

## ELECTRONICS

# SEAC Takes Pictures

Some of the winners of the 17th Annual Science Talent Search were present at the first public demonstration of a digital computer that can take pictures.

## See Front Cover

► AN EXPERIMENTAL technique that uses a digital computer to scan and reproduce pictures has been shown by the National Bureau of Standards.

The first public demonstration of the picture-making ability of SEAC or Standards Electronic Automatic Computer, took place during the visit of winners of the 17th Annual Science Talent Search to the Bureau's laboratories.

The demonstration featured the scanning of a photograph of one of the young winners that was mounted in a newly developed device on a rotating metal drum and scanned optically by a photomultiplier cell.

The data received from the scanning was stored as numerical information in the memory of the computer by an automatic process involving some 30,000 digits. When this "image" was transferred electronically to an oscilloscope display device, the resulting picture was recognized by the high school seniors as that of one of their group, Paul Joseph Devine Jr., 17, of Gonzaga High School, Washington, D. C.

This experiment was developed by the data processing division of the Bureau to

allow the automatic recording of data contained in pictures, diagrams and other graphic forms by a general-purpose digital computer such as SEAC. Machines to recognize printed characters have been developed, but they have required construction of specialized equipment for very specific functions.

For these preliminary experiments, simple question-answer routines have been worked out to enable SEAC to count the number of objects in a picture, evaluate the area of each object, and disregard irrelevant images such as specks of dust on the photograph.

Eventually a machine may be able to answer such specific questions about a photograph as "Does a house or road appear in the foreground?" or "What is the name and empirical formula of the organic chemical symbolized by this structural diagram?" It may also be possible for a computer to interpret patterns and classify objects in maps and aerial photographs.

During their tour of the Bureau's laboratories the young scientists were also given lecture-demonstrations on nuclear energy, free radicals and the properties of materials at high temperatures.

The photograph on the cover of this

week's SCIENCE NEWS LETTER shows a group of Science Talent Search winners at one of the Bureau demonstration and exhibition rooms. (Another group of students visited the Walter Reed Army Institute of Research and the Armed Forces Institute of Pathology).

Dr. A. T. McPherson, associate director, for engineering of the National Bureau of Standards, is speaking to the group while, seated at the right, Dr. Alan J. Goldman, a STS winner in 1949 and now with the Bureau, listens.

During their trip the students also heard talks by eminent scientists in government, industry and in academic research.

The visit was part of the five-day Science Talent Institute being held for the 40 top winners of the nation-wide Science Talent Search conducted each year by Science Clubs of America, administered by SCIENCE SERVICE.

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## SURGERY

## Surgery May Help Cancer to Recur in Body

► THE STRESS resulting from surgery for cancer increases the likelihood of a recurrence of the disease, two doctors from the University of Illinois College of Medicine reported.

Surgery is still the most effective method for treating cancer, however, Drs. Malcolm R. Lewis and Warren H. Cole told the Central Surgical Association meeting in Columbus, Ohio. They also pointed out that surgically-treated animals used in their studies lived longer than those not operated on, even though the spread of cancer increased.

The experiments were designed to find out if an operation or similar stress, with or without removal of the primary cancer tumor, might itself influence the subsequent growth of cancer elsewhere in the body.

Three sets of animals were inoculated with tumor-producing cancer cells. Each group was then subjected after various lengths of time to one of three kinds of stress.

Other groups of animals similarly inoculated with cancer cells were not subjected to stress. These were observed for comparison.

In each series of experiments, cancer spread much more rapidly among those groups subjected to stress.

Those animals operated on and subjected to the stress, lived longer, however, than those not operated on, even though the spread of cancer increased in the stress-subjected animals.

The explanation offered by the doctors centers around the possibility that the stress of the operation itself reduced the host's ability to fight the growth of cancer cells that had spread to other parts of the body.

The University of Illinois scientists are now engaged in perfecting mechanisms for neutralizing the decreased resistance to cancer which follows operation.

Science News Letter, March 8, 1958



**STUDENTS WATCH SEAC**—Three of the Science Talent Search winners, left to right, Robley Cook Williams Jr., Paul Joseph Devine Jr., and Jane Shelby, examine a photograph of Paul taken by the digital computer SEAC. The three high school students were part of a group visiting the National Bureau of Standards' laboratories.