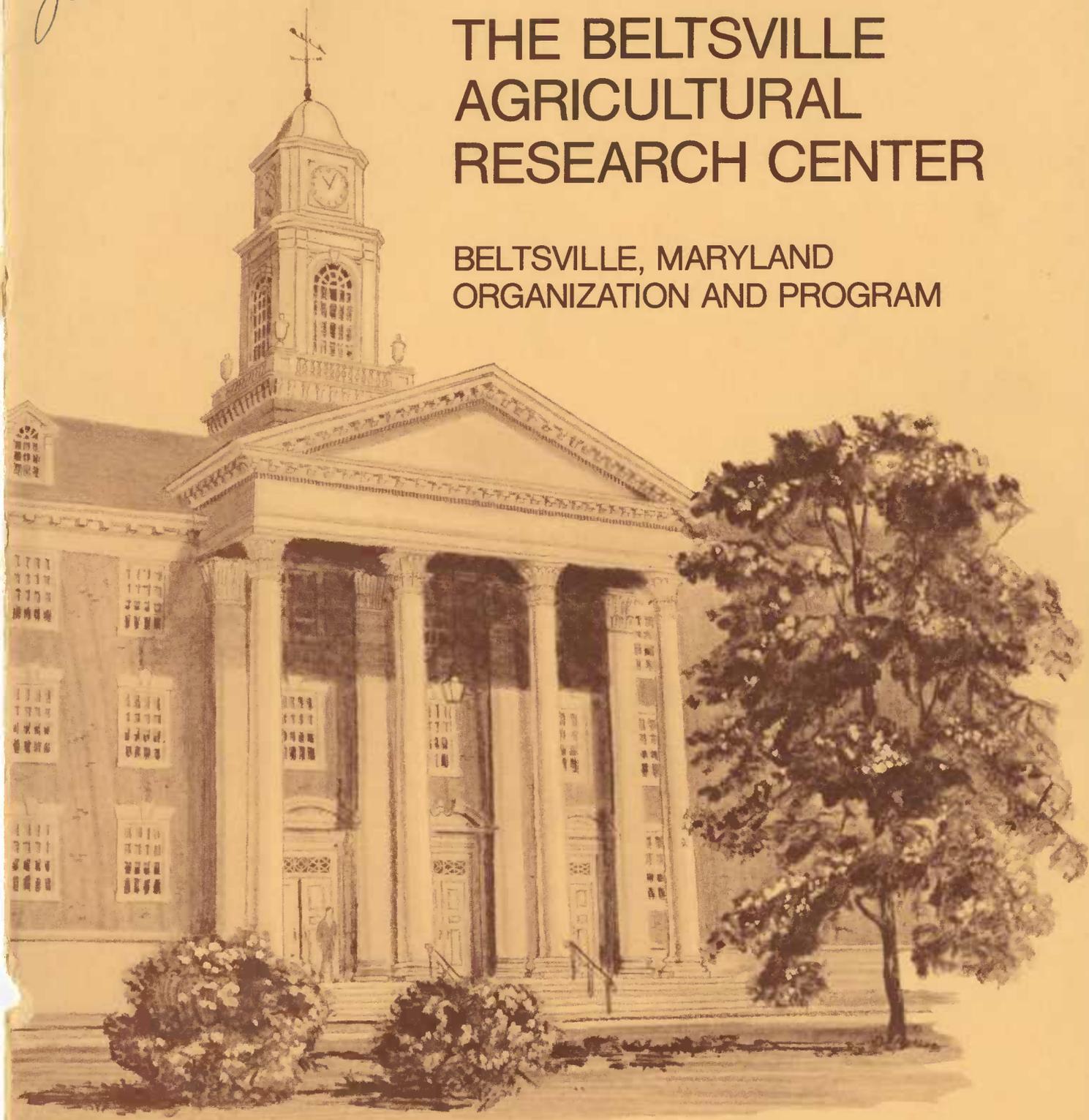


1977
John Shedd

THE BELTSVILLE AGRICULTURAL RESEARCH CENTER

BELTSVILLE, MARYLAND
ORGANIZATION AND PROGRAM



NORTHEASTERN REGION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Zoology
Livestock Protozoan Diseases
Non-Ruminant Helminthic Diseases
Poultry Protozoan Diseases
Ruminant Helminthic Diseases

**ANIMAL PHYSIOLOGY & GENETICS
INSTITUTE**

Animal Improvement Programs
Avian Physiology
Feed Energy Conservation
Genetics & Management
Nutrient Utilization
Reproduction

**INSECT IDENTIFICATION & BENEFICIAL
INSECT INTRODUCTION INSTITUTE**

Beneficial Insect Introduction
Systematic Entomology

Bioenvironmental Dec
Insect Pathology
Insect Physiology
Mycology
Nematology
Plant Virology
Soilborne Diseases

SUPPORTING SERVICES

Administrative
Animal Operations
Cooperative Farm Building Plan
Exchange
Division of Operations
Engineering & Planning
Farm Management
Maintenance & Construction
Utilities & Services
Safety
Instrument Design & Machine Shop
Visitor
Photographic

THE BELTSVILLE AGRICULTURAL RESEARCH CENTER

In 1910 the United States Department of Agriculture purchased a 475 acre farm in the Maryland countryside some 15 miles from Washington, D.C., to conduct research on animal husbandry, dairying, and animal diseases. In the following years more acres were added to the farm and more research projects to its program. The first experiments in pasture development, for example, took place in the late 20's. In the 30's, plant research was gradually transferred to Beltsville from the experimental farm in Arlington, Virginia. By 1942, the move was complete, and the Bureau of Plant Industry was officially located on the west side of the farm at Beltsville. Today, the Beltsville Agricultural Research Center is one of the largest and most diversified research farms in the world.

More than 2,500 people, 450 of them scientists, work in Beltsville's 9 Institutes and 62 Laboratories. It is the home of several world renowned research collections including the National Parasite Collection, the Small-Grain Collection, and outstanding collections of fungi and nematodes.

Animal researchers investigate livestock diseases, animal nutritional needs and animal genetics and physiology in order to improve the productivity of cattle, poultry, swine and sheep. Greater crop yields are sought by breeding plants which use light and nutrients more efficiently, which have built-in disease resistance, or which are able to cope with marginal growing conditions. Other research programs seek to reduce crop and livestock losses caused by insects and insect-borne diseases, to preserve the quality of soil, air and water, to study human nutritional needs, and to find better ways to harvest, store, package and transport food so that it arrives on the grocer's shelf as cheaply as possible with all of its natural taste and nutritional value.

Beltsville's record of accomplishment has made it a leader in agricultural research. Some achievements, like the development of the Beltsville small white turkey, are well known. Other accomplishments such as the chemical isolation of insect sex attractants for use in biological control are familiar to specialists. Some research landmarks such as the discovery of the viroid, the smallest infectious agent known, and the pioneering research on photoperiodism which culminated in the chemical isolation of phytochrome, the triggering mechanism of plant growth, are not only of practical significance to agriculture, but also add to the fundamental store of scientific knowledge. Early research in genetics forms the basis for much modern animal and plant breeding and for the hundreds of new crop varieties developed at Beltsville.

This record of achievement each year brings hundreds of scientists, farmers, and government officials from around the world to Beltsville. Thousands of other visitors come to the farm each year to tour, to learn about agricultural research, or just to enjoy the tranquility of 8,000 acres of country located right in the mainstream of the urban northeast corridor.

If you do visit the Center we hope that you will have the opportunity to see some part of this research in progress. This publication will serve as a guide to the program and organization of the Beltsville Agricultural Research Center and the other activities located here.



UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

Talcott W. Edminster
Administrator

Ralph J. McCracken
Associate Administrator

NORTHEASTERN REGION

Steven C. King
Deputy Administrator

Glen E. Vanden Berg
Associate Deputy Administrator

BELTSVILLE AGRICULTURAL RESEARCH CENTER

Angus A. Hanson
Director
Room 227, Bldg. 003
Phone: 344-3078

Paul A. Putnam
Assistant Director
Room 230, Bldg. 003
Phone: 344-3392

C. Edith Weir
Assistant Director
Room 227, Bldg. 003
Phone: 344-3193

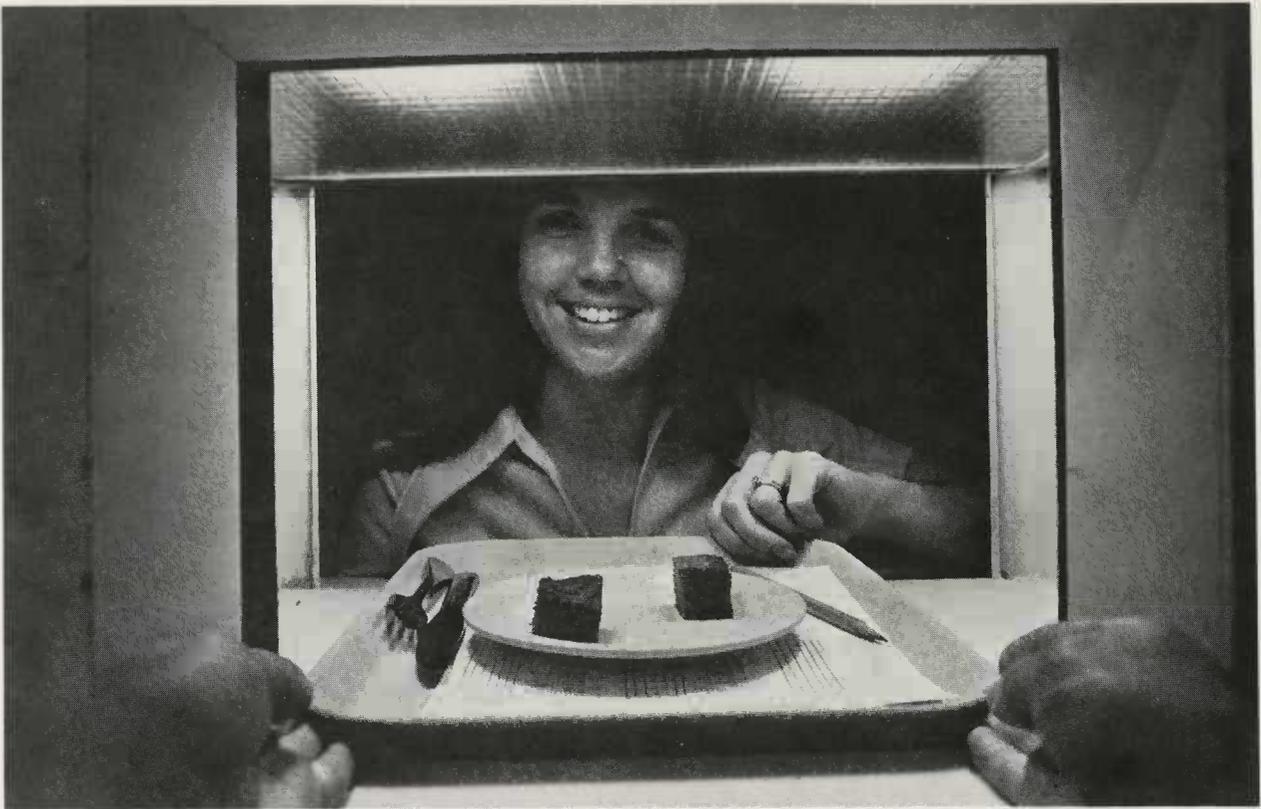
Robert L. Almond, Sr.
Head, Division of Operations
Building 209
Phone: 344-2253

Norman W. Hooven, Jr.
Assistant to Director - Animal
Operations Unit
Room 104, Bldg. 161
Phone: 344-2243

David P. Morgan
Assistant to Director -
Visitor Unit
Building 186
Phone: 344-2483

Evelyn H. Hobbs
Administrative Officer
Room 219, Bldg. 003
Phone: 344-3347

Marion C. Carter
Assistant to Director -
Management & Reporting
Room 230, Bldg. 003
Phone: 344-3087



Taste panels evaluate the palatability of meat.

Market Operations Research Laboratory

*J. C. Bouma, Chief
Room 120, Bldg. 307
Phone: 344-2810*

Research in this Laboratory concerns improved handling of all agricultural products as they move from farms to consumers. The main objective is to rearrange, combine, or otherwise modify agricultural marketing processes to increase efficiency and decrease costs. Current investigations of various systems of handling and transporting food products include: potatoes from grower to retail store; beef from slaughterhouse to retail store; eggs from packing plant to retail store; groceries from manufacturer to wholesale warehouse; and citrus fruit from grower to retail store.

In addition, research is being conducted to evaluate costs, systems, and environmental conditions for marketing feeder livestock, from producer to feedlot, in cooperation with ARS

scientists at College Station, Texas, and the Southwestern Great Plains Research Center, Bushland, Texas.

Meat Science Research Laboratory

*A. W. Kotula, Chief
Room 13, Bldg. 201
Phone: 344-2400*

Basic and applied research is conducted on beef, pork, poultry, lamb, fish, and other animal products for quality maintenance, improvement, and evaluation of these products during marketing. Data for USDA grading and inspection programs are obtained so that Department regulations can be evaluated continuously and revised as necessary.

In basic research, scientists seek to control microbiological, physical, and chemical deterioration or contamination of meat, and to develop more adequate means of measuring

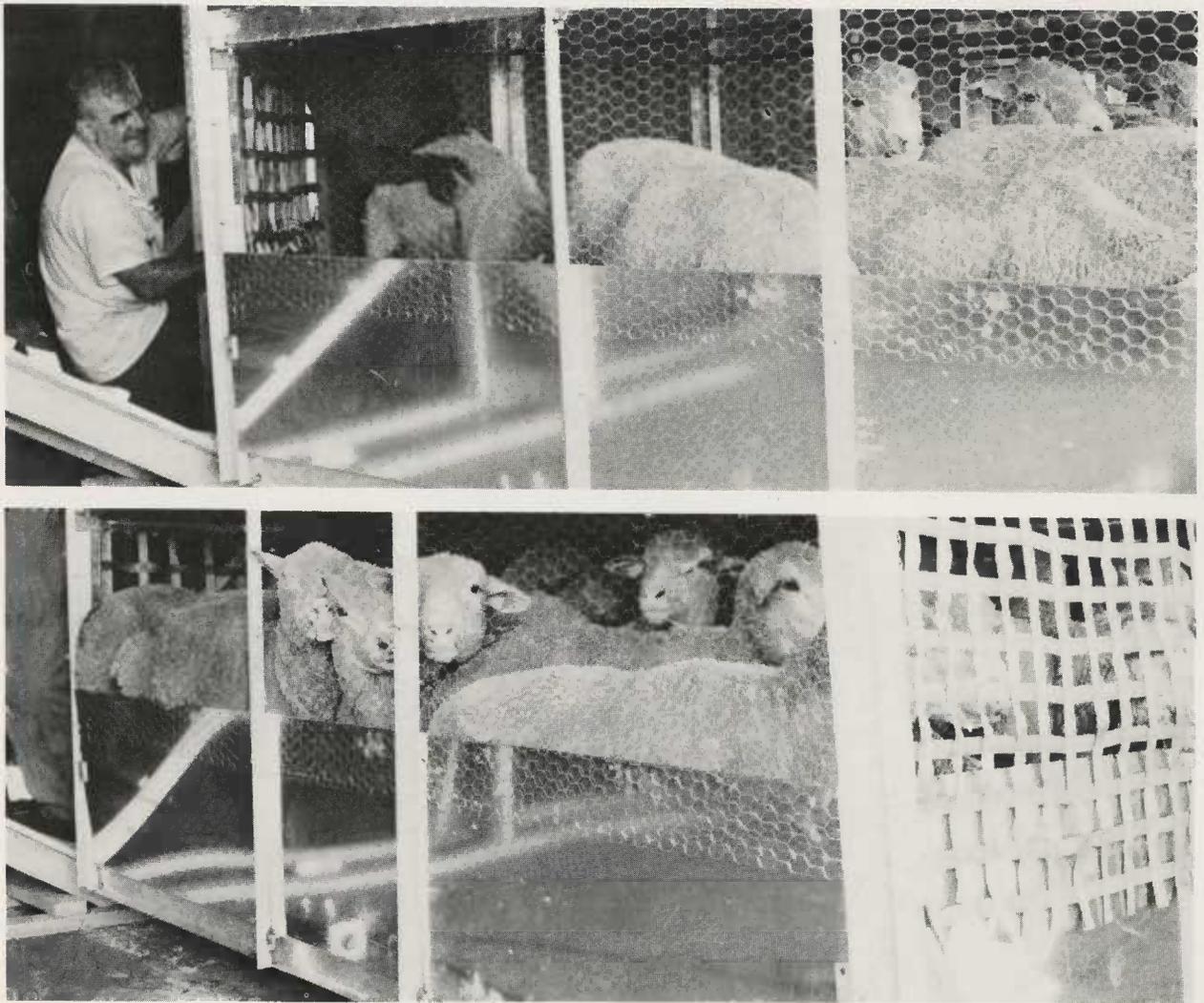
product quality. In applied research the Laboratory develops theory and prototypes for evaluating effects of changes in operating methods on ultimate product quality. When marketing efficiency research yields innovations, the Laboratory determines the effects of these procedures on product quality.

The work is carried out at Beltsville and at meat marketing centers throughout the country in cooperation with industry. Additional studies are undertaken by cooperative agreement with State Experiment Stations, other government agencies, and PL 480 grants to foreign scientists.

Post-Harvest Plant Physiology Laboratory

M. Lieberman, Chief
Room 205, Bldg. 002
Phone: 344-3014

The overall mission of the Laboratory is to develop basic information that will contribute to a better understanding of aging and senescence of flowers, fruit, vegetables, and seeds after harvest. This information is needed to develop improved methods for transportation, storage, and handling of perishable agricultural products.



Sheep are loaded onto an aluminum modular container for air shipment overseas.

