Dedication...

STURTEVANT HALL

DECEMBER 7, 1964

SEED INVESTIGATIONS FACILITIES

of the

New York State Agricultural Experiment Station, Geneva, a part of the College of Agriculture, a Contract College of the State University of New York at Cornell University.

On a Seed

This was the goal of the leaf and the root.
For this did the blossom burn its hour.
This little grain is the ultimate fruit.
This is the awesome vessel of power.

For this is the source of the root and the bud . . . .
World unto world unto world remolded.
This is the seed, compact of God,
Wherein all mystery is enfolded.

Georgie Starbuck Galbraith.

PROGRAM

Morning

9 —Registration and Coffee Hour

10 - Noon—Informal Tours of Experiment Station

Noon —Lunch (on your own)

Afternoon

Scientific Seed Improvement

Master of Ceremonies

Donald W. Barton, Director

New York State Agricultural Experiment Station, Geneva

1:30 — "The Role of the College of Agriculture in Service to Industry"
Charles E. Palm, DEAN, College of Agriculture,
Cornell University, Ithaca

2:00 — "How Your Research Helps Our Service"
Don J. Wickham, COMMISSIONER OF AGRICULTURE, Department of Agriculture and Markets, Albany

2:30 — "Problems of Releasing and Increasing Seed"
Joseph Harris, Harris Seed Company, Rochester, N.Y.

3:00 — "New Techniques for Harvesting and Processing Seeds"
J. E. Harmond, PROFESSOR, Department of Agricultural Engineering, Oregon State University, Corvallis

3:30 — "Preserving Seed Vitality"
James F. Harrington, PROFESSOR, Department of Vegetable Crops, University of California, Davis

4:00 — Tour of Seed Investigations' Facilities, Sturtevant Hall

Evening

Master of Ceremonies

A. A. Johnson, Director

New York State Cooperative Extension Service, Cornell University, Ithaca

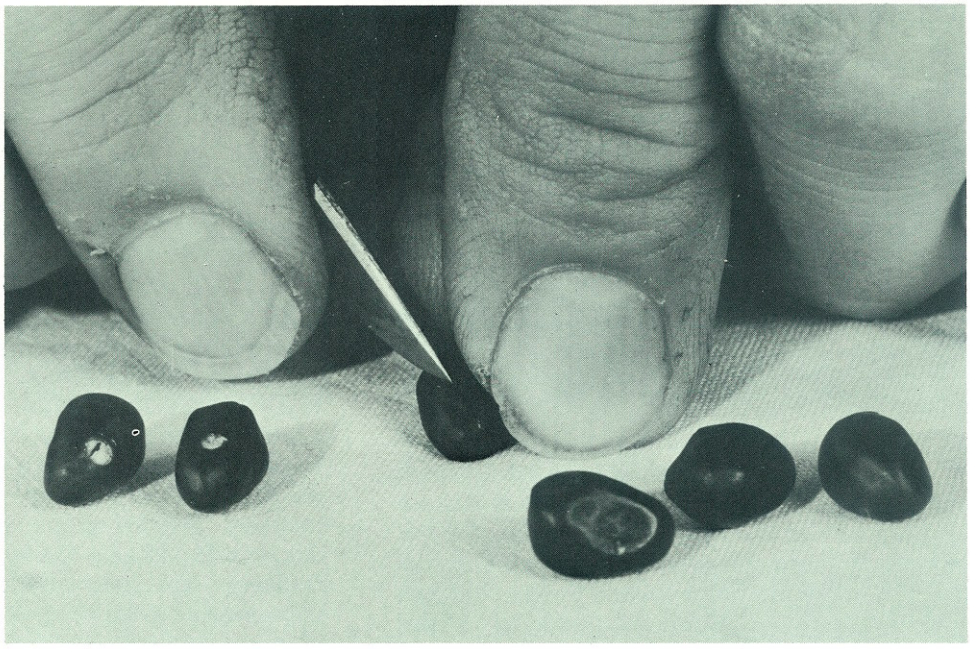
6:30 — Social Hour, American Legion Home, Route 14 south of Geneva

7:00 — Banquet

8:00 — SPEAKER
John L. Creech, ASSISTANT CHIEF, New Crops Research Branch,
U. S. Department of Agriculture, Beltsville, Maryland

— Topic
"The Search for New Germ Plasm"

SEEDS



THE GERM OF LIFE

Secretary of Agriculture Orville L. Freeman said recently, "Good Seeds are both a symbol and a foundation of the good life our people have gained. A basic factor in our realization of mankind's most sought goal, agricultural abundance, good seeds can be a means of our bringing about an Age of Plenty and an Age of Peace and Freedom. We can use our good seeds to help end hunger and fear for the less fortunate half of the human family. So used, our seeds can be more meaningful to a hungry world than can the rocket that first carries man to the moon."

Finding and developing better seeds is the oldest service the United States Government has offered to the agricultural people in this land. Seeds of every nature have been collected from all parts of the world. They have been tested, catalogued, grown, and distributed wherever they have been found to prosper.

