1875-1925

SEMI-CENTENNIAL

OF THE

Connecticut Agricultural Experiment Station

NEW HAVEN, CONNECTICUT

OCTOBER TWELVE

NINETEEN HUNDRED AND TWENTY-FIVE

BULLETIN 280 JULY, 1926

Connecticut Agricultural Experiment Station

New Haven, Connecticut

1875-1925

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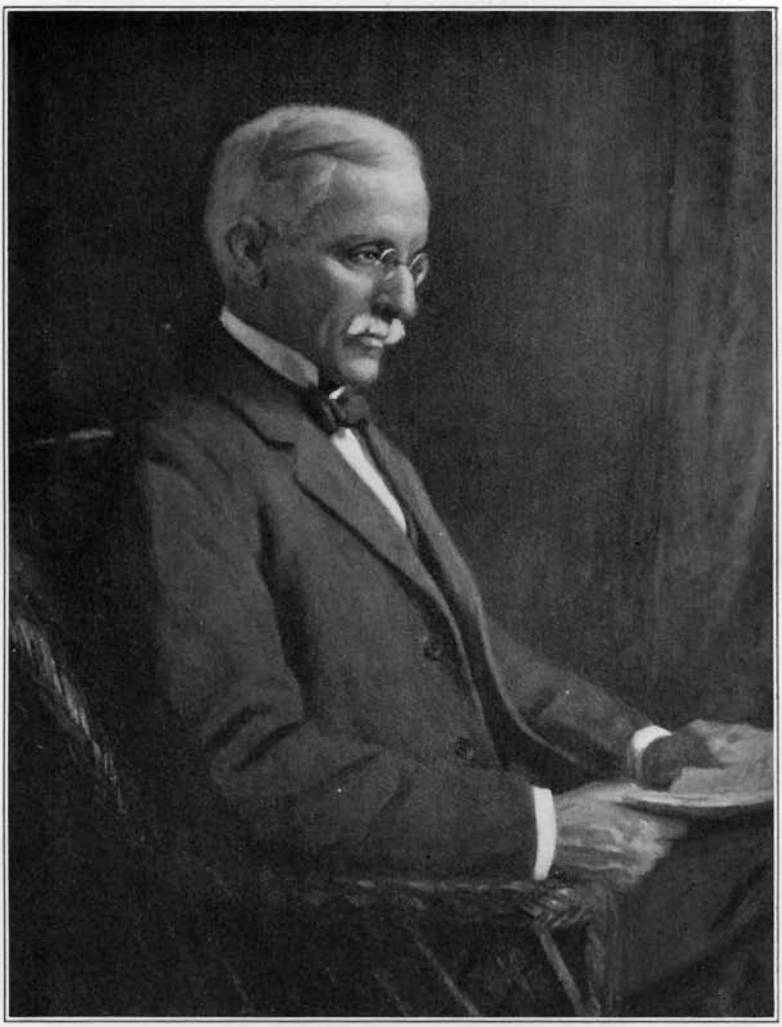

SAMUEL WILLIAM JOHNSON

Professor Samuel W. Johnson may be well called the father of the agricultural experiment station idea in this country. Beginning in 1855, his writings for the agricultural press on the progress and results of scientific agriculture in Europe, his reports on commercial fertilizers as chemist of the State Agricultural Society and later of the State Board of Agriculture, his frequent addresses at farmers' meetings in all parts of the state and his papers on science as an aid to agricultural practice, prepared the way and urged on the movement to found an Agricultural Experiment Station in Connecticut. This was the first Station to be established in America and so proved its value as to encourage other states immediately to follow the example.

The portrait here reproduced was presented to the Station by Professor Johnson's daughter, Mrs. Thomas B. Osborne.

SEMI-CENTENNIAL

of the

Connecticut

Agricultural Experiment Station

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Seventy-five years ago Samuel W. Johnson began his labors in the interest of American agriculture. Through his contributions to the agricultural press, his early analyses of fertilizers to expose frauds, his addresses before agricultural societies, he soon became a leader, especially in Connecticut, where he labored to improve the status of the farmer and bring to him the teachings of science. During these early years he never lost an opportunity to urge the need of research and the propriety of maintaining an agricultural experiment station at public expense. In 1875, after twenty years of constant effort, Professor Johnson saw the fruit of his labors in the establishment of this station. It seemed appropriate, therefore, that the semi-centennial of this station, which marks the passage of fifty years in experiment station history in this country, should be fittingly recognized.

The announcement on the next page was sent to all experiment stations, to many scientific institutions and societies in this country and abroad and to the citizens of Connecticut. Following this will be found a brief history of the station, its establishment and government, its growth and some of its outstanding accomplishments. There are also included the two principal addresses delivered on this occasion, and reproductions of the portraits and memorials presented to the station at that time.

THE BOARD OF CONTROL

OF THE

CONNECTICUT AGRICULTURAL EXPERIMENT STATION

INVITE YOU TO BE PRESENT

AT THE EXERCISES TO BE HELD ON THE

TWELFTH DAY OF OCTOBER

NINETEEN HUNDRED AND TWENTY-FIVE

AT

NEW HAVEN, CONNECTICUT

IN CELEBRATION OF THE

FIFTIETH ANNIVERSARY

OF THE FOUNDING OF THE STATION

JOHN H. TRUMBULL
GOVERNOR OF CONNECTICUT
AND
PRESIDENT OF THE BOARD

HISTORICAL SKETCH
OF
THE STATION

The Connecticut Agricultural Experiment Station dates its birth early in 1875. At that time the General Assembly, voting that the Trustees of Wesleyan University at Middletown had tendered "the free use of laboratory and other facilities for establishing and carrying on an Experiment Station for the general benefit and improvement of agriculture and kindred interests of the State of Connecticut," appropriated $2,800 a year for two years for its support. Prof. W. O. Atwater of Wesleyan University was chosen director.

With very limited means at its disposal the Station's efforts were chiefly directed to the examination of commercial fertilizers and the study of their adaptation to special local requirements. But the director saw clearly the real purpose of an agricultural station, declaring that "it will be worthy of the name in proportion as it carries on accurate and thorough investigation and experiment in agricultural science."

The usefulness of the Station was made so apparent that at the end of the two year period the State resolved to establish it as a separate and independent State institution. This was done by an act of incorporation approved March 21, 1877. The Station's purpose was declared to be, "To promote agriculture by scientific investigation and experiment." Five thousand dollars were appropriated for its annual support and it was placed at New Haven.

Unlike other stations, afterwards organized, it is not connected with any other institution and has the corporate rights to receive and hold real and personal property and to sue and be sued in courts. It is managed by a Board of Control of eight members, one each appointed by the State Board of Agriculture, the State Agricultural Society, Wesleyan University and the Sheffield Scientific School and two by the Governor. The Governor of the State and the Station director are *ex-officio* members. Of the original members four were leading farmers, one an agricultural editor and one a professor in the State Agricultural College. Prof. S. W. Johnson was chosen director.

The Station for a time occupied an office and laboratory in the Sheffield Scientific School given by the School for its use without charge, but in 1882 the General Assembly provided a permanent home in New Haven, which the Station has occupied ever since, with about six acres of land, a dwelling house and barn. A laboratory was also built for its use.

WILBUR O. ATWATER, PH.D., LL.D.

First Director, Connecticut Agricultural Experiment Station, 1875-1877.

Graduated from Wesleyan University (A.B.), 1865; graduate student, Yale University (Ph.D.), 1869, Leipzig and Berlin, 1869-1871; Professor of Chemistry, Tennessee, 1871-1873; Maine State College, 1873; Wesleyan University, 1873-1907; First Director, Storrs Agricultural Experiment Station, 1888-1902; Founder and Director, Office of Experiment Stations, United States Department of Agriculture, 1888-1891; Established the series of United States Farmers' Bulletins, 1889; Special Agent, Nutrition Investigations, 1891, Chief in 1893, and until some three years before his death carried on the long series of dietary studies and investigations with the respiration calorimeter; Honorary LL.D., University of Vermont, 1904; Recipient of the Elliot Cresson gold medal of the Franklin Institute, and gold medal from the Paris Exposition in 1900, and other medals. Fellow, American Association for the Advancement of Science; member American Chemical Society, American Physiological Society, Washington Academy of Sciences, and of many foreign societies. Born, Johnsburg, N. Y., May 3, 1844. Died, Middletown, Conn., September 22, 1907.

(Illustration by courtesy of the Wesleyan University Alumni Association.)