ANIMAL PARASITOLOGY INSTITUTE

F. D. Enzie, Chairman
Room 100, Bldg. 1040
Phone: 344-2201

This Institute is a national center whose prime objective is to develop ways to prevent, control, or eradicate parasitic infections in livestock and poultry in order to reduce economic losses. Parasitologists, veterinarians, chemists, and other scientists in the Institute's four main laboratories cooperate to achieve this goal.

Institute personnel prepare and maintain two internationally known tools used by parasitologists everywhere—the Index-Catalogue of Medical and Veterinary Zoology and the National Parasite Collection. Both are valuable in studies of parasitism in livestock, poultry, man, and wildlife. They are indispensable in efforts to develop parasite control programs and to prevent exotic species from gaining a foothold in this country.

The Institute occupies 400 acres at Beltsville. Because of the hazard of parasite contamination, strict security is maintained.

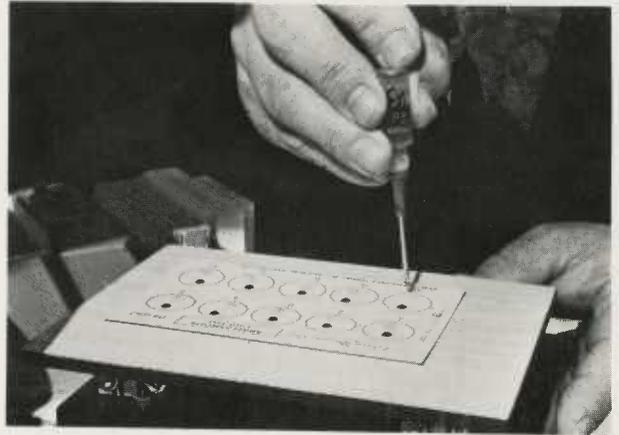
Parasite Classification and Distribution Unit

J. R. Lichtenfels, Head
Bldg. 1180
Phone: 344-2444

This Unit is concerned with parasite taxonomic research and with the maintenance and management of two internationally known working tools, namely, the National Parasite Collection and the Index-Catalogue of Medical and Veterinary Zoology. Primary taxonomic investigations involve the development of morphological characters of value in differentiating and identifying animal parasites and the preparation and publication of

Overleaf

At this location, isolated from the rest of the center, scientists study over 100 organisms that cause parasitic diseases in livestock.



A drop of bovine serum is placed on a special card that can be used in field tests to detect anaplasmosis.

diagnostic keys to important groups of livestock parasites.

Index-Catalogue of Medical and Veterinary Zoology

S. J. Edwards, In Charge
Bldg. 1180
Phone: 344-2162

This compendium of the world's literature on parasitology was established in 1892. It consists of catalogues indexed by author, parasites, treatment, hosts, and subject headings. Over 100 publications have been issued to disseminate the information to the scientific community. They include volumes on special subjects such as "Parasites of Deer" or "Ticks and Tick-Borne Diseases."

The publications have worldwide distribution. Medical and veterinary scientists come to Beltsville from all over the world to use the Index-Catalogue to obtain information about particular problems in parasitology.

National Parasite Collection

J. R. Lichtenfels, Curator
Bldg. 1180
Phone: 344-2444

This is one of the world's largest collections of animal parasites. It includes some 70,000 para-

site lots, each consisting of one or many specimens. New lots of parasites are regularly submitted by U.S. scientists. Specimens from the collection are constantly on loan to parasitologists throughout the world since they provide invaluable aids in studies of parasite taxonomy and systematics.

Livestock Protozoan Diseases Laboratory

T. O. Roby, Chief
Bldg. 1072
Phone: 344-2194

This Laboratory conducts research on protozoan diseases of horses, cattle, sheep, and other classes of livestock. Diseases presently under investigation are anaplasmosis of cattle, sarcosporidiosis of cattle and sheep, and babesiosis (piroplasmiasis) of equids. Basic studies are conducted on the life cycles, ultrastructure, and biological properties of the parasites. Scientists are investigating also new and improved methods of diagnosis, treatment, and control of the diseases.

Non-Ruminant Helminthic Diseases Laboratory

F. G. Tromba, Chief
Bldg. 1044
Phone: 344-2406

The biological control of ascariasis and stephanuriasis, diseases that cause major economic losses in swine, is one of the many pro-



Scientists are studying the larval stage of the clam nematode (*Paranisakiopsis* sp.) for its possible infectivity to animals.

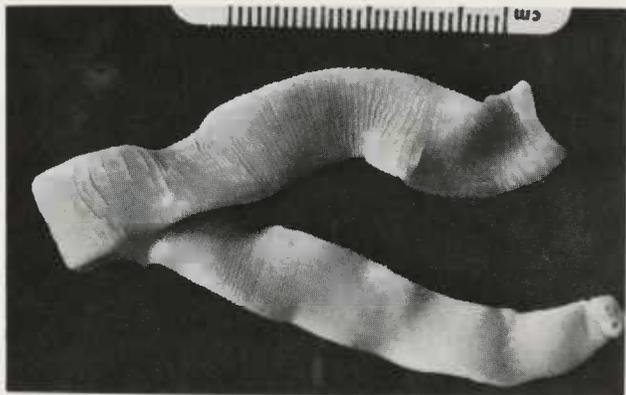
grams at this Laboratory for the detection, prevention, and control of helminths that parasitize swine and other non-ruminant animals.

A prime objective is the development of a reliable test for detecting trichina larvae, parasites of swine that cause trichinosis in man. Basic studies on nematode physiology and work to control animal nematodes by vaccines and other biological methods are in progress.

Poultry Protozoan Diseases Laboratory

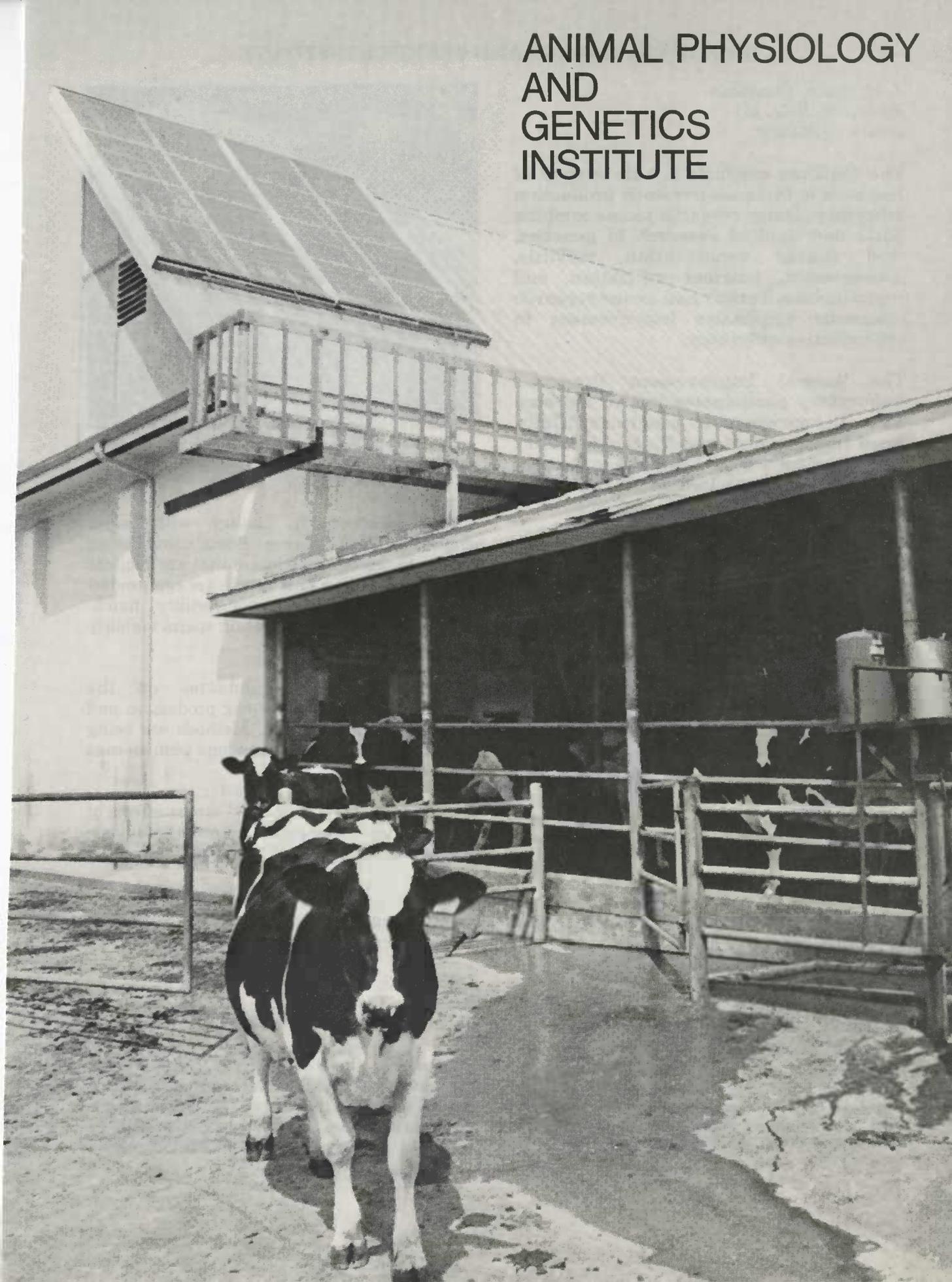
D. K. McLoughlin, Acting Chief
Room 104A, Bldg. 1040
Phone: 344-2300

Primary investigations are conducted on coccidiosis of chickens and turkeys and on histomoniasis (blackhead) of turkeys and other gallinaceous birds. All phases of the parasite life cycles are studied as are the effects of drugs of known or potential value for controlling the diseases. Studies of drug resistance by poultry protozoan parasites are a major activity of scientists in this Laboratory.



