

for all nations eager to share in the pioneering efforts in this vast new frontier.

In addition to the international cooperation through its program of research associateships, NASA has provided technological assistance to the rocket and satellite programs in England, France, Japan, Norway, Sweden, Argentina, Italy and Canada.

In fact, one Canadian program utilizes the facilities of the common launching site at Ft. Churchill, where one-third of NASA's own sounding rockets are launched.

Sounding rockets are used to take readings in the earth's atmosphere that may yield information about weather. Frequently, such scientific rockets are launched into the ionosphere to obtain readings that will increase knowledge related to communication.

Italy successfully launched its first sounding rocket in Sardinia in January, 1961, a project which NASA fostered.

Currently, the United States and the United Kingdom are working on a joint satellite project.

Many of the nations receiving technical and material help from NASA have reciprocated by being hosts to NASA's tracking and communications stations overseas. Almost a dozen countries have these stations, many of which are operated by technicians of the host countries. In some

instances, the operating costs are defrayed by the country. NASA also has made many of the stations available for scientific use by the country in which they are located as operating schedules permit.

Recent participation of many countries in weather observations synchronized with Tiros II was of practical benefit, particularly to the Australian Weather Service. By means of information from Tiros and its own observers, it was able to forecast and prepare for weather in advance, with considerable financial benefit.

Reciprocity or "mutual aid" is essential to the health of any cooperative effort, whether it be in outer space or in health, education and welfare. The amount of aid that may be exchanged is not as significant as the willingness to share.

Currently, the Administration is attempting to promote reciprocal exchange agreements in space with the Soviet Union "that will contribute to some useful purpose."

President John F. Kennedy has pledged that "we are going to continue to attempt to engage the Soviet Union in a common effort of that kind of (useful space) activity."

Such an agreement will satisfy a major goal of NASA—that space be utilized by all men for the common good.

• Science News Letter, 79:218 April 8, 1961

#### MEDICINE

## Muscular Dystrophy Test

► MUSCULAR DYSTROPHY can now be detected long before the physical symptoms have appeared by an increase in enzymes in a person's blood serum.

The new test makes it possible to trace development of muscular dystrophy for the first time from its very early stages. It was reported from the University of California, Los Angeles Medical School by Dr. Carl M. Pearson in collaboration with Drs. S. R. Chowdhury, W. M. Fowler and W. H. Griffith.

"Since there is no known cure for the disease, early detection will not help us to treat the disease any better," Dr. Pearson noted. "But this broadening, step-by-step concept of the disorder may eventually lead to improved methods of treatment and even prevention of it."

In studies of families with a history of muscular dystrophy, elevation of serum enzymes was detected in a number of normal appearing children under three years of age. The youngest was only four months old.

Studies of biopsied muscle tissue revealed that changes in muscle of these children had already occurred although physical symptoms had not as yet appeared. Physical symptoms of muscular weakness have since appeared in some of the children.

These studies have suggested the following steps in development of the disorder: 1. occurrence of a biochemical defect in muscle cells, probably genetic in origin; 2. increased permeability of muscle-cell membrane, causing enzymes to leak out of muscle tissue and into the blood; 3. accumulation of excess biochemical products, leading to early breakdown of muscle; 4. regeneration of muscle fibers which is quantitatively insufficient to keep up with breakdown process; 5. replacement of damaged areas by fat and connective tissue; 6. appearance of clinical muscular weakness (the stage when the disorder is usually diagnosed and biopsied); and 7. advanced muscular weakness.

The disease may in some cases actually begin in the prenatal period, Dr. Pearson said.

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#### GENERAL SCIENCE

## U. S. Research Boon To Economic Growth

► UNITED STATES research and development is one of the most effective spurs to continual economic growth, statistics reported by the National Science Foundation, Washington, D. C., show.

About \$12.4 billion was spent on research and development in 1959, which accounted for 2.6% of the gross national product (GNP). During the past few years, this ratio has continually stayed above 2%, the Foundation reported.

New products absorbed into the economy continually stimulate U. S. investment and output. Such products as transistors show that certain research and development efforts result in much greater returns than in investments for plants and equipment. In 1959, funds for research and development represented about one-tenth of the total U.S. investment.

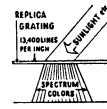
The report is available from the U. S. Government Printing Office, Washington 25, D. C., for ten cents.

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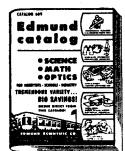
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