be assigned to Horticulture. He stated that, "in this the only experiment seems to be to sell chickens and eggs." He further suggested that the divisions of agriculture and horticulture be combined under him, "I believe that if the chairs of agriculture and horticulture are placed in my charge with Mr. Skinner and Mr. Rhodes as assistants, we can develop the commercial features in a way that will soon show for itself."



DR. GEORGE T. WINSTON

In his statement to Peele, Massey made several specific recommendations. He stated, "I believe that the organic law of the Hatch Stations requires that they be departments of the College and not something merely glued on to the College by association."

He recommended further that since the Station was a department of the College the logical head was the President of the College and, "there should be no divided authority between him and the Station staff." He felt that if the members of the Station staff were responsible to the President of the College, "just as the professors of the College faculty are, and should not be expected to divide their allegiance with someone termed Director."

Massey advocated that the outlining of the different experiments to be undertaken should be in the hands of a standing committee of the faculty of the College, consisting of those actively engaged in the Station work with the President of the College as chairman and that after full discussion and conclusions each Station worker would be allowed full liberty in his work and the means for doing it, and then held to strict accountability for the results he reported annually to the President.

He further advocated that every Station worker also have some teaching in the College but not be expected to take a full load. Part of their salaries would be paid by the Station, and part by the College. "My idea is to do away for ever with the double-headed monstrosity of College and Station and to unify the work completely except so far as it is necessary to keep the account separate in both funds."

Professor Withers, who had served as Acting Director of the Station for the past two years, described very briefly the organization of the Station and then made recommendations for changes, together with three alternatives.

In describing the existing organization, he pointed out, "that the President of the College is Ex-officio President of the Experiment Station, and as such exercises the same general supervision over his work that he exercises over the other departments of the College." It will be recalled that in the previous chapter the authority and function of the Station Council was not clearly defined and there was much discord between the members of the Council.

In addition to the Director's Office, there were four technical divisions, viz., agriculture, horticulture, botany and entomology, chemistry and veterinary science.

Evidently there had been considerable discussion between the members of the staff and members of the Committee prior to the formal meeting, for Withers states, "Taking it for granted that the policy of the Committee is to relieve Professor Massey of Station work entirely and give him charge of the Department of Agriculture and Horticulture in the College with Mr. Rhodes as Assistant, and Mr. Skinner as Farm Superintendent and to relieve Professor Emery and Professor Curtis of both College and Station work, I would respectfully submit the following recommendations." Among his recommendations was the specific statement, "That the Station Council be abolished." He further recommended, "That the Director be responsible to the President and to the Board of Trustees for the technical work of the Experiment Station and that the Chief of each Division of the Station be responsible to the Director for the performance of his duties." He recommended a Division of Field Crops, a Division of Animal Industry, a Division of Horticulture and Biology, and a Division of Chemistry.

As regards functions, Withers recommended that the chief of the Division of Field Crops and of Animal Industry have no connection with teaching work, or certainly not more than two or three hours a week with the higher classes. In the case of Horticulture and Biology he recommended that the chief of the Division of Horticulture and Biology be a professor of Biology in the College and that his Station work be mostly in the line of greenhouse work and in the study of plant diseases. As regards the Department of Chemistry, he made practically the same recommendation as that regarding field crops and animal industry.

His first two alternative suggestions dealt with minor matters. His third alternative dealt specifically with field crops, livestock, and horticulture and biology. In this instance, the head of the division would be responsible for the teaching and the research in his respective line. Under this plan the College Farm would be operated independently, but with the idea that the crops and vegetables grown would serve some instructional purposes.

As regards experimental work in the case of animal industry, it would be conducted in the College Barn, with one herd of cattle, and such lots as might be assigned for the use of the cattle, sheep and swine.

In the case of horticulture and biology, experimental work would be confined to the study of plant breeding and plant diseases that might be carried on in the greenhouse, cold frames, laboratory, and a very small tract of land adjoining Primrose Hall. The officer in charge would instruct the College Farm superintendent as to the vegetables which should be grown on the College Farm for the purpose of instruction, but that the farm superintendent would determine for himself as to the proportion of the land to give to the different crops and would be responsible for the cultivation without further instruction from the head of horticulture.

Withers recommended that provision be made to issue weekly press bulletins relating to practical farming in the name of the College so the College might get the benefit of the advertising.

In connection with field crops, he recommended a professor of field crops who would have no connection with the farm of the College or the Station, but in addition to his teaching work, he might be responsible for the weekly press bulletins. He stated, "Professor Massey would perform these duties satisfactorily." As regards field crops and the Station, he recommended a chief who would conduct his work upon the Experiment Farm and have no connection with the College Farm or instruction. His experimental work would be with garden crops as well as with field crops. According to his recommendation, "This plan would separate College and Station work in field crops and would place classroom work and farm management in the hands of specialists.

The Committee did not accept the full recommendations of either Professor Massey or Professor Withers. As regards the Station Council, the Committee recommended its abolishment at its meeting on April 19, and before it had received Professor Withers written recommendation. The Committee met again on May 2, at which time a motion was passed, "that the Executive and Governing Officer of the Institution be known as President and Director." This was in line with Massey's recommendation. Undoubtedly, his recommendation had influence with the Committee, but probably the financial condition of the Institution as a whole, was also a factor.

There was a deficit of approximately \$12,000 July 1, 1899. The anticipated income was as follows:

Morrell fund (second act)	\$16,235
Landscript fund	7,500
State appropriation	10,000
Student fees	3,000
	<hr/>
Total	\$36,735

In addition, there was the Hatch fund amounting to \$15,000.

It will be noted that there was only \$10,000 of direct State appropriation, but in effect the Landscript fund also came from the State to replace the

total loss of this fund while under the jurisdiction of the Board of Trustees of the University in 1869.

In actual practice, the Hatch fund became a part of the general fund. For all of the teachers in agriculture and chemistry, plus the President, the Treasurer, Chairman of the Board, janitor, nightwatchman, and clerical help received part of their salaries from the Hatch fund.

The Committee, at this meeting on May 2, passed the following motion: "That in the plan of reorganization determined upon not less than \$10,000 and not more than \$11,000 be used to pay salaries out of the Hatch fund." The full Board meeting in June approved a budget for salaries in the College and the Experiment Station of \$29,815, of which \$19,353 was from the college and \$10,462 came from the Station. The President's salary was \$2,500, of which \$1,000 was from the College and \$1,500 from the Station.

As to the organizations of the divisions or departments, the Committee recommended that the heads be responsible for the teaching and the research work in their respective fields, with assistants who usually had some teaching and also looked after such research work as was undertaken. Professor Massey was given the 10-acre experimental farm and the poultry flock was moved to the campus and located approximately where Page Hall now stands.

Undoubtedly, the reorganization committee knew of the impending resignation of President Holladay, for he had been in ill health for some time. He did submit his resignation to the full Board early in June and then there developed a struggle in the selection of his successor. Dr. Winston,



Former Zoology building at State College was the first home of agricultural work.

then president of the University of Texas, and Mr. Primrose, Chairman of the Board of Trustees, were the two main candidates. The Board took four ballots in June without anyone getting a majority and on July 5, 1899 elected Dr. Winston on the sixth ballot by a majority of one vote. Years later it was surmised by some people that Dr. Winston made it one of the conditions of his acceptance that he be President and Director. Obviously this was not a factor for the Committee had made its recommendation in April and it was nearly three months later before Winston was finally appointed.

From the standpoint of research, for two years the Winston administration was of little importance. Winston was a brilliant, classical scholar and his administrations of the presidency of the University of North Carolina and of Texas were of classical institutions. He had many problems in connection with the administration of the College and had little time and probably not too much inclination to give direction and leadership to the Station. Also, the Board of Trustees exercised more authority and direction over details of every kind than has been the case in later years. In the annual reports of the Station, the staff members reported the same general lines of activity as during the Withers administration. The technical staff all had teaching duties and since classes had to be met at stated hours, the research time was limited and was secondary to the teaching.

Without question, Hatch funds to a large degree were used to tide over the College during a period of financial stress. Under present conditions, the Secretary of Agriculture would not approve expenditures such as were made in 1899 and 1900. In fact Dr. A. C. True made an inspection in 1900 and in a long detailed letter called attention to certain practices that had to be changed. These will be discussed more in detail under the succeeding administration.

In June, 1901, Dr. Winston offered his resignation as Director of the Station. He stated that he had felt for some time that the President should not be Director. He further recommended that the research work of the State Department of Agriculture and that of the Station should be under one head and to that end he recommended that Dr. B. W. Kilgore, the State Chemist, be appointed Director.

The previous Legislature had again made the Board of Agriculture the Board of Trustees of the College, and the change recommended by President Winston met with the approval of the Board. In fact, Winston had discussed the idea with the Commissioner of Agriculture, Dr. Kilgore, and some members of the Board so the approval of the Board was largely a formality. Winston's administration of the Station expired June 30, 1901 and he was succeeded on July 1, by Dr. B. W. Kilgore.

## DR. B. W. KILGORE, 1901-1907

The Legislature of 1901 again made the Board of Agriculture the Board of Trustees of the College, but in addition provided for a Board of Visitors. This Board of Visitors had no authority but was directed to inspect the College from time to time and make recommendations to the Board of Agriculture. Thus was created a situation that could result in confusion and friction. In due time that was what happened.

It had been four years (1897-1901) since the Board of Agriculture was also the Board of Trustees. During this time Dr. Kilgore was the State Chemist under the Board of Agriculture and largely through his influence the Department had initiated lines of research separate from that conducted by the Experiment Station, some of which was to be of great significance in future years.

One important step was the initiation of soil survey work in the State. At a Board meeting in December, 1899 the Board ordered, "That the State Chemist be directed to investigate the soils of the State with a view of classifying them for the purpose of conducting experiments with a view to ascertain the fertilizers suitable to improving the crops of the different soils.

"That three members of the Board be appointed by the Chair to act with the Commission of Agriculture and the State Chemist in carrying out this work, and that \$1,000 be appropriated for conducting this work."

In the meantime, Kilgore had been in touch with those in charge of soil investigations of the U. S. Department of Agriculture and proposed cooperation of the U. S. Department of Agriculture and the State Department of Agriculture in making soil surveys.

### TEST FARMS

At a meeting of the Board of Agriculture in March, 1900, Mr. McCallum, representing the committee on soils and fertilizers work, submitted a report on the location of farms for soil experiments and a motion was passed "that the soil experiments in the different parts of the State are to be known as 'Test Farms.'" At this same meeting a motion was passed appropriating \$500 to carry on the work of the Soil Survey in co-operation with the United States Department of Agriculture.

A farm had been rented at Red Springs in Robeson County, and the work was under way. At a March meeting of the Board, Mr. McCallum recommended that a Superintendent be employed for this farm and that \$500 be appropriated for that purpose.

At the June meeting of the Board Mr. McCallum again reported for the Committee on Test Farms and Soil Survey, approving the work that had been done and recommended its continuance. Later the Board appropriated \$1,000 for Test Farms and \$1,250 for Soil Survey.

A year later, in May 1901, the minutes record: "Dr. Kilgore entertained the Board for an hour with an interesting recital of work on the farms,

and exhibited samples of vetches, grasses and soils. He described the work of the Soil Survey, the progress so far made, and spoke of its future prosecution."

It is quite evident that the Board members were enthusiastic about the work. They discussed the need for more test farms and the next day appointed another Test Farm Committee with Dr. Kilgore as a member and Chairman. As a result of the work of this Committee, the Board at the December meeting approved the purchase of a farm of 201.42 acres in Edgecombe County for \$1,913.48 and appropriated \$1,000 for buildings.

Also at this session the Board, on the recommendation of Governor Aycock, appropriated \$7,500 additional for the State's part of Soil Survey.

The Experiment Station at the College had an annual income of \$15,000 from the Hatch Fund plus a small income from farm sales. Far too large a proportion of these funds went into the salaries of professors, assistants and other employees not too productive in research efforts.

The combining of the research of the two State Agencies undoubtedly appeared perfectly logical under the circumstances. However, President Winston did not foresee the complications that were to arise and that while legally the Station was part of the College, yet in practice and in the public mind it was a part of the State Department of Agriculture.

Dr. Kilgore assumed the responsibilities of the Director on July 1, 1901. He had a letter from Dr. A. C. True of the U. S. Department of Agriculture that indicated in no uncertain language certain practices that had to be changed to comply with the Hatch Act. He was obligated to re-organize the Station work and to that end a meeting of the Executive Committee was called on July 16, 1901.

The first action of the Committee was to accept the resignation of Prof. W. F. Massey as Professor of Horticulture and Biology in the College, thus removing from the faculty group a rugged individualist who had more or less been a storm center for several years. He was to remain for some time, however, as a member of the Station staff.

Following action on some minor matters, the Committee called on Dr. Kilgore. He first read the letter from Dr. True and then made the following recommendations:



DR. B. W. KILGORE

"1. It is insisted that the Board should hold the Director fully responsible for the management of the Station and should give him liberty of action commensurate with his responsibility. He should plan and direct the work of all experiments of the Station. The Station should be definitely and fully under his control. He should approve the requisitions and bills and should be responsible for the careful and proper expenditure of the Station Funds. With the Director having such duties and responsibility, it is deemed unnecessary that the President of the Board of Visitors should be paid \$200 for auditing the Station accounts.

"2. The Bursar of the Experiment Station and College is paid equal amounts from the College and from the Station, which is considered not only too much from Station Funds, but is an unfair division in proportion to the amount of work to be performed for the two institutions.

"3. The amount paid the Dairymen, \$150, which is supplemented by an equal amount from the College, is deemed insufficient for obtaining a man of sufficient skill to perform work of experimental value in this line.