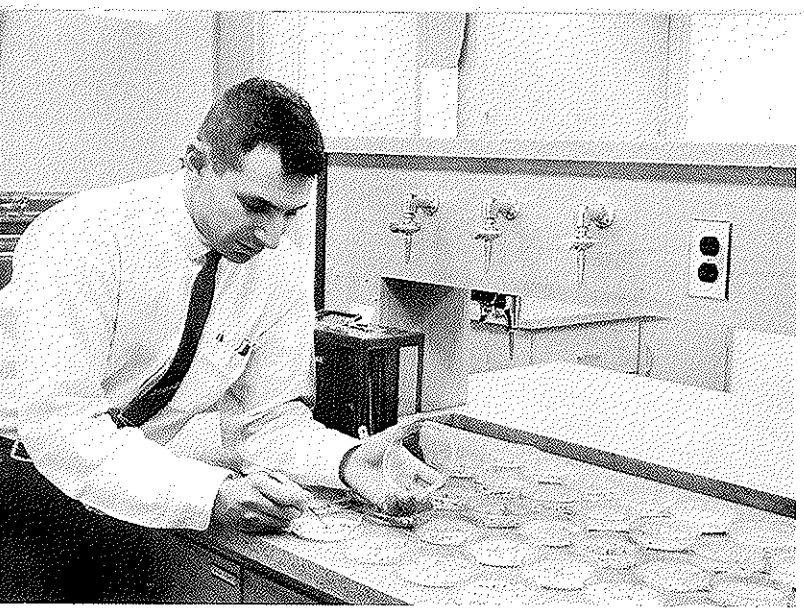
A seed is truly a remarkable thing. It protects and sustains life; it spreads new life; it is food for man and animal; it is the raw material from which many new products can be developed; and, above all, a seed's primary job is to insure continuing life.

Without seeds there would be no plants, no animals, no food, yes, no people. We all are the result of a seed having grown to adulthood. A seed is truly the *germ of life.*

Seeds have been a part of the Geneva Experiment Station's research program since its very beginning in 1882. The first Director of the Station, Dr. E. Lewis Sturtevant, was extremely interested in the value of good seed, and devoted a portion of his initial Annual Report to a dissertation on the subject. In part, this report said, "It is difficult for the average grower of crops to realize what experience invariably teaches, that cheap seed means cheap yields; that quality in seeds costs the grower and costs the dealer and must be paid for in the end by the purchaser; that high cost seeds, provided there is honesty in the growing and sale, are the only economical seeds to buy."

Since that time, a seed research program has always played a prominent role in the Station's activities. Initially, the seed research initiated by Director Sturtevant was assigned to the Botany Department, when there was such a group at the Station. For a number of years, the botanists were primarily interested in the weed seed contaminants of agricultural seeds being planted by New York farmers. Leading growers in the state soon learned to capitalize on this interest and sent samples of their seeds to the Experiment Station for a weed seed analysis. This analysis determined whether their seeds were clean enough to plant. It was at this time that another segment of the seed program at the Station began — the Seed Testing Service.

These may not look like useful plants, but it is possible they contain traits that can be transferred in a breeding program to present varieties.



Testing new introductions for disease resistantance is an important task of the Northeast Plant Introduction Station established in 1953.

Weed seed analysis proved such an asset to the growers in New York State, that it was not long before farmers decided they would also like to know if seeds they were buying would germinate. Because the Experiment Station did not have necessary equipment and personnel for this type of test, it resisted for some time the requests for seed germination testing services. On July 1, 1912, however, a trained seed specialist, Mr. M. T. Munn, reported for work, and from that day forward, the Geneva Station has maintained a complete seed testing service along with its outstanding research program.

Today, the seed testing service provided by the New York State Agricultural Experiment Station and its Department of Seed Investigations is among the most advanced anywhere in the world. As early as 1928, Professor Munn began trueness-to-type trials of seed corn and grains. These trials became world famous and did much to improve the varietal purity of seeds sold in New York State. Eventually, these trials were expanded to include vegetable and flower seeds as well as forage crop seeds.

Just 4 years after the start of trueness-to-type trials, the seed testing and research programs also included seed-borne diseases. Today, there are six basic tests conducted by the Department including: (1) analytical purity, (2) germination, (3) seed-borne diseases, (4) effectiveness of seed treatments, (5) varietal purity, and (6) moisture. Kinds of seeds tested include grain, forage crop, dry bean, turf, vegetable, herb, flower, tree, and shrub.

Farmers and the New York State Department of Agriculture and Markets are no longer the only two groups to use the testing service. Now, seed producers, processors, distributors, florists, nurserymen, freezing and canning companies, state, county, and city departments of public works, and official seed associations and organizations depend upon the reliable and fast service of the Station's Seed Investigations Department.