Since then the Station has acquired from the income of the Lockwood fund, to be noticed later, an experiment field and orchard of 35 acres at Mt. Carmel; 13 acres of land with barns, sorting and fermenting rooms and a small greenhouse for tobacco experiments at Windsor;* tracts of 150 acres in Windsor and Granby and 4 acres in Enfield for experiments in forestry.

On the Station land in New Haven have been built, as the need developed, greenhouses, a large fireproof laboratory (the Johnson Laboratory) accommodating most of the departments, a smaller laboratory for the soils work and the plant breeding department and various small buildings for storage, etc. The original chemical laboratory has been made over for a library.

The steady growth and diversification of the Station's work, as they were made possible by appreciation of its service and by federal and state appropriations, may be indicated as follows:

From the beginning, studies of fertilizers, seeds, feeding stuffs, of analytical methods were carried on. In 1882 began investigations in the interest of dairying; the examination of foods in 1885, a food law being passed in 1895; of drugs in 1907; a department of economic botany was organized in 1888; investigations of the protein bodies followed in 1890. A department of horticulture, soon becoming entomology, was established in 1896; of forestry in 1901; of plant breeding in 1905 and of soils in 1923.

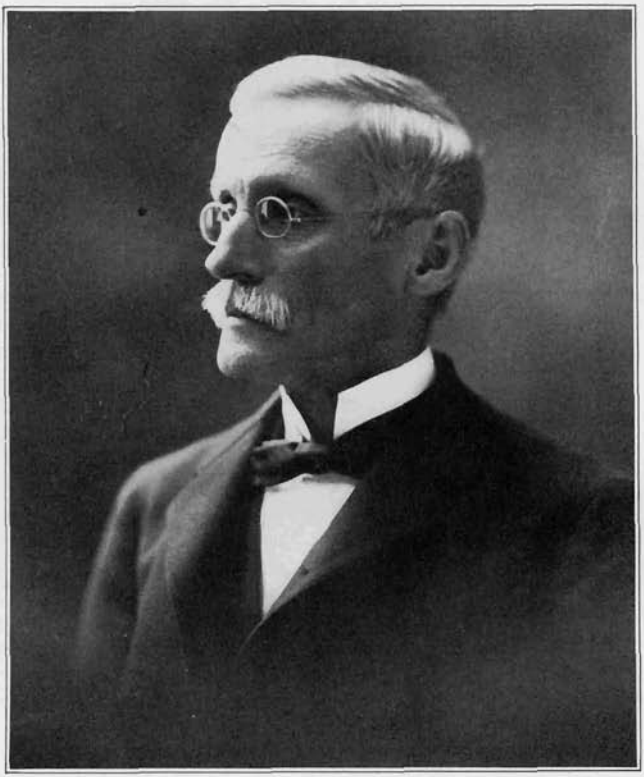
The Station has also been charged with much control work by special statutes. For instance, the fertilizer control; the control of foods and drugs, in coöperation with the Dairy and Food Commissioner; nursery and orchard inspection; control of insect and fungous pests, in immediate charge of the State Entomologist and Botanist, both members of the staff; the work of mosquito elimination; blister rust eradication; and apiary inspection.

For years the State forester was also a member of the staff. The Station forester, entomologist and botanist are an examining board to examine and certify those who are qualified to practice remedial treatment of trees outside their home towns.

What has the Station accomplished in these fifty years? It is impossible here to answer in detail. The few items mentioned below can only serve as examples of its work. It should be remembered that at its beginning there was no telephone exchange in the state, no radio, no trolley service, no automobile, no hardened state roads. No one knew definitely about the nitrogen-fixing habits of the legumes or the control of insects and fungous diseases; there was not a spraying outfit in the state, nor a silo.

There was no efficient grange organization. The only farmers' gathering of importance, outside of local farmers' clubs, was the annual meeting of the State Board of Agriculture.

* These last with the help of an association of tobacco dealers and growers.



SAMUEL W. JOHNSON, M.A.

Director, Connecticut Agricultural Experiment Station, 1877-1899.

Student, Yale University, 1849-1850; Instructor in Chemistry, Physics and Human Physiology, State Normal School, Albany, N. Y., 1851-1852; Student, Leipzig, 1853-1854, Munich, 1854-1855; Honorary M.A., Yale University, 1857; Professor of Agricultural Chemistry, Yale University, 1856-1896; Emeritus, 1896; Associate Editor, *American Journal of Sciences,* 1869-1880; member National Academy of Sciences, American Academy of Arts and Sciences, Society for the Promotion of Agricultural Science, and American Chemical Society, of which he was president in 1878. Author of "How Crops Grow," 1868, translated into six other languages; "How Crops Feed," 1870, translated into four other languages. Born. Kingsboro, N. Y., July 3, 1830. Died, New Haven, Conn., July 21, 1909.

In its early days the Station staff was its own "Extension Service" and went wherever its members could get a hearing, explaining its work; sometimes using its bulletins as a text, often greatly encouraged and sometimes saying with the prophet, "Who hath believed our report?" Personal relations with farmers and the give and take of the discussions which such gatherings made possible established a helpful relation and mutual understanding which made an enduring basis for the Station's usefulness.

Some illustrations of its work, as set forth in a History of Connecticut, are the following:

"It taught and proved by field trials the value of spraying for the protection of field crops and orchards from fungi and insects.

It has studied the life history of each new insect and fungus pest as it has appeared and the best methods of fighting it: the San José scale, the gypsy moth, the pine blister rust, the elm leaf beetle, etc. It has directed the work of mosquito elimination and accomplished much with the insufficient means at its disposal.

It substituted for the very unfair method of payment of cream by the space, the Babcock method of determining and paying for butter fat only, by adapting it for cream gathering creameries and proving its value.

It made, at the request of dairymen, a comparison of economy between the gravity and the separator systems of raising cream for butter-making creameries.

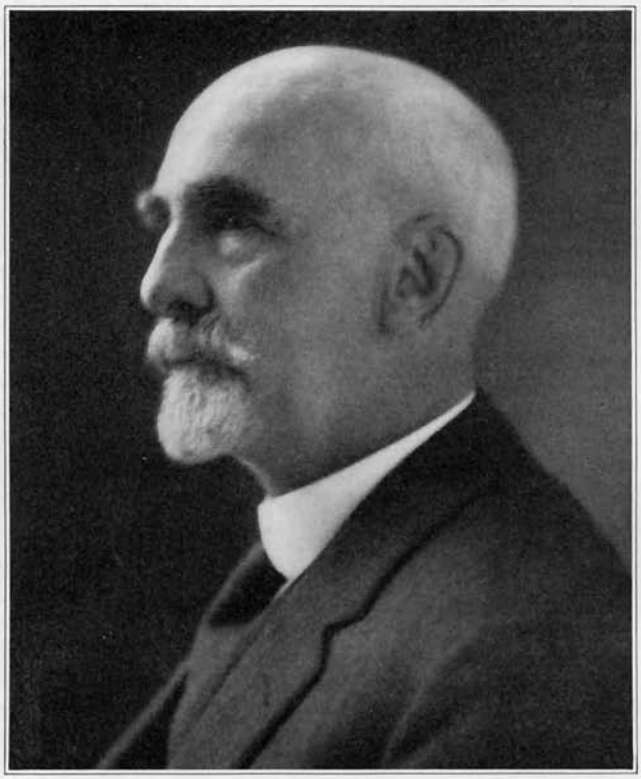
By its inspection and reports it has exposed the frauds in foods and fertilizers and driven most of them out of the State before the Federal Government undertook any of that work. As a part of that work it has examined all the special foods made and recommended for diabetic patients and the reports on them are the standard reference for specialists in the treatment of this disease.

The long continued and fruitful researches of Dr. Osborne have identified and showed the ultimate and structural composition and properties of the principal vegetable proteins.

An inquiry into their relative nutritive value led to extensive studies in nutrition, has perfected a new and most fruitful method of experiment in this field, has led to the discovery of vitamines and studies of their function and to medical studies on the cause of rickets, infertility, etc.

The study of plant breeding here has shown the futility of certain recommended methods of breeding and selection and by methods first adopted here has produced new and improved strains of corn and tobacco and has demonstrated methods of developing superior strains of field crops which have secured general recognition.

It introduced into the State the successful growing of shade tobacco and the method of fermentation in bulk and by its very elaborate field tests with fertilizers has greatly advanced the tobacco-growing industry in the State.



EDWARD H. JENKINS, PH.D.

Director, Connecticut Agricultural Experiment Station, 1900-1923; Emeritus, 1923.