"4. The amount paid for salaries in the Chemical Department is rather out of proportion to that allowed other departments. This criticism is made without reference to work which has been performed by the Chemical Department, and is not intended as a criticism of the work or management of the Chemical Department.

"5. \_\_\_\_\_  
"6. Inasmuch as it has not been possible to arrange definite plans for experimental work, especially in the Agricultural Department, of the Station, I ask that the Director, until the next meeting of the Board, at any rate, be made responsible for plans of work and for the expenditures necessary to put these plans in operation."

The above recommendations, together with some minor details, were approved by the Executive Committee.

This marked the beginning of an entirely new administrative policy for the management of the Station. It definitely placed authority with the Director instead of the Chairman or a Committee of the Board, and while the President of the College was consulted regarding many matters, he at most exercised little control. As a matter of fact, while the Station was by Federal Statute a part of the College, the Director's office was in the State Department of Agriculture in the city. The work of the Station was soon interwoven financially and in scope with that of the Department of Agriculture, and the public soon looked upon the Station as a function of the Department rather than of the College.

This was the situation in the spring of 1902 when the Board of Visitors visited the College. The members of the Board of Visitors took their duties seriously and apparently felt they had more authority than was conferred by the law which created the body.

The Board made two proposals to the Board of Agriculture.

The first proposal was that a joint committee composed of representatives of the two Boards be created which would serve as a College Committee to act on all matters concerning the College when the Board was not in session. The argument was that the College was concerned not only with agriculture but with various phases of engineering and the textile industry and representatives of those interests should be represented on the Board.

The Board of Agriculture took the request under advisement and after several meetings advised the Board of Visitors that the Legislature had charged the Board with the responsibility and therefore the request was declined. Later a visiting committee representing the two boards was appointed. This Committee made joint recommendations to the Board of Agriculture and in the main such recommendations were approved.

The second request of the Board of Visitors specifically asked that the Experiment Station be returned to the College and placed under the Professor of Agriculture. This engendered much discussion and since the action taken has a direct bearing on relationships between the Department of Agriculture and the College from that date until the present time, the minutes of the Board on both requests are quoted in full.

MINUTES FROM MEETING, BOARD OF AGRICULTURE, AUDITORIUM,  
AGRICULTURAL BUILDING

Raleigh, May 27, 1902

"The Board of Agriculture, having invited the Board of Visitors of the North Carolina College of Agriculture and Mechanic Arts to present any recommendations touching the affairs of the College which they had prepared, Chairman Patterson welcomed them and Mr. W. S. Primrose, Chairman of the Visiting Board responded and requested the secretary, Mr. Smith, to read a resolution which had been prepared by the Visiting Board with a view of securing some joint authority to be vested in the joint committee for the control of the College.

"Mr. Smith read the following: 'Whereas the North Carolina College of Agriculture and Mechanic Arts is composed of departments for the study and encouragement not only of agriculture, but also of electrical, mechanical, chemical, mining and civil engineering and textile industries, and,

"Whereas, we believe that the greatest good would be obtained by having men representing these various interests to assist in all matters pertaining to the College, and therefore, be it

"Resolved, that we, the Board of Visitors, suggest to the Board of Agriculture that a college committee be formed consisting of four members of the Board of Agriculture and three members of the Board of Visitors to be selected by their respective boards who shall have power to meet upon the call of the Commissioner of Agriculture and to act upon all matters pertaining to the College, in the interim of the meetings of the Board of Agri-

culture and not inconsistent with the rulings of the said Board, and the compensation of said committee shall be fixed by the Board of Agriculture. Provided, this committee shall be required to meet at least thirty days before the annual meeting of each of said boards, thoroughly examining the College in all of its departments, and transmit a copy of this written report in detail, together with their recommendations, to each member of said boards, at least twenty days before their annual meetings.'

"Upon request of Mr. Primrose, Mr. D. A. Tompkins addressed the boards in advocacy of the adoption of the resolution. At the conclusion of Mr. Tompkins' remarks the Chair requested Mr. Smith to read again the resolution which was made.

"Major Graham moved that the resolution be received, and that the Board of Visitors be advised that the Board of Agriculture would take the matter under consideration and a reply given as soon as a conclusion is reached. Adopted.

"The Chairman replying to an inference made by Mr. Tompkins in the course of his remarks, that the Advisory Board had not been informed in regard to the new buildings in course of erection at the College, that neither the Board of Agriculture nor the Committee charged with the work had had opportunity for doing so, as that body had not been in session since these were undertaken.

"Upon request and in order to allow the Visiting Board to hear it, President Winston read his report of the College.

"Mr. Clark of the Board of Visitors presented the following resolution explaining that it had a bearing on a portion of the Report of the President of the College, to wit:

"Whereas, since the last meeting of this board, the Agricultural Experiment Station has been transferred from the College to the Department of Agriculture in Raleigh, under the directorship of the State Chemist; and whereas, the Experiment Station should be a department of the College, and was contemplated by the law of its establishment, and should be so operated with the mutual benefit of both College and Station, so that the College professors, instructors and students may be used as far as possible in the work of the Station and may derive therefrom the largest possible benefits of instruction and experimentation; and whereas, the present location of the Station at so great a distance from the College necessarily causes much inconvenience; and whereas, the professor of agriculture in the College is well qualified to direct the work of the Station:

"Therefore, it is the sense of this Board that the Experiment Station should be returned to the College under the directorship of the professor of agriculture, instead of being located in the Department of Agriculture, in Raleigh under the directorship of the State Chemist.'

"Upon request, President Winston addressed the Board in regard to this resolution; he stated that as he had taken the initiative a year ago in resign-

ing the directorship he now wanted to acknowledge that he had made a mistake in the matter, and without reflecting in any way upon either the Board of Agriculture or upon Dr. Kilgore in his management of the Station, he wanted to ask the Board to rectify the mistake, to help him correct the mistakes, etc.

"The Commissioner reviewed the history of the Experiment Station in this State and was followed by Messrs. Primrose, Smith, and Graham in short addresses."

#### Afternoon Session

"The Chair called the Board to order and announced that the business before the Board was the consideration of the resolution of the Board of Visitors asking for joint management of the College. The Secretary was directed to read the resolution, after which there was a discussion by Messrs. Graham, Cannon, Allen, and Ray.

"Major Graham moved that the Secretary be instructed to transmit the following paper to the Board of Visitors as a reply to this Board, to wit:"

"The Board of Agriculture has considered the resolution of the Board of Visitors for joint committee of the two boards as to the government of the A. & M. College, and concludes as follows:

"That the intent of the law to commit the management of the College solely to the Board is so evident that we do not feel authorized to act otherwise. We will respectfully receive any suggestions and recommendations your Board may submit, and give them careful consideration.'

"The Experiment Station Resolution was called up and discussed informally.

"Mr. Kilgore was requested to give the status of the Experiment Station; he stated that he had heard Dr. Winston's presentation of the subject and would like for that gentleman to hear his, but Dr. Winston having returned to the College to attend to other duties, he was obliged to proceed without him; he replied to the request of the Board by giving a detailed statement of the affairs of the Station and how they were conducted and by whom the work was done.

"Mr. McCallum moved that we decline to accept the proposition presented in the resolution and that a committee consisting of Messrs. S. L. Patterson and W. A. Graham be appointed to prepare an answer to the resolution. Adopted."

#### Afternoon Session May 28

"The Board met at the appointed hour and Major Graham submitted the following which on motion of Mr. Cannon was unanimously adopted as the answer to the Board, and the Secretary was instructed to furnish a copy of the same to the Chairman of the Board of Visitors; to wit:

*To the Board of Visitors of A. & M. College  
Gentlemen:*

The Board of Agriculture as trustees of the A. & M College have carefully considered the matter presented by you in the attached resolution and return the following in answer thereto.

#### HISTORY OF THE NORTH CAROLINA EXPERIMENT STATION AS RELATED TO THE BOARD OF AGRICULTURE

"The North Carolina Agricultural Experiment Station was organized in 1877, in connection with the Department of Agriculture, which relation continued to exist until December, 1889.

When, and consequence of the Hatch Act, passed in 1887, making appropriations for the support of Agricultural Experiment Stations in connection with colleges of agriculture and mechanical arts, the Station was transferred from the Department of Agriculture to the agricultural college, the delay in the transfer being due to the fact that the college did not open until 1889. At the time of the transfer in 1889, Dr. H. B. Battle was the Director of the Station and the State Chemist to the Department of Agriculture, which position he held until July 1, 1897, when the change in the administration caused his resignation.

Previous to and from 1889 to 1897, the Director's office was in the Agricultural Building, where it now is, and the Director was also State Chemist to the Department of Agriculture, which is the identical relation existing at present. In addition to this, the chemical work of the Station was done during these years in laboratories of the Department, while the agricultural and horticultural work were conducted at and near the College, the agricultural work being on the ground now used for the horticultural experiments of the Station. During these years the Board having charge of the Department of Agriculture, the college and the Station considered that the Station was well conducted and bore a proper and legal connection with the College.

From 1897 to 1898, the Director of the Station, as in previous years, was also State Chemist, and from 1898 to 1899 the Station still did the chemical work for the Department of Agriculture under the general supervision of the Director of the Station and in the laboratories of the Department, as in previous years.

From June 1899 to 1901 the Department of Agriculture and the Agricultural College were under the management of different boards and there was no connection between the Department officers and the Station officers, but again in June 1901, the two institutions came under the management, in accordance with the Act of the Legislature that year, of the same Board—the Board of Agriculture. At that time and on the recommendation of the President of the College and Director of the Station, the old arrangement of 1889-1899 of the State Chemist being also the Director of the Station was resumed, the reason for the return to the former plan being

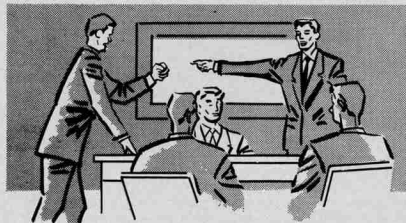
expressed in the following note of resignation of Director Winston, dated June 4, last:

"Gentlemen of the Board: Believing that it will promote the efficiency both of the college and of the Experiment Station, I respectfully request that you accept my resignation as Director of the Experiment Station, and elect as my successor Professor B. W. Kilgore. This arrangement will enable me to devote myself for more efficiency to the management of the College, and will make it possible to carry on all agricultural experiment work in the State under one head and according to one general plan.

Very respectfully  
George T. Winston, Director"

"There was no suggestion at that time that the Experiment Station was being turned over to the Department of Agriculture, nor do the present relationships of the two institutions justify the statement in the resolutions of the Board of Visitors that the Station has been transferred from the College to the Department of Agriculture, as the connection now of the Station and the College, instead of more remote, is as close, if not closer, than it has ever been in the previous history of the institutions, except possibly during the two-year directorship of Dr. Winston from 1899 to 1901, and that change was made not only at the suggestion but on the recommendation of the Head of the College. The latter statement is based on the following facts:

"All of the experimental work of the Station and its several branches, agriculture, horticulture, and chemistry, is conducted by the professors and their assistants in the college, they draw their salaries jointly from the College and Station, and do their work entirely in the laboratories and fields of the college; the Director and veterinarian are the only two Station officers who do not reside at the College; the latter's salary is paid jointly



Which group shall direct research work at the Agricultural Experiment Station?

by the Department of Agriculture and the Station and though the College pays him no part of his salary, he does teaching in veterinary science in the College, as does the State Entomologist also, who gives instruction in entomology, though all of the salary is paid by the Department of Agriculture. The Director draws half of his salary from the Department and half from the Station, though the Department reimbursed the College for the full amount of the half salary of the Director paid by the station, which is equivalent to the Department's paying all of the Director's salary. In this way, it is seen that the Department of Agriculture in addition to giving the College \$2,050 during the first year the Board had charge of the College for several lines of its work paid the entire salary of the Director and consequently gave his services free, making a total of \$3,300. More than the full amount of the Station is thus expended in actual experimental work in teaching, not only at the College, but the work is done by professors and teachers in the College and in the same laboratories and fields that work would be done in if the Director had his office in the College building and the results and benefits of the work could not be more accessible to all desiring to take advantage of them under the arrangement suggested by the Board of Visitors, than under the existing one.

"Inasmuch then, as all of the Station money is used for experimental work and teaching at and in the College in the way above stated, the Station then is in the closest relation and touch with the College and it is, therefore, manifestly impossible for the Station to be returned, since it had not been removed.

"The Board regards the Experiment Station as a department of the College and the election of the present Director, when sitting as trustee of the College, made him an officer of the College, both of which relations are recognized by the President and Faculty in this year's College catalogue on pages 7 and 12. The statement made in discussing the resolution before the joint meeting of the Board of Agriculture and the Board of Visitors that the Experiment Station must be a department of the Department of Agriculture of the College. It is not borne out either by the Hatch Act or the organization of Experiment Stations in connection with other institutions of the United States. It is in fact not required to be connected with any special department of the College, but is of itself a department, the director being head of the department.

"If the above claimed were true, no one but agriculturists could be directors of Stations, whereas at present no less than eighteen of the Experiment Stations in this country are under directorship of the chemists; while the others are presided over by workers in several other lines.

"There is a distinct advantage when it can be so arranged, in having all agricultural workers in the State under one general management. The United States Government gives \$750,000 per annum for agricultural experimental work which is supplemented by \$350,000 to \$400,000 from

the various states. A large number of the states have a number of branch or sub-stations located in different portions of the states for the conduct of lines especially suited to the soils, crops and conditions of the several sections, and these are generally under one management and the direction of one general head.