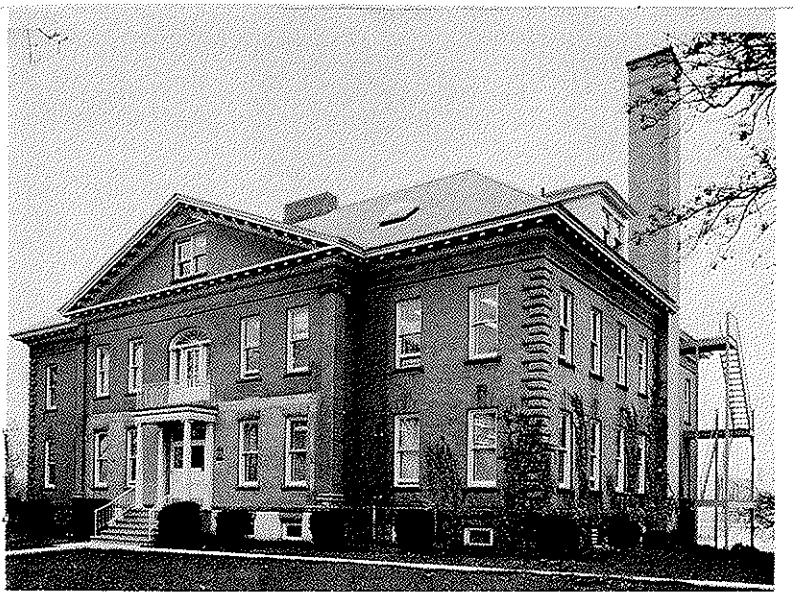
Although a seed testing and research program is an awesome task for any research institution, it was not until 1953 that the prospectus of the Department was fully completed. It was in that year that the Northeast Regional Plant Introduction Station was established at the Geneva Experiment Station. It is a cooperative venture of the U. S. Department of Agriculture, other Experiment Stations in the Northeast region, and our own Experiment Station in evaluating and increasing plant germ plasm of potential value to the northeast, thereby facilitating the development of new varieties.

The importance of these Regional Plant Introduction Stations becomes acute when one stops to realize that none of the main crops grown in the United States actually originated in this country. Indians, colonists, traders, immigrants, Government people, and plant hunters have brought seeds with them and these have formed the basis for our cultivated crops.

A basic goal of these Plant Introduction Stations is to collect germ plasm, the substance of life by which hereditary traits are transmitted, because it is now known that the wild relatives of crop plants are also a rich source of improvement.

Crop breeders use large collections of seeds of cultivated plants and related wild species to select germ plasm for improved varieties of crops grown here, and to find new crops. It is a monumental task to assemble and maintain plant genes from the whole world, and is an activity shared by every state where plant breeders seek new frontiers. For example, many of our domesticated crops came from the Andes of Bolivia and

Growth chambers, located in basement of new building, are used to test for varietal purity as well as for studying new testing methods.



Sturtevant Hall, originally constructed in 1898, is the new home of Seed Investigations.

Peru, the Euphrates Basin of the Near East, China, India, Burma, Middle Asia, the Near East, and Ethiopia, as well as many parts of Europe.

About 2,500 different plant introductions are evaluated annually by the Geneva Station's two professional plant introduction specialists. The results are carefully catalogued, and seeds of promising species sent throughout the northeast region to interested plant breeders.

Agriculture is a dynamic, continuously changing enterprise. This means more demands are constantly being made on the Station's seed testing service. Improvement of these services can only be brought about through a systematized and far-reaching research program.

For example, detailed studies of similar-appearing seed types have revealed characteristic differences of form, markings, or structure by which the seeds can be distinguished. The results of these studies serve as the basis for illustrations, descriptions, and keys used in the identification of seeds.

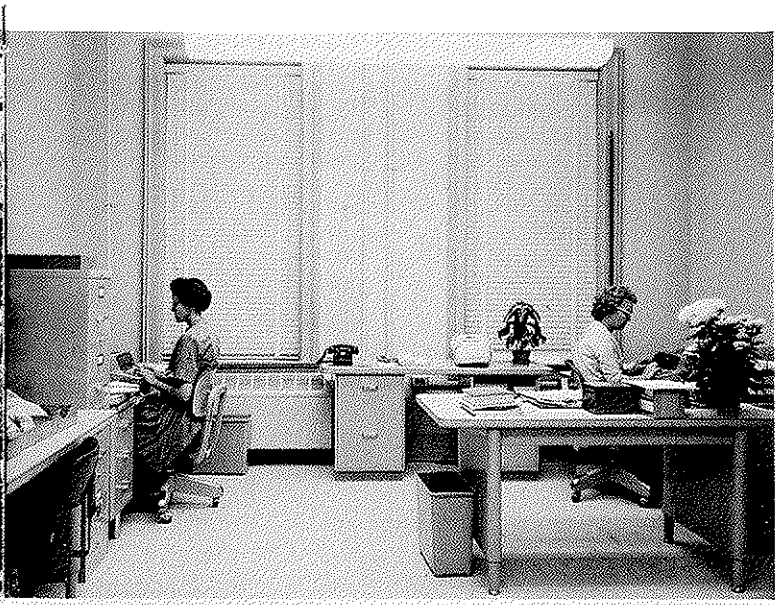
Other studies have shown that high seed moisture and high temperature during storage are causes of weakened seeds that eventually die. The weakened seeds produce seedlings of reduced vigor and also abnormal seedlings that cannot grow into useful plants. It has been found that mechanical injuries to seeds during harvesting and processing often result in abnormalities and death.