Director, Storrs Agricultural Experiment Station, 1912-1923; graduated Yale University (A.B.), 1872; graduate student at Leipzig, 1875-1876, and then at Yale, receiving the Ph.D. in 1879. Chemist, Connecticut Agricultural Experiment Station, 1877-1900, Vice Director, 1884-1900, Treasurer, 1901-1923; Chairman, Connecticut State Sewerage Commission, 1897-1903; Charter member and President, Association of Official Agricultural Chemists and member of its first Committee on Food Standards; President, 1913, Association of American Agricultural Colleges and Experiment Stations; Fellow, American Association for the Advancement of Science; member, Society for the Promotion of Agricultural Science; Author of Agriculture in Osborn's History of Connecticut. 1925. Born, Falmouth, Mass., May 31, 1850, now lives at 108 East Rock Road, New Haven, Conn.

The station established an experimental forest for the study of forest problems, aided in the planting of private and corporation forests, besides giving advice by addresses and field demonstrations in the management of the farmer's wood lot.

These illustrations, by no means a summary, give some idea of the range of the station's work and show how it has gradually become a public service agency. While designed solely for the benefit of agriculture and while its main effort is directed to that end, circumstances have drawn it in several directions into the service of the whole community."

The State has increased appropriations to the Station from time to time, as its necessities required and the contributions made by the Federal government, one-half of which go to this Station, are known to all.

Important individual gifts to the Station should be noticed. Mr. William R. Lockwood of Norwalk, Conn., who died June 10, 1896, left half of his estate in trust to the Station and the other half conditionally. This also eventually came into the trust, the whole amounting to a little more than $200,000. The principal was to be held intact and the income to be used "in the promotion of agriculture by scientific investigation and experiment and by diffusing a knowledge of the practical results thereof among the people of the State of Connecticut" as the governing body of the Station deem most useful. In case of misuse of the trust, or if the Station ceases to exist, the trust terminates and the principal is given to the Sheffield Scientific School. This wholly unexpected gift has been a great boon and has made possible a development of the Station's usefulness which would have been impossible without it.

Prof. S. W. Johnson gave to the Station library, which now contains more than 14,000 volumes, 500 books from his own library, including very valuable series of agricultural and scientific journals, not otherwise obtainable. More recently his son-in-law, Dr. T. B. Osborne of the Station staff, has enriched the library by a much larger collection of rare and valuable works.

This very brief sketch necessarily omits any detailed account of the many pioneer undertakings, of the men who made them possible and of the present scope of the work. A complete history of the Station may be presented later.

THE PROGRAM

ANNIVERSARY EXERCISES

MONDAY AFTERNOON, TWO O'CLOCK

GREETING

William L. Slate, Jr., Director.

THE AGRICULTURAL EXPERIMENT STATION AND THE STATE

His Excellency, John H. Trumbull, Governor of Connecticut. President, Station Board of Control.

RELATIONS OF THE FEDERAL GOVERNMENT AND THE STATES IN AGRICULTURAL RESEARCH

Dr. E. W. Allen, Chief, Office of Experiment Stations, United States Department of Agriculture.

INFLUENCE OF EXPERIMENT STATIONS ON AMERICAN AGRICULTURE

Dr. R. W. Thatcher, Director, New York Agricultural Experiment Stations.

PRESENTATION OF PORTRAIT OF DR. JENKINS

Dr. Henry S. Graves, Provost of Yale University.

RESPONSE *Director Slate.*

ADDRESSES

The Relation of the Federal Government and the State Experiment Station

By Dr. E. W. Allen.

The Department of Agriculture extends cordial greetings and congratulations to this station on its fiftieth anniversary, an occasion of national interest because of the very significant forward step it commemorates. The station occupies a unique position as the original ancestor of a large and influential family, the progenitor of a new race in this country.

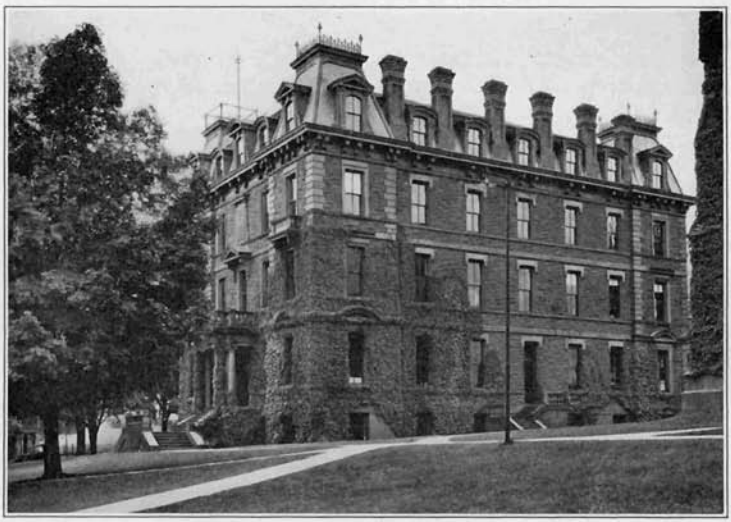
Age itself entitles to respect; age with noteworthy accomplishment brings honor and veneration. To be the forerunner of an idea which has proved so sound and practical as to be propagated in every State and Territory of the Union, and in the distant islands of the seas, is just cause for pride and self-congratulation. But modesty has always characterized this station, and it will be for its friends to bring the mete of praise it so well deserves.

In Washington we look with pride on the record of the Connecticut Station, and revere the names of its originators and leaders: Johnson, who as teacher, writer, and advocate, occupied a foremost position and wielded an influence exceeded by none; Atwater, who had the enthusiasm and persistence to impress others and to carry him over periods of opposition and discouragement; Jenkins, whose whole career has been devoted to this institution, and who for some forty years carried forward its high traditions and created here, as he modestly puts it, "an atmosphere and a somewhat comfortable place for research workers." All honor to them!

This station has served its State not only, but its country. It long since ceased to be merely a State institution; it belongs also to the Nation. As no man liveth to himself, so no such institution as this exists merely for its own community. Its benefits and relationships are limited only by the range and the application of its work; and in the sense that its work and influence have been of country-wide importance, it has come to belong to American agriculture. It is a worthy contribution of the State to the national welfare through the advancement of sound knowledge.

The Connecticut Station was one of the first to take a broad view of research which reached into the fundamentals of science as a means for understanding the common things in agriculture.

It set a standard for work which reveals not merely the bare facts but their real meaning and significance. It has dealt with simple things in a large way. What it has undertaken has been done in no superficial manner, but by digging deep to find out what lay back of the things seen, realizing that these are not themselves causes but manifestations. Its work has lived up to the declaration in an early writing of Dr. Johnson, that "it is not the novelty or the glory of discovery, but the genuineness of discovery that is of first importance." It was a bold stroke for a public institu-



ORANGE JUDD HALL, WESLEYAN UNIVERSITY, MIDDLETOWN.

This building housed the Station during the first two years, 1875-1877. The Station quarters were on the ground floor in the southwest corner and are shown at the right of the picture.

tion established with practical ends in view—a new demonstration of what is practical. It has helped to show the impracticality of half truths, and the permanent value of inquiry that is thoroughgoing.

There used to be a homely saw that what man doesn't know doesn't hurt him, or he does not worry about. Doubtless this was never to be taken too seriously, but to an extent it expressed an attitude at one time. The establishment of this experiment station was a direct answer to any such philosophy, even as applied to the backward art of farming. It was a response to a growing conviction that what man does not know he ought to make an effort to find out, and that in some things this is a just concern of the

State. Mankind has learned by hard experience that lack of knowledge or misbelief has been the greatest source of loss and worries and mistakes, but the founding of this station was the first public expression by any State of this conclusion as related to the industry on which all depend. It was a recognition of the power of research to free from error and guide to progress. It is worth while recalling these facts as showing what this anniversary really means.

Two great agencies have been set up in this country for the advancement of farming—the Department of Agriculture at Washington and the experiment stations in the States. They are separate in organization but have a common purpose, and they bear a relationship in many ways unique in the domain of research.

