it cannot be photographed except with a large telescope. However, when two or three photographic plates are viewed in superposition, the thin line of the fourth ring can be clearly seen.

Printed reproduction of the "D" ring is extremely difficult. Feibelman therefore made tracings of the density of the photographic emulsion, and these clearly show the presence of matter in the plane of the other three rings but at a much greater distance from the planet.

Water for Peace

Of all the water on earth, about 97 percent is in the oceans; only about one ten-thousandth of the total is available to man in streams and lakes.

Of his alloted ten-thousandth, man now controls only about 6.6 percent.

Matching this available water to rapidly growing numbers of people is the underlying theme of the International Conference on Water for Peace now in its second week in Washington, D.C.

The urgency of such an effort is underscored by a report prepared by the U.S. Interdepartmental Committee on Water for Peace. Nearly two-thirds of all the people living in the developing nations of the free world—about one billion people—get their water from unsanitary sources, the report notes. Water-borne disease kills up to 10 million, mostly infants, every year.

Yet, City Planner Constantinos Doxiadis observes, man can have all the water he needs, given time and the determination to bring pure water to everyone.

The most difficult problem to be faced is population growth, he advised delegates attending the conference's first plenary session.

Nearly 5,000 delegates from 90 nations and 19 international organizations were invited to the 10-day conference.

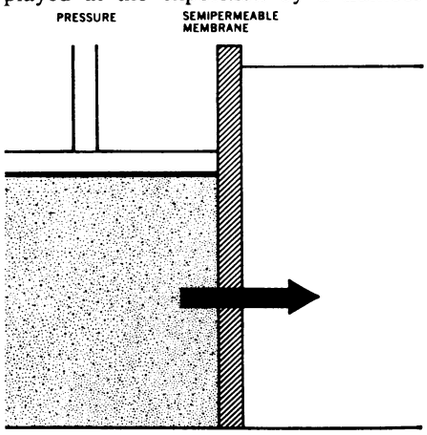
President Johnson announced in an opening address that the U.S. would establish a Water for Peace office in the State Department to coordinate this country's approach to international water programs.

He also called for establishment of regional centers to promote research and the training of scientists and engineers. The first two centers, he suggested, should be in operation within two years.

The technology that finds, purifiies and transports water was on display at the conference. Besides well-drilling equipment and pumping and treatment systems for municipal water supplies, a large number of firms displayed desalination processes.

To date, most desalination plants have been distillation units such as the 150-million-gallon-a-day colossus to be built near Los Angeles. A bill authorizing $57.2 million in Federal participation in its construction was signed into law by President Johnson, just in advance of the conference.

Units employing reverse osmosis, apparently one of the most promising second-generation processes, were displayed at the exposition by a number



General Dynamics Corp.

The principle of reverse osmosis.

of major U.S. corporations including Westinghouse, Aerojet-General, American-Standard, General Dynamics and Du Pont.

An experimental variation on the reverse osmosis process was unveiled by Du Pont.

Du Pont

Du Pont's hollow polymer fibers.

Normally, reverse osmosis involves pumping salt water under considerable pressure against a membrane that will pass fresh water while excluding salt.

In the Du Pont process, trade named Permasep, the plastic membrane is spun into hollow fibers thinner than human hair. A production model desalinator envisioned by the company's engineers would have 20 million fibers in a one foot diameter sealed tube seven feet long.

Water Funds Drop

All new U.S. support for the International Hydrological Decade, a major pillar of the Water for Peace program, has been dropped by the Senate in its version of the Interior Department appropriation bill.

The IHD, two years old this January 1, is a world-wide, 10-year program aimed at better development and use of the world's water resources. It was first proposed by the United States and is now sponsored by the United Nations Educational, Scientific and Cultural Organization.

The Senate cut the U.S. share in the IHD from $2.168 million requested to last year's figure of $168,000.

Earlier, the House had proposed to cut the requested $2 million increase in support to $500,000 (SN: 5/13), declaring that this is not the time for "a foreign aid program for water."

House and Senate conferees will now have to agree on the depth of the cut.

Much of the $2 million increase was to have gone for exchange of scientists and students of hydrology with other participating nations, according to Dr. Raymond L. Nace, chairman of the U.S. National Committee for the IHD.

NSF: Same Ceiling

The National Science Foundation—the only Federal agency charged solely with the support of research—is starting to walk stoop-shouldered after three years under a low budget ceiling of around $500 million. This year is no exception.