Further research may reveal physical or biochemical methods of distinguishing similar appearing kinds of seeds. Moisture and temperature conditions needed to keep seeds viable are known, but the changes within seeds that lead to weakness and death have had little study. Very little is also known about the changes within seeds that result in dormancy or about the internal processes that accompany the overcoming of dormancy. Further knowledge about such changes would make it possible to devise more dependable methods of determining seed viability.

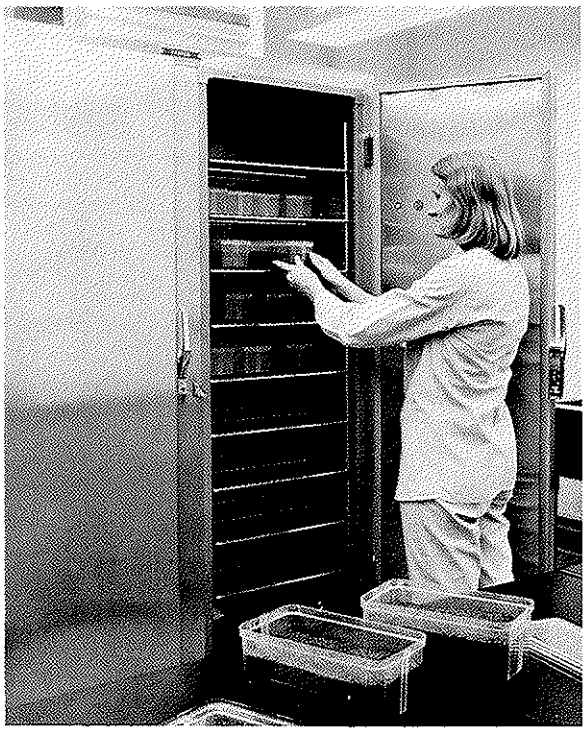
It is no wonder, then, that the former seed facilities in Hedrick Hall became inadequate for the type of seed testing and research program required of today's agriculture. For more than 37 years, the Seed Investigations Department was located on the third floor of this building. Before then, the Department had been located in a small portion of Sturtevant Hall until its needs outgrew those facilities.

Examining seed samples for weed seed contaminants. This was one of the first services of the Department — and is still important.

Now, the seed program is returning to its original home—Sturtevant Hall—but this time, will occupy the entire building. Within its walls are 20,000 square feet of office and laboratory



General Seed Investigations office. Used as combination sample receiving, reporting, and filing room.



Seeds undergoing a "cold test" to determine germination ability in cold, wet soils.

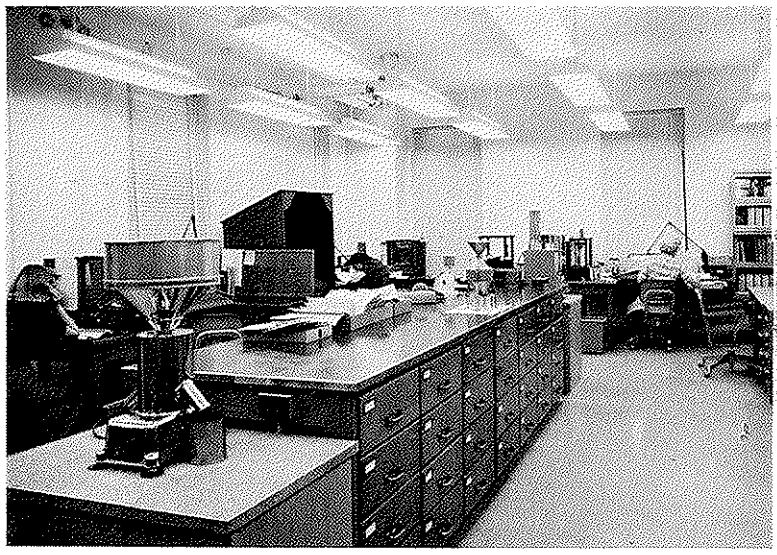
space, along with the most up-to-date equipment available for seed testing and research, as well as for the Regional Plant Introduction Station.

The first floor of the building is assigned primarily for the seed testing service. It has one laboratory designed for germination tests of pea, bean, corn, squash, and other large seeds. This laboratory is equipped with specially designed "Slant Roll" germinators used in testing the germination of such seeds.

Another laboratory on this floor is specially equipped for germination tests on turf grasses and small-seeded vegetables. Still another is used for testing the germination of flower, tree, and shrub seeds.