"Experimental work is of the utmost importance to the agriculture of the State, in fact, no progress or improvement is made in the growth and handling of any crop, or new crops introduced, except as the result of the findings of new facts regarding them, either by the farmer in the field or the well-equipped investigator in the field or laboratory or both. For this reason all that is possible of the Experiment Station's funds should be used for strictly experimental work for the benefit of the agriculture of the State, as is required by the Hatch Act establishing the Station, which states that it is to—'conduct original researches and verify experiments.' These considerations, with the following letter from the Director of the Office of Experiment Stations of the United States Department of Agriculture, who is charged with the supervision of the work and expenditures of the various Experiment Stations receiving Government aid, together with other information that it contains, is submitted in answer to the claim made in the discussion before the Boards, but not included in the resolutions, that practically all of the Experiment Station funds can be used for College work:

"Letter of Dr. True concerning management of the North Carolina Experiment Station:

UNITED STATES DEPARTMENT OF AGRICULTURE OFFICE OF  
EXPERIMENT STATIONS.

Washington, D. C.

July 2, 1901

Mr. S. L. Patterson, Chairman  
Governing Board  
Agricultural Experiment Station  
Raleigh, North Carolina

Dear Sir:

*As a result of my recent visit to the North Carolina Agricultural College and Experiment Station, there are certain matters which I desire to bring to your attention and which I think should be given careful consideration by the Board in re-organization of the work of the College and station.*

*Every effort should be made to secure and maintain a permanent and consistent policy. Evidently the work of both the College and Station have suffered severely from frequent changes in officers and policy during the past few years, and it is to be hoped that the period of change and uncertainty has now reached its end.*



Having separated the offices of President and Director, and elected a competent director, the Board should make him fully responsible for the management of the Station and give him liberty of action commensurate with his responsibility. He should plan and direct the work and expenditures of the Station. The Station should be definitely and fully under his control. He should approve the requisitions and bills and should be responsible for the careful and proper expenditure of the Station funds.

I would suggest that the Director submit in writing a plan of work and expenditures once a year. After this plan has been approved by the Board, he should endeavor to carry it into successful operation and his work should be judged by his general results.

In organizing a Station staff, an arrangement should be made by which the chief officers of the Station would have the Station work as their primary business. They should be able to give their time and best energies to it, and if they are required to do any teaching, this should be a secondary matter and so arranged as not to interfere with the prompt and efficient performance of their Station duties.

The lines of work of the Station should be few in number and petty enterprises should be avoided. Only those investigations should be undertaken upon which there can be a sufficient expenditure of funds and time to promise a successful issue when they are conducted by competent investigators.

The operations of the Station should be planned with reference to the benefit of the agriculture of the whole State. This means in the case of field operations that investigations will often need to be carried on in a number of different localities. As regards the Hatch Fund, this should be considered strictly as a research fund, to be devoted wholly to the expenses of investigations and the publication of the results. The College work must not be allowed to infringe on these funds; neither should it be burdened with expenses for the State inspection services, whether it be fertilizers, foods, animal diseases, or anything else.

An examination of the salary roll of the Station for the past fiscal year shows that the amounts spent for salaries is too much. During the present fiscal year ways should be found to reduce the relative amount spent for salaries. I find for example that the president of the Board of Trustees was paid \$200 for auditing the Station accounts, and this was in addition to \$500 paid the bursar for keeping the accounts. This in my judgment is entirely too much to pay for accounting for so small and simple a fund as the Hatch Fund. I deem the charge for auditing entirely unnecessary, and the relative amount paid the Bursar also seems to me to be too large. Without having examined the matter very closely, it would seem that the amount paid for assistants in chemistry are relatively large, I think this should receive consideration. Amount paid to dairyman was too small to do

any work of importance, and unless this line of work can be further developed, I would recommend its abandonment as a Station enterprise.

It was not made clear to me whether the budget for the current fiscal year has been actually adopted in detail by the new board. It should be clearly understood that as far as this department is concerned, it will hold the new board fully responsible for the proper expenditure of the Hatch Fund, and will not accept an account made on the plan of the budget for last year. Any re-organization there must be a new deal. Expenditures from the Hatch Fund must be arranged on the basis of adjusting the expenditures and services actually rendered which are legitimate and necessary in the conduct of the Station under the Hatch Act.

As regards the land and building, I think the Station should have its own equipment separate from that of the College as far as this is practicable. I always advise great moderation as regards the area of the land on which the Station shall operate. Expense of properly maintaining large areas of land on an experimental basis is necessarily very great and require much wisdom to adjust such expenses wisely to the limited income of the Station. On the other hand, I do not believe in restricting the field operations of the Station to plot experiments. Such experiments have their uses, but also have decided limitations, especially where the land is not level and uniform. Oftentimes after experiments have been made in a small way, they should be repeated on a large enough scale to make sure that the results can be applied and practiced. This, however, does not mean that a considerable number of acres need be given to any one experiment in any one locality.

The fact that the College at Raleigh owns a large tract of land should not in my judgment lead the Board to undertake extensive operations in clearing and utilizing this tract, especially in consideration of the very limited funds at the disposal of the Board for the work of the College and Station. A few acres well utilized will be of much greater advantage than a large tract ambitiously laid out and poorly and superficially treated. There is nothing the farmer in this country needs to learn more than thoroughness in the management of his plans so as to make his farm more profitable and productive. The College and Station ought to set him a good example in this matter.

The affairs of the North Carolina Station have not been under satisfactory condition for several years. They can only be made so by securing and retaining competent men to make investigations of importance and the fair going compliance with the letter and spirit of the Hatch Act. The new Board has taken encouraging action with reference to the re-organization of the personnel of the Station and we hope that it will also readjust the finances on a satisfactory basis.

As regards the College, it seems clear that its funds are inadequate to enable it to put its work on a very satisfactory basis. College education in

the industrial arts is necessarily expensive. Competent officers require relatively high salaries and equipment of buildings and laboratories is costly. The problems of agricultural education are particularly difficult. The tendency is for young men to leave the farm, and now that mechanic arts and manufacturers are rapidly developing in the South, we may expect to have this tendency aggravated. This, however, makes it all the more necessary and important that agricultural education should be developed wisely and made more attractive. This can only be done by providing as competent instructors and as good equipment for agricultural courses as for courses in mechanic arts and other branches.

The fact that only a few students are applying for college courses in agriculture does not do away with the obligation to put the college course in agriculture on as sound and efficient a basis as the other courses. Moreover, the four years college course in agriculture is not the only one which the college should be varied and extension work should be done by the college officers, through the farmers institutes, correspondence courses, traveling dairy courses, etc. For these purposes a strong agricultural faculty should be organized. The old time professor of agriculture is passing away. The agricultural faculty should now comprise a number of expert teachers. There should be at least one for each of the following branches: Plant production, animal husbandry; and dairying. There should also be instruction in rural engineering, and rural economy, if practicable, and these courses should be developed, as times go on. The principal professors on the agricultural faculty should have time and opportunity to develop agricultural education in the State. It must do considerable missionary work among the farmers and educators, and get their courses on a firm foundation and bring their students in to them.

With its present limited resources it is evident that the North Carolina College can only go a little way in doing what should be done for agricultural education in that great State. It is, however, very important that at this time of re-organization the right policies should be adopted, and an effort made to lay the right foundation and build on them as time goes on. Here, as in the Station work, little will be accomplished until there is a permanent policy adopted. This work is just as important as the Station work, but it will do the College no good to carry on its operation at the expense of the Station. The Station should be made as strong as possible with the funds available for that purpose and the College should do likewise with its own funds. These should be increased by the State as the needs of the work demands. It is my desire to help both the College and the Station in any way I can, and I shall be glad to confer with the Board and the officers of this institution whenever it is felt that I may be of assistance.

Very truly yours,  
A. C. True, Director

"The above letter was written July 2, 1901, as a result of a visit and inspection of the Experiment Station, its expenditures and work on June 24 and 25 of that year. Another visit and inspection was made on April 1 and 2 of the year 1902—by an officer of the same department of the National Government and the following interview, which appeared in the *News and Observer* the morning of April 3 is of interest in comparison with the letter written the previous year:

#### OUR EXPERIMENT STATION

"Dr. E. W. Allen, Assistant Director of the Office of Experiment Station at Washington, D. C. was at the Station yesterday, leaving for Washington after spending several days here looking over our Experiment Station. Speaking of what he had seen he said: 'I am very pleased with the outlook and the trend of things here. Your Experiment Station is very fortunate in having such a man as Professor Kilgore at its head. The Station here is just now tackling some of the hardest problems, and we look to see it one of the most important of Stations in the South. There seems to be quite a demand for agricultural education. I think 78 students this year is a mighty good showing.'

#### CONCLUSIONS

"For reasons given above, the Board of Agriculture, sitting as trustees of the college, make the following answer to the resolution of the Board of Visitors:

"1. The Experiment Station clearly bears the same relation to the College now as in the past. It has not been removed, and there is, therefore, nothing to be returned.

"2. The Experiment Station has had four directors in five years. The Board considers these frequent changes not only unwise but demoralizing to the work of the Station. This is shown by the lack of very much important work from the Station in this period of frequent changes and interruption of work. Agricultural experimental work, to be of value, must be carefully planned and conducted for a number of years under continuous and competent management."

Beyond question the long explanation of the Board of Agriculture was largely prepared by Dr. Kilgore, for no member of the Board as then constituted would likely have the detailed background information given in the statement. The unequivocal answer of NO was in line with the Legislative Act placing the responsibility on the Board of Agriculture.

The Board of Visitors accepted the decision without apparent question and during the existence of that Board continued to function in an advisory capacity and made many suggestions for the improvement of the College which were approved by the Board of Trustees.

Dr. Kilgore was now firmly established as Director and with the necessary authority to administer and develop a program of research. The six

years of his administration was marked by an expansion and broadening of the research program and particularly by the addition to the staff of a few vigorous, well-qualified men who got things done and who laid the foundation for fundamental and applied research in the years to come.

The first of these was Charles W. Burkett, who was appointed as Agriculturist to succeed Ben Irby whose position was declared vacant at the Board meeting in June 1901.

Burkett was selected from a group of applicants. He had graduated only a few years before from Ohio State University where he had been an outstanding student leader and one of the founders of the honorary agricultural fraternity of Alpha Zeta. Burkett was young, vigorous, aggressive and a man of imagination. He supplied the necessary spark to get the agricultural work of the College on a respectable basis and thus began the long climb to its proper recognition. Burkett secured the blue prints of a new agricultural building at Ohio State University and these were used almost entirely in the erection of Patterson Hall in 1905. Burkett outlined and got underway much plat work involving fertilizer test, rotations and variety tests with various crops. He was here only six years but those were fruitful in the years to come for the College and the Experiment Station. He is now retired and lives in Florida.

The second outstanding man to join the staff was Dr. Tait Butler of Kansas as veterinarian. Dr. Butler was thorough, aggressive and a man of imagination in various fields. His main efforts were devoted to the erad-



Patterson Hall, present campus headquarters of research administrative officials.

ication of the Texas Cattle Tick. Under his leadership the "tick free" line was moved farther toward the east each year. He left the Department many years before the state was declared free of ticks, but during his time the main battle was won and the foundation laid for a successful livestock industry.

Butler was interested in all phases of livestock production and also took a very active part in Farmers Institutes. He was recognized as an outstanding farm leader. He was carried in the list of staff members of the Station but his salary was paid entirely by the State Department of Agriculture. He later became Associate Editor of the *Progressive Farmer* and an outstanding leader throughout the South.

A year later F. L. Stevens was appointed Biologist for the Station. He was the first properly trained and qualified man to join the staff in the field of plant pathology. He had a fine personality that made friends easily and he was soon recognized as an authority in his field. He did research, farmers institute work and taught in the College. Years later he was one of the outstanding members of the faculty of the University of Illinois.

The fourth man of this group was Franklyn Sherman, Jr., who was appointed Entomologist to the Station during 1902-1903. He had been employed for a short time by the State Department of Agriculture in pest control. He was competent in his field, a man of pleasing personality, energetic mentally and physically. While here he did not carry on too much research as compared with the present research program, but the educational work he did left a lasting impression on the future of agriculture in the State.

The official records do not indicate how much influence Dr. Kilgore had in the selection of the above quartette, but those who know Dr. Kilgore and his smooth, quiet way of getting things done give him full credit. At any rate these five—Kilgore, Burkett, Butler, Stevens, and Sherman—shaped the policies and programs of the Station during the period from 1901 to 1907 and the full fruition of their efforts came several decades later.

Mention has been made of the fact that Kilgore immediately on his appointment as Director, combined, or perhaps more accurately scrambled, the research work of the College and the Department of Agriculture. The annual reports were prepared on a somewhat similar basis. Projects supported from Hatch funds were reported as of the Experiment Station and a table of expenditures was included.

The work done on the Test Farms was supported almost entirely by the Department of Agriculture fund and reports were made to the Department. However, the field experiments on the College farm started by Burkett soon after his arrival were planned almost parallel to those on the two Test Farms in the Coastal Plain and one year later on the Piedmont Farm at Statesville. The objective was to get data regarding fertilization, rotations, varieties, grasses, etc., on varying soil types and climatic condi-

tion and thus be in a better position to answer the farmers' question throughout the State.

During his first year Burkett selected and prepared the land for about 400 plats and these were planted in 1902. These were located on the college land south of Rocky Branch. He states, "The work in these several lines is of a permanent nature and outlined to cover a series of years. The work will be enlarged so as to cover all new questions arising from the investigations now begun."

These lines of work, with some expansion, were the main research activities during the remainder of Burkett's stay at the college.

During his first year, the poultry work was in his division, but when a new Poultryman, Mr. J. S. Jeffrey, was secured February 1, 1903, poultry was made a separate division. The title "department" was to come into general use later.

In the Horticultural Division, Massey continued to serve until December, 1905 when he resigned to devote his time to editorial work.