This *Anoplocephala magna* tapeworm infests horses.

ANIMAL PHYSIOLOGY
AND
GENETICS
INSTITUTE



ANIMAL PHYSIOLOGY AND GENETICS INSTITUTE

J. W. Smith, Chairman
Room 106, Bldg. 161
Phone: 344-2259

The Institute conducts a wide variety of research to increase livestock production efficiency. Dairy research teams combine basic and applied research in genetics, feed energy conservation, mastitis, management, nutrient utilization, and reproduction. Turkey and swine research programs emphasize improvement in reproductive efficiency.

The Animal Improvement Programs Laboratory participates in two national animal improvement programs (Dairy Herd Improvement and National Poultry Improvement Plan) which have demonstrated their worth to the industry.

Animal Improvement Programs Laboratory

F. N. Dickinson, Chief
Room 10A, Bldg. 263
Phone: 344-2271

Personnel of this Laboratory operate the National Dairy Sire and Cow Genetics Evaluation Programs and the National Poultry Improvement Plan. They also coordinate the National Cooperative Dairy Herd Improvement Plan. These nationwide livestock performance testing programs provide data which enable scientists to improve methods of estimating the genetic transmitting ability of farm animals.

Avian Physiology Laboratory

H. Cecil, Chief
Room 32A, Bldg. 262
Phone: 344-2545

Scientists conduct research on the physiological and endocrine factors that control repro-

Overleaf

Experimental solar heating panels mounted atop the milking parlor provide energy for this installation, along with research data to help dairy farmers save on fuel costs.



A film cassette is loaded into a microscope to photograph and check boar semen specimens for their fertilizing capacity.

ductive efficiency in poultry, with major emphasis on the turkey. Some contributing factors to reproductive losses that are subjects of research in this Laboratory are egg production, level and duration of fertility, hatchability, and failure to maintain sperm viability *in vitro*.

Basic studies are conducted on the neuroendocrine aspects of egg production and the broodiness syndrome. Methods are being developed for both short and long term storage of semen.

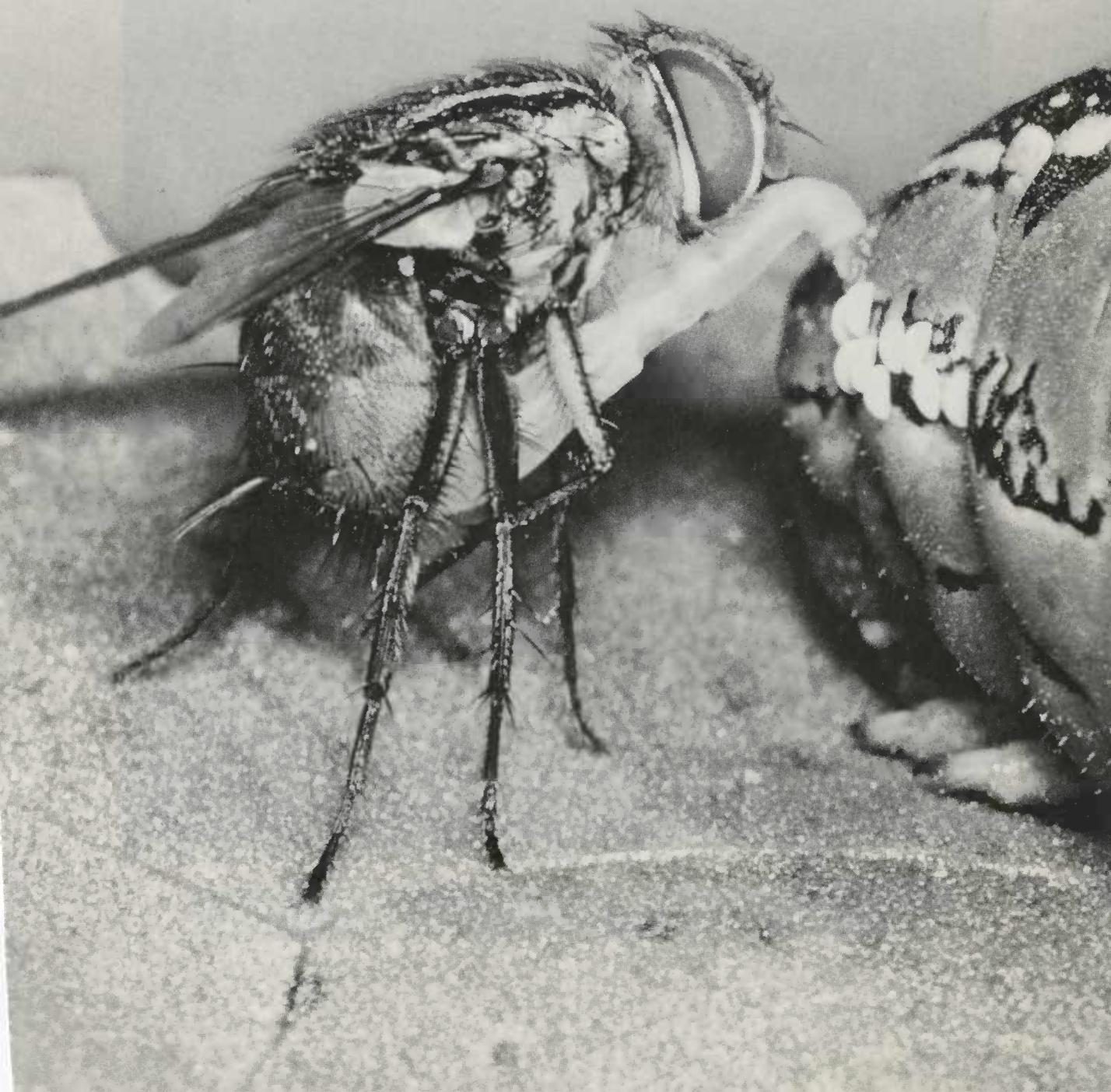
Work is also being conducted on the effects of pesticides and other chemicals on the reproduction of the chicken, duck, and quail.

