

Dedication of

SLATE  
LABORATORY

June 9, 1959

THE CONNECTICUT  
AGRICULTURAL EXPERIMENT STATION  
NEW HAVEN

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## DEDICATION

June 9, 1959, 4 p.m.

Director James G. Horsfall, Presiding

Address	Paul C. Mangelsdorf <i>Harvard University</i>
Address	Edmund W. Sinnott <i>Yale University</i>
Presentation	Joseph N. Gill <i>Commissioner of Agriculture</i>
Acceptance	Charles G. Morris <i>Senior Member of the Board of Control</i>



*William L. Slate*

## Welcome

**James G. Horsfall**  
**Director**

Good afternoon ladies and gentlemen. Welcome to the Experiment Station and to the dedication of Slate Laboratory.

All of you, I hope, have had a chance to greet Mr. Slate or will have an occasion to do so after the ceremonies are over.

Until today I did not realize that Bill Slate was so modest. He says he would rather be home working in his garden today than here, but on the other hand, that is the price one has to pay when he has a laboratory named after him.

I would like to welcome you on behalf of my colleagues on the staff and on behalf of the Board of Control. We are grateful to see so many of our friends here today. I think that one of the nicest things about an Open House is that it gives us an opportunity to welcome our friends.

We are proud of our new laboratory and we on the staff are proud today to be able to dedicate it to a distinguished leader of agricultural science in America, to our great friend, W. L. Slate.

With your permission I would like to introduce your hosts, the Board of Control, and as I introduce them I hope they and their ladies will stand.

I am sorry that the Governor, as president of the Board, is unable to be here. Of course he is pretty busy with many commitments now that the Legislature is just over. He sends his regrets. I am sure he would like to have joined us.

(Director Horsfall then introduced other members of the Board of Control and their ladies: Mr. and Mrs. A. Ward Spaulding of Suffield, Professor and Mrs. E. W. Sinnott of Yale University, Mr. Charles G. Morris of Newtown, Mr. and Mrs. Thomas Burgess, Jr., of Wapping, Commissioner of Agriculture and Mrs. Joseph N. Gill, Professor and Mrs. Joe Webb Peoples of Wesleyan University, and Mrs. Horsfall.)

Now the staff, of course, are also your hosts, and since you will have met most of them this afternoon or will do so before you go home this evening,

and since your hands are stinging already from your gracious applause, there is no need to introduce them one by one.

At this point I want to introduce the guest of honor, William L. Slate.

And then representing his family, Mrs. Slate and their son-in-law and daughter, Dr. and Mrs. Burr Overstreet.

We have, of course, numerous visitors from almost, I might say, all over the world. We have a visitor from Argentina and one from Pakistan. We have visitors from other Experiment Stations, from the University of Connecticut, from the Boyce Thompson Institute, and from the Office of Experiment Stations in Washington. May I introduce only one person to represent all of the scientific institutions that are represented here today. This is Dr. M.J.R. Healy of the Rothamsted Experimental Station in England, to which we bow as the oldest Experiment Station in the world. Dr. Healy from Rothamsted. It is a pleasure to have you here, Sir, and I hope, when you get home, that you will convey our kindest regards to Dr. F. C. Bawden, your new Director there, whom I know very well.

Well, now, I think we should at this point take up the Bill Slate story. I have introduced him up to now as William L. Slate but I don't really know him as William L. Slate. To me and to all of you, he is just plain Bill.

Now this is also particularly a great honor to me because this is a time when I can do all the talking. For the first time in my life I have got Bill Slate where I would like to have him — and that is silent.

Now, of course, Bill is not normally silent. He will expatiate at the drop of a hat on the place of women in society, or the rising tide in population — there are too many people in the world — or failing to generate any enthusiasm from anybody on either one of these two subjects he will then talk about salt-rising bread.

Today we will not give him that opportunity. But, speaking of rising, I would like to ask one of his former boys, Paul Mangelsdorf, to rise in a few minutes and tell you about Bill Slate. Perhaps I shouldn't say Paul Mangelsdorf, perhaps I should say Professor Paul Mangelsdorf, Professor of Botany at Harvard, but on the other hand Paul was also a freshman on our staff a few years ago, and so we all look upon him as Paul here, and if he doesn't mind I will introduce him that way.

Now Professor Mangelsdorf comes originally from Kansas, from way out West in Kansas where men are men and the women — well, they are just women even in Kansas.

Mangelsdorf started as a good many geneticists have with Dr. Donald F.

Jones on hybrid corn. We cannot ever have a meeting at the Station at which we do not talk about hybrid corn. It gives us something to brag about, and so we will identify Dr. Mangelsdorf as an early worker in that field. He went on from here to Texas, eventually rising to be vice-director down there, but he was smarter than I — he didn't ever become director, he went on to Harvard to better things, I hope, and he has been at Harvard now for some years. Professor Mangelsdorf is a distinguished botanist. He is particularly well known for his researches on the origin and history of corn. He has a museum at Harvard in which many of the historical aspects of corn are on display. He has been a consultant to the Rockefeller Foundation in their program on South American and Central American agriculture.