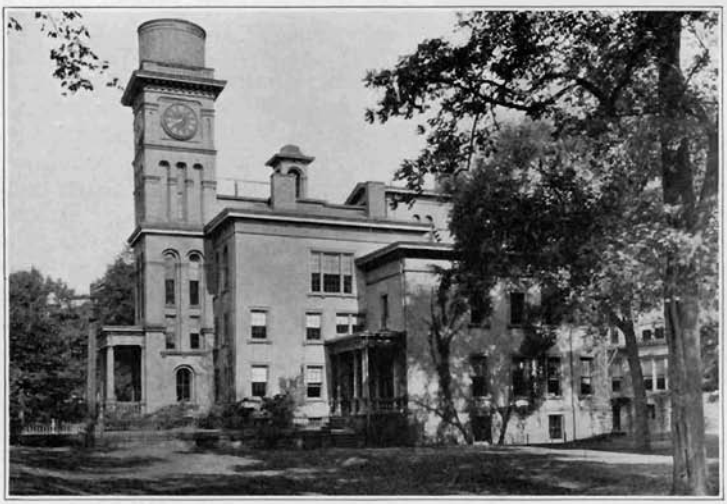
It is interesting to recall that the Department of Agriculture and the agricultural colleges were provided for by Congress in the same year, 1862. The establishment of the Department was a realization of President Washington's hope, and a response to public opinion sponsored by the U. S. Agricultural Society. The colleges were founded on confidence in science and the ability of its teachings to advance the art and make it more self-reliant. Both the Department and the colleges fostered research, although they made relatively slow progress in it.

Farming in this country had depended largely on looking backward, on following the experience and traditions of the past. In contrast to this, the experiment station was a proposal to look forward. To some extent the facts of science were being brought to bear on agricultural questions, but they were mostly derived from borrowed science developed under quite different conditions and frequently misapplied. Here was a plan to anticipate practical experience, to aid in its correct interpretation, and to get new scientific facts applying to our own conditions. Public support for it grew slowly until the State of Connecticut had the courage and the vision to take the first step.

At that time the Department of Agriculture had a total appropriation of but little over $300,000, the largest items of which, aside from salaries, were for seeds, the collection of statistics, and printing. There were allotments of $24,000 for the experimental garden and grounds, $4,500 for the museum and herbarium, and $1,300 for the maintenance of a laboratory. These represented the scientific activities of this National Department when the movement in Connecticut was at its height, and nowhere else were any public monies provided for agricultural investigation. Against such a background, the establishment of this station and the winning of support for this new idea stand out in their true significance.

Once the example was set and the initial step taken, other States followed one by one, and a movement was soon set on foot for Federal aid to provide stations in all the States. In this Dr.

Johnson was active. A bill introduced in Congress in 1883 was without result, and in the summer of 1885 the Commissioner of Agriculture called a convention of agricultural colleges and experiment stations in Washington to promote the movement. The convention endorsed a new measure which had been introduced, and appointed a committee to follow it up; and two years later, in 1887, the Hatch Act was passed, which laid the foundation for a national system with an annual appropriation of $15,000 to each State.



SHEFFIELD LABORATORY, YALE UNIVERSITY, NEW HAVEN.

Here the Station was quartered for five years, 1877-1882. The rooms used by the Station were on the ground floor of the wing and are shown at the right of the picture.

This nation-wide subsidizing of research in agriculture was evidence of the change which had come in the conception of the relationship of the Federal Government and the States. It was a recognition of a joint responsibility in developing the industry of agriculture on a high stage of efficiency, and it was a new expression of what the general Government may do under the Constitution for the promotion of public welfare. The appropriation of money for use of the States was a new departure; and the amount carried was considerably more than most of the dozen existing stations were then receiving. Indeed only one had a State appropriation equal to the new Federal grant; most of them had less than half.

The Hatch Act came twenty-five years after the Land-Grant Act providing for agricultural colleges, and it was only a beginning. Nineteen years later the Federal support was doubled under the Adams Act, and in nineteen years more, in February last, the then prevailing amount was trebled by the Purnell Act. When this latest Act comes into full maturity each State will receive $90,000 a year, or six times its original donation in 1887. It was a very significant thing, as the Secretary of Agriculture remarked, that "at a time when the Federal Government is working under an administrative policy which calls for strict economy in the appropriation and use of public funds, both the President and the Congress have given their support to a substantial increase in the Federal funds for the use of the agricultural experiment stations in all the States." It was a fitting climax for this anniversary year.

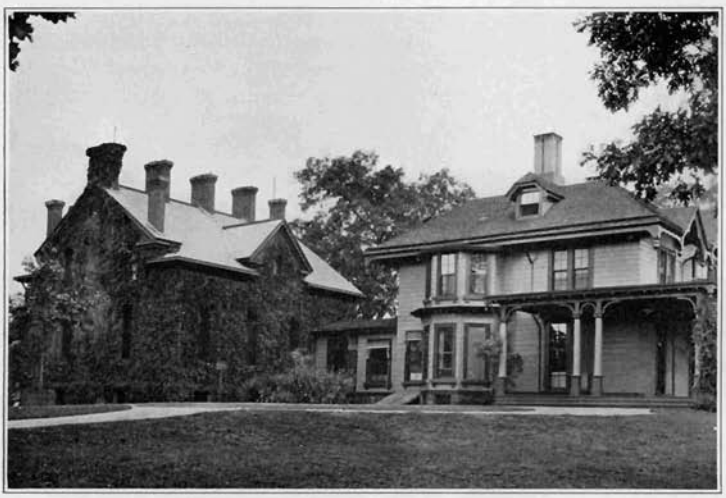
The official relationship between the Federal Department of Agriculture and the experiment stations dates from the establishment of the national system. Provision was then made for a central office in the Department to aid and promote the work of the stations in all possible ways. It is worthy of mention that the first director of that office was Dr. W. O. Atwater, under whom the station in this State was originally organized. His vision was a broad one and his belief in the possibilities of the new system was well-nigh boundless. His influence in advocating proper standards and ideals was very large in those formative years.

The relationship of the Department has been progressive with the growth of the enterprise. Naturally such sums of public funds as were involved were found to deserve a measure of oversight which would secure their adequate use in accordance with the plans and purposes originally designed; and there were methods and standards and policies to be established. One can not speak of this official relationship without referring to the spirit and purpose which have characterized it from all sides, for these have been fundamental in preserving the harmonious, sympathetic feeling which has prevailed. I remember the quite natural feeling of uncertainty and apprehension which the more definite provision for supervision in the early nineties caused in some quarters, but this was soon allayed by the fair-minded, considerate course pursued by Dr. True, who had these matters in charge for so many years.

The administration of the Federal funds has been actuated by no desire of the Department to assume any of the functions or responsibilities of the State in the management of the stations, or to determine the lines of work to be followed. There has been no suggestion of coercion or control, no purpose to dominate or subordinate, no stipulation of State appropriations. The stations are recognized by law as State institutions, and special effort has been directed toward maintaining their individuality and

strengthening their organizations. This policy of helpfulness and co-operation has been the guiding motive through all the years; and as one fully realizing the opportunity for misunderstanding, may I say, to the credit of the experiment stations, that I can conceive of no finer relationship between the Federal Government and the States.

In such a nation-wide system, with the varied conditions found in the States, there are some things a central agency can do more effectively than the individual institutions. One of these is the



GENERAL OFFICE AND LIBRARY.

Director's residence and office at right, General Library at left. Property purchased in 1882. The brick building was erected in 1882, equipped as a chemical laboratory and used for that purpose until the completion of Johnson Laboratory in 1910. Then it was fitted with book shelves and has since been used as the General Library of the Station.

shaping of policies and guarding from harmful interference. The Federal laws and their interpretation have given a basis for sound policies and practices, and have set off the field of research from other types of activity. While such interpretations carry no authority beyond the funds from the general Government, the local authorities have applied them in large measure to the entire institution. This served in the early years to build up a sentiment and custom which have safeguarded the stations and their personnel. Local politics, which for a time menaced the management in some sections, have practically been eliminated. A power and authority which have rarely needed to be invoked have had a steadying influence, exercised through counsel rather than force.

The Federal relation also has been directed toward the development of standards for the work of the stations, viewing it from a broad viewpoint. This was especially the case during the formative period, when the local conception of their field and function was less clear and when the methods were in an initial stage. Much of the work was of elementary character, and sometimes tarried unduly in that stage. There were few leaders and many leaners, with the result that there was much imitation and duplication. Such duplication was frequently unwarranted because it was not co-ordinated or correlated, and hence did not advance the subject or lead progressively to the next stage as it should.

Duplication and repetition have been a frequent subject of criticism from various sources. As distinguished from replication, there has been some ground for it. In a measure, it has been difficult to excuse, because the means have long been at hand for guarding against it. A review of the progress of agricultural research throughout the world has long constituted one of the Department's contributions in aid of investigation, and latterly lists of the projects of all the stations, classified and subdivided by topics, have been prepared annually for circulation. Still work has sometimes continued after it was calculated to add substantially to what is known, beyond a further confirmation often amounting only to a local demonstration. This, happily, is passing, and the condition is one of the evidences of increased strength and progress.

