GENERAL SCIENCE

Pure Science Important

➤ THE USEFULNESS OF SCIENCE is not its most important aspect, Sir George Thomson, Nobel Prize winning British physicist, said at a National Science Foundation lecture in Washington.

"The value of 'useless science' must be stressed," he said. "I should like to be able to make people see research in science as one of the great achievements of the human mind, an activity more allied to the arts."

Sir George called attention to three important discoveries that resulted from research at or near Cambridge, England, where he is Master of Corpus Christi College.

These "useless" discoveries are a near-successful attempt to see atoms; comparative research on the atomic structure of hemoglobin (oxygen-carrying component of blood) and myoglobin (material found in muscles that acts as local oxygen supply to muscles); and in radio astronomy from listening to the radio waves emitted from sources in space.

The scientists engaged in such "pure" or "useless" scientific research were motivated by the "sheer joy of the art," much as the great artists who put their works on canvas because of a great inner compulsion to so create, Sir George told SCIENCE SERVICE. Whether the knowledge discovered may have practical application is not and should not be the paramount consideration in appraising its value, he said.

"However, it is possible that being able to see atoms and thus see 'atomic dislocations,' which could indicate structural weaknesses in materials, might have vastly important practical aplication," Sir George said. "There also may be some medical value to understanding the atomic structures of hemoglobin and myoglobin; but I seriously doubt whether radio astronomy has any ractical value at all."

Sir George credited applied or "useful" science with making it easier for scientists to engage in pure science research. Applied science has helped pure science by making "wonderful instruments" and by making them available at low cost, he said. An example is the perfection of vacuum techniques that has resulted in improved electric lighting and radio tubes.

• Science News Letter, 79:53 January 28, 1961

MATHEMATICS

Algebra in Third Grade

➤ "BY HOLDING the introduction of algebra to the ninth grade, we are squandering some of the best mathematical learning years in children's lives," Dr. Robert B. Davis, associate professor of mathematics education at Syracuse University, Syracuse, N. Y., charged.

Dr. Davis is director of an experimental program that attempts to accelerate mathematics education by introducing algebra in grades three to six, teaching basic principles of mathematics in lower elementary grades and developing an early understanding of the nature of mathematical thought.

Expansion of this program, which now operates in schools in New York, Massachusetts and Connecticut, is now under way through receipt of two new grants, one for $50,000 from the Alfred P. Sloan Foundation and the other for $2,000 from the Marcel Holzer Foundation.

Sloan funds have been used to establish special fellowships awarded to 15 teachers of superior ability in the Northeast who will expand the experimental program by training other teachers in its use. Funds will also be used to produce special teaching materials for the experimental program, known as the "Madison Project."

The program is used by teachers as a supplement to, not as a substitute for, the regular mathematics curriculum.

Dr. Davis reports that teachers using the "Madison Project" seem to agree that abstract mathematics comes easy to children and the youngsters do not have difficulty in learning algebra and arithmetic at the same time.

"The 'Madison Project' makes learning algebra seem like a fascinating game to students in the elementary grades," Dr. Davis said.

Pointing up the need to speed up mathematics education, Dr. Davis noted that the amount of material a student has to learn actually doubles every ten years.

• Science News Letter, 79:53 January 28, 1961

TECHNOLOGY

New Instrument Detects Costly Oil-Well Leaks

➤ AN INSTRUMENT has been developed to detect weaknesses in oil-well walls that could result in costly oil leaks. This weakness is caused by corrosion, a multi-million dollar problem in the oil industry each year.

Designed by Shell Development Company engineers at Emeryville, Calif., the instrument measures the effect of corrosion in a well casing by drawing an "electronic profile" of the thickness of the steel wall lining the well. Its gauge can detect where the wall was eaten away only one two-hundredth of an inch deep, which can be corrected in time before an oil leak develops.

The instrument is the first to detect an attack of corrosion on the outside, or earth side, of the steel lining. Here, the well casing is exposed to the eroding action of strong acids found in some of the rock layers surrounding the well. Instruments now in use are limited to probing the inside walls, detecting corrosion after the damage has been done.

The new instrument gauges the thickness of a casing by measuring from a transmitter lowered slowly inside the well the time it takes radio waves to travel through the casing wall. The thinner the wall, the faster the wave passes through.

This information is relayed to a surface recording instrument that draws a continuous profile of the wall's thickness on a rotating drum.

• Science News Letter, 79:53 January 28, 1961

TECHNOLOGY

Computer-Designed Computer Built

➤ THE FIRST KNOWN COMPUTER designed from complete information supplied by another computer has been built by Western Electric Company scientists in Burlington, N. C. The computer will be used in target tracking tests for the Nike-Zeus, the U. S. Army's anti-missile defense system.

The entire logic network or "brain" of the digital computer was built from wiring diagrams, assembly information and parts list furnished by a general purpose digital computer. This method will save both months of valuable man-hours spent designing missile-defense equipment and thousands of dollars in defense funds.

In order to design the computer, the logic network for performing the necessary functions was first determined. This network was converted into a series of equations that was fed to the general purpose computer.

The computer produced written sheets of instruction specifying the number of components and the wiring plan of the new computer.

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COMPUTER FROM COMPUTER