

AGRICULTURE

Bountiful Thanksgiving

Contrasting with food shortages of Pilgrim Fathers, art and science of agriculture have now made it possible to have a feast at every American table, Watson Davis reports.

► THE BOUNTIFUL Thanksgiving America celebrates not just on the holiday but every day, in contrast to the traditional shortages of the Pilgrim Fathers, is made possible by the art and science of agriculture, including chemicals unheard of a few decades ago.

This year has seen a pre-Thanksgiving furore over the dangers of these chemicals, an overemphasis that may give distorted opinions of dangers. There may be little realization of the impossibility of eating well without the scientific advances based on chemistry.

Raising the Thanksgiving bird itself, on a commercial scale, would be impossible without chemical treatments to control the parasites of this and other kinds of poultry.

Pesticides Necessary

The U.S. Department of Agriculture, official guardian in use of chemicals on food, in an official statement says:

"Without pesticides many of the foods we take for granted would be luxury items available to only a few.

"Commercial apple production would be impossible as would be the production of eastern grown peaches. Oranges and grapefruit would be infested with maggots and the producers of potatoes and tomatoes would lose every second and third crop. The expansion of beef and dairy products in the southeastern section of the United States would have been impossible."

No people in the world today or during the whole course of human history has been more bountifully supplied with good and nutritious foods for which to be thankful.

We are far removed from the early days of the Pilgrim Fathers when the harvest was appreciated more keenly because of food shortages and starvations within the memory of those hardy settlers. In recent decades Americans, unlike many other peoples in the world, have had ample supplies of basic and luxury foods that make every dinner every day of the week a feast of thanksgiving. Our abundance of food is embarrassing, piling up surpluses, some of which is used to allay the hunger of other peoples. Our experts have valiantly given knowledge and assistance as well as actual surplus commodities to the less fortunate nations, particularly the developing nations.

Many factors in scientific agriculture and economics have contributed to the food wealth so important to our daily life. Mechanized farming with its combines and great tractors, better crops and animals through selective breeding and extraordinary production giving more meat from less foodstuffs, are but a few of the factors.

Above all, chemical agents of great vari-

ety combat insect hordes which would otherwise devastate the American harvest. This is chemical warfare against an extraordinarily prolific and persistent part of the animal kingdom. While there is only one species of man there are well over a million species of insects, conservatively figured. Not all of these insects are harmful, some are allies of the farmer and good creatures who help grow the crops.

Some of the chemical insecticides do become misplaced. Those who apply them in dusts or sprays are sometimes poisoned when they do not use care or do not follow the directions on labels.

There has been an outcry against the use of chemicals. A book titled *Silent Spring* by Rachel Carson campaigns against use of chemicals and pesticides. This attack upon agricultural progress may give new warning as to some abuses and dangers that have arisen.

If the use of chemicals were abolished, however, Thanksgiving would indeed be sad and silent.

Agriculturists and entomologists have imagined what would happen if by some incomprehensible turn of circumstances the United States were to go through a single year completely without pesticides. The dreary and appalling prospects have been documented in a pamphlet entitled "The Desolate Year," prepared and available free from Monsanto Chemical Company, St. Louis 66, Mo.

This is the picture of a chemical-less world:

"Quietly, then, the desolate year began. Not many people seemed aware of danger. After all, in the winter, hardly a housefly was about. What could a few bugs do here and there? How could the good life depend upon something so seemingly trivial as a bug spray?"

"Desperation grew in Florida; infected trees were hacked and burned and the diseased fruit consigned to the flames. The Medfly produced and reproduced and spread, bent on making every orange and lemon and grapefruit over millions of acres so massively infested with maggots that humans would not ship or can or freeze or eat them."

"So the farmers planted and cultivated, and too often the harvest was garbage."

"Insect and weed raced each other for strawberry patch, garden plot and field of grain."

"In nook and cranny and open field where plants were just in bud, the insects bred and re-bred, cross-bred and in-bred."