The second address today will be given by Dr. Edmund W. Sinnott, distinguished scientist, Sterling Professor Emeritus of Botany at Yale University, and for many years a member of the Station Board of Control. He will discuss the challenge of research at this Station in the years ahead.

## **William L. Slate — The Scientist, the Station Director, and the Man**

**Paul C. Mangelsdorf  
Harvard University**

It was exactly 38 years ago this month when I, a country boy from Kansas, arrived in this historic city to begin a career of research in agriculture. The five and a half years which I subsequently spent here were undoubtedly, measured by any standards, the most fruitful of any comparable period in my life, for during this period, which now in retrospect seems all too short, I acquired a wife, a first son, a doctor's degree, and new skills and insights which opened for me promising paths of research and scholarship which I have followed happily and profitably ever since. I am deeply indebted to the Connecticut Experiment Station and to all those members of its staff who helped to make those early years so rewarding.

One of those to whom I especially owe this debt is Mr. Slate, who saw in me more than I recognized in myself and whose tolerance of my shortcomings and encouragement of whatever abilities I may have had, helped greatly to inspire in me the confidence which I, like many young men in spite of their brashness, desperately needed. Someone has said that "we admire, above all others, those who have the wit to recognize our genius and the talent to foster it." Mr. Slate undoubtedly had the ability to see and to encourage the best abilities of his staff. But perceptiveness is only one of the many attributes of leadership which he brought to his position as Director of the Experiment Station. How to speak of all these and express, too, our admiration, respect, and warm affection without embarrassing him or becoming unduly sentimental poses a real problem. I know at least what I wish not to do. I wish not to emulate a one-time president of Michigan State College, who at a ceremony honoring the late Dr. Liberty Hyde Bailey, then Michigan State's most famous graduate, indulged in a long, flowery, and flattering introduction. Dr. Bailey sat through this, fidgeting uncomfortably, and when he rose to speak his first remark was, "Now I know how a pancake feels when it has maple syrup poured on it."

Perhaps I can communicate what I would like to say in an indirect, impersonal way. Since institutions reflect their leaders let me describe to you,

as I see it, the institution which Mr. Slate led for so many years and which he loves: the Connecticut Agricultural Experiment Station. Perhaps in this reflection you will see the man, the scientist, and the experiment station director as I, through long acquaintance, have come to know him.

At this point it is necessary to explain that the title "Director," when applied to the administration of a scientific institution such as the Connecticut Station, does not mean at all what it seems to mean. Scientists are at least as independent and temperamental as artists and they do not take kindly to direction from above. They must be gently guided and this requires skill, tact, an unflinching sense of humor, and above all, patience. Any director who can survive the ordeal of his position for 25 years and still leave a staff eager to honor him by naming a new building after him must have possessed and employed these qualities in a remarkable degree. He not only richly deserves this honor but ought in addition to be awarded a gold medal for valor.

The Connecticut Agricultural Experiment Station, which Mr. Slate guided so successfully, is unique in a number of important respects. Let me mention several of them. Founded in 1875, it was the first American agricultural experiment station and it set the pattern for the establishment of a system of state experiment stations throughout the 48 states. The results of the research conducted by these stations, applied to the farms through agricultural education and extension, have quite literally revolutionized the practice of agriculture. The extent to which the age-old art of agriculture has been transformed into an applied science in the United States during the past 40 years is not generally recognized even by the farmers themselves. The innovations growing out of this research have made American agriculture a highly developed technology and the American farmer a well-paid technologist having little in common with that traditional agricultural worker, the peasant.

The Connecticut Station was not only the pioneer in these revolutionary new developments but also contributed significantly and substantially to them. About this I shall have more to say in a moment.

The Connecticut Station is unique in a second respect: the quality of the research which it has conducted. Almost from the beginning its program of research has covered a broad spectrum ranging from highly theoretical problems in basic science to the technological problems of practical farming. It is only in historical perspective that we can see how important and how beneficial has been this marriage of pure science and technology. These are not separate and unrelated human activities. They are or should be complementary to each other or to use a biological term

“symbiotic.” This important insight has been beautifully expressed by Robert Oppenheimer, at a symposium on basic research recently held in New York City, in the following statement:

Yet science and technology are symbiotic. I suppose that our concern today is that this symbiosis be benign for both. They are symbiotic not only because technology would be impoverished, blinded and crippled were it not for the new knowledge which is sought and found for other reasons. Technology gives back again to science a rich reward in new instruments, new techniques, and new powers. Some of the largest questions that today agitate our curiosity and wonder relate to the disposition and motion of the remotest nebulae, billions of light years away. For evidence on this we look increasingly to radio-astronomy, which is based on microwave techniques, largely developed for military purposes during and since the second world war. Chemistry and biochemistry are able to put and answer questions not only of structure but of dynamics, because they have available the neutrons and tracers which, in large measure, are a byproduct of the industrial and military development of nuclear fission. It is this incessant feedback and reciprocal fertilization which makes a sharp distinction between pure science and technology academic and dreary. There is also an important traffic, not only in ideas and in equipment and in techniques, but in men, between the two, a traffic without which both would be the poorer.