Each year Massey wrote the longest report of any of the division chiefs. He never was satisfied with his facilities. It will be recalled that during the Withers' administration he was successful in having the original 10 acre Station farm assigned him as the only suitable land for horticulture. Later he concluded that this land was not suited and when poultry was set out as a division the old farm was assigned to that work and so remained until the land was sold for real estate development some 25 years later.

Much of his so-called research was trials and observations of vegetables and fruits in his own garden and a limited amount in the greenhouse and outdoor cold frames. Massey was educated as a civil engineer but his real interest was in horticulture. It is doubtful whether he had sufficient fundamental training even for that time to really plan a good research program. However, he read the available literature in his field. He was a popular farmers' institute speaker and answered more questions from farmers than any other member of the Station staff. In spite of his shortcomings he made valuable contributions to the College and the agriculture of the State while he was a member of the staff.

The Chemistry Division during this period as in past years was largely chemical analysis of various crops, nitrification in various soils, and the development of new methods of analysis for determination of various elements in soils and plants.

## POULTRY DIVISION

Until February, 1903 poultry was part of the Agricultural Division. When Jeffrey became Poultryman he reported directly to Kilgore, the Directors, thus setting up Poultry on a parity with Agriculture, Horticulture and Chemistry. Jeffrey spent his first year in construction of houses and runs

and moving to the new location—the 10 acres that had been used by Horticulture.

The most popular breeds were kept. Tests with wet and dry mash, preservation of eggs, incubator hatching, and value of addition of green feed in winter were the main lines of activity.

The Biological Division first appears in the 1902-1903 report with F. L. Stevens as Biologist. Practically all his activity was in the field of plant disease. He had many inquiries from farmers who sent in specimens. This gave him an opportunity to learn of the existence and location of various plant diseases in the State. He prepared many bulletins describing various diseases and made such recommendations as were then known for their control.

## GRANVILLE WILT

For the next few years, the main lines of investigation were with Granville Wilt of tobacco and watermelon wilt. The latter work was in cooperation with the Bureau of Plant Industry of the U. S. Department of Agriculture. Comparison of variety resistance and selection of seed from apparently wilt resistance plants were the main lines of attack. Each year there would be some promising results, but it was years later when more skilled plant breeders joined in the battle before real successful progress was made.

In connection with the Granville Tobacco Wilt, more than 40 kinds of chemical treatments were tried near Creedmoor. The chemicals were usually applied in relatively large quantities and the percentage of survival of plants was determined. There were variations but nothing sufficiently promising to justify recommendations. In the 1906-1907 report, the Director stated that the tobacco work was continued but the Biologist does not mention it.

In the Veterinary and Entomology Divisions, names and reports are given but in both lines of work the financial support came almost entirely from Department of Agriculture funds and the personnel was engaged primarily in control activities.

There were two significant developments during the latter part of this administration of Dr. Kilgore—the construction of an agricultural building (Patterson Hall) on the campus and the passage by Congress of the Adams Research Act.

The construction of Patterson Hall marked a real milestone in the history of the College and the Experiment Station. Prior to its erection the College facilities for teaching and research laboratories were practically non-existent. Classes were held wherever a room could be found and outside Chemistry there were no laboratories except the very limited use of the livestock barns.

Many individuals had a part in developing the demand for a passage of a bill through the Legislature of 1903 for such a building.

President Winston requested such a building in his report to the Governor in the fall of 1902. Most likely Dr. Burkett, the Agriculturist, had much to do with stimulating the thinking of the President and it is definite that Burkett secured the plans of the new agricultural building at Ohio State University. These plans were followed almost in toto.

Governor Aycock, in his message to the Legislature in January 1903, urged an agricultural building provided the necessary money could be found.

The leader in the Legislature for such a building was R. W. Scott, an able farmer from Alamance County and the father of Governor Kerr Scott. The Poultry Building, completed in 1952, was named in honor of Mr. Scott.

Mr. Scott introduced the bill in the House making an appropriation from the General Fund. While there was general support by the members of the Legislature it became evident as the bill moved through the Legislature channels that the General Fund was not sufficient to take care of all the departments and agencies of the State. Accordingly the bill was amended so that the cost of the building, not to exceed \$50,000, would come from the Agriculture Fund. At the Committee hearings President Winston, Dr. Burkett and others appeared. Among those who spoke were several students taking the agricultural course. According to a report in the *News and Observer* the students made a fine impression and were asked many questions about their work and how they made their expenses.

When the bill reached the House floor, Mr. Scott made a "forceful and eloquent" speech. He argued that the college was agricultural and mechanical but that agriculture had been neglected as compared with mechanic arts. The farmers were willing to pay the costs from the Agriculture Fund which came largely from the fertilizer tax. When the vote was taken a comparatively few members voted no. The fight was not over, however, for there was much argument in the Senate. Some wanted the bill referred to the Committee but the rules were suspended and the bill put on immediate passage. Some Senators who wanted appropriations for other pet projects made a number of suggestions, one even suggesting that the Agriculture Fund be turned into the General Fund. Finally, however, the bill passed by a large majority.

It directed the Board of Agriculture to borrow the money but only after an amendment was added stating that the credit of the State was not to be obligated.

While it required two years for construction, when completed the facilities for teaching and research were almost unbelievable when compared with the facilities that had been available.

The cost of the original building was approximately \$43,000. Many modifications have been made in recent years and the cost of repairs and modification has been many times the original cost of construction.

## ADAMS ACT

The passage by Congress of the Adams Act in March, 1906 was a distinct milestone in the development of Agricultural Experiment Stations. It provided an initial appropriation of \$5,000 to each state and an increase of \$2,000 annually until the total reached \$15,000. This brought the total Federal contribution to each state to \$30,000 annually.

The purpose of the Adams Act was "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States, having due regard to the varying conditions and needs of the respective states or Territories."

The Secretary of Agriculture, James Wilson, on March 20, 1906, sent a letter to all Directors of Experiment Stations giving instruction as to the administration of the law. He advised that Adams Funds were for the "more complete endowment and maintenance of the experiment stations" and "accordingly, expenses for administration, care of buildings, and grounds, insurance, office furniture, and fittings, general maintenance of the station farm and animals, verification and demonstration experiments, compilations, farmers' institute work, traveling, except as is immediately connected with original researches in progress under this act, and other general expenses for the maintenance of the experiment stations, are not to be charged to this fund."

During the next year, 1906-1907, salaries from the Adams Fund was over \$4,000 and the next largest item was \$714 for scientific apparatus. Again no specific projects under the Adams Fund are mentioned. However, the report does show expansion in personnel and work in the Agricultural and Biological Divisions which indicates that most of the increase from Adams Funds went to those Divisions. All livestock work was still in the Agricultural Division at that time.

The Legislature of 1907 passed an act creating a new Board of Trustees for the College, thus divorcing the Station from the State Department of Agriculture and terminating for a five-year period the Directorship of Dr. Kilgore.

The stress and strain of the next five years will be discussed under the chapter on the Administration of Mr. C. B. Williams.

## MR. C. B. WILLIAMS, 1907-1912

The Legislature of 1907 provided for a new Board of Trustees—again divorcing the College and Station from the Department of Agriculture.

It will be recalled that the Board of Visitors in 1902, in a conference with the Board of Agriculture, had pointed out that the function of the College was broader than just agriculture and that there should be representation from industry and textiles on the Board.

At a meeting of the Board of Agriculture (then the Board of Trustees) in December 1906, Governor Glenn met with the Board and recommended separate boards for the Department of Agriculture and the College and that the Board of Trustees have industry as well as agriculture represented. He requested the reaction of the Board members. No further mention is made in the minutes so apparently if any felt differently they expressed themselves privately. At any rate the Legislature meeting during the first few months of 1907 passed an act providing for a new Board of Trustees, composed of 16 members appointed by the Governor with the advice and consent of the Senate and to include the Governor as ex officio President of the Board.

The act creating the new Board also carried sections applicable especially to the Experiment Station.

*Sec. 12. The Agricultural Experiment and Control Station shall be connected with the College and controlled by the board of trustees thereof.*

*Sec. 14. The agriculture building (Patterson Hall) built under the authority of Chapter six hundred of the Laws of one thousand nine hundred and three shall be used for conducting investigations and for instruction in respect to milk and beef cattle, diseases of animals, trucking, fruit growing, commercial fertilizers, diversified farming and other subjects pertaining to practical agriculture.*

Taking these sections alone it appears that it was the intent and directive of the Legislature that the Experiment Station including all research would be a part of the College and under the control of the Board of Trustees. Such a conclusion however would be far from the facts for the same Legislature passed an Act pertaining to the work of the Department of Agriculture.

*Amending Chapter 87 Revision of 1905, Sec. 5. That section three thousand nine hundred and forty four be amended by adding at the end thereof the following: 16. The work of investigation in agriculture required in this Chapter may be designated by the Board of Agriculture as an agricultural experiment station, and the four test farms now in operation be and the same are hereby designated and established as branch experiment stations, to be conducted as at present under the auspices of the Board of Agriculture and out of its fund.*

The Code of 1905 and section 8944 directed the Department to make certain investigations relating to the improvement of agriculture; the beneficial use of commercial fertilizer and compost; improvement of milk and beef cattle; diseases of cattle; ravages of insects; experiments directed to introduction of new agricultural industries adapted to various climates and soils, especially truck and market gardenings; drainage and irrigation; diversified farming, rotations, etc. None of these directives were repealed. The amendment was an addition and gave the Board of Agriculture additional authority, if such was needed, regarding the Test Farms.



MR. C. B. WILLIAMS

Thus, by legislative action was created an unfortunate situation in that there were two experiment stations working in the same field. Such an arrangement makes for duplication, confusion in the minds of the people to be served, jealousy between workers, and a lack of sufficient financial support for either agency to perform most efficient service.

That was the condition in North Carolina from 1907 to 1911.

The Station at the College was supported only by Federal funds and a small amount from the sale of farm products. Fortunately the Federal Adams Act funds were increasing annually by \$2,000 so there was some chance for expansion.

The State Department of Agriculture had its own receipts from fertilizer, feed and other tag sales, plus the receipts from farm sales on the Test Farms. The Board of Agriculture had authority to use these funds largely as it saw fit.

The new College Board of Trustees at its first meeting, May 29, 1907, was confronted with the problem of taking over the Experiment Station, the appointment of a Director, and approving a research program within the limits of a budget of \$24,000 for the next fiscal year. Evidently the Board felt that there was a possibility that the research work of the Department of Agriculture and that of the College could be handled under one director as it had been for six years. To that end the Board at its first meeting passed the following motion:

"Resolved that the Executive Committee be authorized to confer with the Board of Agriculture concerning the Experiment Station, and to settle the details thereof . . ."

The activities of the Executive Committee in this connection are related in the minutes of several meetings beginning May 31, 1907.

MEETING OF EXECUTIVE COMMITTEE  
May 31, 1907

"Resolved: That Mr. W. B. Stickley and President George T. Winston be appointed a Committee to confer with the Board of Agriculture in accordance with the resolution of the Board of Trustees regarding Experiment Station. That the special Departmental Committee of the Board of Trustees meet with the above mentioned Committee on June 5th, and that the offer be made to the Board of Agriculture that it join in with the Experiment Station. This money to be used to continue and further develop the four experiment farms now maintained by the Board of Agriculture, and to also maintain on the College farm a model Experiment Farm, and further that the Station Director have no other employment, so that all of his time may be devoted to the Experiment Station work."

EXECUTIVE COMMITTEE  
June 20, 1907

"The following report of the special committee appointed to go before the Board of Agriculture was made:

"Meeting of special Committee of the Board of Trustees of the North Carolina College of Agriculture and Mechanic Arts, called to order and Mr. R. H. Ricks of Rocky Mount, N. C. was made chairman, O. L. Clark of Clarkton, N. C. Secretary. After discussing the advisability of co-operating with the Board of Agriculture for carrying on experimental work in the State, the following resolutions were offered and adopted.

"Resolved, First that the Trustees of the North Carolina College of Agriculture and Mechanic Arts invite the State Board of Agriculture to co-operate with us in conducting Agricultural experiments for the improvement of Agriculture in the State.

"Second, that they contribute annually, a sum of money equal to that furnished by the College Experiment Station to be expended by a Director who shall give his entire time to this work, and have no other employment. It was moved and seconded, that our Committee meet with the Board of Agriculture at this meeting at two o'clock P.M. and secure their co-operation in accordance with the above resolutions.

"At two o'clock our Committee went into consultation with the Board of Agriculture, and presented our resolutions and did everything in our power to secure their co-operation. After a long and heated discussion they gave us the following answer:

To the Trustees of the A & M College

Gentlemen:

The Board of Agriculture, after thoroughly considering the resolution presented by you inviting co-operation on the part of the two boards in the experiment work of the two institutions, are of the opinion that it will be unwise and detrimental to the best interests of both institutions to comply, and in view of the fact that the last legislature, after thoroughly canvassing both sides of the question, decided it was for the best interest of both institutions to be separate, we feel that we ought to carry out their instructions.

We wish to assure you that we are ready to lend you any assistance in our power.

(Signed) R. W. Scott  
A. Connor.

"After receiving the above answer from the Board of Agriculture, we decided to try to secure the services of Dr. B. W. Kilgore. The result of our conference with him will be found in a letter from him which is attached hereto.

Yours truly,  
O. L. Clark, Secretary"

Messrs. O. L. Clark

R. H. Ricks

and J. F. Ellington

COMMITTEE

Gentlemen:

I fully value the consideration shown by your Committee in asking that I continue the direction of the work of the Agricultural Experiment Station, connected with the North Carolina College of Agriculture and Mechanic Arts.

