

## GENERAL SCIENCE

# U. S. Needs Basic Science

The National Science Foundation warns that basic scientific research must be encouraged and expanded and that the Federal Government must be active in its support.

► IN COLD, blunt language the National Science Foundation has warned the American Government and people that they must understand, accept and promote basic science or face a bleak future.

In an unprecedented plea in defense of basic scientific research, the Foundation says its 64-page report presents "the case for basic research as an activity so indispensable to the Nation that the Federal Government cannot avoid responsibility for its encouragement and support." (See p. 300.)

In anticipation of the report's impact, the Foundation's director, Dr. Alan T. Waterman, said: "The Foundation recognizes that some of the issues raised by this study may bring out differences of opinion. Many affect public policy, however, and should therefore be discussed in public forums. Differences can be resolved when the issues involved are clearly understood."

The report charges that the "picture most of us have" of the basic research is "distorted." This distortion has been corrected somewhat in the last decade and support for basic research from both Government and industry has increased appreciably.

"But," the report warns, "the increase is still not enough to keep pace with the nation's requirements."

The central purpose of the report, the Foundation says, is to focus on "the very real need to foster, by increased financial support and all other methods, a national atmosphere in which basic research may continue to flourish." This, the Foundation adds, is very close to another national problem—the shortage of scientists and engineers.

To achieve the proper climate for basic research in the United States, the Foundation emphasizes two main steps to be taken.

The first is to establish conditions more favorable to the continued growth of basic research, and the second is to achieve a greater flow of funds for basic research.

This can be done in eight ways, the Foundation states:

1. By industries increasing their financial aid to basic research, especially in the form of more unrestricted funds to universities and other nonprofit institutions, as well as more basic research in their own laboratories.

2. By a sensitive management of private industry that sees lack of knowledge as a roadblock to its progress.

3. By encouragement to "industrially oriented" institutes, foundations, professional societies and other nonprofit organizations.

4. By encouraging state governments, with appropriate Federal assistance, to increase their support of basic research.

5. By setting up incentives to increase philanthropic giving to basic research and

even changing existing laws to help giving, "particularly in the Federal internal revenue laws."

6. By reducing the amount of development work for Government agencies now being done under contract by universities and colleges, and increasing the amount of basic research instead.

7. By recognizing the requirement that Federal grants for research and research training should carry a minimum of restrictions on the freedom of the scientist and the administration of his institution.

8. By developing closer relations and better understanding between members of Congress and scientists, in view of the responsibility of the representatives of the



**THREE STRIKES**—The 300-foot water plume of a conventional depth charge, resulting during routine underwater explosion experiments conducted by the U.S. Naval Ordnance Laboratory, induced a cloud to discharge its electrical energy. The three consecutive lightning bolts, following the same path and all striking the plume within one second, were photographed with high-speed cameras. Great care is exercised by the Navy in handling explosives and atmospheric conditions were clear when the depth charge was placed in the water. NOL scientists reported no indication of storm or electrical activity.

people to make important decisions involving some understanding of science.

The report points to examples of promising research resulting from what it terms "unpredictable" basic research: radio astronomy, virus heredity and translation by electronics.

It also touches upon basic research in Russia:

"It would appear that the United States has a formidable competitor in the Soviet Union which, although starting from a relatively low research-and-development level, is progressing at a remarkably rapid rate."

Summarizing our own present situation, the Foundation says that, "much progress has been made, but basic research is still under-emphasized in the United States."

Science News Letter, November 9, 1957

## BIOLOGY

## Vaccination Increases Parthenogenesis Chances

See Front Cover

► FATHERLESS turkeys may become less rare, only a few having been hatched in years in research, if turkey hens are vaccinated.

Nonmated turkeys and chickens are more likely to produce "spontaneous embryos" after they have had a fowl pox vaccination, scientists have reported.

It is not yet clear if the "activating agent" is the vaccine itself or a contaminant it may contain. Whichever it is, it has caused about a six percent increase in the number of eggs showing spontaneous embryos.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the bird believed to be the oldest surviving parthenogenic poult. Weighing about 12 pounds, the young turkey was 161 days old at the time the picture was taken in early September.

Dr. M. W. Olsen, poultry scientist at the U. S. Department of Agriculture's Research Center, Beltsville, Md., believes genetics is still the important contributor to the phenomenon of parthenogenesis.

Poultry's tendency toward parthenogenesis, the spontaneous development of embryonic tissue in an infertile egg, can be increased or decreased by selective breeding. A combination of vaccine "activating agent" and a susceptible strain of birds does, however, produce more and better organized embryonic tissue.

Of the more than 28,000 turkey eggs Dr. Olsen has tested during the past few years, a number of poults have survived. Two of the fatherless birds have lived more than a month—one is alive at close to seven months and is "normal" except for crooked toes, and bad eyesight or improper nerve coordination.

The USDA studies of parthenogenesis are contributing important information in two research fields: The fundamentals of cell development and growth, and the problems of poultry fertility and hatchability often critical problems for the turkey farmer.

Science News Letter, November 9, 1957