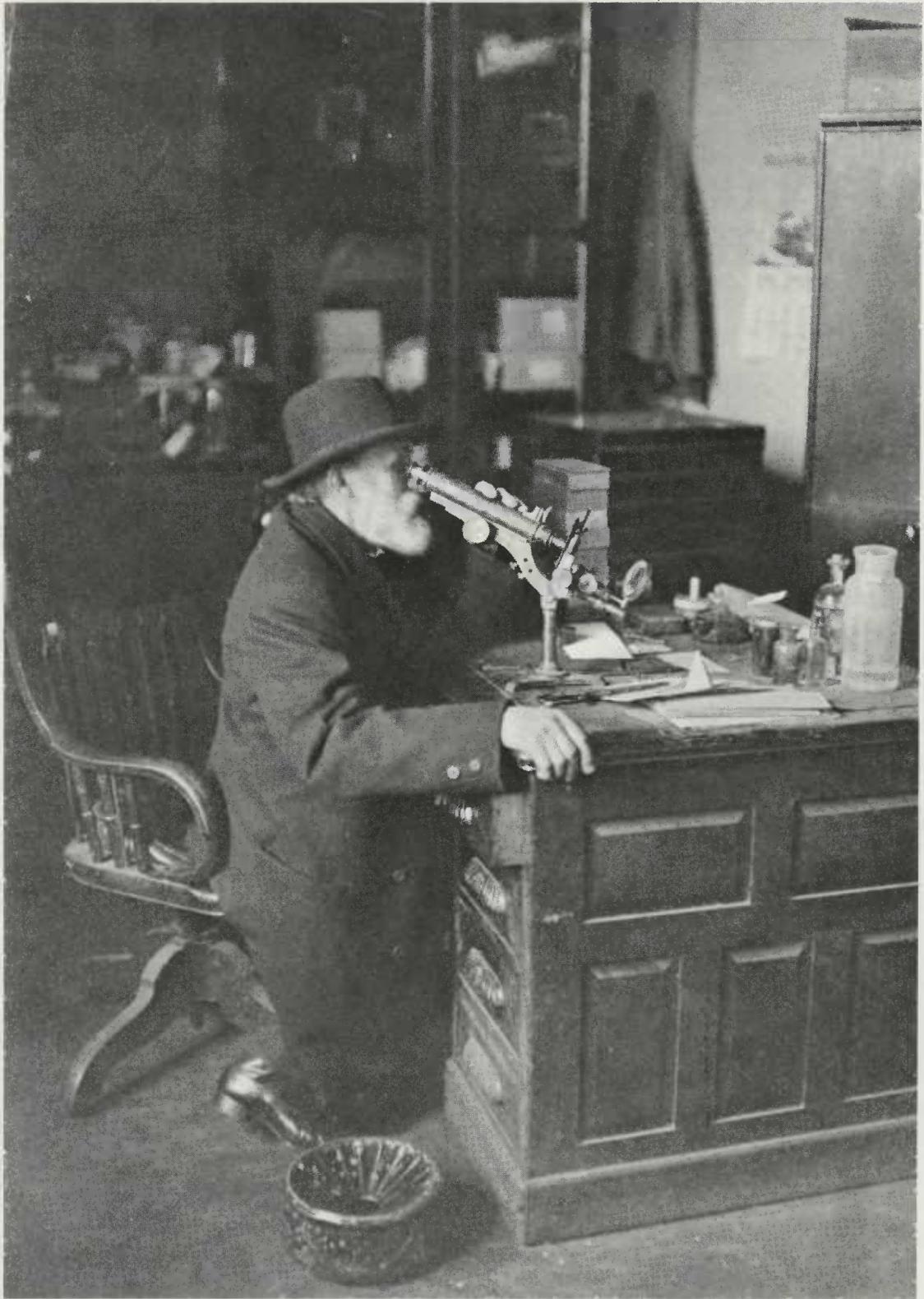
Feed Energy Conservation Laboratory

L. W. Smith, Chief
Room 219, Bldg. 200
Phone: 344-3431

Research in the Feed Energy Conservation Laboratory is aimed at increasing efficiency and economy in the use of feedstuffs in livestock production. Major emphasis will be devoted to basic nutritional factors, digestive

INSECT IDENTIFICATION
AND BENEFICIAL INSECT
INTRODUCTION
INSTITUTE





Identification and classification of insects as a formal government effort began when the Department of Agriculture was established in 1862. The Entomology Office of that day has evolved into what is now known as the Systematic Entomology Laboratory.

INSECT IDENTIFICATION AND BENEFICIAL INSECT INTRODUCTION INSTITUTE

L. Knutson, Chairman
Room 1, Bldg. 003
Phone: 344-3182

Insects and mites cost American farmers and consumers millions of dollars annually in loss of food and other products. The Institute is devoted mainly to the development of new and improved principles and practices of insect and mite identifications to support pest control technologies; and to the identification of insects and mites and the discovery of foreign species that show promise for use in biological control of domestic insect pests and weeds.

Entomologists estimate that there are at least two million insect species that have never been identified. Institute scientists conduct field surveys in this country and abroad to fill this knowledge gap.

The Institute helps to coordinate research by scientists in the United States and abroad relating to the introduction of beneficial insects. Results of these studies will help to develop improved pest-control methods; more effective environmental and farm management practices; and better conventional, biological, biochemical approaches to pest control.

The staff is divided between two Laboratories with headquarters at Beltsville. Some scientists are stationed in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

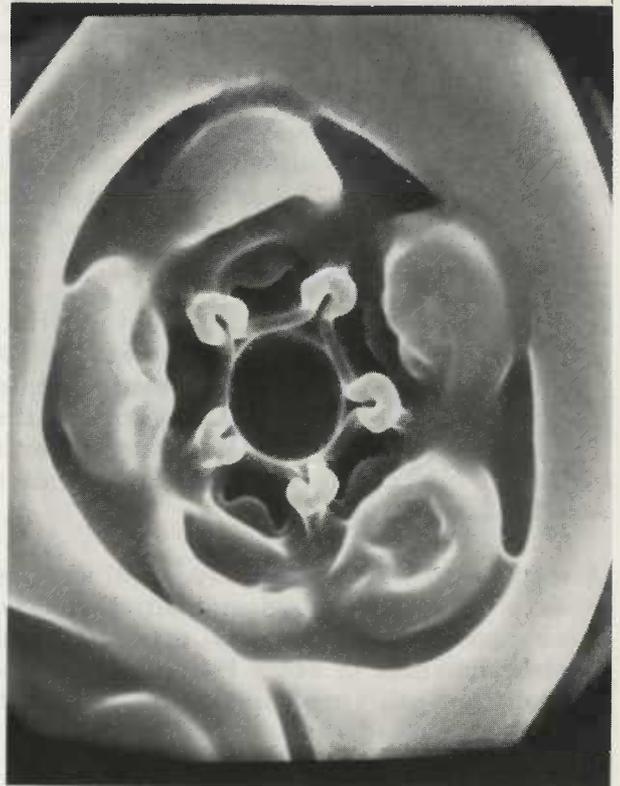
Beneficial Insect Introduction Laboratory

J. R. Coulson, Chief
Bldg. 417
Phone: 344-3185

This Laboratory coordinates research involving the importation, colonization, and

Overleaf

A parasitic tachinid fly lays its eggs on a host caterpillar.



A scanning electron micrograph shows the wax pore of the latania scale insect.

evaluation of beneficial foreign insects. It maintains a center where records are kept of all beneficial insects, mites, and other arthropods that are imported into the United States by Federal, State, or other agencies. Records also are kept on beneficial foreign insects successfully colonized in the United States.

Staff members conduct research on the biological control of insect and weed pests, through the utilization of parasites and predators, and weed-feeding insects.

Systematic Entomology Laboratory

R. W. Hodges, Acting Chief
Room 2, Bldg. 003
Phone: 344-3183

This Laboratory is concerned with the classification and identification of insects and mites. Scientists also study new methods of

recognizing various species of insects and mites and sorting them into appropriate related groups. They determine the geographic and seasonal distribution of these insects and mites and their sources of food and shelter.

Principle Laboratory scientists have as their working tool the Smithsonian Institution's National Collection. This is the world's second largest collection of preserved insect specimens and other reference sources.

Significant physical and biological characteristics of insects and mites are studied intensively and used to develop basic reference publications. This research makes possible the precise enumeration and recognition of North American insects and mites and of those native to other parts of the world.

Scientists of the Laboratory also identify insects to assist biological control studies, environmental studies, and extension and control activities of other Federal and State agencies and other organizations in the United States and abroad.

Most of the Laboratory workload falls into three categories: research, identification and information activities, and curation of the National Collection. There are two fields of research. The first involves research based on anatomical features of insects, so that the different species can be identified by direct examination of specimens. The second comprises research leading to the detection of differences between insect populations based on behavioral and physiological characteristics.

Identification and information activities involve the efforts of specialists who make hundreds of thousands of identifications annually for many Federal agencies, State organizations, and university researchers within the United States and foreign countries.

A well-curated Collection is essential to the proper functioning of research and identification activities. An ordered arrangement of specimens, by species and higher categories, could not be maintained without highly professional and dedicated care and management.



The National Collection of Insects includes more than 22 million specimens and is used for both taxonomic research and as a guide to identification.

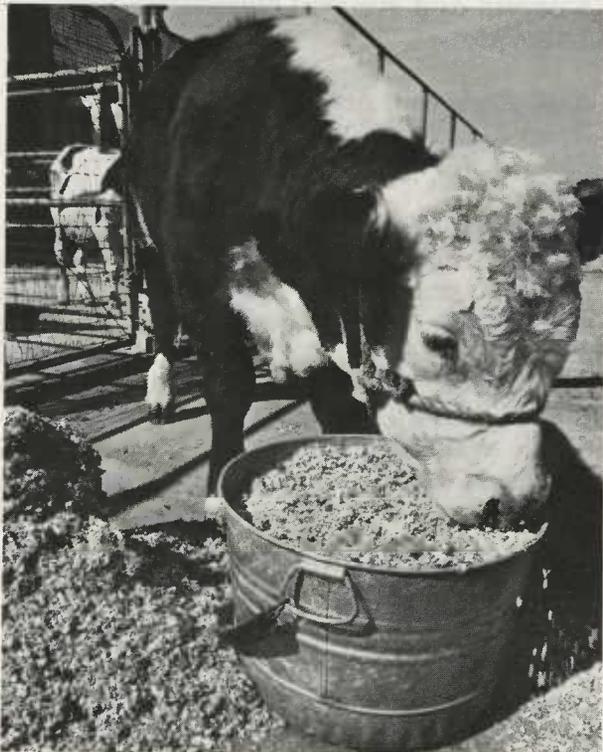
fats in man and in experimental animals, and the role of dietary fat in cardiovascular diseases and thromboses.

Non-Ruminant Animal Nutrition Laboratory

L. T. Frobish, Chief
Room 220, Bldg. 200
Phone: 344-2222

The objective is to improve the use of feed by non-ruminants, particularly swine and turkeys. Research on swine nutrition emphasizes investigation of the effects of energy and protein intake on reproductive performance; use of carbohydrates by fetal and newborn pigs; interactions of genetic and nutritional factors in swine; and the metabolizable energy value and availability of amino acids in feedstuffs.

Turkey research involves investigations of the effects of nutrients on reproduction, effects of protein and energy on growth and carcass composition, amino-acid requirements for turkey growth and reproduction, and the energy and amino acids provided by feeds.