A well equipped laboratory is provided on the first floor for measuring the analytical purity (freedom from weed seeds and other contaminants) of turf seeds. This facility has carefully calibrated seed blowers and special magnification equipment for detecting and removing seed contaminants. It will also have a seed herbarium for use in identifying turf seeds as well as other kinds of seeds.

Refrigerators and soil handling equipment for making "cold tests" of seeds are provided in one laboratory. These tests are conducted in soil at low temperatures and prove valuable in measuring the ability of seeds to produce plants under unfavorable field conditions at planting time. Until now, the Department has had only limited facilities for making these tests.

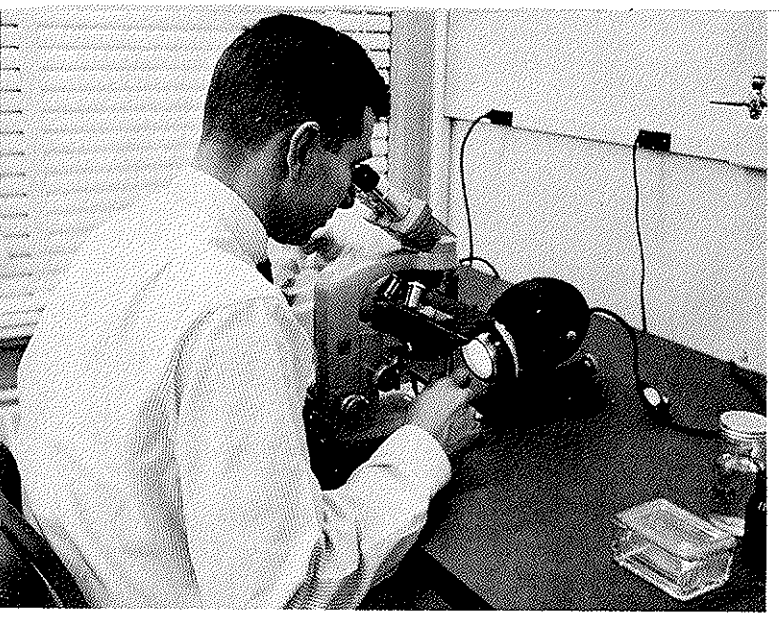


Seeds are carefully studied in this laboratory to see that they meet package label specifications.

Another laboratory is available for testing grain and forage seeds. In addition to having the usual testing equipment, this room features a miniature seed cleaning machine used in detecting objectional weed seeds that may occur in relatively low quantities.

Finally, on the first floor of the newly renovated building is a laboratory for testing the

Office of Regional Coordinator for the Northeast Regional Plant Introduction Station.



Identifying plant disease organisms of new introductions is part of plant introduction work.

moisture content of seeds. It is equipped with a standard drying oven along with oil distillation and electronic moisture testers.

Facilities on the second floor are for testing seeds for seed-borne diseases, for seed treatments, for measuring the varietal purity of seeds, and for the Northeast Plant Introduction Station.

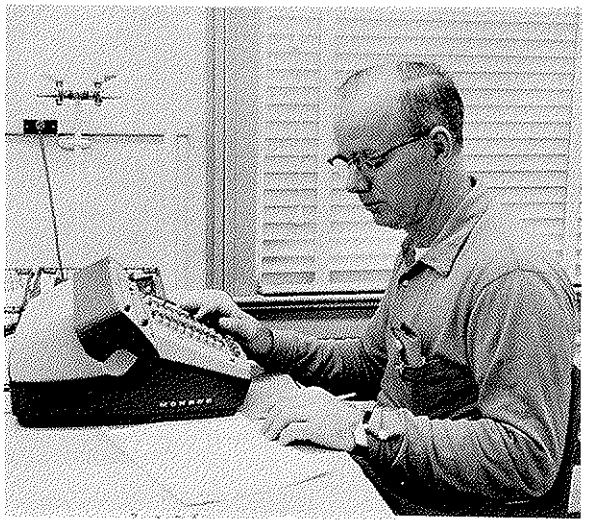
Plant Introductions has a general laboratory, a general stenographic office, and an office for the Regional Coordinator who directs the activities of this important segment of the Seed Investigations Department.

A special laboratory is provided for operations connected with the screening of plant introductions for disease resistance. This laboratory is supplemented with an incubator room, a culture transfer room, and other facilities for growing cultures of disease organisms used in measuring the disease resistance of plant introductions.

These same culturing facilities are to be used for identifying seed-borne disease organisms and in conducting research on seed-borne diseases. In addition, a specially equipped laboratory is being provided for studying seed-borne diseases.

