

## EDUCATION

# Montessori Expands

The Montessori method of teaching, controversial even for normal children, is being carefully considered as an instrument for teaching crippled youngsters—By Patricia McBroom

► A TEACHING PHILOSOPHY popularly known as the Montessori method, only recently revived in the United States, is under careful scrutiny by educators of crippled children.

Since the philosophy was developed some 40 years ago by an Italian doctor, Maria Montessori, it has been controversial as a method of teaching normal children. Less well known is Montessori teaching of brain-damaged children.

But that application is now growing in importance, Miss Margaret E. Stephenson, director of the Montessori Institute of Washington, D.C., told SCIENCE SERVICE. Educators from throughout the country attended a symposium on Montessori, sponsored by the National Society for Crippled Children and Adults.

Interest was greatly sparked with the publication of a comparison report by Dr. William P. Argy, medical director of the District of Columbia Society for Crippled Children, showing the relative advantages of Montessori over orthodox education.

Children with a variety of brain dysfunctions—spastic movement, retarded speech, impaired spacial perception and other consequences of cerebral palsy—learned better with Montessori than with other techniques.

Montessori proponents emphasize the approach is not a "method" but a philosophy, "a preparation for life."

Maria Montessori observed that children

move through four stages of learning from infancy to adulthood. The first encompasses the years through six. At this age, children need to learn with their senses and their hands. Therefore, Dr. Montessori developed an environment to fill this need.

Classrooms are filled with specially designed manipulative apparatus. An instrument might consist of four blocks of varied sizes. Children have the task of fitting the blocks into proper holes.

This prepares them for holding a pencil as well as teaching them to recognize size, Miss Stephenson said.

Another apparatus teaches color by making students match red, blue and yellow tablets.

Essential to the techniques is the necessity that children be allowed to work alone. They may be guided by the teacher to an apparatus, if necessary, but once a child has settled on it, he is left alone to develop at his own pace.

Montessori teachers say children develop an attention focus. They will work at an apparatus until its lesson is exhausted. This is particularly important to the child with brain damage because, in the process of learning to master an exercise, he also learns to organize his physical movements.

The Montessori environment is organized. Contrasts are always presented before similarities, with quality gradations following.

So far, only Montessori's first stage is

bio-medical laboratories. Part of the grant son said, though a beginning has been made toward introducing more advanced learning levels. Last year eight American teachers studied in Italy at the center for advanced Montessori.

The Washington training center, largest in the country, has 65 trainees currently.

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## GENERAL SCIENCE

## Population Research Gets Ford Foundation Grant

► FERTILITY and population research have received a major boost in the form of a \$14.5 million Ford Foundation grant for the establishment of an international research complex in New York.

Columbia University and the Population Council are to receive \$8.5 million and \$6 million, respectively, for studies in human reproduction and fertility control.

The most comprehensive center for reproduction research in the world will be established at the Columbia-Presbyterian Medical Center. The new International Institute for the Study of Human Reproduction will serve as a training center for physicians. An international advisory council for the Institute will include European, African, Asian and Latin American representatives.

The \$6 million earmarked for the Population Council will be used to expand its Bio-Medical Laboratories. Part of the grant will be used to construct new laboratory quarters at Rockefeller University in Manhattan.

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## ACOUSTICS

## Computer Makes Music Of Trumpet Sounds

► THE CLARION NOTES of a trumpet are now sounding forth from a machine.

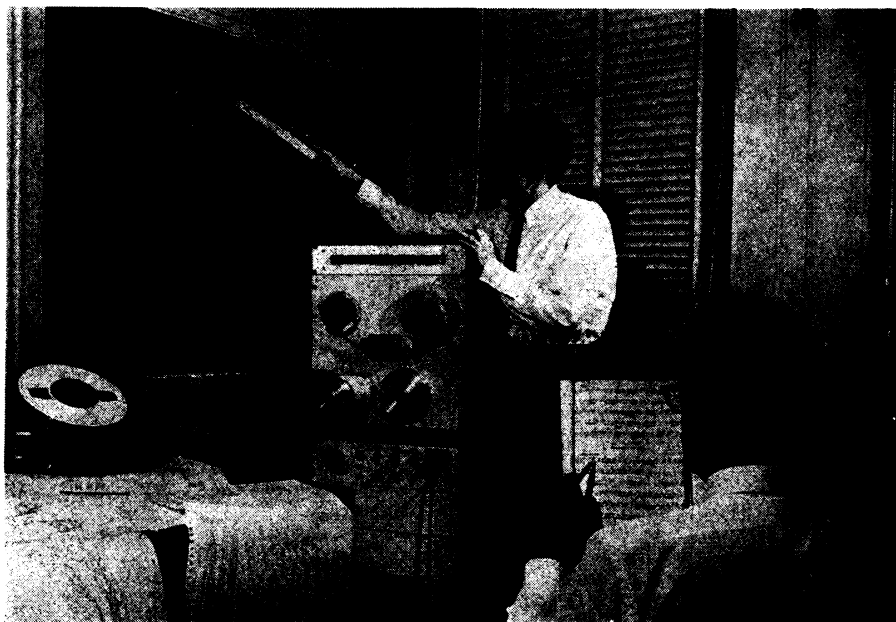
For the first time, the sound of a trumpet has been generated by a computer with such fidelity that professional musicians are unable to tell the difference between the computer sound and the real one, members of the Acoustical Society of America were told in St. Louis, Mo.

A special computer program was devised by researchers at the Bell Telephone Laboratories and was used to achieve the trumpet notes by Jean C. Risset, French physicist and composer on visit to Bell Laboratories for the past year.

In the research study, trumpet notes were recorded on magnetic tape and converted into digital form, which was then fed to an IBM 7094 computer, Mr. Risset said. The computer analyzed each tone for its sound wave frequencies and then displayed the spectra, or patterns, in graphic form.

Having made spectra from musical notes, the computer then used its "knowledge" to make notes from spectra. It generated numbers which were converted to electrical signals. These signals were fed to a loudspeaker, resulting in the realistic notes of a trumpet.

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Bell Telephone Laboratories

**COMPUTERIZED TRUMPET SOLO**—Jean Claude Risset demonstrates a trumpet tune synthesized by a computer at Bell Telephone Laboratories, New York, following a simple Henry Purcell trumpet composition on the board while listening to the computer-generated version played back on tape.