Newspapers, along with other waste wood products, can serve as a roughage substitute for ruminant animals when used in the right proportions.



Blood samples are drawn from rabbit to determine calcium level and its relationship to dietary lipids and cardiovascular problems.

Nutrient Composition Laboratory

K. K. Stewart, Chief
Room 103, Bldg. 161
Phone: 344-2356

The mission of the Laboratory is to provide data on the nutrient composition of food by analyzing foods. Although the primary effort is to carry out the needed analysis, considerable research is done on the development of new and improved methodologies for the analysis of nutrients. Work is underway to develop sampling systems of the U.S. food supply. The appropriate research is done on the effect of food handling procedures on the nutrient composition of food.

Protein Nutrition Laboratory

D. A. Vaughan, Chief
Room 214, Bldg. 308
Phone: 344-2059

Scientists determine human dietary requirements for proteins and amino acids and recommend foods to meet these requirements. They characterize the chemical nature, properties, and nutritional usefulness of food proteins, and learn how they are used by the body.

The distribution, nature, properties, and composition of proteins in foods are investigated. Processing methods are tested for their effects

on the nutritional availability of amino acids. Methods are developed to chemically identify amino acids in foods. Scientists also study the effects of type and level of dietary protein on body processes, such as growth and aging, and the effects of heredity on use of proteins.

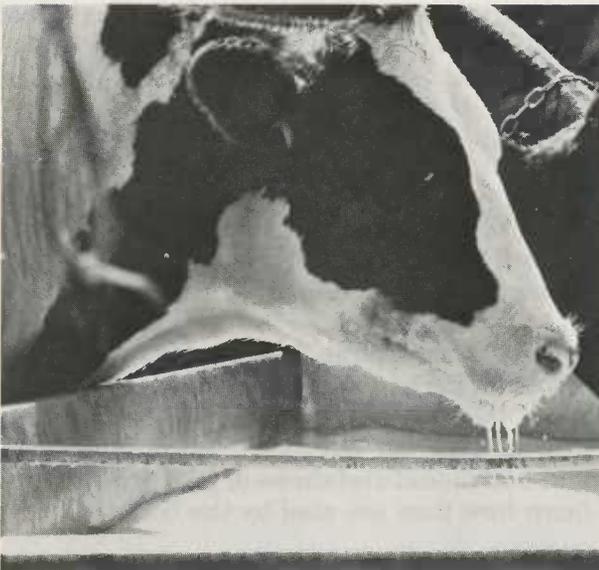
Ruminant Nutrition Laboratory

R. R. Oltjen, Chief
Room 118, Bldg. 200
Phone: 344-2283

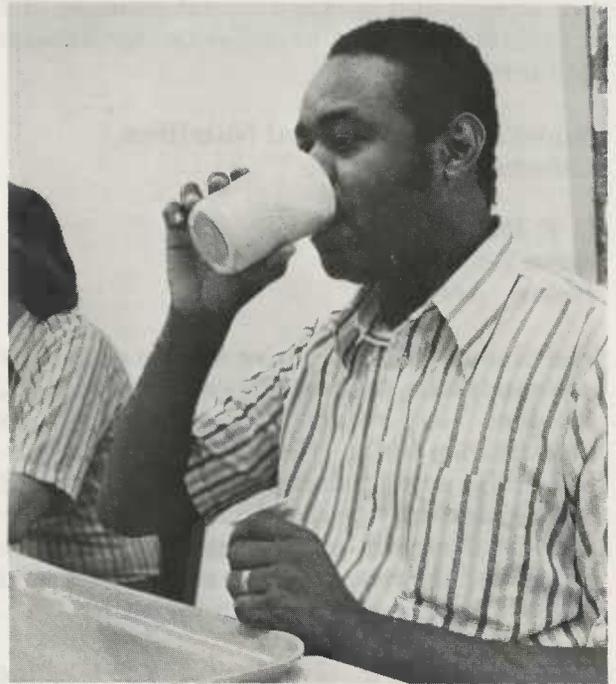
Nutrition studies are aimed toward improving the efficiency of beef cattle, dairy cattle, and sheep in converting feeds into meat, milk, and wool. Much of the research is basic, but the new information developed is tested in practical situations.

A major concern is to make ruminants less competitive with humans and other animals for available food supplies.

Subjects currently under investigation include residue hazards of diethylstilbestrol; use of non-protein nitrogen; effects of feeding "Protected" polyunsaturated fat; nutritional value of forages and plant wastes; preservatives for silage; and dietary requirements and toxic effects of minerals.



Whey, once dumped as a waste product, can be a valuable supplement to the diet of dairy cattle.



Subjects eat special diets containing single sources of protein in studies to develop methods for estimating the nutritional value of proteins for humans.

Vitamin and Mineral Nutrition Laboratory

R. A. Anderson, Acting Chief
Room 215, Bldg. 307
Phone: 344-2351

Research concerns the function of vitamins and minerals in the development, growth, and health of humans and animals. Procedures are developed to measure small amounts of these nutrients and to estimate their biological availability from different sources. For example, scientists found that iron in wheat is highly available compared to iron in egg yolk because of the difference in molecular structure of the naturally occurring compounds in the two foods.

The Laboratory also investigates dietary requirements for chromium and selenium. The biologically active form of chromium in food is being isolated. The function of vitamin E and its possible relationship to selenium are being studied. Research is being planned on various other trace elements, including zinc, tin, vanadium, and nickel.

Vegetable Laboratory

R. E. Webb, Chief
Room 220, Bldg. 004
Phone: 344-3380

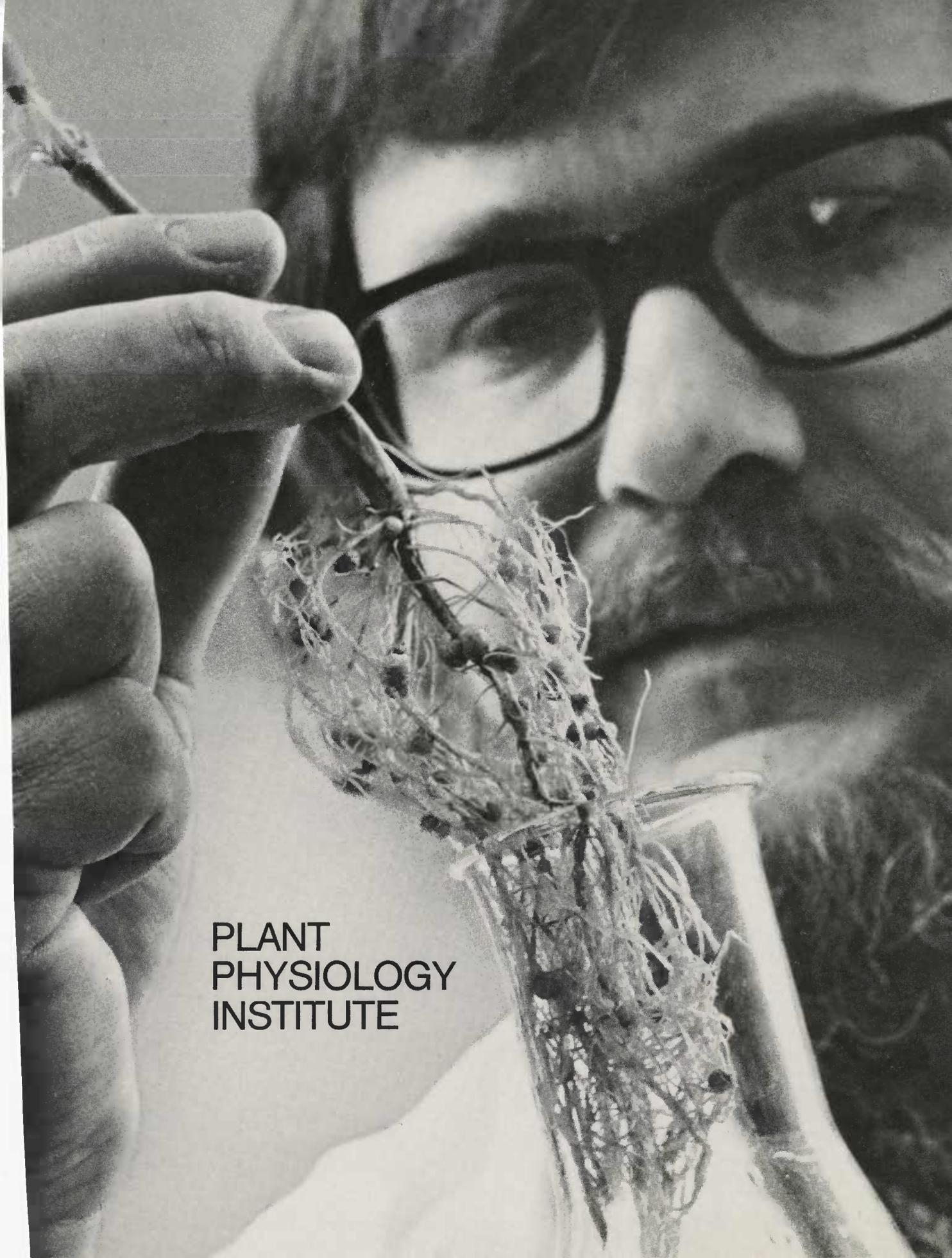
Major vegetable crops are studied in relation to resistance to disease and insect pests, improved yields, better nutritional marketing and processing qualities, and adaptation of vegetables to various farming conditions and areas. Plant breeding is developing new processing and fresh market varieties, new potatoes suited for fresh market or processing, and improved mushroom spawn to increase the efficiency of mushroom production.