Numerous examples in the history of the Connecticut Station could be cited to illustrate the impact of basic research upon agricultural technology. I shall mention only one, that which is most familiar to me — the development of hybrid corn. If I fail to mention the many important contributions which the Station has made in other fields of research — chemistry and biochemistry, nutrition, entomology and plant pathology, soil science and horticulture — it is not for want of appreciation but for lack of time.

It was basic research by E. M. East and D. F. Jones on the effects of inbreeding and crossbreeding using the corn plant as a subject that resulted in a better understanding of heterosis or hybrid vigor which, next to photosynthesis, is undoubtedly one of the most important biological phenomena involved in agriculture. The fabulous by-product of this basic research was the development of hybrid corn on the importance of which I should like to repeat a statement which I made some years ago:

In my opinion, hybrid corn is the most far-reaching development of this century, not only in applied genetics, but in the entire field of applied biology. It has already affected more lives, I venture to guess,

than any of the epoch-making discoveries in medical biology of the same period. Insulin and penicillin have saved thousands of lives in the past twenty-five years, but the new abundance of foodstuffs which hybrid corn has created has saved millions of lives in this same period of the world's history. Hybrid corn may even prove, in future historical perspective, to have been one of the most important factors in saving our American culture and the European civilization from which it was born.

A recent issue of Time magazine in which the cover story was devoted to describing the revolution in American agriculture quite correctly credited hybrid corn with sparking the revolution and Dr. Jones with a major part in developing hybrid corn. But Time committed an unfortunate error in placing Dr. Jones at another institution instead of at the Connecticut Experiment Station where he has worked for more than 40 years.

In recent years the use of hybrid corn has spread to the corn-growing lands of southern Europe and to the countries of Latin America. In this latter development two of Dr. Jones' former assistants, Dr. L. M. Roberts and I, have had the privilege of participating. And we have had the rewarding experience of seeing peasants, still practicing the age-old methods of their ancestors, becoming converted, almost overnight, to the techniques of modern agriculture, once they had grown hybrid corn and come to realize that the productiveness of their basic food plant could be greatly increased. The new ideas and methods growing out of the research of the Connecticut Station have spread around the world, to improve agriculture wherever they have touched it.

Not only is a sharp distinction between basic research and technology “academic and dreary,” to use Dr. Oppenheimer's words, it is also quite dangerous. The State of Connecticut is extremely fortunate, in my opinion, in having an experiment station which has successfully resisted the current trend to concentrate its resources on immediately practical results. It is always a temptation for a station director to seek the kind of practical results to which he can point in asking for ever-larger appropriations from the state legislature. It requires a deep conviction concerning the value of basic research as well as moral courage to resist this temptation and to maintain the long-range as well as the short-range view with respect to research. The Connecticut Station has been fortunate in having three directors with both conviction and courage and I have no doubt that in Dr. Horsfall it now has a fourth.

Closely related to maintaining a broad spectrum of research in the sciences related to agriculture is another characteristic in which the Con-

necticut Station has been and still is virtually unique — its close affiliation with liberal arts colleges. I refer especially to the fruitful collaboration which has existed from its founding between the Connecticut Station and Yale University. Members of the University faculty have often collaborated in research with members of the staff of the Experiment Station. Many members of the Station staff, including Mr. Slate, have been appointed to the faculty of the University and have offered courses or have guided the research of graduate students. And although the Connecticut Station naturally has a strong attachment to Yale University it has not been averse to collaborating with Yale's elder sister in Cambridge, Harvard University, with the University of Connecticut, and with Cornell University. This collaboration has taken several forms, including research, publications, and at times a free exchange of personnel.

The Connecticut Station obviously has roots deep in academic soil and like a good partner in a symbiotic relationship has in turn enriched that soil. Here is a splendid example of the traffic between science and technology of which Dr. Oppenheimer has spoken, "... not only in ideas and in equipment and in techniques, but in men, a traffic without which both would be the poorer."

The fourth characteristic in which the Connecticut Station is virtually unique is that it has remained small. There is a tendency for government bureaus and other public agencies always to expand. This is recognized in Parkinson's Law, a piece of facetiousness, which, unfortunately, contains all too much truth. Parkinson cites as examples illustrating his Law the British Navy which between 1914 and 1928 suffered a loss of 68 per cent in the number of capital ships in commission while during this same period the number of Admiralty officials expanded by 78 per cent. The British Colonial Office has provided a similar example. Between 1943 and 1954, as successive colonies achieved self-government and were lost to the Empire, the Colonial Office staff more than doubled, growing in number from 817 to 1661.

We Americans, being prone to measure success in terms of size, are especially susceptible to the operations of Parkinson's Law, yet Director Slate has shown us that there can be exceptions to this general rule. The staff of the Connecticut Station was not substantially larger when he retired than when he assumed his duties as Director and he pointed to this fact, not apologetically, but with pride. He recognized that in research, quality of the personnel is more important than sheer numbers — that a few distinguished and dedicated men, provided with the proper working conditions, can usually make greater contributions than regiments of second-rate investigators.