Furthermore, there has sometimes seemed to be a feeling that agricultural science is different from other science, and that research in agricultural subjects is different in quality and essentials from that in other lines. This view affected much of the earlier work of the stations—expressed in the attempt to get quick returns by short cuts. Because the aim was immediately practical there was sometimes a feeling that thoroughness and completeness were not essential, and that superficial efforts were quite as appropriate to the subject as more profound ones which could not be understood by the general public.

Empirical findings often served a temporary purpose at that stage, but it was soon found that the end of borrowed science and short-cut tests was reached, and many perplexing exceptions began to arise. The need was evident for broad truths and a better understanding of things observed. It was discovered that the farmers could not be given infallible rules and formulas, as had sometimes been expected, but that the reasons and limitations must be worked out to give an intelligent basis for individual judgment. The farmer must be a man of self-reliant judgment, able to use discriminatingly the tools which are prepared for him. He can be taught new facts but he never can be freed from the making of the applications to his own case and conditions.

There is an important difference between reducing experimental

results to practice—testing their applicability and working out their practicability, and the attempt to make rules and formulas for general application. One is interpretation, the other is predigested information without caution as to its use.

It is the glory of the experiment stations that their most scientific inquiries have a practical objective, and their work does not end until it has been shown how it fits into practice. But many of their investigations will, for the time being, seem to be of a

JOHNSON LABORATORY.

The present building occupied by the Departments of Analytical Chemistry, Biochemistry, Botany, Entomology and Forestry. The easterly wing was erected in 1905, and the larger portion of the building completed in 1910.

theoretical nature, and require tolerance and confidence on the part of the public.

Much that is designed to be strictly practical misses the mark. The very directness of its aim runs it to the ground. One of the things learned in these years of experience is that more often the shot with the high trajectory makes the decisive hit.

We need to increase the product of research. Changing conditions bring a constantly increasing group of problems which crowd for solution. A scientific fact remains unchanged, but it may be brought into new applications, and new facts will be needed to add to it and increase its potency. What we do not understand to-day we hope to understand to-morrow, through the agency of

new research, and this will make practice more enlightened and effective.

This is the basis of the Purnell Act, and of responsibility for the selection of live projects on the basis of permanent as well as temporary and local needs. The feeling that research is a creative function and not alone routine, and certainly not demonstration, finds general acceptance, and it is guiding the Department and the stations in the development of plans under the new Act. It constitutes a further enlargement of relationships, with new standards and policies to be worked out.

The Purnell Act is designed to give further aid to a group of institutions in existence from 35 to 50 years. It is to enable them to build upon what has been done—to broaden and strengthen the foundations where necessary, and progressively to carry the superstructure higher. Usually it will be some years before the roof can be put on, but the lower stories can be underpinned to make the structure secure, and one story after another added. The duplication of structures on an insecure foundation or according to plans shown to be inadequate is of course to be guarded against.

All research, whether actively co-operative or not, needs to be co-ordinated in the sense that it is planned and proceeds on the basis of what others have done and are doing—i. e., in accordance with the general status of the subject. If the work is constructive it will be guided by a constructive purpose; the defects or deficiencies or the limitations of what already exists will be the basis for the further effort. This may mean the necessity for laying the foundations deeper. It may mean rebuilding in part, or remodeling—sometimes only renovating; but in any event it will bear relation to what already stands, unless it be a new structure on a new site, in which case it will represent a new vision.

Despite all the uncertainties of research it is believed these things can be largely determined in advance and stated in the proposal. Clearness about them is evidence of preparation, and justification for the new undertaking. These are first steps in starting a new project; and so in passing upon such new proposals stress is being laid on a clear objective, a point of departure which takes account of the general status of knowledge in the subject, and procedure which is adequate at the start. The point of view and the method often will change as the investigation progresses, but at the outset it seems reasonable to expect that they should be forward-looking and constructive. Such a standard of quality is in the interest of all concerned. It will help to meet the high responsibility which the large sums of money received for research now entail.

In a further attempt to promote forward-looking and conclusive investigations under this new fund, more extensive co-operation in research has been strongly urged by Department and station

people, and is more definitely in mind than ever before. The Department has a great variety of work which needs to be brought into harmony and relation with similar work in the stations. The Secretary of Agriculture is anxious that this should be done. He has declared his belief that "co-operation is good for research people as well as for farmers. Waste and needless duplication are just as reprehensible in research as in the handling of farm products, and the Department of Agriculture and the experiment stations should set farmers an example in the elimination of wasteful methods."

Co-operation is not here used in the restricted sense of organized effort under a definite agreement and assignment of parts, but to refer to co-ordinated or correlated effort as contrasted with every man for himself. Research is an individual product, true enough, but in the experiment station it is a public enterprise, not a private one. Without repressing individuality and without dampening the incentive which comes from individual attainment—all highly important, a good deal is believed to be practicable in arranging co-operation on many-sided problems, in effecting an increased measure of co-ordination or correlation, and in bringing workers into closer association.

This view and objective have led to something of an extension of the Department's relations with the experiment stations. A number of subjects which lend themselves to co-operation have been selected by the stations, and these have been outlined by committees of specialists. Most if not all of them involve lines in which the Department is active, but this will not mean the assumption of direction or leadership. Many workers already have set up projects under these topics which will fit into the broader inquiry. Similarly, more local or regional subjects have been selected for co-operative or co-ordinated study. In the newer fields of agricultural economics, home economics, and sociology, in which there now is rapid expansion, the opportunity is especially inviting.

Not everyone will care to join in such enterprises; many workers already have lines of inquiry under which they will wish to continue; others may prefer to do their work independently. There will be no coercion—at least from the Department, anxious as it is that co-operation should have a fair trial and that much of its own work should be joined up with that in the States.

These things have no claim to novelty. They are only given a new setting and a new emphasis by the advanced stage which has been reached and the new epoch of expansion. They were more or less definitely in the minds of the early founders, and they were exemplified by them and by their successors. They are cited to illustrate the close relationship of the Federal Department and the experiment stations, and the common ends toward which they are striving.

Influence of Experiment Stations on American Agriculture

By Dr. R. W. Thatcher.

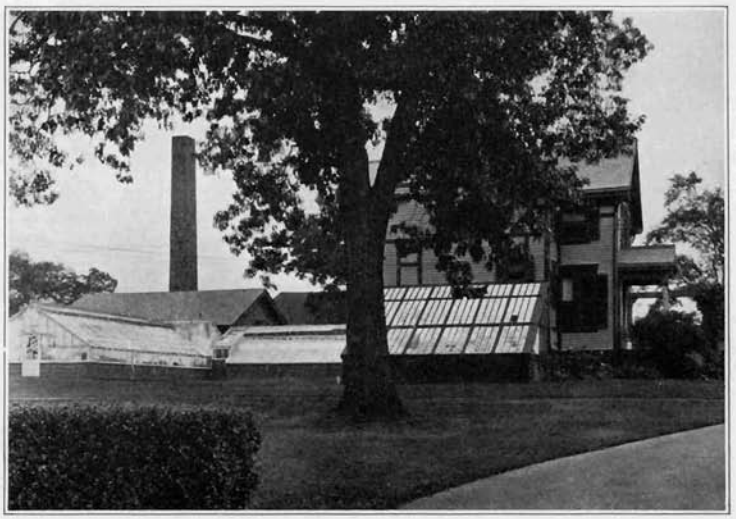
Fifty years ago the first of this month the Connecticut Agricultural Experiment Station was organized. Within the next ten years, a dozen or more states had followed this example. The success of these new ventures was so immediate and so generally recognized that there was no very great difficulty in securing the passage by Congress of the Hatch Act to provide Federal aid for the establishment of similar stations in each state in the Union. With the establishment of the station in Wyoming in 1891, only sixteen years after the organization of the Connecticut station, the chain of Federally-supported state agricultural experiment stations was complete. I cite this familiar history of an almost unparalleled development of a national policy for the promotion of agricultural welfare, in order to point out and to emphasize the wisdom of the founders of this Connecticut station and as the starting point for this discussion of the influence of the experiment stations upon American agriculture.

In most of the states, these stations were organized as a unit of the land-grant college and under the administrative supervision of the same officers who administered the teaching functions of the institution. In a few states, there were organized experiment stations which were entirely separated in their location, administration, functions, and activities from the teaching service. These separate stations apparently reflect a recognition at the time of their establishment of the need for agricultural research as a part of the State's agricultural development rather than as an adjunct to the teaching of agriculture in the college. Such an individual function of the station is now very generally recognized in all of the states. But in most cases, the agricultural research work is closely associated with the teaching duties of the faculty of the agricultural college, and in about one-half of the states the college itself is an integral part of the state university, with its graduate school which also has general research possibilities.