This is my sixteenth year of service with the station and the State Department of Agriculture. I am greatly interested in problems of agricultural investigations, and can but feel that some of the progress so evident in farming in recent years is due, in part, to our experimentation and the dissemination of the results. It is more difficult for North Carolina than for most states to cover adequately the field of agricultural work, because of its three different conditions of soil and climate—east, piedmont, and west—as though they were different states. The work which the State Department of Agriculture has been developing during the past eight years on its Test Farms in different needs, the idea having been that these efforts and the work of the Experiment Station would, when they had reached a fuller development, cover in a fairly comprehensive way the demands made upon them by our varying agricultural conditions.

During the past six years I have done what I could to bring this about by dividing my time between the station and the Department of Agriculture, and doing as even justice to each as I knew how.

*As there must be a division of these efforts and having been treated with the utmost fairness and consideration by the Board of Agriculture, whose plans and purposes for agricultural work I am fully aware of and in accord with, I feel that it is not best for me to give up my entire connection with the work of the Department of Agriculture. In making this decision, I wish to assure you of my continued interest in the station and its work, and not only of my entire willingness, but desire to be of whatever service I can to you in arranging for its conduct.*

*Very truly yours  
(Signed) B. W. Kilgore*

"On motion the resignation of Dr. Kilgore as Director of the Experiment Station was accepted.

"On motion, Dr. Kilgore was sent for and a conference was held with him regarding the work of the Experiment Station, and the selection of his successor. At this conference Dr. Kilgore recommended Mr. C. B. Williams as a very capable man. The Committee authorized President Winston to tender the Directorship to Mr. C. B. Williams at a salary of \$2,250 per year."

The above report of the Executive Committee did not give quite the whole story, however, for there was a difference of opinion among the members of the Board of Agriculture and recorded in the Board of Agriculture minutes.

"When Mr. Stickney and his Committee met with the Agriculture Board, a committee composed of Messrs McCullum, Graham and Dr. Kilgore was appointed to meet with the College committee and see if details could be worked out.

"The Committee retired and upon its return, Major Graham reported orally that the committee could not agree: the main point of difference being the demand on the part of the Trustees for the whole time of the Director and the unwillingness on the part of the Board of Agriculture to surrender the services of the Director and the State Chemist, neither side yielding in the matter. The Conference adjourned without reaching a conclusion.

"Mr. Mitchel moved that the Committee on the part of the Board of Agriculture, who had conducted the conference, draft a reply to the Resolution, declining the proposition as outlined in the resolution and present same to the Board for concurrence/adopted.

"Board met at 8:30 that night, Major Graham presented the report of the special committee.

"Hon. M. B. Stickney, Chairman: The Board of Agriculture has considered the resolution submitted by yourself and associates from the Board of Trustees of N. C. A & M College and received the report of the Committee appointed to confer with the sub-committee of your body.

"After mature deliberation, we submit to your Board of Trustees the enclosed plan for co-operation and ask your concurrence.

"The Board of Trustees of the A & M College shall appoint three of its members, who, in conjunction with the Commissioner of Agriculture and two members of the Board to be chosen by the Board shall compose a body to be known as "Board of Directors of Experiment Stations."

"Said Board shall have in charge the practical work of the Experiment Station established in this State by the United States Department of Agriculture, and of the Experiment Station and Test Farms operated by the N. C. Board of Agriculture.

"Said Board shall elect a Director of Experiment Station and Test Farms, who shall have direct supervision of this work. He shall receive a salary of \$3,000 per annum—\$1,500 of which shall be paid from the funds of the U. S. Experiment Station, and \$1,500 from the funds of the N. C. Department of Agriculture.

"He shall give at least half his time to the work required by the laws of the U. S. in connection with the U. S. Experiment Station the other half to be subject to the direction of the N. C. Board of Agriculture, but in so far as necessary shall be in connection with its experiment stations and test farms. The N. C. Board of Agriculture shall appropriate from its funds an amount of money equal to that furnished for experimental field work from the U. S. Experiment Station fund."

(Signed) Graham  
McCullum"

The full Board discussed the recommendations of the committee. Mr. Mitchell moved for adoption, but the motion was lost. Only Mitchell and Horne voted in the affirmative with Laughinhouse, Dunn, Scott, McCullum, McRae, Doughton and Cannon voting no. Mr. Graham did not vote. Dr. Kilgore, while a member of the Committee was not a member of the Board hence had no vote.

It is interesting to note that neither member of the Committee voted for the motion—Graham abstaining while McCullum voted against. ———

Mr. Scott then moved that the proposition be declined and that a committee be appointed to draft a reply to the Board of Trustees. Messrs. Scott, Mitchel and Cannon were appointed and they brought back to the full Board the reply which was quoted in the minutes of the Board of Trustees.

The above action however settled the matter only temporarily for four years later the difficulty again came to a head as will be related subsequently.

Dr. Kilgore was elected Director of the "Agricultural Experiment Station of the North Carolina Department of Agriculture."

Mr. Williams had been with the Department of Agriculture for many years, first as a chemist, and when Dr. Burkett resigned in 1906 Williams was appointed as Agronomist, the first time that title appears in the reports.

Mr. Williams moved his office to Patterson Hall on the campus and his staff consisted mainly of those men who had some teaching responsibility as well as research. Among those remaining with the Department in addition to



Kilgore were Dr. Tait Butler, Veterinarian; W. N. Hutt, Horticulturist; and Franklyn Sherman, Jr., Entomologist. Among those transferred to the College were Dr. Withers, Chemist; Dr. Stevens, whose title was changed from *Biologist to Vegetable Pathologist*; J. S. Jeffrey, *Poultryman*; and F. C. Reimer, who had been Assistant Horticulturist now promoted to Horticulturist.

The funds from the Adams Act were still increasing \$2,000 annually so Williams was able to increase his staff to some extent and to fill the vacancies created by those remaining with the Department. Among the new personnel was R. S. Curtis as Animal Husbandman, the first time this title appears as a distinct title. Previously, animal husbandry work was under the Agriculturist.

The research work was all done in the College laboratories and on the Station Farm which was separate from the College Farm. Most of the field program was a continuation and expansion of the plant work outlined and started by Dr. Burkett. This included rotations, fertilizer treatments, variety tests of cotton, corn, small grains and cowpeas.

The work of the divisions—Horticulture, Animal Husbandry, Dairy Husbandry, and Entomology—all practically started from scratch in 1907. Much of the work of these divisions was financed from Adams funds and was of a more fundamental nature than had been true of most of the work during the past history of the station.

Adams fund continued to increase for three more years, and with this increase the Director was able to increase personnel and to broaden the research projects. However, since the Federal funds had certain limitations



Typical farm scene early 1900 (except modern car!); molasses mill in foreground.

on use for buildings and publications, the program was handicapped in many respects. The Director, in his reports, and also the Office of Experiment Stations in Washington mention the difficulties and point out that the Station cannot serve its full responsibility until the Station secures more adequate financial support from some state source. In the meantime the State Department of Agriculture Station was expanding and with increased appropriations from the agriculture fund, secured more and better trained personnel. The character of the work on the Test Farms was much improved and while the type of work of the two stations was very similar, yet the results of that work as a whole was helpful in that the information secured represented varying types of farming as related to elevation, climate and soil types.

### COMBINED AGAIN

However, as mentioned before there was much confusion in the public mind and, as might have been expected, jealousy developed between the two agencies and the personnel, especially where the workers were in similar fields.

To correct this situation, the fourth wedding between the Departments of Agriculture and the College was consummated in 1912, but this one was more properly of the "shot-gun" type.

Early in the legislative session in 1911, a bill was introduced to consolidate the two agencies. Before this bill came back from the Committee a resolution was presented by Representative Dowd to create a commission composed of three Representatives and two Senators to meet with the Board of Agriculture and the Board of Trustees of the College to ascertain the wisdom of such consolidation or to secure closer co-operation and to make a report to the Governor to be transmitted to the next session of the Legislature. This resolution was approved on March 7, 1911.

The Commission was duly appointed, but no record of its meetings has been found except its final report to Governor Kitchen.

This action on the part of the Legislature brought about immediate results. In fact, one week before the final passage of the Dowd Resolution, the Board of Agriculture adopted a motion directing the Commissioner of Agriculture, as soon as the Legislature adjourned, to arrange for a conference between the Board of Agriculture and the Board of Trustees for the purpose of preventing duplication of work.

The College Executive Committee, on March 29, 1911, passed a motion requesting a meeting with the Executive Committee of the Board of Agriculture "regarding the Dowd Resolution." The two committees met on May 4, 1911. After a thorough discussion of possible methods of co-operation, a smaller committee composed of representatives of two agencies was appointed to develop plans and report to their respective boards.

This sub-committee met May 23, and following this meeting, during the summer and fall, there were many conferences of committees and officers of

the two agencies. Beyond question, Kilgore was the driving force in the development of plans for co-operation. It was a difficult situation. The two State agencies naturally wished to maintain their identity. Each was charged by law with specific responsibilities, some of which did not overlap. Regarding these there was no controversy. In the field of research, however, both agencies were directed by the Legislature to carry on experiments and largely in the same field. Also, both were developing various kinds of extension activities that overlapped.

Neither institution received any appropriation from the Legislature for research or extension, the Department getting its funds from the fertilizer tax while the College supported its activities in these fields almost entirely from Federal sources.

Naturally the personnel in both agencies were disturbed for none knew what might be their fate in a new setup. All professed to be for co-operation, but . . .

To complicate the situation still further, Kilgore and some members of the Board of Agriculture were in a bitter controversy with Commissioner Graham regarding who had the authority to hire and discharge employees, especially on the Test Farms. The Attorney General had interpreted the Laws in favor of the Commissioner, but even this ruling did not prevent the matter from being aired in the public press.

It was in this atmosphere that the joint committee of the two boards met on November 10, 1911 to hear a report from the sub-committee.

According to the minutes of the meeting, Mr. Williams was asked to make any recommendations. He stated that he was for co-operation but did not feel it was incumbent on him to take the initiative without the approval of the President and the Commissioner of Agriculture.

Dr. Kilgore gave his views, but no details recorded.

President Hill urged that nothing be done unless it was for the best interest of the work and unless it was going to be permanent and for the good of the State.

Dr. Kilgore then read a plan of co-operation regarding experimental work, but again this was not recorded.

#### RESOLUTION ADOPTED

Following Dr. Kilgore, President Hill read the following resolution which was adopted.

"The two committees from the Department of Agriculture and the College do hereby unanimously recommend to our respective Boards that the two institutions co-operate in their experimental work and in their demonstration work, and that a committee of four from each Board and the Commissioner of Agriculture and the President of the College be appointed to carry out this co-operation; and that a joint committee be authorized to work out the details of the co-operation and to put the system into operation on the first of January 1912." Graham, Hill, Kilgore and Williams were appointed.

The joint committee met again on December 19, 1911, at which time President Hill as chairman presented the report of the sub-committee. The report outlined the situation and then offered three propositions for the consideration of the joint boards:

"First, for the College Station to be conducted as at present under its Director and for the State Department to continue such experiments as it sees proper, but hereafter for the two officials in charge to confer frequently and see that there is no duplication of such experiments.

"Second, that the College Station and the Experiment work of the State Department be continued practically as they are now organized, that is, in the nature of two entities, but that they be put under a Director and a Vice-Director and that a closer union of the two be ultimately brought about.

"Third, that all the workers in the College Station and in the Department of Agriculture who are engaged in investigational or experimental work be grouped into one compact station under a Director and a Vice-Director who shall each give all his time to this Station; and that this Station be organized into the present divisions and with the present workers, but be put on a strictly scientific basis.

"All of this recommended joint work will of course be under the direction of the joint Committee from the two Boards and the details of execution will be completed from time to time as needed."

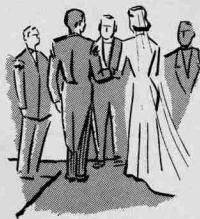
Graham favored the first proposal, but on a substitute motion the third proposal was adopted.

Then followed the appointment of a committee of two, one from each board, "to recommend salaries of the Director and Vice-Director, location of the Station and all other matters pertaining to the combination."

The next meeting of the joint committee was on January 24, 1912.

The Committee on salaries and location (Scott from Agriculture Board and Clark from College) "reported that they could not agree."

"The matter of location of the station was discussed at length; on the motion of Mr. Broughton, duly seconded, it was moved that in view and as a result of the consolidation of the experimental work of the State Department of Agriculture and the North Carolina College of Agriculture and Mechanic Arts, that the headquarters of the consolidated station be located on the farm and in the buildings now in use by the Experiment Station connected with the college."



Fourth wedding of Dept. and Station.

This motion carried unanimously and then Kilgore was elected Director and Williams Vice-Director.

Kilgore and Williams were then directed to work out the details.

The next meeting of the joint committee was on January 24, 1912, at which time Kilgore and Williams submitted an extended and detailed report covering divisions, personnel and functions of each division. They recommended the following Division organization:

- Director
- Vice-Director and Agronomist
- Chemistry
- Entomology
- Horticulture
- Animal Husbandry
- Plant Pathology
- Poultry Husbandry
- Veterinary

However, in the case of entomology and horticulture special arrangements were necessary. Dr. Metcalf in entomology and Prof. Pillsbury in horticulture were primarily teachers in the College, but both also did some work in research.

The Entomologist (Sherman) and the Horticulturist (Hutt) of the Department of Agriculture were made chiefs of their respective divisions in the new organization, but Metcalf and Pillsbury reported directly to the Director instead of through the division chiefs. While the official report explains this arrangement as due to the type of research done by these two people, the real reason (confirmed in personal conversation with one of the persons involved) was the strenuous objection of the two college people and President Hill who objected to a head of a teaching department being responsible to an outside chief for the man's time and work. Even with this arrangement Metcalf and Pillsbury reported to two bosses, but that was not as bad as would have been true had they reported through the chiefs of divisions.