Henry Wallace, a former Secretary of Agriculture and often a visitor to the Connecticut Station, has made some penetrating comments on the subject of size in relation to research. In a little book, "Corn and its Early Fathers," he has a chapter entitled "Small Gardens and Big Ideas" in which he points out that a great part of the best work in corn breeding has been done by persons using a few plants and small areas of land. In a regretful tone he adds:

The modern trend in science is in exactly the opposite direction. The present emphasis is directed toward doing things in a big way, toward the use of large numbers and "coordinated" research. In many of our educational institutions, scientific progress seems to be measured in terms of the growth of departments and the number and size of financial grants that can be obtained for support of the work. And even cornbreeding, it appears, has not entirely escaped this emphasis. Today's trend is toward the use of large areas of land and, in many cases, routine types of investigation and thought. The work accomplished is often measured in terms of budget size, of the numbers of pollinating bags used, or the numbers of acres devoted to yield testing . . . .

The great scientific weakness of America today is that she tends to emphasize quantity at the expense of quality — statistics instead of genuine insight — immediate utilitarian application instead of genuine thought about fundamentals . . . . The point we are making is that lots of land, equipment and power can never produce scientific advancement in cornbreeding or anything else unless the ideas are big enough to match.

It would be misleading to suggest that Mr. Slate deserves all of the credit for the unique and enviable position which the Connecticut Station occupies and he would be the first to object if we tried to do so. After all he was Director of the Station for only 25 of its first 75 years. Here, incidentally, is still another unique characteristic of the Connecticut Station, to have had only three directors in 75 years when the average tenure of station directors throughout the country is, I believe, slightly less than four years. Long tenure is not itself a virtue but when it is accompanied, as it has been here, with distinguished leadership it can become a distinct asset.

In succeeding two eminent Station directors, Samuel W. Johnson and Edward H. Jenkins, Mr. Slate did not disdain, as some administrators might have, to follow the precepts and practices of his predecessors. On the contrary he made a profound study of their methods, adopting those which had proved especially successful and adapting them to the changing times. This was not a simple task for the times were indeed changing.

Agriculture was already in a depressed state when Mr. Slate assumed his duties in 1923 and not many years later there came a nation-wide depression. This was shortly followed by a drastic reorganization of our Federal government, one aspect of which was the increased centralization of governmental activities. In the field of agriculture research "coordination" became the watch word of the day and there was great pressure to coordinate everything related to agricultural research.

I recall one Washington bureaucrat who in seeking one hundred per cent coordination between his agency and the experiment stations of the 48 states was driven to a state of frustration by Director Slate's refusal to have the Connecticut Station committed to a program which he felt sure had no meaning for the state of Connecticut. This gentleman would no doubt have agreed heartily with Mr. Slate's old friend, Walter Stemmons, who once described him as one of the "roughest, toughest old coyotes ever to come down the road."

And it did indeed take toughness to survive the vicissitudes of these 25 troublesome years and to resist the numerous pressures which accompanied them. To have maintained the independence of the Connecticut Station through these years and to have preserved and enriched its traditions during this trying period of depression, reorganization, and war is an achievement in which any scientist, any director, may well take pride. And the achievement is also a measure of the man for it has required many qualities — humility, perceptiveness, tact, understanding of scientists and their problems on the one hand, of the public on the other, a sense of humor, a warm friendliness — and combined with all of these a hard core of unassailable integrity, a pride of independence, and a toughness of mind and spirit. All of these characteristics Bill Slate possessed and employed in guiding the Connecticut Station through 25 of its most critical years. All of us engaged in agricultural research, whether here in Connecticut or elsewhere, are deeply in his debt.

## Station Research Today — and Tomorrow

Edmund W. Sinnott  
Yale University

First let me congratulate the Experiment Station and the State of Connecticut on this very fine building. I am most happy to be here, especially since the building bears the name of my old and very good friend, Bill Slate. I have known him, believe it or not, for almost half a century. I could tell you a lot of stories about him, because he is the kind of man about whom stories gather.

Just to show you the kind of fellow he is. Back in the heartier days when the trout fishing season opened on the first of April, very often the dirt roads were partly frozen. Bill and I liked to fish, and we decided one day to go to the Town of Ashford to a brook we knew about. After a few miles we felt that sinking feeling when the rear wheels dropped into a mud hole. It didn't discourage Bill. He said, "I think I know the farmer who lives near here. I will run down the road and see if I can get some help." Before long he came back with the farmer and a yoke of oxen — they had oxen in those days — and dragged us out of the mud hole. I was all for going fishing, but not Bill. He began to discuss with the farmer some of his pasture problems — how much fertilization was needed, what kind of grasses to use, and before long I was listening to a seminar in pasture agronomy. Then we went fishing.

Bill always combined pleasure, practicality, and research. Almost anybody can combine the last two, but to have fun at it is a mark of a very unusual man.