Under these circumstances, there has often been a failure to differentiate sharply between the experiment station research function and the university research function. Also, since the development of the extension service has taken over, in recent years, most of the opportunity and responsibility for direct contact of the research workers at the stations with the ultimate users of the constructive results of their efforts, there is often a failure by the general public to recognize the source of this new information and

to "give credit where credit is due." For this reason, it has seemed to me that it is wholly fitting and proper to use this anniversary occasion to point out just what is the contribution which the experiment stations have made, can make and will make in the future to agricultural welfare.

Reference has been made frequently to the fact that the earlier activities of the first experiment stations were largely in connection with the securing of data which led to the passage of various laws for the protection of farmers from fraud in the sale of



THAXTER LABORATORY, GREENHOUSE AND HEATING PLANT.

The wood building at the right houses on the first floor the Department of Soil Research and on the second floor the Department of Plant Breeding. The building was erected in 1888 for the Botanical Department and later the Entomological Department used the second floor, both Departments moving into Johnson Laboratory on its completion in 1910. The greenhouse was erected in 1895, and the central heating plant marked by the tall chimney was constructed in 1917; this contains a small assembly room.

fertilizers, feeding stuffs, etc., and later in aiding in the enforcement of these laws. Sometimes it has been said that these activities hardly justified the name "experiment station," and in later years it has become fairly customary to look upon these regulatory activities of the stations as of a somewhat lower order of service to agriculture than the research work of the station. But I am inclined to think that this earlier type of service reflects an attitude by and toward the station which we ought to cherish and strengthen in every way; namely, the recognition of the station as

an unbiased and unimpeachable fact-finding and truth-reporting agency for agricultural and public welfare.

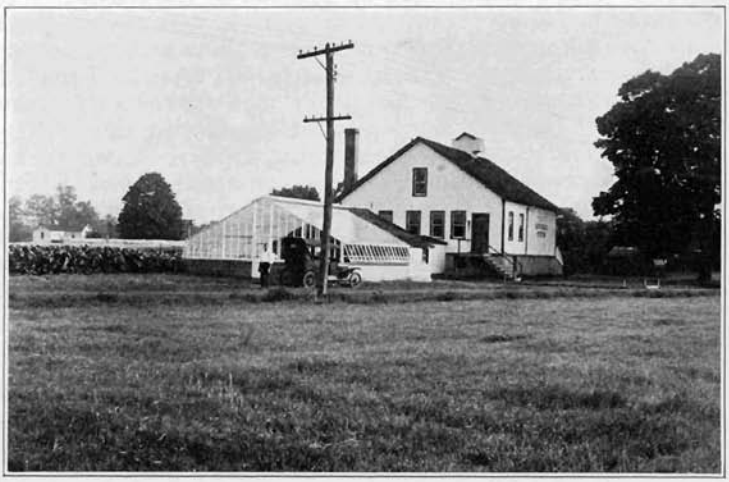
In the early days, there was also another aspect of station activities which has disappeared to a considerable degree with the increasing efficiency of organization of land-grant college work which yet had in it certain elements which we ought to cherish and preserve as best we can. I allude to the fact that, prior to the organization of the agricultural extension service, the scientists at the experiment station were called upon to give both resident and field instruction in agricultural practice, often to an extent much beyond that which could be justified as the making public or putting into effect of the results of their own investigations. The sharper differentiation between the teaching and the research function in recent years, and particularly, the organization of the extension service, has diminished the demand upon station workers for extraneous teaching services; but it has also shut off to a very considerable extent the direct contact of these station workers with the farmers of the state; and there is a real serious difficulty confronting the station administration to keep alive any appreciative recognition of the source of the knowledge which is being imparted through extension teaching. There is also a real loss to the research worker if the lack of opportunity to present the constructive results of his studies diminishes his sense of responsibility to secure such results and of that achievement which comes from the presentation of these results to appreciative audiences.

At the time of the preparation of this paper, I was not quite sure what would be the nature of the audience to which it would be presented. Hence, I was at a loss to know whether the most effective discussion of the topic would be a presentation of a series of striking contributions of experiment stations to agricultural science and practice which would be interesting and perhaps convincing to a farmer audience, but more or less stale repetition of familiar material to other scientists; or whether a more academic discussion of the place of station research in the public economy would be of more interest and use to this audience. It seemed to me, however, that there could be no question as to the propriety of emphasizing on this occasion the place and importance of the leadership which experiment stations have had and should have in the agriculture of the state and nation.

The retirement from active service during the past five years of such imposing figures in American agricultural history as Experiment Station Directors Woods of Maine, Brooks of Massachusetts, Jenkins of Connecticut, Jordan of New York, Armsby of Pennsylvania, Thorne of Ohio, and Davenport of Illinois has given excellent opportunity for the evaluation of personal and individual leadership in these fields. More than this, it has called attention to the guiding principles upon which their unquestioned leadership was based. It would be impossible, in the brief space of this

paper, to adequately review the publicly expressed opinions of all of these men concerning the service which they have sought to have their institutions render to the cause of agricultural development. But a few quotations selected at random from the many gems of concise and illuminating statements which came from their pens will serve to illustrate the viewpoints which these sages of American agricultural research brought to their work.

Dr. Armsby is quoted as having said, after first pointing out the purpose of the station to select for study problems which appear to



TOBACCO EXPERIMENT FARM, WINDSOR.

Thirteen acres purchased in 1921. View showing laboratory and greenhouse erected in 1924.

be of most immediate practical importance: "It will seek to do thorough, conscientious work; to do a few things well, rather than many superficially." Concerning the function of the Experiment Station, he maintained that this is not the impossible task of giving the farmer recipes suited to every conceivable emergency—not a device to save the farmer the trouble of thinking—but rather to enlarge the farmer's knowledge, to make him think more; and he maintained that it is only to the extent that the farmer can by his own thinking digest and utilize the Station's help that the latter may expect to assist him permanently and effectively; he said "The true field of the experiment station is the farmer's mind, not his acres."

Dr. Thorne's view may be fairly well summarized in the following quotation: "The agricultural experiment station is a necessary

and indispensable complement to the college of agriculture, for the experiment station is both the crucible in which theories are tested and the fine gold of truth is separated from the dross of error, and the instrument of research by which further progress is made into the realm of the unknown. After all is said, it is to the soil and its secrets that we must turn for the material progress of the race; and when material progress ends the intellect will also stagnate."

Dr. Jordan's views are well known to most of you. They may be summarized in the following sentences quoted from different addresses made by him on several occasions: "The greatest and most permanent acquisitions that have come to agriculture as an art during the past fifty years are the outcome of profound scientific study." "We should guard against centering an experiment around facts or conditions which are of merely local or temporary importance." To this he added that agricultural literature "is already cluttered with so-called practical conclusions that in a brief time will be swept into the rubbish corner." He held that experiments should "deal with matters of general and permanent utility," and that the contributions which have really enriched agricultural practice "are mostly those which have been proclaimed from the inner temple of science," and that "the discoveries of scientific truth which are to-day blessing the farmer in his daily toil are mostly those which have been reached through the severest and most searching investigations."

Expressed in other terms than those which I have just quoted, I think that it may be said that it is the duty and the opportunity of a state experiment station to contribute to the agriculture of the State and nation such information concerning the problems of agriculture as can be ascertained by *the scientific method* of investigation rather than the results of practical experience in farm operation. Presumably, it is not necessary to explain to this audience what I mean by the *scientific method;* but a word as to its application to the problems of agriculture may not be amiss.

Briefly, it may be said that modern science seeks to understand the laws of nature rather than simply to learn her facts. The scientific method consists in bringing together as many related facts or phenomena as possible in order to develop therefrom a theory as to the probable cause for the observed facts, then to test this theory by every possible critical analysis to the end that the theory may finally be recognized and adopted as an hypothesis or law on which later plans may be safely based. In substance, the scientific method is to study facts with the view to the discovery of fundamental laws, in order that working practices may be based on these laws, rather than upon empirical recipes or so-called "rules-of-thumb."

Of course, a knowledge of the facts themselves is a necessary part in the development of agricultural practice, and the calls for

information which come to the experiment station are usually requests for such facts or for rules of practice which can be followed without any particular thought concerning the fundamental principle involved. While this kind of information may satisfy the immediate needs of the individual farmer or fruit-grower, progress in the development of a sound agricultural practice and an intelligent farming population is much more to be expected from a more fundamental and better established knowledge of the laws of nature with reference to crop growth, animal production, etc.

