

## MATHEMATICS

## Find "Pi's" 100,000 Digits

➤ TWO SCIENTISTS have used an electronic computer to determine the value of "pi" to 100,000 digits.

The computation was done by two methods as a check on how accurately a computer can compute. Both methods gave the same answers. The computer twice determined that the last ten of the 100,000 digits for pi are: 5493624646.

It took the computer eight hours to make the calculations. In comparison, it would take a man, working eight hours a day without error on a desk calculator, 30,000 years to make the same computation. This is an indication of the relative speeds of machine and man.

Pi is the ratio of the circumference of a circle to its diameter. Its value, to ten decimal places, is 3.1415926535. (The figure 5 is correct for last place. Since the digit following five is eight, the five is usually rounded off to six.) Also using computers, its value had previously been computed to

16,167 decimal places in Paris. Before computers were developed, men spent years finding pi's value to many decimal places by hand.

However, no matter to how many decimals places the value of pi is computed, there is no end. Also there never is any periodic repetition in the sequence of figures. Pi is therefore called an irrational number.

The computation was made on an International Business Machines 7090 computer under the direction of Drs. John W. Wrench, Jr. and Daniel Shanks of the U. S. Navy's David Taylor Model Basin at the IBM Datacenter in New York.

One use of the 100,000 decimal places generated by the computer to find the value of pi is in statistical studies of the distribution of digits, of interest and importance to scientists.

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## CIVIL DEFENSE

## Plans for Emergencies

➤ NEWLY BUILT cities should make plans for "smooth-flow" traffic so they can be evacuated swiftly and efficiently in case of a nuclear attack warning, a Canadian geographer believes.

Dr. Bogdan Zaborski of the University of Ottawa favors a set of one-way, arch-shaped avenues running west to east, curved toward the business center and connected to mildly merging snake-shaped streets, for a smooth-flowing road pattern. A few added north-south arteries, where they are needed for quick travel between industrial and business districts, would be at different levels than the east-west routes by means of overpasses or underpasses.

The main roadways would be restricted to moving traffic. The pavement would be widened at intervals to provide "bays" for bus stops. Side lanes would be used for visits and deliveries in residential sections.

"The whole road network will serve then as one-way communication lines leading out of the center of the city," Dr. Zaborski told the Association of American Geographers meeting at Michigan State University in East Lansing, Mich.

Automobiles would have time to go six miles in a 15-minute warning period and 15 miles in a 30-minute warning period, he said. Primitive earthen or rock shelters, facing away from the blast direction, could be built along the escape route if more expensive protective measures could not be undertaken.

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### Better Maps Aided North

➤ USEFUL MAPS were scarce at the start of the Civil War, and the North's superior

mapmaking facilities gave them "a distinct advantage" over the South, the Association of American Geographers meeting was told.

A. Philip Muntz of the National Archives, Washington, pointed out that the Union was lucky enough to retain "the organization, files, equipment, and most of the personnel" of the two Federal agencies then responsible for topographical mapping, the Corps of Topographical Engineers and the Coast Survey.

The mapmakers "contributed significantly to the Union victory" by producing thousands of detailed maps needed to plan and carry out successful campaigns, he said. Many of the maps have been preserved and are kept at the Archives.

The geographers are meeting at Michigan State University, East Lansing, Mich.

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## OCEANOGRAPHY

### Automatic Buoys Map Atlantic Coast Currents

➤ A STRING of automatic buoys along the United States Atlantic coast is now measuring the ocean currents.

Woods Hole Oceanographic Institution scientists have planted 14 buoys strung out along a 670-mile line stretching from New England to Bermuda. Bobbing on the open ocean in waters up to three miles deep, the floats are automatically recording oceanographic data continuously, Dr. William S. Richardson, director of the project, reported.

The project is the first of its kind. Off-shore currents, including the Gulf Stream, will be measured, as will surface winds.

The brightly colored plastic floats have a ten-foot metal tripod that houses the recording equipment. Current measurements obtained from instruments attached to the buoy's dangling anchor cable are recorded on film. A radio transmitter beams out signals identifying the buoy to ships that spot this lone sentinel on the open seas.

Dr. Richardson spoke at a symposium on oceanographic instrumentation in Washington, D. C.

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## ASTRONOMY

### Fast Dimming Nova Found in Sagittarius

➤ A NEW NOVA, a star that suddenly increases its light and energy output and then fades again, has been found in the constellation Sagittarius, the archer.

Before the star brightened, it could not be seen on photographs taken with the 200-inch telescope on Mt. Palomar. It was therefore fainter than 21st magnitude (the larger the magnitude the fainter a star).

When first seen on Aug. 2 by Dr. V. M. Blanco at Case Institute of Technology, Cleveland, the nova was of 10th magnitude. By Aug. 10 it had dimmed down to magnitude 12, Harvard College Observatory, Cambridge, Mass., reported.

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**ELECTRONIC FIRE MAP** — The newest fire-fighting device is a map that lights up at stations where equipment is in use. The dispatcher can determine what equipment is available and make instant radio contact with stations and individual firemen at the Rochester, N. Y., fire control center, built by General Railway Signal Company of Rochester and Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.