Other projects involve pepper, spinach, eggplant, and the cucurbits: squash, pumpkins, watermelon, and cucumbers.

Scientists are seeking effective, integrated control of vegetable (including mushroom) pests by using plant resistance along with crop management practices, plus selected chemicals when needed. They are determining the minimum amounts of pesticides required under various management conditions for economical control of specific pests of vegetables.

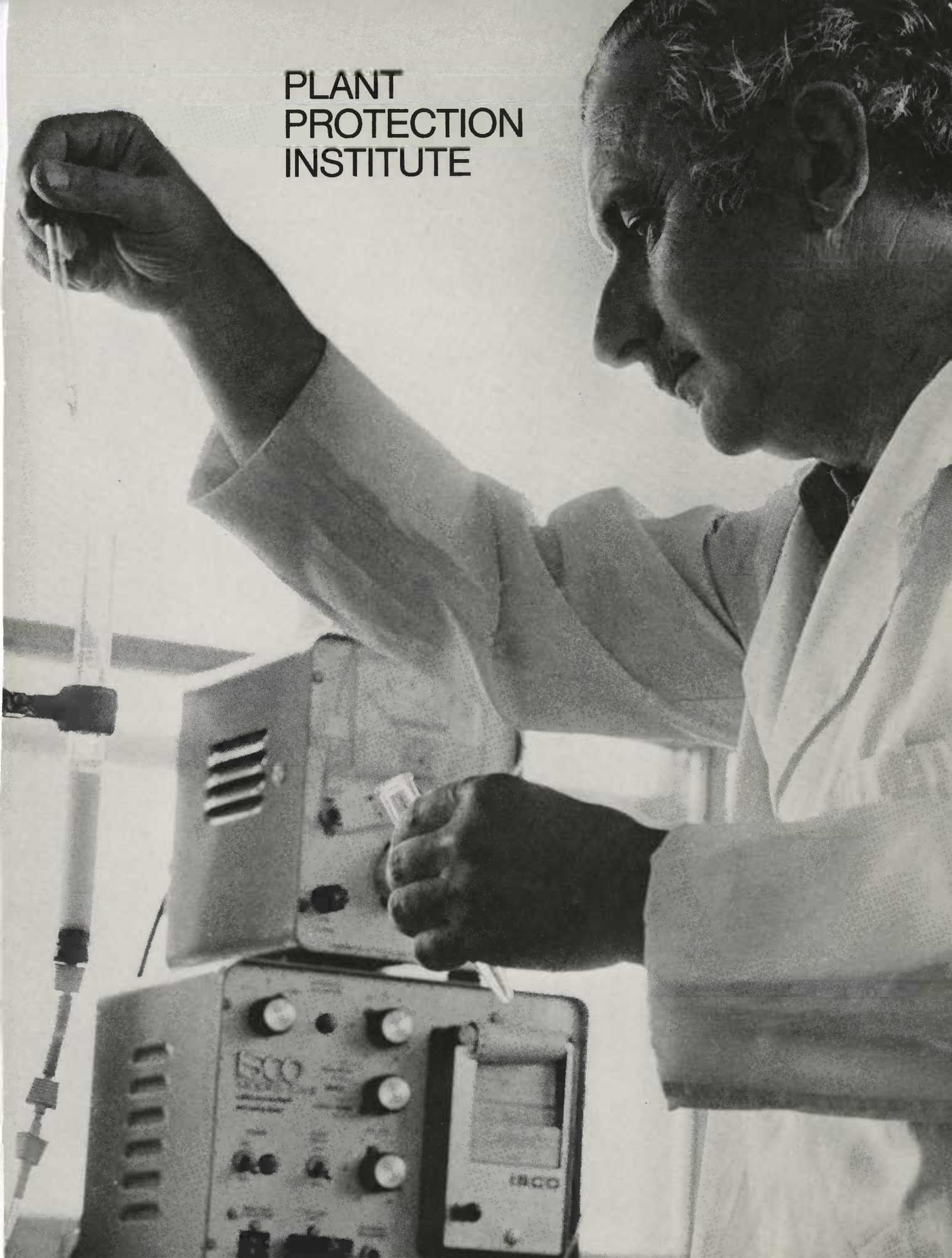


Performance of experimental varieties in field plots helps to tell scientists how much progress they are making in the development of improved vegetables.



PLANT
PHYSIOLOGY
INSTITUTE

PLANT
PROTECTION
INSTITUTE



Light and Plant Growth Laboratory

G. E. Carlson, Chief
Bldg. 046A
Phone: 344-3295

The goal is to realize the full yield potential of plants by improving their response to light and other environmental factors. This goal is sought through improved methods for measuring and controlling environmental factors that affect plant growth, and by determining their effect on physiologic, morphologic, and biochemical responses of plants.

Plants and portions of plants such as leaves, tissues, and cells, are grown in controlled and natural environments, and photosynthesis, translocation, respiration, flowering, tiller development, and other physiologic and biochemical processes are observed. As a result, specific selection criteria for increasing yield and quality can be developed. Physical parameters are determined for the design of controlled-environment facilities for plant research and production.

Plant Hormone and Regulators Laboratory

G. L. Steffens, Chief
Room 4, Bldg. 050
Phone: 344-3061

The mission of the Laboratory is to discover and evaluate natural and synthetic bioregulants to improve production efficiency and quality of agricultural crops. Regulants beneficial to agri-



Photosynthesis is measured in studies to develop superior yielding plants.



The soybean plant on the left has been treated with brassins, a plant hormone, and shows a marked increase in growth.

culture may include, but are not limited to, those which inhibit, retard, or accelerate growth; promote or retard leaf or fruit abscission; speed or retard flowering, fruit set, or ripening; alter chemical composition, appearance, and storage of agricultural products.

This mission is accomplished by the isolation, identification, characterization, synthesis, and evaluation of plant hormones and growth regulators. Compounds which show biological activity are evaluated for their usefulness in agriculture and characterized as to mode of action and relation of structure to activity.

Plant Stress Laboratory

M. N. Christiansen, Chief
Room 206A, Bldg. 001
Phone: 344-3143

Plant stress research has two main objectives: determining the effects of environmental stress on plant processes, and developing methods for improving the plant's ability to withstand and recover from such stress. Plants are subjected to air pollutants, heat, cold, drought, toxic materials, and oxygen or nutrient deficiencies, to determine the environmental limits of plant functions.

Scientists also attempt to modify plants by genetic, chemical, and cultural methods to increase their tolerance to adversity.

Research on plant stress ultimately will improve the environmental adaptability of food and fiber crops, thus reducing farm losses due to environmental extremes and increasing land area suited to production of some crops.



Plant roots are examined for nematode infestation in investigations that include studies on plant resistance and host-parasite interactions.



Test diets of bee colonies are evaluated in an effort to increase pollination and honey production.

Insect Physiology Laboratory

W. E. Robbins, Chief
Room 106, Bldg. 467
Phone: 344-2389

Basic and applied research is conducted on the normal hormone regulated processes of growth, metamorphosis, reproduction, and behavior in insects with particular emphasis on natural and synthetic chemicals that either control or disrupt these processes.

Scientists search for and isolate these chemicals from insects, plants, and other natural sources. They determine their structures and synthesize them in the laboratory. Related compounds are synthesized and studied to determine if they are more active or if they interfere with the action of the natural chemicals. Such chemicals are evaluated for their potential use as pesticides or chemotherapeutic agents for the control of insects as well as other pests and parasites of plants and domestic animals.



Close-up of a male giant silkworm moth shows the feathery antennae used to detect the female sex attractant of the female.



Phytophthora root rot of soybeans is controlled with a fungicide applied to the seed with acetone; long "soaks" yield better plants.

actions and on the physiology of nematodes and their hosts.

The Laboratory maintains one of the world's largest collections of literature on nematodes and collections of hundreds of type specimens. These collections provide information needed to establish causes of crop losses, distribution of nematode species, and quarantines that can prevent the spread of nematodes.

Plant Virology Laboratory

R. L. Steere, Chief
Room 252, Bldg. 011A
Phone: 344-3684

Basic research is conducted on plant viruses and diseases once thought to be caused by viruses. Examples of the latter include mycoplasma-like organisms, rickettsialike organisms, and viroids. Biochemical activities are explored in virus particles, including satellite

viruses (which can reproduce only in plants already infected by another virus).

Other aspects of research are the biochemistry and structure of viroids and the isolation of additional viroids, including attempts to determine whether viroids cause certain animal diseases.