STATION FARM, MOUNT CARMEL.

View during Field Day, August 1924. This farm contains thirty-five acres, of which twenty acres were purchased in 1911, and fifteen acres in 1915. On this farm are conducted many experiments in plant breeding, spraying and fertilizing of orchard, field and garden crops.

In the earlier stages of agricultural experiment station work, before these principles were so well appreciated, the investigations were largely elementary in character and based largely on observations, comparative trials, and simple field experiments which did not seriously attempt to establish the underlying principles. The results of these early experiments have been very useful and have supplied a fund of information on which much of the successful agricultural practice at the present time is based. There will almost certainly continue to be need for carefully controlled experiments of this kind in order to furnish accurate information to farmers concerning matters of farm practice about which their own individual experiences lead them to be in doubt. But there ought to be a continually increasing fund of fundamental knowl-

edge of agricultural science going abroad in the land, so that there will be steadily less and less of these questions which the intelligent farmer is unable to understand and answer for himself.

Having dwelt thus at some length on the necessity for research which shall be fundamental in character so that it will lead to intelligent knowledge rather than "rule-of-thumb" recipes as the basis for farm practice, I turn now to a consideration of the means to be used, or the general method of attack upon problems of this kind. Here, I find myself apparently somewhat at variance with the attitude which seems to have been taken by some of my illustrious predecessors in administration of agricultural research. For a long time, there has been among university scientists a school of workers who have held that real advance in human knowledge can be made only by the study of purely natural phenomena. These scientists have scrupulously avoided the study of plants and animals which have economic uses and have confined their researches to those phenomena which have had no artificial influences in their development. Such men will have nothing to do with a study of cultivated varieties of fruits, for example, saying that the natural basis for their classification has been disturbed by the domestication process. To men of this type, the so-called "practical application" of science is a commercial, non-intellectual process which is beneath the dignity of a true scientist. Such conceptions used to be common and discussions of the relative merits of so-called "pure science" and "applied science" were numerous and acrimonious. I have thought that I have observed an influence of the earlier academic viewpoint upon some of the announced plans for the development of agricultural research. Fortunately, however, Dr. Armsby's statement that experiment station problems must be those which are of most immediate practical importance has generally been the guiding principle in the selection of the problem to be worked with and generally also in the selection of the material with which the investigations are to be made.

There are still many college faculties which insist on the preservation of the A.B. degree as an insignia of true education and culture and hold that the B.S. degree should indicate the completion of a course of vocational study which is in itself less intellectual or less cultural than the non-vocational arts course. These ideas, which were more prevalent and more pronounced twenty-five years ago than they are now, have undoubtedly had some influence upon the minds of some of the men whose opinions with reference to the character of the best research work in agricultural science I have quoted above. Personally, I came up through the science course of a university with a fixed conviction that all of the necessary elements of a real education can be obtained through the study of the materials and facts of every-day life and surroundings as well as, or better than, through the study of dead

languages, ancient art, or foreign physical surroundings. I have felt that the same powers of memory and of reasoning can be developed through the study of current literature, laws and customs as well as of those of by-gone ages. I have believed that just as keen an appreciation of beauty of form, of expression and of life can be developed through a sympathetic study of Nature as she manifests herself in the forest, lakes, mountains and fields about us and of the wonderful creations of men in our cities, transportation lines, etc., as by the study of the paintings of old Masters,

EXPERIMENTAL FOREST, LOCKWOOD FIELD, WINDSOR.

This field was purchased in 1900, with additions in 1905 and 1908 totaling about 100 acres. In background at left, red pine and at right Scotch pine, seventeen years after setting. In foreground, white pine, six years after setting.

the ancient cathedrals or the splendors of profligate civilization of by-gone days. I have steadily held the conception that the powers of accurate observation, logical reasoning, and sound deduction can be just as well developed by the study of the phenomena of nature with which we are surrounded and in every-day contact as by any degree of profound consideration of those things which are without any taint of economic use or practical application. In short, I have grown up with the conviction that a *real* education may be obtained using the facts, phenomena, and materials of every-day life as the materials with which to illustrate or from which to derive the principles which are to be learned.

With these ideas in my mind, I naturally feel that the materials with which we are to work at the experiment station should be those which are of common occurrence and of practical use on the farms and in the orchards, etc., of our own State. The study, by the scientific method, of any problem in agricultural science or practice will, I believe, be as certain of giving accurate data for the solution of the problem in question and at the same time will yield a fund of practical working information such as cannot be secured if the materials worked with are foreign to our every-day working conditions. For example, it seems to me that the study of a problem in plant breeding may better be carried on with wheat, raspberries, or some other economic crop and be so planned that the results of the investigation may yield an improved new strain of field or garden crops, than with larkspurs, sweet peas, or skunk cabbage. Similarly, other things being equal, I should prefer to use swine instead of guinea pigs for studies of animal nutrition, chickens instead of pigeons, for studies of deficiency diseases, etc. To be sure, it is sometimes simpler and easier, and often cheaper, to use non-economic plants or animals for studies of general fundamental principles of heredity, nutrition, disease-resistance, etc. But as a general principle, it seems to me to be wise to have a definite economic improvement of the species, or some profitable end in view, at the same time that the data necessary from the establishment of the fundamental principle in question is being sought.

In other words, I would have the Station worker seek to secure fundamental scientific principles, but at the same time "keep his feet on the ground" in choosing his material and planning his analytical studies.

Perhaps I can best illustrate the service which the station renders to agriculture by using the simile of the doctor as an agency for promoting human health. Each community needs to have its local doctor who can be called upon at any time to give advice and render assistance for immediate needs, bringing to the community the best that is known concerning sanitation, campaigns against communicable diseases, and the curing of the ills of his constituents. But the local practitioner is not a research investigator, the latter is always located at some hospital or city laboratory where the necessary clinical material and specialized equipment for the study of new diseases or new methods of combating known ones are available. The medical research worker conducts his experiments with all the scientific skill which he possesses, until the new operation the new method of treatment or the new plan of protection of public health is well established; then he publishes his findings and intelligent citizens everywhere follow his advice so far as they are able to understand it and apply it. But when their individual problem gets beyond the scope of their own learning or ability, they call upon the local doctor, who brings to their service

the results of the researches at as many laboratories as possible, as well as those of his own experience in dealing with these matters of health.

Now, if we apply this simile to agricultural needs, it is plain that the local doctor represents the local agricultural extension worker, the county agent, or his assistant. He ought to be near at hand and always available with skillful advice and assistance as needed. He should conduct demonstrations, give public instruction, and personal assistance in all matters which are sufficiently established to be past the experimental stage. He may even conduct simple experiments of his own, provided he does not under-

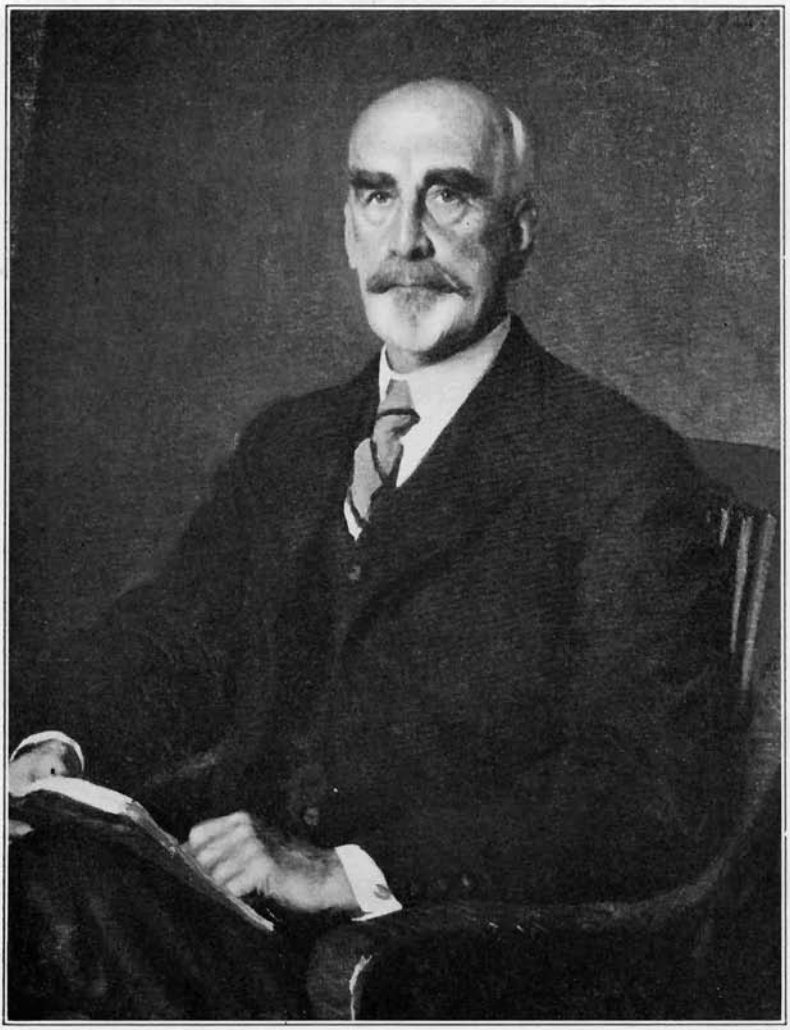
A GROUP OF STATION DIRECTORS AT THE SEMICENTENNIAL.