Dangers From Insects Real

While this is an imaginary year, the situation is not fantasy. The dangers from insects and other pests are well documented.

Entomologists generally feel that the dangers of insecticides have been overplayed. A report by the Entomological Society of America shows that 75 per cent of the total area of continental United States has never had any insecticide applied on it. In this area wildlife is affected only by water pollution, fire, insect outbreaks, urban encroachment, super highways and similar



USDA

FLOURISHING CORN BORERS—More than 200 kinds of plants are attacked by the European corn borer, commonly encountered entrenching the ears of both field and sweet corn. These are the insects in just one hill of corn.

hazards. In areas where insecticides are used, these chemicals protect our health as in mosquito and fly control, decrease discomfort and annoyance and increase the efficiency of agricultural production.

Seventy-five per cent of all insecticides are applied on two per cent of the total land area of the United States. This is primarily

AGRICULTURE

More Chemicals Needed

► **CHEMICALS** will be more in demand, more used and more necessary than ever as American agriculture progresses.

This is the prediction of veteran entomologist and research director, Dr. A. M. Boyce, dean of the College of Agriculture, University of California, Riverside.

"A million species of insects and mites have competed with man for his food and fiber since he first emerged as an intelligent being," Dr. Boyce said.

During the last two decades probably the biggest single development has been organophosphorus and organochlorine insecticides. Farmers have controlled insects and mites to a degree that 20 years ago would have seemed almost impossible. Without these compounds many crops could not be produced economically, he said.

Farmers will increasingly rely on chemicals not only for pest control but for a variety of new uses.

Insects, attacking our farms and forests, cause losses estimated at from \$10 billion to \$15 billion a year, but ultimately new chemicals will reduce a very large part of these losses, Dr. Boyce believes.

To meet these needs, the pesticide industry, now producing compounds with an annual value of \$300 million, will have to raise its output tenfold in the next 20 years, Dr. Boyce predicted.

In the last 20 years alone, pesticide output increased sevenfold. The 50 basic chemicals available 20 years ago have increased to 250.

What are the new prospects in pesticide chemicals?

"Industry's rapid progress in producing systemic insecticides has resulted in hundreds of compounds with systemic activity," said Dr. Boyce. "These are making possible the first practical control of plant virus infection carried by insects. Systemics applied to the rootbed at planting time or as a side dressing to mature plants kill the feeding insect before it can infect inner tissues with the virus."

Systemics also protect animals from pests such as lice, ticks, flies and grubs.

Grubs alone cause yearly damage of \$100 million in the United States. Among the compounds for controlling grubs, Co-Ral, Ruelene and Ronnel are the principal ones used. Healthier animals and better animal products are resulting from this application of the systemic principle.

"Analogous to the entomologist's use of systemics is their use by plant pathologists in controlling plant diseases by chemotherapy. One newly proposed form of protection is to model a chemical after naturally occurring substances that enable plants to resist

cotton, fruit and nut, and vegetable land and urban areas.

There are still many millions of acres today in which fish, birds and other wildlife may live without ever coming in contact with insecticides.

• Science News Letter, 82:290 November 3, 1962

disease. Other compounds might change the metabolism of the host plant to make it inhospitable to a disease," said Dr. Boyce.

Weed control will be another area with great development potential. "Chemical mowers" that desiccate controlled areas offer great promise. Many new herbicides are coming into use now, and more than 50 million acres of farmland are chemically treated for weed control each year.

Defoliation, rodenticide, growth regulation, synthetic nutrition, fungicide—these are the jobs that chemicals will increasingly perform in the future, in addition to today's chores as insecticides, acaricides, nematocides and herbicides.

For example, synthetic vitamins are used in many animal rations, synthetic fats are produced from petroleum and the sulfur-containing amino acid, methionine, is valuable in poultry nutrition.

"In the years to come expanding world population will make such a demand on natural foods that synthetic foods may become the largest of all the agri-chemical industries," Dr. Boyce states. "Certainly we need not fear this increasing dependence on chemicals."