The recommended organization and plans were approved later by the respective boards. The reports of that period state that the two agencies voluntarily worked out the arrangement for co-operation. It was voluntary but all during this time the Legislative Committee, appointed in the spring of 1911 to investigate the two institutions, was the motivating force. Without this higher authority in the background it is very doubtful whether an agreement would have been reached at that time.

Mr. Williams thus relinquished the directorship on June 30, 1912, after serving in that capacity for five years. He was fortunate in that during that period the Adams fund increased annually by \$2,000 until it reached a total of \$15,000 by 1912 thus increasing the total available funds by 100 per cent. He was responsible therefore for the initiation of practically all the new lines of work required under the Act and it should be noted that the type of

projects developed were largely of a more fundamental nature than had been true in the past. More effort was made to find out "why" rather than the more simple trial and error method of what happens under a given condition.

The work started and continued during his administration was reflected in the type and number of publications issued in the succeeding years. Previously a large number of the bulletins and circulars issued were largely academic discussion, but from 1911 on most publications reported results from North Carolina experiments. That period was really a turning point in the life and effectiveness of the Station.

According to the minutes of the Board of Trustees, Mr. Williams made long and detailed reports to the Board each year. He endeavored to acquaint the board members with every detail of the experiments. The Board appointed a committee on Station work and each year this committee visited the farm and made glowing reports on work and the conditions of the farm. Mr. Williams had been second choice for Director, but after the first year they reported that they were fortunate in getting such a good Director.

Mr. Williams continued to serve many years as Vice-Director and Head of the Agronomy Department. He was meticulous, conservative, and "long winded" when appearing before groups, but he rendered invaluable service to the agriculture, not only of North Carolina but the nation as a whole, and the naming of the new Agronomy Building Williams Hall was a well merited tribute to his memory.

## DR. B. W. KILGORE, 1913-1925

This was the second time that Dr. Kilgore served as Director of the Experiment Station. During the interval from 1907 to 1912 he had charge of the experimental work of the State Department of Agriculture, including the Test Farms, and also continued co-operative work with several bureaus of the U. S. Department of Agriculture.

The conferences and maneuvering mentioned in the previous chapter extending over a period of 12 months and finally culminated in a so-called "voluntary" agreement between the State Department and the College that was approved by the Joint Committee on June 5, 1912. The plan was put into effect on July 1.

However, all was not harmonious in the organization but there was the Commission appointed by the Legislature of 1911 and charged with the responsibility of investigating the two agencies and reporting to the 1913 session. No records have been found to indicate that this Commission had a meeting until December 8, 1912, at which time a report of the Joint Committee of the two Boards was presented. Undoubtedly the Legislative Commission knew of the efforts of the two agencies to get together and did not feel that it was necessary to have a meeting while the negotiations were in progress.

The report of the Joint Committee first outlined the various activities of the two agencies pointing out certain functions about which there was no controversy. As regards research the Committee recommended:

"All the scientific experimental work of the two institutions will hereafter be consolidated into one Experiment Station under a Director and a Vice-Director and with the Director's office at the College. This arrangement will give a perfect unity to all the experimental work done by the State, will of course prevent all duplication of work and thereby economize the funds of both institutions."

The report recommended further: "That all appointments made and all vacancies filled for any departments of this co-operative work be made by this Joint Committee."

Evidently there was a feeling that some members of the Joint Committee might have mental reservations for a motion was passed requiring all members of the Committee to sign the report, which they did. This is the only instance in the minutes of meetings of the two Boards where such action was taken.

It should be noted that the agreement provided specifically that the Director's office would be at the College and that appointments of personnel would be made by the Joint Committee, for both of these items were to recur in a new re-organization coming 10 years later.

The Joint Committee further recommended that the Investigation Commission sponsor a bill in the 1913 Legislature legalizing the action of the Joint Committee and to provide the machinery for preventing duplication and confusion in the future.

The Commission approved the recommendations of the Joint Committee and the bill was passed and ratified March 7, 1913, as follows:

*Section 1. There is hereby authorized and legalized a Joint Committee to be known as the 'Joint Committee for Agricultural Work'; that this Committee shall be composed of four members of each of the boards of agriculture and trustees of the North Carolina College of Agriculture and Mechanic Arts; and in addition thereto the Commissions of Agriculture and the President of the North Carolina College of Agriculture and Mechanic Arts to be ex officio members of said Committee.*

*Section 2. That the four members of the Joint Committee from each of the two boards shall be designated by the board of which they are members respectively, and shall serve on the Committee during their terms as members of the board, unless excused from such service by their respective boards. The members already designated by the two boards for service on this Committee shall continue to serve during their terms as board members.*

*Section 3. That for the purpose of preventing duplication and friction and for increasing efficiency in agricultural work in the State the Joint Committee for agricultural work heretofore provided for shall have supervision and control of such agricultural work of the same kinds as both the Department of Agriculture of the State and the North Carolina College of Agriculture and Mechanic Arts are conducting or may conduct under authority of law, together with any work which either of these institutions may agree to place under the Joint Committee, and especially shall this Joint Committee have supervision and control of all experimental and investigational work in agriculture in the State.*

*Section 4. The Joint Committee shall use funds as may be designated by law or which may be placed at its disposal by each of the two boards or by any benefactions in the conduct of the work outlined in Section 3 of this report. It shall determine and employ such workers as may be necessary for the conduct of the work and regulate their salaries and duties. All actions of the Joint Committee shall be subject to the approval of the Board of Agriculture and the Board of Trustees of the North Carolina College of Agriculture and Mechanic Arts.*

In addition to the experimental work mentioned specifically in the above act both agencies were engaged in other activities that more or less duplicated. One was Boys Corn Club work and another was demonstration work with farmers. The Joint Committee took action on the Boys Corn Club work and transferred that to the College prior to the passage of the Legislative Act of 1913.

The Farmers Co-operative Demonstration work was first sponsored in North Carolina in late 1907 by the U. S. Department of Agriculture but without any State funds. About the time of the movement to co-ordinate the research work, the State Department of Agriculture appropriated from its own funds to help the demonstration work. Later the Congress in 1914 passed the Smith-Lever Act which made available to the Land-Grant Colleges funds for Extension work. The Joint Committee placed all this work, including Boys and Girls Club work, under Dr. Kilgore's direction, thus combining under one administration head all the research and extension work in the State.

This arrangement argued well for the future and for a number of years there was no difficulty, at least on the surface.

There were weaknesses in the structure, however, that culminated in a breakdown 12 years later.

Kilgore for some reason kept his office in the Department of Agriculture. Part of the research workers were in the Department of Agriculture and part at the College. The same was true of extension personnel.

The College Treasurer had to disburse the Federal source funds for both research and extension activities while funds appropriated by the Board of Agriculture were handled through the State Agricultural Department.

Technically each board retained its authority and responsibility, but in actual operation both institutions surrendered their control to the Joint Committee. The Committee was composed of men of ability and strong personality, but Kilgore was in most instances able to operate with a free hand. He now controlled not only the investigational work, but also the demonstration or extension work and was the State Chemist for fertilizers and feed inspection.

Immediately on becoming Director the organization plan previously proposed by Kilgore and Williams was put into effect. This brought together administratively in the various divisions the work at the College, that done on Test Farms and some special types of work such as soil survey which had been handled by the Department of Agriculture in co-operation with the Federal Bureau of Soils. Soil survey now was made a part of the Agronomy Division under Mr. Williams.

## DIVISION OF ANIMAL INDUSTRY

While the negotiations were in progress for coordinating the work of the two agencies, a motion was passed by the Joint Committee directing that an able man be secured to head the animal industry work. After about a year of searching, Dan T. Gray was appointed Chief and began his work on January 1, 1913.

Mr. Gray had a dynamic, aggressive personality and did not hesitate to drive for what he wanted. He remained with the Station about seven years,

During that time the division expanded very materially in personnel and in type of work.

The annual reports for 1913 and 1914 were combined into one publication. This report as well as succeeding reports of Dr. Kilgore have some interesting features.

The 1912 report listed only 18 members of the Station staff, including the Secretary. The 1913 to 1914 report listed 67 people. However, this list included the extension workers, (except the county agents), and the fertilizer and feed control chemists. Only the title of each worker indicated whether he or she was engaged in research. The public in general would not make any distinction. The Joint Committee had made extension work a part of the Experiment Station so technically the report was correct.

Another interesting feature was the financial statement. While all reports emphasize the union of all work and that performed on the Test Farms is discussed, in the financial statement only the funds disbursed through the College Treasurer are reported. This included \$30,000 from the Hatch and Adams funds, plus receipts from sales on the College Farm. The Federal acts required that Federal funds be reported in detail to the Secretary of Agriculture.

Other expenses were borne by the State Department of Agriculture and of course reported there. That was before the establishment of the State Budget Bureau and the Board of Agriculture had full control in the handling of its receipts and disbursements.



When Extension work began with field demonstrations, it was part of Station program.

It is somewhat strange that with the emphasis given to the fact that the Station was under the control of a Joint Committee from the two boards, when it came to listing cost of operation, only one source, the College, was given in the printed report.

In the printed report and also in the minutes of the Board of Agriculture it is found that annual operation costs sometimes ran ahead of receipts. This necessitated carrying an overdraft, or borrowing from the bank against next year's receipts. One member of the staff of that period advises that at least on one occasion at the end of the fiscal year he was paid his salary by the Director's personal check.

#### SMITH-LEVER ACT

This period, 1912 to 1925, was marked by a number of developments affecting the Experiment Station. The passage by Congress of the Smith-Lever Extension Act in 1914 had a direct bearing on research work. In North Carolina, by agreement approved by the U. S. Department of Agriculture, extension work was made a part of the Experiment Station, thus bringing the research and extension workers more closely together.

The State Department of Agriculture finally was granted permission by the Legislature to construct a new building. For a time there was a tug of war as to whether the building would be located at the College or downtown, where it was finally located. When completed many of the research and extension people made their headquarters there. The College was short of space for Patterson Hall and the old Zoology Building (then the Animal Husbandry building) housed all the work of the School of Agriculture.

The First World War materially affected the work of the Station as was true of all other activities.

Also in the early twenties the movement to organize the cotton and tobacco growers associations took precedence over other work. Kilgore was one of the key men promoting these associations and for months he used all members of his staff in the campaign. Most of the workers went far beyond the traditional educational or information type of activity.

All of these developments affected the research program, but on the other hand receipts from fertilizer and feed tax increased rapidly during the period and Dr. Kilgore thus had the finances to expand the work.

Early in Kilgore's administration there were distinct developments in organizing the divisions into sections with a leader in each section. In Agronomy there were: (1) soil chemistry, (2) soil fertility, (3) plant breeding, (4) soil survey, and (5) miscellaneous. In Animal Industry the work was organized around swine, beef cattle, sheep, dairy experimentation, horses and mules, poultry and dairy farming.

In the division of Entomology and Horticulture, as previously related, there was an ambiguous situation. The chiefs of the divisions were down-

town and had charge of most of the work on the Test Farms in addition to other duties in connection with control work, while at the College there was an Entomologist and a Horticulturist reporting directly to the Director. The Test Farm experiments were largely routine while the men at the College devoted their research time to more fundamental investigations financed largely by Adams funds.

The divisions of Chemistry and Veterinary Science devoted most of the research time to co-operative projects, particularly with Animal Industry. For several years Chemistry and Animal Industry had worked co-operatively trying to isolate the toxic principle in cotton seed meal when fed to hogs.

Chemistry and Bacteriology also co-operated in soil nitrification studies.

It is interesting to note in the report for 1915 that "this state is now the largest producer of soybeans in the Union." Also in 1914, considerable quantities of soybeans were crushed by the oil mills, and in 1915 more than 100,000 bushels were crushed.

#### PLANT BREEDING

So-called plant breeding work had been reported by the Agronomy Division for a number of years, but plant breeding as now recognized really began about 1913 when Dr. R. Y. Winters, later Director of the Station, was put in charge of plant breeding in Agronomy. Previous work was primarily field selection and field comparisons of so-called varieties but now began the plant row propagation, and this in turn was followed by cross pollination.

Dr. Kilgore was quite successful in getting the various bureaus of the U. S. Department of Agriculture to assign workers to North Carolina. He had started soil survey work under such an arrangement about 1900. When he issued the annual report for 1913 and 1914, co-operation was reported with bureaus of Plant Industry, Soils, Animal Industry, and the Office of Experiment Stations. Drainage work is first mentioned in 1914. The work is not mentioned by any of the division chiefs so it was probably attached to the Director's office for guidance.

Relationships between the College and the State Department of Agriculture for some five or six years after the research and extension work was placed under the Joint Committee appear to have been satisfactory. The First World War engulfed the United States and the attention of all was turned to the foreign enemy and family quarrels were largely forgotten or postponed. With the ending of the war, however, pressures began to build up within and without the State.

In 1917 a committee representing the National Association of Commissioners of Agriculture and the Land-Grant Colleges outlined a memorandum regarding the functions of the two institutions. It was agreed that the primary function of the colleges was research and extension and that of state departments of agriculture was control and regulation of the sale of

seed, feed and fertilizer. These recommendations, however, were not binding on the several states and nothing was done in North Carolina.

In January 1919, Secretary Houston of the U. S. Department of Agriculture made an address to the National Association of Commissioners of Agriculture in which he stated, "A great gain would result if the states adopted the policy in general of confining the agricultural colleges to investigational and educational work, both in the colleges and in the field, and the commissioners or board of agriculture to administrative and regulatory matters, heading up under such commissioners or boards the proper administrative and regulatory activities affecting agriculture, thus providing in each state two great strong central agencies for the betterment of agriculture and rural life."