On this occasion I am particularly happy to bring greetings from Yale University. The Sheffield Scientific School was in a sense the parent of this Experiment Station. Many of the great names in the early days of the Station were shared by Yale — John Pitkin Norton, a professor in the Sheffield Scientific School who conceived the idea of an Agricultural Experiment Station, Samuel W. Johnson, Atwater, Brewer, Osborne, and Mendel were great men in those days. Yale has long had reason to be proud of her offspring. Today we dedicate a fine new building, a substantial addition to our facilities. We are very grateful for it to the State of Con-

necticut and to our many friends whose efforts made it possible. It will tremendously increase the usefulness of this Station.

But as important as it is, we should remember that the research stations, like universities, are much more than bricks and mortar. It is the men and women in the buildings that give them their significance. This Station is fortunate in the distinguished members of its staff in the past and the worthy successors of those men working in its laboratories today. I need not name them because most of them are known to you. The success of a great director is the list of notable scientists that he gathers about him. Dr. Jenkins, whom many of us remember well, was such a director; the man we honor today was another, and so is the present director. It is a great art to pick out those particular young scientists who will develop into great investigators. There is no yardstick here that is infallible. Sometimes the man with the most brilliant promise falters and runs out of ideas; sometimes the quieter fellow will ripen slowly and will in the end produce far more. Something like a sixth sense is required.

At a time like this when facilities for work are expanding, we ask ourselves what is the task that is set before these men? What do we expect them to do here? The detailed answer to this question changes from one generation to the next, but basically remains the same. First of all, we know that research is a scientific adventure, a pushing out across frontiers into the unknown. Investigators today are the spiritual descendents of the explorers and discoverers of earlier centuries. Quite apart from what is discovered, the very quest itself is exciting work. In some respects, scientific research is the most rewarding and satisfying kind of life there is. The true scientist would rather do it than anything else. But let us remember that research is not something done for personal gratification alone. It has implications for society as well as for the individual. The great service that Sputnik I did for the United States was to convince us dramatically, though rather painfully, that one of the requisites for national greatness and survival is active and skillful scientific research. The continued prosecution of research is essential in the competitive world. To fall behind in it is perilous. One of the chief factors that makes the Russians such hard bargainers around the council table is their knowledge that in the field of sciences, both theoretical and applied, their place is very high.

A research man thus has an important obligation to society which he should never lose sight of. He may fulfill it by work in a military laboratory on missiles or submarines, or in one of our great medical laboratories on the conquest of disease, or in an industrial laboratory on perfecting methods of production, distribution, or communication, or in a laboratory like this to help produce more efficiently the nation's food supply.

If he works in a university his research may not be directed to any par-

ticular goal, but the time and effort he spends in teaching are part of his obligation to society.

How can we best strike a balance between individual freedom and social obligation? Certainly new ideas, which are the most valuable product of research, are born in the minds of individuals. The creative process in science is an art. It is a fascinating and complex one. It requires not only diligence in the accumulation of facts, but judgment in arranging them and freedom in planning work ahead. It also needs a certain leisureliness too rare in this country, which provides opportunity for pondering a problem, walking all around it as Darwin did for so many years with natural selection, and viewing it from every side. It should provide for the free interchange of ideas, not only between men in the same field but between men of different interests, for in this way new ideas are often formed. Remember that Darwin got one of his from Malthus, an economist. The environment in which a scientist works is, therefore, very important and it is one of the chief tasks of any research institution to make the environment as stimulating as possible.

That the Connecticut Agricultural Experiment Station has been successful in doing this is shown by the long list of productive scientists who are members of its staff and by the fact that young men are anxious to come here to work today. Its scientific standing is manifested by the remarkable fact that three of its present staff members, and a considerable list of others in the past, have been elected to the National Academy of Sciences for work done here, a longer list than many much larger scientific institutions can boast. This is striking testimony to the fact that research in so-called practical fields can be as productive scientifically as that in purely theoretical problems.

It has been one of the glories of this Station to encourage the approach to agricultural problems, as Professor Mangelsdorf has said, from the side of theory and fundamental science as well as from the more usual ones of immediate dollars and cents returns. This method has proven in the long run to be very effective. I know of no problem being investigated here today that does not have important implications for theoretical science. To be sure, the Station has always endeavored to fulfill its obligation to the state and to society by centering its work around the problems which are important in the fields of agriculture, and its practical contribution here has been very great.

In the early years of their history, the chief task before our Agricultural Experiment Stations was to increase agricultural production, per unit of land and labor. To a considerable extent this is still their function, directly or indirectly. How well the task has been accomplished is evident in the

tremendous crops our farmers now produce. In view of this fact, some people are beginning to ask whether the Experiment Stations have not outlived their usefulness; whether their work is not now largely done and should be discontinued. When poultry farmers have so increased their production that the prices they receive have fallen too low to support them, and when agricultural production in this country in general is so staggering that the disposal of the surplus poses the major economic and perhaps even the major political problem we now face, this question is a reasonable one.