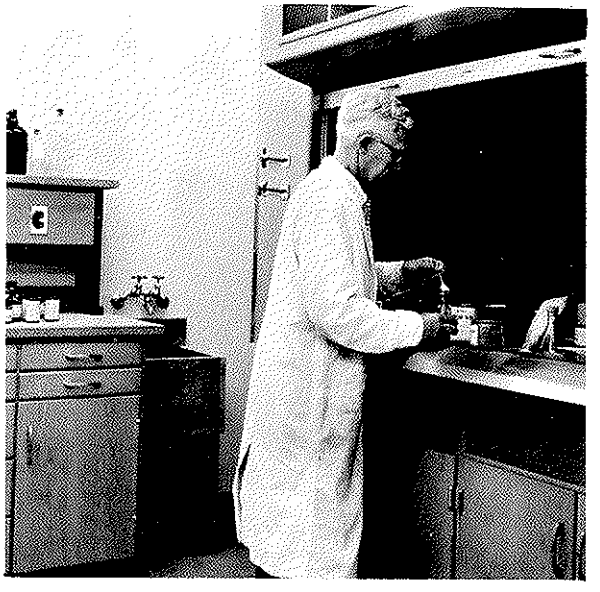
Another laboratory on this floor is used for studying chemical and other treatments designed to improve the planting value of seeds. One section of the second floor has been assigned for conducting varietal purity research and will be used for summarizing and analyzing data obtained in field, greenhouse, and growth chamber experiments.

Although the entire building has been turned over for Seed Investigations, it will not be until the new Entomology-Plant Pathology building is completed in 1967 that Seeds can obtain full occupancy of Sturtevant Hall. Currently, the third floor is fairly well occupied with certain research projects of the Department of Entomology, another of the Geneva Station's six research departments.

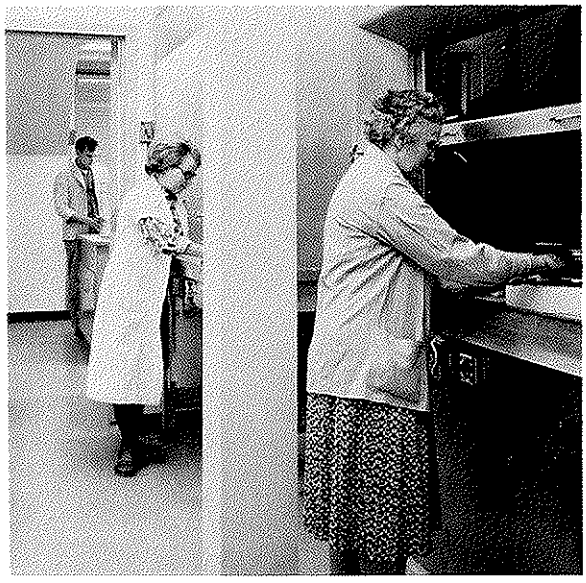


Research is a very important part of the Department's activities. Here, a member of the staff summarizes varietal purity data.

However, when this section of the building is vacated it will be used primarily for research on dormancy, vitality, and other physiological factors affecting the planting value of seeds. There are also several large laboratories on this floor that will provide excellent facilities for this research and they will be equipped with the most modern tools needed for physiological studies. Five rooms with temperature and humidity controls will supplement the laboratory facilities, and will



A Department plant pathologist studies one of his experimental seed treatments.

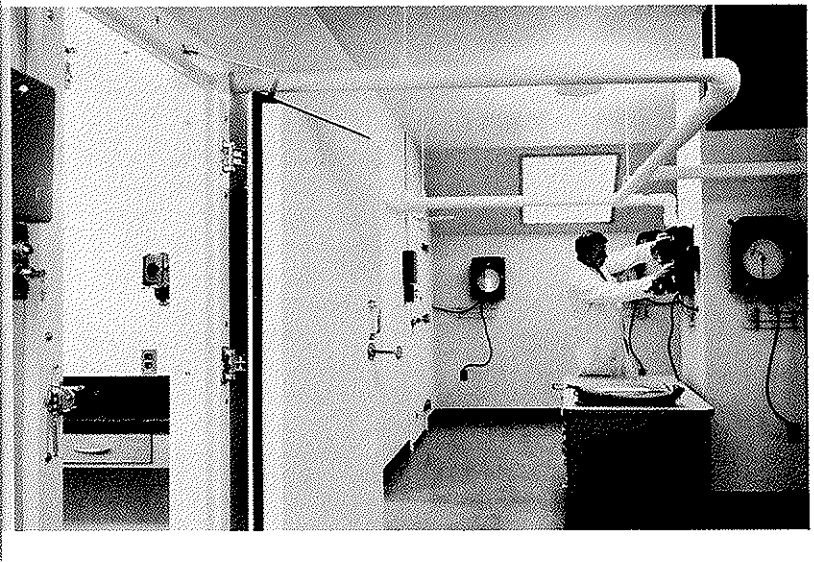


Third floor of Sturtevant is now used by Entomologists. Eventually, it will be used for seed physiology research.