In February, 1923 Henry Wallace, then Secretary of Agriculture, sent a letter to all the governors in the several states which set out rather specifically the policy the U. S. Department of Agriculture observed in co-operative relations with the state public agencies as regards regulatory work and law enforcement, and as regards research and extension work. The pertinent paragraphs are as follows:

"In all regulatory work and matters of law enforcement, we co-operate with the State Department of Agriculture, or such law enforcement agencies as the state may have created.

"Our research work, if done in co-operation with the states, is carried on with experiments of the Land-Grant College.

"Our extension work in agriculture and home economics is carried on with the extension divisions of the Land-Grant Colleges. This co-operation is made mandatory in the Federal Smith-Lever Law itself, the provisions of which have been accepted by the State Legislatures."

While this pressure was building up from Washington, conditions within the State were not entirely harmonious. The agreement between the College and the State Department specifically provided that the Director's office would be at the College, but for some reason the office remained in the State Department. The matter was discussed, at least in one meeting of the Joint Committee, and Kilgore suggested that he have a part time office at the College but apparently this was not consummated. President Brooks in the *State College Record* in October, 1921, in discussing relationships between the College and Department, mentions several times that the Director's office remained in the Department in violation of the agreement.

The break came about more from extension activities rather than research, but the final result was the moving of both activities to the College.

## EXTENSION INCREASING

While research funds remained practically constant during this administration of Dr. Kilgore, the extension budget increased each year, beginning in 1914, from both Federal and State sources under the provisions of the

Smith-Lever Act, and Federal funds were further increased from emergency funds when the U. S. became an active participant in the war. As previously mentioned, Kilgore in his reports made little distinction between the Station and extension and the same was true as regards general publicity or information. Under such conditions it was only a question of time before the friends of the College would make complaint. President Riddick in one of his last reports to the Board of Trustees mentioned that the College was not getting proper credit for its contributions to both the Station and the extension work.

Brooks, in his publication mentioned above, states that: "However, in giving the Joint Committee the authority to determine and employ such workers as may be necessary for the conduct of the work and regulate the salaries and duties, the General Assembly made it possible for a third institution to develop. This was further stimulated by the act of the Joint Committee in uniting the research and demonstration work under one Director, whose headquarters still remained at the Department of Agriculture. . . . In perfecting this arrangement, however, one factor was overlooked, and this was largely psychological rather than professional or institutional. It was not then foreseen that two groups of workers located at the College, and responsible for their professional guidance and executive control, one to the Board of Trustees of the College and the other to the executive officer of the Joint Committee located at the State Department of Agriculture, would sooner or later cease to form a working unit or see the necessity of maintaining a co-operative basis; and yet this is exactly the thing that happened. . . .

"From the beginning of the co-operative agreement, the Joint Committee saw the necessity of basing instruction in agriculture on research and investigation, and it continued to locate the research men and nearly all extension workers at the College, but their headquarters really were at the Department of Agriculture, where the executive officer resided. Their physical location was at the College, yet they were under no College regulations; they occupied offices and laboratories sometimes adjoining the offices or laboratories of the College workers, yet in many instances they grew farther and farther apart, and in some instances they were as widely apart psychologically as if they lived in different parts of the city. As a result, the program that was begun for the purpose of promoting harmony was gradually promoting discord. . . .

"Members of the State Board of Agriculture and the Board of Trustees of the College recognized that the growth of the third institution was producing a situation not anticipated when the Joint Committee was created, and that it was necessary to take some steps to correct the defect and change the psychology, which was becoming more and more injurious both to the State Department of Agriculture and to the College.

"Such were the conditions in the spring of 1923, when the two Boards agreed to take the following steps:

"1. To unite the Agricultural Research with Agricultural Extension and Instruction at the College, in order that instruction in agriculture might be more directly based on research. Moreover, the plan contemplated unifying in the State Department of Agriculture the large administrative and control functions.

"2. To elect the Director of Extension and of Research as Dean of Agriculture of the College. The Director was then the Executive Officer of the Joint Committee of Agricultural Work. It was the plan to transfer his office to the College in order to change that psychology which seemed to be promoting disunion. It was apparent to all that a closer union was necessary before harmony could be effected and a better working basis established."

At the meeting of the Board of Trustees in June, 1923, Dr. Kilgore was elected Dean of Agriculture and finally, after 11 years, moved his office to the College.

This was only the first step, however, for the Joint Committee still had control of the research and extension work rather than the Board of Trustees. Brooks stated: "It became necessary, therefore, for the College to terminate its old relationship with the Joint Committee in order to comply with the State and Federal Acts and with the rulings of the United States Department of Agriculture."

Accordingly in May, 1924, the Board of Trustees passed resolutions advising the Joint Committee that the Trustees desired to assume full control of the Federal funds for both extension and research and the executive committee of the Board was directed to take such steps as would complete the transfer and place both lines of work under the administration of the College.

The resolutions further requested that the Board of Agriculture continue to appropriate from the Department of Agriculture funds the same amount for research (\$60,000) and extension (\$20,000) as had been done the previous year.

These resolutions were presented to the Board of Agriculture in July and were unanimously approved.

#### FOURTH DIVORCE

Thus again and for the fourth time the Station was divorced from the Board of Agriculture, but in a sense the Board continued to pay alimony for 15 years for the support of research work.

The administrative situation of the Station was just in reverse of what it had been since 1912 in that the College Board now had the responsibility instead of the Joint Committee and the Director's office was at the College instead of the Department of Agriculture.

However, the State Department still owned and operated the Test Farms and by law the Board of Agriculture was charged with the duty of carrying

on certain types of research. Unfortunately the College was also by law charged with similar responsibility and in the same field. These conflicting and duplicating laws are still on the statute books (1953) and human nature being what it is, the old wars will be resumed at some future date unless some subsequent Legislature repeals some of the old acts and more clearly defines the functions of the two agencies.

Many people and the press in the past have been extremely critical of the conflicts and jealousies between the staff members of the two agencies and to place the whole blame on the people trying to administer the programs. The writer holds no brief for or against those who have been participants in previous controversies, but he does submit that the primary cause of previous conflicts rests squarely on the Legislatures that passed the acts governing the two agencies.

With the complete return of the Station to the College and in line with the policies adopted for the re-organization of the whole institution under the administration of President Brooks, new directors were appointed for extension and the Experiment Station but administratively responsible to Dr. Kilgore as Dean of Agriculture.

Dr. Kilgore served as Dean through the scholastic year 1924 to 1925, when he resigned his duties with the College.

Dr. Kilgore was of slight physical stature and during his later years found it necessary to conserve his physical strength. He often had personal conferences while reclining on a couch in his office.

He was a quiet, soft-spoken, lovable gentleman who had the happy faculty of generating intense loyalty on the part of most members of his staff and others. He knew how to get things done in line with his wishes without fanfare or general knowledge by those who might oppose him. One of his friends stated: "Dr. Kilgore could walk on egg shells and not crush one." He undoubtedly desired power in his chosen field and for a period of 30 years he usually got what he wanted.

He was strong for a program as a whole, but in reaching the objective was not particularly concerned with source of funds or administrative regulations regarding their use. Under present day Federal and State budget control practices he would probably experience endless difficulties.

In spite of any shortcomings he may have had, Dr. Kilgore was the leading professional personality in agriculture in North Carolina for more than a quarter of a century. He served during a formative period in technical education which blossomed into full fruition shortly after he severed his connection with the College.

In the spring of 1925, Dr. Kilgore as Dean and President Brooks clashed regarding the administration of the teaching work in the School of Agriculture. As a consequence Dr. Kilgore resigned all connection with the institution in June, 1925.



## DR. R. Y. WINTERS, 1925-1937

Dr. R. Y. Winters, who had been Plant Breeder and Associate Agronomist, was appointed Director of the Station upon the resignation of Dr. Kilgore in June, 1925.

There were many details of re-organization and co-ordination still to be worked out so the new Director had many problems confronting him. One of the major problems was the relationship of some research workers still employed by the Department of Agriculture and also the Test Farms owned and controlled by the Department. A long step was taken when an agreement was signed between William A. Graham, Commissioner of Agriculture, and President Brooks of the College dealing with these specific problems as follows:

"1. All research work in the state is conducted either by the College or by the Department of Agriculture under the supervision of the Director of the Experiment Station of the College. This agreement has been consistently followed. But arrangements have been completed for the college to take over the remainder of the research work in Feed Nutrition (Animal Nutrition) and in Entomology at the close of the present scholastic year. This will take from the Department of Agriculture the balance of the research conducted by members of that department. Therefore, at the end of the year 1925-1926 the College will have full control of all the research conducted in the state.

"2. The Test Farms owned and supported by the Department of Agriculture are used by the College for conducting experiments or research in such manner and to such an extent as the President of the College and the Commissioner of Agriculture may determine; and the Director of Research of the College is given full authority to plan and supervise any research work on the test farms without referring the same to the President or to the Commissioner, provided the total expense of conducting the same in one year does not exceed the total expense of the preceding year.

"3. The Department of Agriculture maintains a supervisor of the Test Farms and the Department agrees to keep its force and provide service for the use of the College. The Test Farms, therefore, are under the supervision of the Director of the Experiment Station and the Supervisor of the Test Farms. They, working jointly, can carry out any program that may be mutually agreed upon.

"But, in a case of disagreement, the matter may be settled by the President of the College and the Commissioner of Agriculture, and if they are unable to agree, the matter may be referred by either to a joint Committee composed of the Governor and equal representatives from the Board of Agriculture and the Board of Trustees of the College."

To further implement this arrangement, two committees with equal representation from each board (the Board of Agriculture and the College Board of Trustees) were appointed. The first was an Experiment Station Committee, with three members appointed by each board while the second was a

Joint Committee on Agricultural Work with four members from each board.

The plan outlined above worked very satisfactorily and from the standpoint of organization and project co-operation has, in the main, been in effect from 1925 until the present time.

Beginning in 1923, the College was reorganized and expanded in line with the recommendations of Dr. George F. Zook of the U. S. Bureau of Education who had made a survey of the College at the request of the Board of Trustees. Dr. Zook was emphatic in his recommendations that the College take full charge of research and extension and his recommendations were followed almost entirely during the next few years. His report brought about a change in nomenclature in that the organization of groups of workers in a given field were called departments instead of divisions as had been true for many years. The annual report for 1925 is the first to carry the title "Head, Department of —."



DR. R. Y. WINTERS

## FINANCES

From the standpoint of financial support the passage by Congress of the Purnell Act in February, 1925 gave the Station an additional appropriation of \$20,000 for 1925-1926. This was increased annually by \$10,000 until the total reached \$60,000—an increase of 200 per cent from Federal sources.

Contributions from the State Department of Agriculture were uncertain and during the next 10 years steadily decreased. The Department's contribution to the Station was contingent on fertilizer tax receipts and were available only after all needs of the Department had been met. During the depression of the thirties income from this source was sadly lacking. When the transfer of the research was made to the College the Department contributed \$60,000. By 1937 this contribution had dropped to \$26,350. Dr. Withers, in his report for 1932, stated that "these changes have reduced the research personnel supported wholly or in part by the State fund from 25 to 11, and the research program to the extent of 46 projects."

The reduction in funds necessitated limiting publications to minimum needs. At times it was impossible to print the Director's annual report for two or more years after it was prepared. The publication of bulletins was

limited to those considered most essential and the number of copies printed was so small that the supply was often exhausted within a few weeks after being printed.

The budget situation was helped materially by the passage of the Federal Bankhead-Jones Act of 1935 which gave an increase of \$26,657 for the fiscal year 1936 and \$51,314 for 1937. However, both the Purnell and Bankhead-Jones Acts were for rather specific purposes and for new research. These funds, therefore, were not available to any appreciable extent to take up the slack resulting from the reduction in State funds. In addition the Bankhead-Jones funds had to be matched from state sources. Dr. Winters had sufficient state funds to make the offset during his administration but later as Bankhead-Jones appropriations increased from year to year, making the offset become a real problem.

Dr. Winters worked unceasingly to get appropriations from the General State Fund, but without success until 1937 when the barriers were finally broken with an appropriation of \$5,000 for Brushy Mountain apple research.

Early in Winters' administration we find a record of financial co-operation from commercial organizations. In 1928 there were four projects of this type. Three of these were for fellowships and one a direct grant. All of these were concerned with fertilizer studies.



During the 1920's, research work was reorganized to meet farmers' needs better.

With regard to the research program, Dr. Winters initiated a careful study of all projects, underway when he became Director, with "reference to present day problems confronting farmers of the state and in the light of existing knowledge." This examination resulted in the following changes and revisions in the research program:

1. The dropping of projects that have matured.
2. Preparing results for publication.
3. Dropping projects which have not given profitable returns.
4. Strengthening the attack upon a few problems important to the state and region by supplying better support and arranging co-operative efforts between one or more departments of the Station and with the U. S. Department of Agriculture.

In addition to the study made by the staff, conferences were held with farm leaders in the various sections of the State to determine their most pressing problems and to redirect the efforts of the Station as far as resources would permit toward finding the answers.

#### CALLS FOR MORE RESEARCH

At this time (the late twenties) extension through county agents had been underway approximately 20 years and vocational education in the high schools about 10 years. Activities of these workers, together with other forces, were bringing about a general awakening of interest in agriculture on the part of more and more farmers and business interests. This situation turned the pressure on the Experiment Station for more and more information. Many of the questions asked could not be answered with the available knowledge and some people became critical. In one report Dr. Winters stated:

"There exists at times a feeling of impatience among growers and others toward the slow process of fact finding and the lack of proven information. The danger lies not so much in the existence of impatience but in its stimulation of superficial tests and practices which are misleading. Expressions of impatience are useful in directing the attention of research workers toward needed information. Expressions of impatience would be doubly useful if they were also directed toward support for research personnel and facilities."

Compared with present day facilities it is interesting to note the needs as stated by Director Winters 25 years ago:

"The station has no provision for research in agricultural engineering.