take experiments which may result disastrously to his constituents, or interfere with his readiness to render the service for which his constituents call rightfully upon him. The research worker is located at the experiment station where the clinical material and right equipment for his study are available. The research worker, if he is to render real service, must not let his investigations lead him off into realms which have no connection with the agricultural needs of his constituency, but he must be free to prosecute his investigations without interruptions by calls to attend individual needs for assistance. These latter ought to be provided for by the local practitioners. But the research worker ought to be in close enough touch with the people and conditions which his study is to benefit so that he will not be led away from a constant attempt to meet a definite need for fundamental, sound, and scientific

information which will be applicable to the conditions which he is seeking to alleviate or improve.

I am in doubt that this admittedly academic discussion of the relation of experiment station work to agricultural development has been altogether appropriate to this occasion. I was emboldened to undertake it because it seemed to me to be so clearly the lesson of experience of half a century of experiment station work, and that the historic figures of the Connecticut station were such shining examples of the successful application. I know that I have not done justice to the clear-minded convictions and brilliant achievements of Johnson and Atwater, of Jenkins and Osborne and Mendel; but I have tried to raise aloft the lamp which it seems to me has guided their feet and illumined their pathway to noteworthy achievements and world-wide honor and respect. I hope that I have been able to say some things which modesty might have prevented their saying.

In closing, I wish to voice the debt of gratitude which we of the next younger generation of station workers owe to the pioneers in this field, not the least of whom are the members of the staff of this Connecticut station whose fiftieth anniversary we are to-day celebrating. The earliest of our stations naturally had no other experience to guide them. We have had their example. Fortunate has it been for us that the standards which they set were so high and the ideals which they cherished so noble. Our contributions to the exercises of to-day are but a feeble attempt on our part to recognize this debt. We salute you, we congratulate you, we wish for you years of added success and achievement.



EDWARD HOPKINS JENKINS

PRESENTATION
OF
PORTRAIT OF DR. JENKINS

By Dr. Henry S. Graves

It is my happy privilege to speak on behalf of the friends of Dr. Jenkins in presenting a portrait of him to the Agricultural Experiment Station. This I am particularly glad to do, not only because of my admiration for him and for his many public services, but also because of our personal friendship of many years' standing and an affectionate regard for him that is shared by a great host of friends in this community and throughout the States.

It is in no sense of fulsome praise that I say that Dr. Jenkins has made the greatest individual contribution to the economic development of Connecticut. The very structure of Connecticut Agriculture has been built upon the sound foundations laid through his efforts and those of his associates.

His leadership has rested upon his ability as a scientist and executive; but he has also been a great educator of the people of the State. Tens of thousands of farmers and men connected in various ways with the agricultural industry have been his pupils and are applying in practice what they have learned from him and those working with him.

Few men have had the opportunity to carry on a public work for so long a period and to see their efforts crowned with such success. Few men have been able in so great a measure to command the confidence of the community. A man of simple and straightforward character, of rare judgment in public matters, and seeking only what is in the interest of the community and state, he has enlisted the support of the people in his work to an extent possible only by a great public servant. Is it any wonder that the legislature could not refuse his requests for the support of his work or that the people could not fail to listen to his instruction?

His tact and fine judgment enabled him to bring together in effective effort the two branches of the experimental organization in Agriculture and to harmonize the research and educational undertakings of the State.

Associated with the early research enterprises in Agriculture with Professor S. W. Johnson, nearly fifty years ago, he soon became a leader whose influence was felt in the national work of building up our agricultural experiment stations.

We love him for his service to the public, but even more for his personal qualities. Possessed of rare wit and felicity of expres-

sion, he has always been under pressure to speak at public gatherings. Inspiring as a speaker and writer, with a broad vision in public affairs and with a natural sympathy with the viewpoint of the average man, he has unfailingly been able to command the attention of those who have had the good fortune to hear him speak or to read his written messages. It is quite characteristic that after a half century of arduous work devoted to public service he should continue his writing, as is illustrated by his admirable work on Connecticut Agriculture in Mr. Norris G. Osborn's History of Connecticut. His influence continues, stimulating those who have taken up his official work and those who are seeking to measure up to his high standards of achievement in the service of the State.

It is with a deep sense of appreciation of what he has accomplished and with warm personal affection for him that his friends present this portrait to the Agricultural Experiment Station.

Memorials

TO ALL ASSOCIATED WITH THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION.

The Director and Staff of the Rothamsted Experimental Station, desire to take the opportunity presented by the occasion of the Fiftieth Anniversary of the foundation of the Connecticut Agricultural Experiment Station, to express to all connected therewith the high esteem in which it is held among those interested in agricultural science in this country. We recall with interest that it was the first Agricultural Experiment Station to be set up in the United States in those early days when Rothamsted was but thirty two years old.
We still read with pleasure the writings of its first Director, S. W. Johnson. Among the chemists who have worked there stand out the names of, H.P. Armsby, Milton Whitney and T.B. Osborne.

who in their several fields have contributed largely to the advance of science and have brought much fame not only to the Institution and themselves, but to their country. It will always be remembered that Osborne's work on proteins was carried out at the Connecticut Experiment Station. The work of the second Director, Dr. Jenkins, in developing agricultural research is too well-known to need comment. It would be invidious to particularise further, but we fervently hope that your Station may in the future maintain and if possible enhance its high reputation in the scientific and agricultural world.

Signed on behalf of the Rothamsted Experimental Station.

E J Russell

7th October, 1925 Director.

The Governing Board of the Sheffield Scientific School of Yale University

extends its congratulations to the

Connecticut Agricultural Experiment Station

on the occasion of the celebration of the

Fiftieth Anniversary

of the founding of the Station, on Monday, October the twelfth, one thousand nine hundred and twenty-five.

It is a matter of no little satisfaction to the Governing Board to recall that it has played, through the work and influence of a number of its members, an important part in the development of agricultural science in the United States and particularly the work of the Connecticut Agricultural Experiment Station. SAMUEL WILLIAM JOHNSON, for fifty-four years a member of the faculty of the Sheffield Scientific School, was a pioneer in agricultural science and was largely responsible for the establishment of the State Board of Agriculture and the first Agricultural Experiment Station, which to-day celebrates its semi-centennial. JOHN PITKIN NORTON, JOHN ADDISON PORTER, and WILLIAM HENRY BREWER are among those who took a keen interest in the work of the Agricultural Experiment Station and rendered it valuable service. There are also among the members of the Governing Board at the present time several who are in one way or another contributing to the development of agricultural science. It is the wish and hope of this Board that the close affiliation that has always existed between the Connecticut Agricultural Experiment Station and the Sheffield Scientific School may continue in future years.

Charles H. Warren
President

Isaac L. Bishop
Secretary

Printed at the Yale University Press, in New Haven, Connecticut, in the year of Our Lord the one thousand nine hundred and twenty-fifth and in the year of Yale University the two hundred and twenty-fifth.

THE TRUSTEES AND FACULTY

of the

Connecticut Agricultural College

Extend their Congratulations to the

Connecticut Agricultural Experiment Station

on the occasion of the Celebration of the

FIFTIETH ANNIVERSARY

of the Founding of the Station

on Monday, October the twelfth, one thousand nine hundred and twenty-five

THE anniversary celebration of an institution that has completed fifty years of successful work is a just reason for pride and satisfaction to its board of control and to the members of its staff, but we feel that there is a special honor due to the Connecticut Agricultural Experiment Station in having inaugurated a movement for organized agricultural research that has been followed by every state in the nation.

It is our hope that the institution, so well founded as to become an example, and so wisely directed as to attain such notable distinction, may continue its contribution for the future years.

Signed,

Charles L. Beach,

For the Trustees and Faculty
Connecticut Agricultural College.