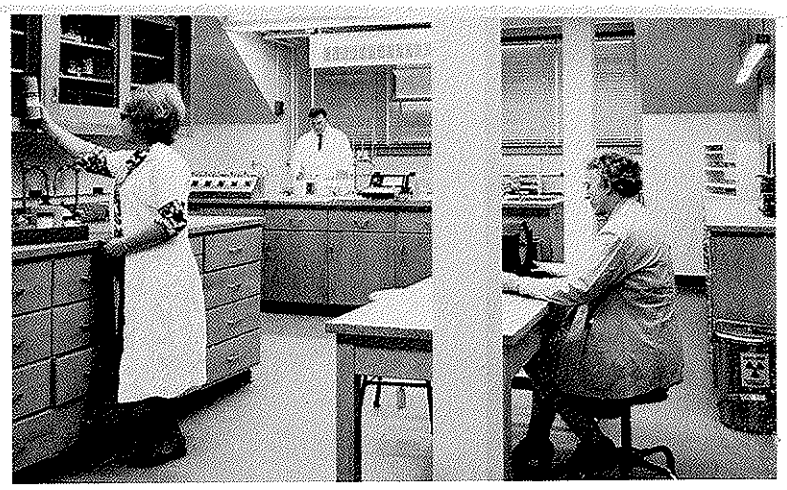
provide opportunities for observing the physiological behavior of test specimens under carefully controlled environmental conditions.

Even the basement of this historic old building, originally occupied in 1898, has been revamped and geared for use by the Department of Seed Investigations. It is in this area of the building that three plant growth chambers and other facilities for growing seedlings under standardized environmental conditions have been located. These will be used primarily for developing methods for measuring the varietal purity of seeds as well as for other seed research.

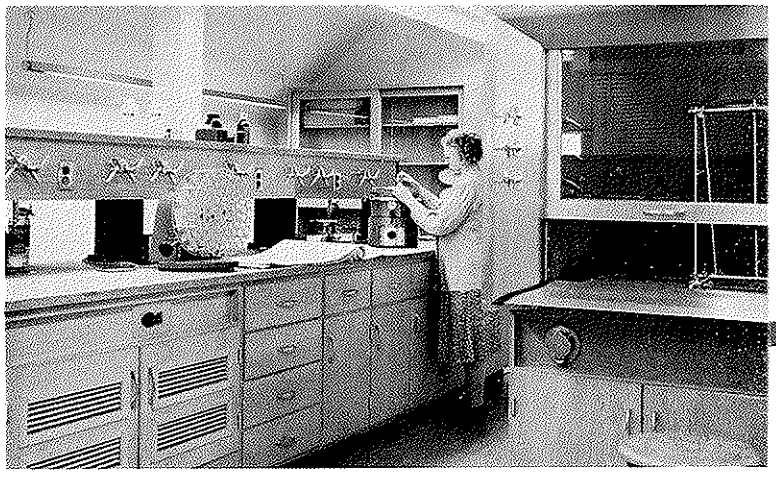
The basement also houses a special seed storage capable of providing freezing temperatures with a relative humidity of 50% or less. This



These controlled temperature rooms will play an important future role in seed research.



This will eventually be a seed physiology laboratory. It is now used by Entomology.



Another laboratory now used by Entomology that will eventually yield much fundamental seed research data.

storage is used for preserving the germinability of seeds used in developing new varieties. Seeds kept here are expected to remain germinable at least four or five times longer than those stored under the conditions formerly available.

Finally, there is a room for shipping and receiving plant introductions. This room has limited facilities for processing seeds of crops such as tomatoes and squash harvested from plant introduction trials.

However, says Dr. B. E. Clark, Head of the Department, "The greatest advantage of the improved facilities is the opportunity they will provide for improved seed research. As additional trained personnel become available, it will be possible to expand the seed research program of the Department and to delve deeper into the fundamentals of seed physiology than has been possible previously. Such seed physiology research will help to build the fund of basic knowledge which will be applied to the solution of our future practical seed problems."