"Funds available are not sufficient to provide for the study of forage crops and pastures.

"Much research is needed in the study of animal diseases and parasites which are usually destructive to domestic animals of the South.

"Less than 10 acres of the 150 acres of the Station Farm are suitable for field plot experiments because of the irregular soil and contour.

"The present laboratory for soils research is inadequate for this purpose and is now shared with advanced students in soils.

"The field crop research is in need of storage and laboratory facilities. . . . The cotton fiber studies are being done in an office 8 x 10 in size.

"The swine research is isolated on a small farm four miles from the College, detached from other livestock investigations and farm operations."

In his reports, his speeches, his writings, and personal contacts, Dr. Winters made his pleas. But in the main, "his was a voice crying in the wilderness." Efforts to gain the joint support of farm organizations were unsuccessful. Those were depression years and the Legislature and the State Administration found it extremely difficult to balance the budget. Finally the State found it necessary to cut salaries of employees one-third. The reduction in salary was applied to all State Experiment Station workers though some of them were paid entirely from Federal funds which had not been diminished.

It was 1937 before the Station was able to get support from the State's General Fund and then only through the progressive and aggressive leadership of a few men at Wilkesboro who got an appropriation of \$5,000 for apple research in the Brushy Mountain area.

With the reorganization of the College in 1923-25, efforts were made to stimulate research by full time faculty members. To that end, Dr. Winters appointment covered Director of Research for the College as well as for the Station.

During the Winters' Administration there was a marked change in the type of many research projects. With the additional funds coming from the Purnell Act in 1925 and the Bankhead-Jones Act of 1935, new lines of work were initiated and in nearly all departments new and better technically trained workers were added to the staffs. Research was placed on a more sound scientific basis than ever before.

## ECONOMICS AND SOCIOLOGY

Agricultural Economics, including Rural Sociology, was developing as a new department with a staff of eight workers. Agronomy expanded from 11 workers to 21. Horticulture doubled from four to eight.

It was during this period that the role of minor elements in plant and animal nutrition came into prominence and for many years staff members in Agronomy were recognized as national leaders in this field.

Beginning in 1935, co-operative arrangements were made with the Tennessee Valley Authority for investigations of new fertilizer materials, especially phosphates. Out of this work grew the remarkable improvement of agriculture in the mountain area of the State.

Extensive work was done with chemical treatments to prevent damage from plant diseases, especially with tobacco. This approach failed to solve the problems, but a few years later the answer was found in breeding new varieties resistant to the diseases.

Horticulture developed from a few men largely comparing the effect of varying cultural practices to a more fundamental scientific approach, especially in the field of breeding of potatoes, tomatoes, small fruits and other garden crops and fruits. Pickle studies were initiated in 1935 and later conducted co-operatively with the U. S. Department of Agriculture.

Considerable time was spent in cultivating cooperative research with the U. S. Department of Agriculture: the soil erosion station (then at Statesville), small fruit breeding, farm management and marketing research, the initiation of pasture research under Dr. Lovvorn, the cucumber pickle work under Gardner and Jones, and later the initiation of corn hybrid work under Harvey. The Station took an active part in the planning of soil conservation districts and the program for removal of submarginal lands from agriculture, and acted as a focal point for bringing together representatives of other States agencies in this program.

Animal husbandry investigation offers a good illustration of how circumstances may influence the emphasis in a research program. For 25 years or more, after the development of processes to extract the oil from cottonseed, the meal was the most economical source of protein for feed purposes in the South. However, it was soon discovered that cottonseed meal was toxic to pigs if fed in quantity. It was logical, therefore, for the Station to direct its research toward finding the cause of the toxicity and if possible a remedy. Accordingly, for many years staff members from Animal Industry, Chemistry, and Veterinary devoted their main efforts along that line. Finding the answers was not easy but at long last the toxic element was isolated and a practical remedy found.

A few years later, however, the use of cottonseed meal as a source of nitrogen in fertilizers took much of the available supply of meal and efforts were then directed toward other protein feeds. Work was directed to the use of peanuts, soybeans and soybean meal for hog feed. These oily feeds, however, produced soft pork and most commercial packers cut the price paid for such hogs.

The Station then, over a period of years, carried on research to find a feed mixture that would utilize as far as possible the oily crops and yet produce a carcass hard enough to satisfy the packer. This problem was of such great importance to the South that for several years a number of other State Experiment Stations and the U. S. Department of Agriculture and for many years the Station has recommended cottonseed meal as part of the ration for fattening hogs.

Fortunately, about that time, fishmeal suitable for feeding became available from North Carolina factories and the station turned its research efforts



Despite problems, North Carolina agriculture kept on growing up during the 1930's.

toward finding its most efficient use, not only with hogs, but with poultry as well.

Much of the work with hogs was done at Wenona, Upper Coastal Plain and Piedmont Test Farms.

Dr. Winters resigned in the fall of 1937 to accept an appointment in the Office of Experiment Station in Washington.

In spite of lack of financial support and indifference or lack of interest on the part of some officials whom he would naturally expect to give him his strongest backing, Dr. Winters during his 12 years as Director organized the Station on a sound scientific basis and laid the foundation for the large expansion in financial support, personnel, and scope of work that was to take place during the next decade.

## GROWTH OF DEPARTMENTAL ORGANIZATION

From 1877 to 1886 there was only one unit of the Station—the Director's office. The primary function was fertilizer analyses and control work. The staff was composed of the Director and several assistants—all chemists. Research and dissemination of information was of secondary importance and was handled entirely by the Director.

The first break in the one-unit organization came in 1886 when a 10-acre farm was purchased for field research and a farm superintendent, Milton Whitney, was appointed. Whitney was more than just a supervisor in that he planned and personally carried on much research activity. He resigned in the fall of 1887 and for some months the work on the farm was suspended.

Also in 1886, at the request of the Board of Agriculture, the Signal Corps of the U. S. Army stationed a weather observer at the farm. Temperature and rainfall records were kept and reports were widely distributed throughout the State through the cooperation of the telegraph offices of the railroads. This work was financed by the Signal Corps. It was discontinued in 1895.

In 1888 an Agriculturist was appointed. He had charge of the farm which was reactivated for field and livestock investigations.

Also in 1888, a Botanist was employed whose duties consisted primarily in collecting plant specimens and also began, in a simple way, testing seed for purity and germination.

In December, 1889 the Station became a department of the newly established Agricultural and Mechanical College and W. F. Massey, the Professor of Horticulture, was also appointed as Horticulturist to the Station. The Agriculturist and the Botanist were full-time Station employees without any teaching responsibilities.

By 1891 insect control was becoming important and this work was assigned to the Botanist. This arrangement continued until 1897.

In 1891 the Horticulturist was given an assistant to look after the research work with vegetables, fruits and flowers.

In 1897 a new Board of Trustees took control and made the Agriculturist of the Station responsible for teaching work in agriculture and the research in that field. He was given an assistant in agriculture and also work with poultry was initiated. Apparently at first the "poultry manager" as he was called, worked independently but later reported directly to the Agriculturist.

Likewise, in 1897 the work in botany and entomology was assigned to the Horticulturist. His assistant in horticulture was continued. However

the Botanist and Entomologist was discharged and a new man appointed with the title of Assistant Botanist and Entomologist.

In 1899, there was a new Board of Trustees and consequently some re-organization. The Agriculturist was discharged and the Professor of Agriculture prior to 1897 was made head of the research and teaching. The title of the Assistant Agriculturist was changed to Assistant in Animal Industry, the first time this terminology appears in the reports. For two years there was no special man in poultry, this work being handled by the Agriculturist.

The first time Chemistry, as a unit, appears in the reports was in 1899. The chemical analyses of fertilizers was transferred to the State Department of Agriculture and the head of Chemistry in the College was made Chemist of the Station and given two assistants. All, however, did teaching as well as some research.

During 1901-2, a new poultryman was employed as assistant to the Agriculturist. The Horticulturist lost both of his assistants and for a time he was responsible for all three lines of activity.

In 1902 there was considerable expansion in organization. The Agriculturist had one assistant in field tests and was given an assistant in dairy husbandry, the first time this title appears. Poultry was organized as a separate division and was to remain so for some 10 years.

Botany and Entomology were transferred from Horticulture and made separate divisions. In the case of Botany, however, the title was Biologist rather than Botanist. The work of the Biologist was really plant pathology. Also at this time a Veterinary Division was organized.

During this period, 1901 to 1907, the Board of Agriculture was also the Board of Trustees and both the Veterinary and Entomology divisions were engaged largely in control work rather than research.

In 1906, the Agriculturist, C. W. Burkett, resigned and the responsibility of the division was divided between the professor of agriculture, C. M. Conner who had the title, Agriculturist, and C. B. Williams as Agronomist, the first appearance of this title. An assistant was appointed in plant diseases.

The year 1907 brought a new Board of Trustees and again a separation from the State Department of Agriculture.

The Division of Agriculture was broken down into three divisions—Agronomy, Animal Husbandry and Dairy Husbandry. The new Director, C. B. Williams, also served as head of Agronomy.

Poultry, Horticulture, Entomology and Biology (plant diseases) continued as Divisions. Veterinary was suspended for one year but was reinstated in 1908 with Dr. G. H. Roberts as head of both research and teaching.

For one year only, there was a division designated as Animal Pathology.

During the fiscal year 1911-12 there were a number of changes in the heads of divisions but the administrative units of organization remained the same until 1912.

From 1907 to 1913, the State Department of Agriculture from its own funds had conducted a State Agricultural Experiment Station. The scope of the work covered the operation of a number of Test Farms, soil survey, soil drainage and farm management in cooperation with the U. S. Department of Agriculture, soil chemistry, and a number of other subject matter lines. Much of the work was in the same general field as that conducted by the College Station.

This situation resulted in bitter jealousy in some instances and general confusion on the part of the farming interests of the State. The Legislature of 1911 had taken notice of the situation and appointed a Joint Committee representing the Senate and the House of Representatives to make an investigation of both agencies and report to the next session of the General Assembly. This investigating committee served as a goad to the Board of Agriculture, the Board of Trustees and the administrative officers of the two institutions. Representatives of the two agencies promptly got together and in the course of a few months agreed that all the research work of both agencies would be administered by one executive officer who would report to a Joint Committee composed of equal representation from the two boards.

This new arrangement brought about considerable change in the organization of divisions. The major change was the combining of animal husbandry, dairy husbandry, and a year later, poultry into one group designated as Animal Industry.

Soil survey and soil chemistry which had been in the Department of Agriculture were assigned to Agronomy.

Soil drainage and farm management apparently were left more or less independent reporting directly to the Director.

In the case of Entomology and Horticulture the organization was somewhat ambiguous. In the published organization list men formerly with the State Department of Agriculture were designated as chiefs, but in both Entomology and Horticulture, the two college people reported directly to the Director rather than through the division chief. This arrangement held for a decade.

Chemistry, Plant Pathology, and Veterinary continued as in previous years.

A new division, Markets, was organized but it was more of a promotional and service activity rather than research.

In 1914, an Assistant Director of Test Farms was appointed and this position has been continuous since that time.

There was no further material change in organization until 1921 when the Veterinary Division was discontinued. Chemistry also was discontinued as an administrative unit with some personnel being transferred to other divisions.

During 1923 the College had a major reorganization and this brought about a general change in the Station. For the fourth time, the administrative research work was transferred from the Department of Agriculture to the College. The Department still owned and operated the Test Farms, but by mutual agreement the research on these farms was planned and supervised by the Experiment Station.

It was during 1924 that the term "department" superseded the term "division."

From 1924 to 1926, the administrative work in Agronomy was divided with one man in charge of field crops and another in charge of soil fertility. This arrangement was changed in 1926 with the appointment of one person as Head of Department.

Poultry was moved in 1924 from Animal Industry and again organized as a department.

During the fiscal year 1926 a new department called a Bureau of Economic and Social Research was established. A year later Sociology was made a separate department. However, three years later, due primarily to changes in personnel, Sociology was again assigned to Agricultural Economics and so remained for more than 10 years.

Following the reorganization of the College in 1923-24, the policy was established of making the Head of a Department responsible for the administering of the teaching and research in his respective field and likewise responsible for the technical subject matter recommendations in extension.

In 1930 there were 40 technical members of the Station staff distributed in the departments as follows:

Agronomy	15
Animal Industry	7
Agricultural Economics	4
Botany	3
Horticulture	4
Rural Sociology	2
Zoology and Entomology	2

There were changes in personnel but no major changes in organization for the next decade. The almost miraculous expansion of the Station staff and programs of activity did not occur until the decade beginning about 1940 when increased financial support from Federal and State sources made such growth possible.

Dr. Albert R. Ledoux	Apr. 19, 1877—Oct. 30, 1880
Dr. Charles W. Dabney, Jr.	Nov. 1, 1880—Aug. 31, 1887
Dr. H. B. Battle	Sept. 1, 1887—June 30, 1897
Dr. W. A. Withers (Acting)	July 1, 1897—June 30, 1899
Dr. George T. Winston	July 1, 1899—June 30, 1901
Dr. B. W. Kilgore	July 1, 1901—June 30, 1907
Mr. C. B. Williams	July 1, 1907—Dec. 31, 1912
Dr. B. W. Kilgore	Jan. 1, 1913—June 30, 1925
Dr. R. Y. Winters	July 1, 1925—Sept. 30, 1937
Dr. I. O. Schaub (Acting)	Oct. 1, 1937—Sept. 30, 1940
Dr. R. M. Salter	Oct. 1, 1940—Sept. 30, 1941
Dr. L. D. Baver	Oct. 1, 1941—Dec. 31, 1947
Dr. James H. Hilton	Jan. 1, 1948—Sept. 30, 1950
Dr. Ralph Cummings	Oct. 1, 1950—