If one examines the matter carefully, however, he will find, I think, that the necessity for research in agriculture, in the broadest sense, is actually greater today than ever it was before. Agriculture is the wholesale exploitation of plants and animals and the soil for the benefit of man. It involves a tremendous disturbance in the balance of nature as she thus is subjugated to man's will. The difficulty is that she does not stay subjugated! A famous rust-resistant wheat became susceptible again in a few years, not because the wheat had changed but because the rust fungus has developed more virulent strains. The continued use of antibiotics or of chemicals like DDT, often meets the same difficulty. No battle is ever permanently won in this war. The development of drought-resistant plants may be nullified by the continued fall of the water table. Soil that was rich may lose its fertility in various ways. The widespread use of automobiles and airplanes greatly increases the spread of harmful insects and fungi. Such examples could be multiplied almost indefinitely. It is more than probable that unless scientific research on such problems is energetically continued, another decade or two would find our present bumper crops back to their earlier levels or even more seriously threatened. There is no armistice in this war. No nation in its combat either with foes on the farm or with aggression elsewhere, can ever succeed unless it continues to maintain its scientific research at a high level. This is a salutary lesson which emerges from our experiences of the last year or two of the cold war.

Furthermore, research of this kind is becoming increasingly more complex. The workers at our Experiment Station are no longer simply trying to find better varieties or new sprays or more efficient fertilizers. They must go far more deeply into such problems than ever before. Luther Burbank's methods no longer are sufficient to produce new varieties for us. To develop hybrid corn and meet concomitant problems, Dr. Jones and his colleagues had first to master the basic theories of genetics in order to apply them intelligently. The same sort of genetic knowledge is being used to induce harmful mutations such as sterility in insect pests. To produce a superior fungicide or insecticide now requires far more than trial and error. One must understand the basic physiological processes of the organism before he can find how these may be blocked or stimulated. The biochemical

bases of susceptibility and resistance must be discovered if an intelligent program for the development of immunity and for disease control is to be developed. The life history of an insect must be thoroughly known because it may give us a clue for eradicating the insect, as may happen, for example, when the amplified call of a female mosquito is used to lure millions of amorous males to their destruction. The wide use of sprays from the air has many other effects than simply to kill a particular pest. It may kill many other kinds of animals and thus seriously disturbs the balance of life. To use it wisely requires not only knowledge of spray materials and their specific toxicities but an understanding of that complex subject called ecology. To tamper seriously with nature without understanding her may be perilous.

The agricultural research man is therefore much like the military scientist, continually seeking better weapons to counteract those of a resourceful foe and thus necessarily exploring more deeply not only the older scientific frontiers but opening up new ones. Some of these new ones we can as yet see but dimly but we are moving toward them fast. One of these, for example, is a better knowledge of the weather and its prediction, and perhaps even its control. It is significant that in our Station there is much research on climatology. If temperature and rainfall can to any degree be controlled, surely it is the farmer who will be most intimately concerned.

Taking the world as a whole, the chief limiting factor on crop production is an insufficient water supply. Falling water tables and reduced stream flow are familiar phenomena in wide areas. When a great city depends for its water supply on a pipeline 800 miles long, its very existence is threatened. And yet the supply of water is almost limitless. It simply needs to have its salts removed to be made fit for the use of man and his crops. Surely the day is not far off when this will be done on a major scale. It is significant that recently a practical project was started to use atomic energy for the distillation of sea water. Here is a wide field for scientific research.

Even more fundamental problems may soon be upon us. The chemical reaction that underlies all food production is the synthesis of sugar by a union of carbon dioxide and water, a process thus far incompletely understood and one that goes on only in green plants through the energy of light. Attempts to imitate it on anything more than a very minute scale have thus far been fruitless. But carbon dioxide and water are very simple substances and available in great quantities. Surely it does not seem beyond the ability of synthetic chemists, who have already produced such wonders, to put these substances together without the help of plants and on a large scale, now that abundant supplies of energy seem available. There is every reason to believe that in the not too distant future this will be done. Should

we be able to synthesize a simple sugar — finally starch and perhaps protein — and thus make much of our food in factories without the necessity of playing nurse to green plants, the effect on man's life would be more far-reaching than any other change, perhaps, since the discovery of fire. What this might do to agriculture is a matter for some interesting speculation, but the agricultural scientist will certainly need to be present when these far-reaching changes are taking place to guide them into directions most serviceable to man. It may be that the basic energy goods will thus be produced in a wholesale fashion (though this seems a long way off) but it seems extraordinarily unlikely that specific organic structures like fruits and flowers and puppy-dogs will ever be produced in any other way than the good old-fashioned methods. Perhaps, however, the efforts of agriculture will be devoted in the distant future more and more to the improvement of products like this than to the basic food crops. In ministering to man's satisfactions higher than the cravings of his stomach alone, agriculture might in time serve him even more fruitfully. Such a radical change, if it should take place, will offer opportunities for constructive agricultural research even beyond those we have today. The future here is rich and unpredictable.

In all this we are still concerned with the manipulation, through agriculture in the broad sense, of plants and animals and chemical and physical processes for the satisfaction of mankind. But agriculture cannot help being involved with a far more complex problem — man himself. The great questions for agriculture today, as we have said, deal not so much with production as with distribution. When surplus corn has to be burned or great masses of wheat, purchased at high cost, stored unproductively in elevators and the hulls of the mothball fleet, there is a challenge to the efficiency of our whole economy. Surely there is need for intensive thought and research on the part of agricultural economists, and what might be called agricultural sociologists, on this matter. To the solution of these problems the Agricultural Experiment Stations should be asked to make a greater contribution. Their workers know the problem at first hand and can be expected to approach it more constructively than more theoretically minded workers. Of course it is human nature that is involved here, and human nature on the farm is no different from that in the factory or in the home.