The United States has more information on food additives and pesticide chemicals than any other country. Industry and Government have spent many millions of dollars and years of work accumulating the data needed to make sure chemicals are used safely.

"Chemicals have provided us with the world's safest, most nutritious and best food at reasonable prices. If we want to maintain our present standard of living we must continue and increase the use of chemicals in agriculture," Dr. Boyce concluded.

• Science News Letter, 82:291 November 3, 1962

GENERAL SCIENCE

Help to Farmers Instead Of Atom Study Urged

► **EDUCATE** farmers not nuclear scientists, the developing nations were advised by Sir William Kershaw Slater, of the United Nations Department of Scientific and Industrial Research, London, in a University of Chicago lecture.

Nuclear science has become a status symbol in some less advanced countries, whereas what they really need is men trained and willing to solve agricultural problems and go out into the fields to instruct farmers how to raise production, Sir William said.

• Science News Letter, 82:291 November 3, 1962

BIND and SAVE Your SNL's



All 52 issues of SNL, for a full year can be permanently filed in these sturdy buff-colored, buckram binders.

Each issue snaps into the cover with a metal strip. Only \$4.00 complete. Postpaid.

Order now, from

SCIENCE NEWS LETTER
1719 "N" N.W. Wash. 6, D.C.

Curious Coins!

Worth \$1—But Yours
FOR ONLY
10c

SEND for this valuable packet of odd and curious coins, paper money—an exciting introduction to fast growing hobby! You'll find coins from Formosa (Free China—our ally), Austria, far-off East Africa, friendly Turkey, etc. Actual value at least \$1—but yours for only 10¢ on this special offer!

Join the Fun Right Away!

Get your packet of coins and money—plus \$100,000 Confederate money bonus—together with lists of rare coins available and other interesting offers on approval. Just send your name and address now, with 10¢ to:

LITTLETON COIN CO., Dept. 11-SNL
Littleton, New Hampshire

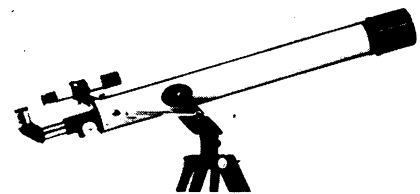
INCLUDED



\$100,000 in CONFEDERATE "MONEY"!

These lots-of-fun facsimiles are yours for promptness while the supply lasts.

SCIENCE SPECIALS



PRECISION REFRACTOR TELESCOPE

The telescope you have been waiting for. This 5 1/2 ft. high all metal model with heavy 6 section hardwood tripod is our most popular instrument. Powers are 55X, 80X, 115X and 175X. Features include enameled aluminum barrel with coated 60mm achromatic lenses and locking tremor brace. 2 Huyghenian eyepieces, a 1 1/2 X erecting eyepiece, a prism star diagonal, a 1/8" filter, a 5X finderscope with coated lenses, rack and pinion focusing, star chart and 190-page astronomy manual. All fittings are cast steel, chromed brass or polished aluminum. This is a beautiful telescope. Please include \$2.00 shipping costs—excess will be refunded. **\$36.95**



SOLAR TOWER MOTOR

At last! A solar cell and motor at a realistic price. Entire vertical tower assembly revolves in sunlight or under light bulb—a new concept that fascinates all observers. Powerful solar cell generates current to drive the precision ball bearing motor. Complete with motor, cell, base, bracket and 20-page experiment book. **\$5.75 PPD.**



MICROSCOPE "BEST BUY"

For advanced amateurs wanting a better grade low cost microscope. Heavy steel base, aluminum frame, chromed brass tubes, 4 stop turret with ACHROMATIC objectives, 2 Huyghenian oculars. Parfocal within 1/8 turn. Excellent resolution from 50X to 900X. A large and handsome instrument complete with wooden chest and accessories. Please include 90¢ shipping costs. **\$14.95**

THE FREY SCIENTIFIC COMPANY
273 ORANGE ST. MANSFIELD 8, OHIO
SATISFACTION GUARANTEED SEND FOR FREE CATALOG