Scientists also are developing new techniques, such as freeze etching, to prepare viruses for study with the electron microscope, an instrument which can magnify specimens more than 30,000 times.

Soilborne Diseases Laboratory

G. C. Papavizas, Chief
Room 274, Bldg. 011A
Phone: 344-3682

The main objective of this Laboratory is to develop biological, cultural, and integrated methods of control of economically important and widespread soilborne plant diseases.

... ..
... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..

... ..
... ..
... ..

... ..
... ..
... ..

... ..
... ..

... ..
... ..
... ..
... ..
... ..

... ..

... ..
... ..
... ..

... ..
... ..
... ..
... ..
... ..

SUPPORTING SERVICES



SUPPORTING SERVICES

Administrative Office

E. H. Hobbs, Administrative Officer
Room 219, Bldg. 003
Phone: 344-3347

The Administrative Office assists in planning and organizing the administrative activities of the Center by advising the Director and participating in developing and promulgating overall general administrative policies, plans, and objectives. It provides effective and efficient administrative services by coordinating personnel, budget, fiscal, procurement, property, supply, labor relations, and plant management programs with the Regional Administrative Office.

Animal Operations Unit

N. W. Hooven, Jr., Assistant to the Director
Room 104, Bldg. 161
Phone: 344-2243

The Animal Operations Unit provides animal service, facilities, and technical assistance to scientists at the Center working with beef and dairy cattle, poultry, sheep, and swine. It also operates the granary facility which provides feed to all the animal research programs.

The veterinary staff provides medical care and surgery for the animals and assures compliance with Federal and State animal health regulations. The staff assists scientists in the development and management of animal experiments, coordinates the allocation of animals to various trials by assignment from existing animal populations or through direct purchases of animals, and coordinates the management of the crop and pasture land for the livestock according to the needs of the various animal research laboratories.

The Unit assists in coordinating the management and operation of the cooperative Dairy

Overleaf

Aerial view shows a portion of BARC-East, where livestock, nutrition, and engineering studies are concentrated.

Research Program with the University of Maryland.

Cooperative Farm Building Plan Exchange Unit

M. S. Timmins, Unit Head
Bldg. 228
Phone: 344-2121

These specialists work closely with the four ARS regions and other Federal, State, and private groups to advance planning of farm buildings. Final plans are available through the Land Grant Universities and Extension Service.

Illustrators, architects, and engineering draftsmen cooperate in development of plans for farm houses and other farm buildings.

Division of Operations

R. L. Almond, Sr., Division Head
Bldg. 209
Phone: 344-2253

The Division of Operations is responsible for the operation, plant engineering, maintenance, repair, and security of all facilities and land on the Center. It is responsible for safety at the area center to accomplish its mission, the Division is composed of four Branches and a Safety Officer.

Engineering and Planning Branch

D. J. Milano, Branch Chief
Bldg. 426
Phone: 344-2434

This Branch is responsible for plant engineering services and the management and control of all facilities, maintenance, and construction work assigned to the Division. It develops short and long range plans, budgets, and estimates for the improvement and expansion of utility systems, roads, laboratories, and buildings.

and streams, development of irrigation systems, construction and maintenance of fencing and fire trails, employment of environmentally acceptable pest management practices, and road and parking lot maintenance.

Maintenance and Construction Branch

W. W. Conley, Acting Branch Chief
Bldg. 426
Phone: 344-2434

This Branch performs maintenance, construction, alterations, renovations, and repairs to

R. L. Almond, Acting Branch Chief
Bldg. 209
Phone: 344-3048

This Branch operates and maintains both central and separate heating plants which include high pressure steam, hot water, and domestic oil burner systems. A water treatment plant and two sewage treatment plants are operated and maintained. It provides in-house custodial service and monitors the performance of a custodial contractor. The automotive fleet is maintained by this Branch. It also provides security service for the Research Center, including roving patrol and guard service for the National Agricultural Library.

OTHER AGRICULTURAL RESEARCH SERVICE ACTIVITIES AT THE CENTER

ARS Northeastern Regional Office

The program of the Agricultural Research Service is divided into four geographic units in order to be responsive to regional research needs. The Deputy Administrator for the Northeastern Region, Dr. Steven C. King, has the major responsibility for the implementation and operation of the research program within this region.

He is responsible for maintaining close liaison with action agencies, such as the Soil Conservation Service and Extension Service, which use research information, and with the State Agricultural Experiment Stations to insure that State and Federal research programs are complementary. Support is provided at the regional level in administrative services, information, program planning, development and evaluation, and biometrical services.

ARS Data Systems Application Division

This staff is responsible for all data processing activities in ARS. This responsibility includes approvals, installations, programing, systems analysis, and leasing of both software and hardware. The staff provides technical guidance for the consulting statisticians and for providing guidance for modeling and simulation.

ARS National Program Staff

The National Program Staff was established to assure that the ARS research program remains nationally oriented even though personnel and financial resources are allocated on a regional basis. The group serves as advisors to researchers and administrators in developing policy and program, and in making reviews and evaluations.

National Technical Editors are attached to the National Program Staff to assist scientists

nationwide in maintaining high-quality reporting and coordination of information exchange. The staff includes an executive letter writing group that responds to congressional correspondence to assure adequate liaison between the executive and legislative branches of government.

ARS Program Analysis and Coordination Staff

This staff is responsible for providing for retrieval of information on funding, scientist resource allocation, and progress of the separate aspects of the overall research program. It assists in maintaining proper priorities for initiation of new research.

ARS Radiological Safety Staff

The Radiological Safety Staff of ARS is responsible for the proper acquisition, safe use, and disposal of radioactive materials and/or equipment that emits potentially hazardous ionizing radiation.

OTHER USDA AGENCIES AT THE CENTER

Other USDA agencies represented at the Center are Agricultural Marketing Service, Animal and Plant Health Inspection Service, Extension Service, Forest Service, National Agricultural Library, and Soil Conservation Service.

OTHER FEDERAL AGENCIES AT THE CENTER

The Environmental Protection Agency and the Food and Drug Administration have facilities at the Center.



BARC-West, with its greenhouses, laboratories and administrative buildings, is the center for crops research. The tall building in the background is the National Agricultural Library.

Farm Management Branch

V. L. Miller, Branch Chief
Bldg. 301
Phone: 344-2448

This Branch is responsible for the direction and execution of the agricultural land management program which includes land allocation, crop production, landscaping and grounds maintenance, conservation and development of land

facilities including office and laboratory buildings, animal quarters, greenhouses, environmental chambers, and special equipment. Utilities include water, sewer, and steam lines, and electrical substations and distribution systems.

Utilities and Services Branch

Safety Office

R. J. Unger, Safety Manager

Bldg. 209

Phone: 344-2113

The Safety Office is responsible for maintaining an aggressive, intensive, and effective accident prevention program to protect employees and property under the custody of the Center; and for providing employees with a safe and healthful working environment in compliance with USDA, USDL, and Occupational Safety and Health Administration standards.

Instrument Design and Machine Shop

T. P. Collins, In Charge

Room 36, Bldg. 007

Phone: 344-3046

This staff designs special research equipment, provides machine shop services and repairs electronic instruments.

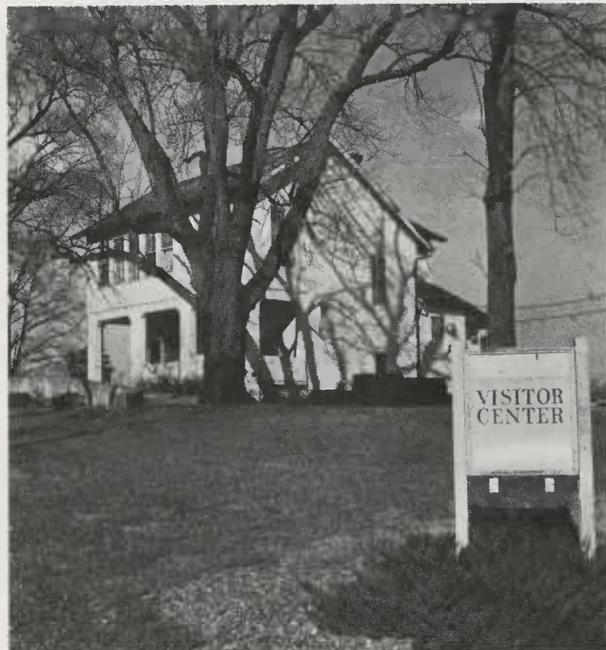
Visitor Unit

D. P. Morgan, Assistant to the Director

Bldg. 186

Phone: 344-2483

The Visitor Unit conducts tours and plans programs for approximately 20,000 visitors who come to Beltsville each year. These visiting groups include foreign and domestic scientists, university teachers, students, agriculturists,



Personnel of the Visitors Center conduct tours and plan programs for approximately 20,000 visitors who come to Beltsville each year from throughout the country and abroad.

agribusinessmen, Congressmen and their constituents, and other interested citizens.

Photographic Services

T. O'Driscoll, In Charge

Bldg. 012

Phone: 344-3223

This staff provides photographic services for the Center. It is attached to the Visitor Unit for administrative purposes.