In the great field of conservation, which is agriculture in the broad sense, economic and political and aesthetic values are also involved. We are stewards of the earth's resources and the man who understands this stewardship best is likely to be the one closest to the soil and the forest. Conservation is uppermost in the minds of many people today, and some of the best research in it, directly or indirectly, comes out of institutions like ours.

But there is an even wider service, I think, in which the Agricultural Experiment Stations of the future should concern themselves. We live in a changing world, not only scientifically but socially and culturally. One of the great facts of this world is the vastly enhanced productivity of individual workers. A conspicuous result of this is that the hours of labor are continually being reduced. The six-hour day and the four-day week seem to be just over the horizon. A consequence of all this is greatly increased leisure. This holds not only promise for us but peril, depending on the way this leisure is employed. One of the most satisfying and constructive uses for it is the increased attention to gardens, flowers, and plantations of many sorts and to the rearing of non-agricultural animals. As the exurban emigration continues, more and more people will come to live closer to nature than they have been doing for two generations and will have time and opportunity to cooperate with it toward an increase of many satisfactions — physical, gustatory, and aesthetic. Many of these people know relatively little about plants and animals but they are anxious to learn. Here, I think, the Experiment Station has a growing responsibility. The cultivation of fruits and vegetables has long been one of its concerns, but it should enter more vigorously into the solution of problems in floriculture, for example. This should not be treated as a minor and somewhat dilettante field but as one in which important contributions to man's welfare and his deeper satisfactions can be made. Its goals are different from those of major crop production but the problems and techniques are often much the same. I venture to predict that in another 25 years a very large share — perhaps most — of the problems and activities of this Station, located as it is in a state that will soon be largely urban or semi-urban, will be primarily concerned not with the professional farmer — though I hope that he long continues to thrive here — but with the men and women who dwell in the country but who earn their living from other sources than the soil. Who shall say whether this will not be a greater contribution, or at least a more widely distributed one, than that which the Station has so long and so skillfully been making and which it makes today?

Such is the work of the Connecticut Agricultural Experiment Station as it is today and as it may be tomorrow. A major step in its development is the event we here are celebrating. In years to come the work done in this Slate Laboratory will doubtless be very different in many respects from work going on here now — different in aims, techniques, implications to society, and carried on in fields we have hardly yet begun to dream about. But of one thing we can be sure, that if the Station is faithful to its long tradition its work will remain in the forefront of scientific research in agriculture. Connecticut is rightly proud of the eminence of this Experiment Station in the scientific life of this nation, and can look to it in confidence to maintain this high distinction in the years ahead.

## Dedication of Slate Laboratory

James G. Horsfall

Slate Laboratory, as you may suspect, marks the culmination of a long series of operations. Mr. A. Ward Spaulding on our Board was the man who first introduced the bill into the Legislature in 1953 for this building, but the Legislature was unconvinced as it sometimes is the first time it hears even some good ideas, and so the bill failed to pass. In 1955 the bill was again introduced by a great friend of the Station, Mr. Robert Cairns, representative from Madison. I would like to ask Mr. Cairns to stand.

Of course, those of you who have gone to the Legislature will realize that there is more to getting a bill through the Legislature than getting it introduced. Obviously, it must be introduced, but Representative Cairns had some assistance from numerous citizens of the state, who provided, shall we say, the information the members of the Legislature required before they could make up their minds to appropriate funds for Slate Laboratory.

We are indebted to a vast variety of citizens from all over the state who took their time and their efforts to go to the Legislature to explain the problems of the Station and the need for a building. I think that if I were to have to name a single individual who put the really maximum amount of effort into it, I could not help but name John Lyman of Middlefield, who probably put more effort into it than anybody else. John has just come back from a short vacation in order to be here with us. John, will you stand up?

There were, however, any number of other individual citizens from all groups in the state, and I so wish that I could introduce them all, but I can't. At least I can divide them into three groups and introduce one person to represent each, one from the rural groups, one from the urban groups, and one from among the legislators themselves who also spoke in our behalf. There are delegates here today from all of the farm organizations and other commodity groups of the state. I do not think anybody could better represent the rural groups in the state than our long-time friend, on whose farm we did many experiments in the early days, Dave Clarke of Milford. Dave, could you stand up?

The Legislature meets for six months, but they seldom do any business until the last day — — at least this was true in 1955. Dave Clarke was there the last night that year and he saw to it that the Legislature didn't forget us even after the clock was stopped.

Of the urban groups I think it might be well to introduce the current President of the Federated Garden Clubs of Connecticut — Mrs. Robert P. Anderson of Noank. She hardly stood up long enough for you to see her. She is a very timid young lady. She was not President at the time, but many ladies of the Garden Clubs gave us a hand, and I thought she could represent the urban groups.