A STATEMENT

by

Donald W. Barton
Director

New York State Agricultural
Experiment Station
Geneva, New York

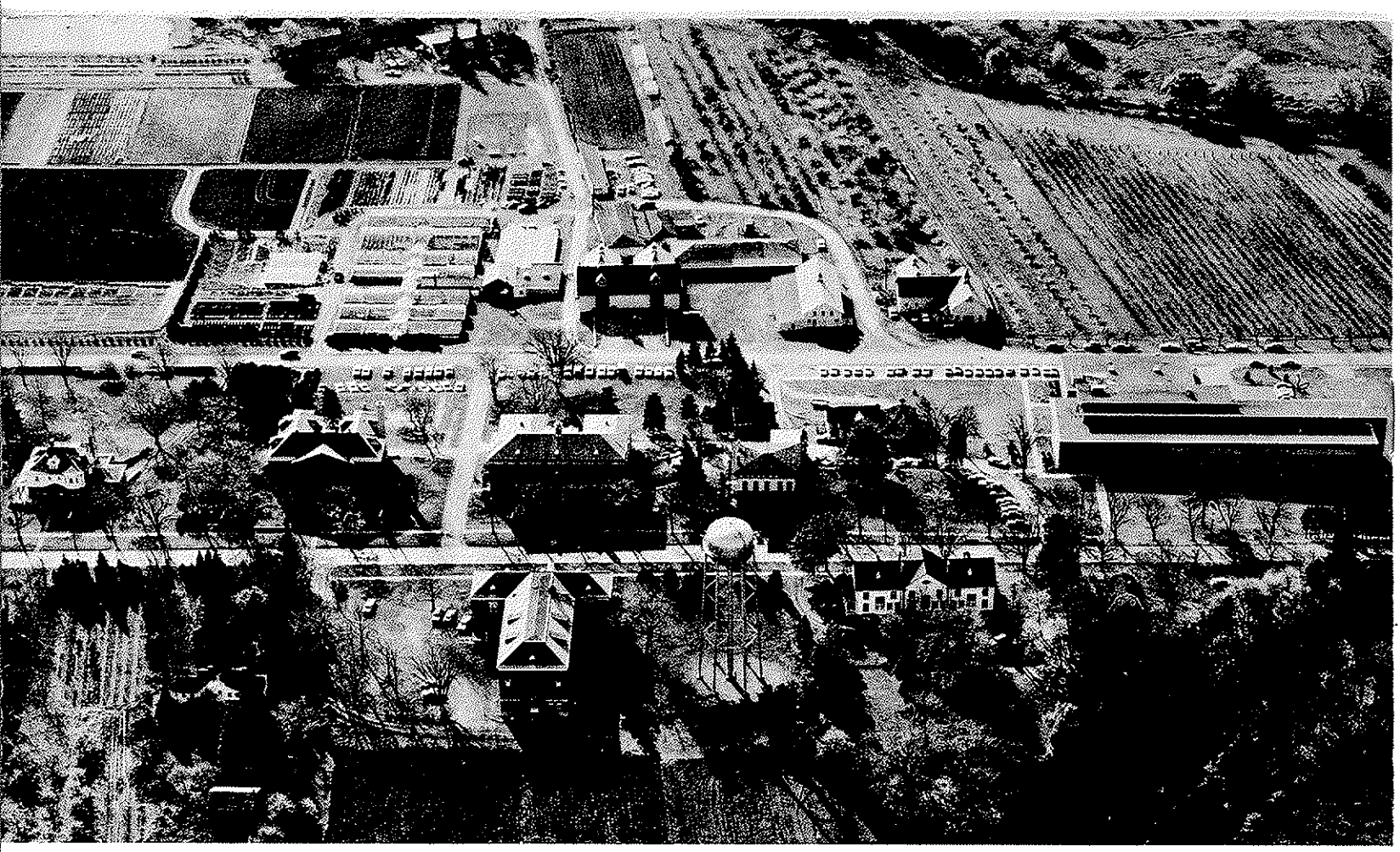
Seeds are the essential beginning of all farm and horticultural crops. They, therefore, are among the most basic essentials toward maintaining and improving our agriculture.

The first Director of this Institution saw the need for good seeds and sound seed research. It is, therefore, quite fitting that when we found it necessary to expand our Seed Investigations facilities, the most logical choice was the building carrying the name of our first Director—Sturtevant Hall.

New York agriculture is among the most strongly developed and firmly footed economies in the world. It provides the people of this State with food and fibre products of the highest quality and at the least cost possible with today's technological achievements. Certainly, a large segment of this success can be directly attributable to the outstanding testing, seed research, and plant introduction contributions made through the years.

As the population increases, as the demands for food become greater, and as the total acreage of farm land diminishes, good seeds will play an even more important role. We are now equipped to handle problems that not only are presently confronting us, but assuredly will come forth in the future. As time moves forward, and the demands still greater, we will do everything possible to provide the people of New York State with the finest Seed Investigations program so that we can always have an abundance of high quality food and the healthiest of people.

Donald W Barton



The New York State Agricultural Experiment Station, Geneva

About the Station . . .

WHEN established 82 years ago, State legislators undoubtedly did not dream that the New York State Agricultural Experiment Station at Geneva would ever have the renowned distinction that it enjoys today. In fact, it was only through the diligent efforts of a few that the Experiment Station was ever started.

Today, the staff of 60 professional scientists and 200 other technicians and assistants are working on more than 250 projects. The results of these efforts determine to a large extent the direction of today's agriculture in New York State, and will form the the design for tomorrow's.

The Station is an integral part of the New York State College of Agriculture, a contract college of the State University of New York at Cornell University. Research work concentrates largely on the production, protection, and utilization of food crops grown for processing. Scientists undertake to develop high yielding, disease resistant varieties of fruits and vegetables that will make high quality products for the consumer. To accomplish all this work, more than 600 acres of land are maintained by the Station for field trials.

Research at the Institution is divided among six departments — namely, Entomology, Plant Pathology, Pomology, Seed Investigations, Vegetable Crops, and Food Science and Technology. A Regional Plant Introduction Station, operated under the auspices of the U. S. Department of Agriculture, Washington, D. C., is also located at Geneva and is an integral part of the activities of the Department of Seed Investigations.