Among the legislators who spoke, I would like to introduce Representative Julia Wright from Orange. Is she still here? I am afraid she has left.

I wish I could introduce many others who went to the Legislature on our behalf.

Now buildings such as this require the work of several artists — the architect, the builder, and the landscape architect. Is Mr. Raymond Percival, the architect here? Yes, way in the back. The one with the red tie. Thanks, Ray, it was nice of you to come.

Beside him is Sam Costanzo, the contractor. Last but not least, the landscape architecture for the building was provided by The Connecticut Nurserymen's Association, and Peter J. Cascio is here: Pete will you stand up?

You probably saw the beautiful plants in the new building which were provided for us by the Connecticut Florists Association.

Now inasmuch as the Governor was not able to be here to present our building to us, he has delegated the responsibility to the Commissioner of Agriculture, Mr. Joseph N. Gill. I do not know very many stories about Joe, so I will present his honor, the Commissioner of Agriculture, Mr. Gill.

Then the building will be accepted by Mr. Charles G. Morris, our senior member of the Board.

**Joseph N. Gill**  
**Commissioner of Agriculture**

Governor Ribicoff has asked me to express his regrets at being unable to attend this dedication today but I am very happy to be able to represent the Governor. This new laboratory provided by the State of Connecticut furnishes improved facilities so that this Station can continue to advance in scientific research. The people of Connecticut by providing these new facilities are recognizing not only the quantity but the quality of the research that goes out of this Experiment Station, the oldest in the Western Hemisphere. Connecticut can justly be proud of the world-wide recognition of the scientists on the staff here. At the 50-odd experiment stations throughout the country there are only 15 scientists who have been honored by membership in the National Academy of Sciences. Of these 15 members, three are on the staff of the Connecticut Agricultural Experiment Station. With this distinguished record I am happy on the behalf of Governor Ribicoff and the people of Connecticut to turn over the key of this new Slate Laboratory to the senior member of our Board of Control, the greatly beloved and highly respected, Charles G. Morris.

**Charles G. Morris**  
**Board of Control**

As the senior member in service on the Board of Control of this Station it is both a welcome duty and a sincere pleasure to accept the ceremonial key to the Slate Laboratory and to turn it over to a man who has for many years devoted himself to developing the usefulness of this Station to Connecticut. The Station has served well, not only the basic agricultural and food industries, but it has expanded its service to the home gardeners and to the flower lovers within the State. Endless hours of research have been spent for the common good of many branches of agriculture. If the insect pests, the fungus pests, the bacterial pests (in short the various plant diseases) had not the well organized restraints developed by this Station's research work, Connecticut agriculture would be severely handicapped in its competition with other areas of the Nation.

When the railroads first opened the West to a flood of new farm owners it was freely prophesied that the worn soil of New England had had its day. The type of this State's agriculture has of course been modified, but with the help of this Station in the past Connecticut has come far from being a desert. This newly built laboratory, named in honor of the former Director of the Station, William L. Slate, will now be added to the working units of the Station which are looking and working toward the future of Connecticut agriculture.

Where is that man Slate? I want to give him the key.

**William L. Slate**  
**Director Emeritus**

I am not sure that this key fits any of the doors over there, but I think it will make a very fine symbol and we will see that it is kept in a prominent place whether it is used in keyholes or not.

Now since I am on my feet — I am not going to talk about salt-rising bread.

Director Horsfall and others have referred to the Station Board and I would like to pay my personal tribute to these wonderful men with whom it has been for me, for 25 years, a very great privilege to work, and, of course, you know who the present members are, but we could go back. Mr. Sinnott mentioned, for instance, Professor Brewer, who was a member of the Board for 33 years before my time. Mrs. Wright's father, Charles Treat, was on the Board when I took over. Mr. Joseph Alsop, of Avon, Mr. Elijah Rogers, and so on and so on; Mr. Morris coming on in the middle of my term; Mr. Albert Plant, now gone, of Branford; Judge Webb, who was the vice-chairman of the Board when I came in. It has been a very wonderful privilege to work with men who were thoroughly interested and willing to take their time on any occasion no matter how busy, to attend to the business of the Station. As most of you probably know, the Station Charter states specifically that this Board shall manage the Station, and they have, and for that I pay my tribute now.

**James G. Horsfall**

Thank you, Bill.

I think only one other item needs mentioning. I would call your attention to the fact that funds for the equipment and facilities in the new building have been provided by our endowment funds, particularly the Lockwood Trust and the Samuel William Johnson Fund provided in memory of our founding Director.

Thanks again to all of you for coming. I regret to announce that the barbecue has been somewhat delayed, and it will probably be 6:30 or quarter to seven before we can sit down to eat. I hope that does not discommode you too much. It is one of those difficulties that sometimes hits us however well we plan. Every once in a while we run into a snag, and I apologize for this. I remind you, however, that the laboratories will be open, and I hope you will take the occasion to meet our staff.

Again, thank you for coming.

Mr. Gill, our thanks to the Governor for providing a building of such quality to match the genius of Mr. Slate and the scientists who work in it.

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