The House of Representatives has trimmed $31 million from the $526 million authorization requested by the NSF; the amount still represents a $15 million increase over the budgets of the previous two years.

Most of the increase will go for research in four areas of science: chemistry, social sciences, atmospheric sciences and oceanography. In particular, the House Appropriations Committee made a point of seeing that $4 million requested for the National Sea Grant Colleges program was preserved intact.

A study by the National Academy of Sciences provided one reason for boosting the NSF's appropriation: the cost of chemical research, the Academy found, has been going up at a rate of more than 15 percent a year.

The NSF requested only $25 million this year for its University Science Development Program, part of the national Centers of Excellence plan to bring almost-great universities up to the top rank. This is a $10 million decrease from the $35.6 million appropriation of last year. Under this pro-

gram, the NSF has already awarded grants totaling almost $97 million to 25 institutions in 14 states. The most recent recipients are Carnegie Institute of Technology, the University of Maryland, the University of North Carolina, Notre Dame and Vanderbilt Universities.

The only item allotted a specific sum of money in the House bill was a program of supplementary training for high school science and mathematics teachers, for which the legislators set up a $37.6 million minimum. The NSF had requested that the program be broadened beyond its present scope, which includes only summer and academic-year training institutes for teachers, but the House Appropriations Committee opposed this recommendation.

Among the specific projects planned by the NSF for the coming fiscal year is a 150-inch reflecting telescope to be built in Chile at the Cerro Tololo Interamerican Observatory. The instrument, not scheduled for completion before 1969 or 1970, is to be the Southern Hemisphere's equivalent of a similar 150-inch telescope being built at Kitt Peak Observatory, Arizona.

An increase of almost $4 million was requested for the NSF's Science Information Service, which is engaged in establishing a national computerized data center for chemists and plans to extend the system to other sciences, including sociology and astronomy.

The bill next faces a trip through the Senate, but in the past this has proven to be an easier journey than that through the House.

Drought or Sinkholes

In Bartow, Fla., Mrs. Benny Watson got up on a Sunday morning. She glanced out the window to see the two houses next door slowly disappear into the ground. The Watsons ran.

The houses were the latest victims of Florida's curious geology—a rock structure that erodes underground, then falls in, engulfing houses, roads, even people.

Last week's heavy rains, although they broke a devastating drought, increased the danger from sinkholes. Underground water that usually held up the surface formations had drained away during the bitter dry spell; the new rain soaked the surface, making it heavier and more likely to fall in.

Floridians live with a quirk of geological fate which began some 100-million years ago when what was to become Florida was a shallow tropical sea dotted with small islands.

Today's Atlantic coastal plain was submerged; the Gulf of Mexico extended as far north as Cairo, Ill. That vast area of warm, shallow sea water was the recipient of eons of dissolved sediments from the eroding Appalachian Mountains as well as an accumulating rain of debris from teeming sea life.

The result was several thousand feet of calcium carbonate—limestone—deposits over what are now the states of Louisiana, Mississippi, Alabama and Florida. Then, in the period between 60-million and 1-million years ago, Florida and the other Gulf Coast states rose from the sea.

Almost all of Florida is underlain with rock which geologists describe as "soft limestone containing truly enormous quantities of ground water." This means that Florida's basement is

UPI

Danger grows as drought ends.

honeycombed with caves. And that sinkholes are inevitable.

As rain falls it picks up carbon dioxide from the air, forming a very weak solution of carbonic acid. To this is added humic acid found in the soil. The end result is a dilute acidic solution capable of dissolving limestone rather rapidly, forming cavities and then subterranean caverns. A sudden rain will then overload the gound and any weakness in the formations may cause cave roofs to drop in and form sinkholes.

Indian Education

The progress of contemporary American Indian education reads like the history of Indian-white relations—promises made and not kept, funds continually cut, too little sensitivity on the part of whites, mistrust and alienation on the part of Indians.

Though this condition has existed for 75 years, the Government has only recently begun to pay attention. Last week a conference of 50 anthropologists, sociologists, educators, government officials and Indian leaders met at Pennsylvania State University to initiate a major reassessment of Indian education. The issues are basic: What kind of education—mainstream American or Indian oriented—what values, what goals, what language, how much local control, even what studies need to be undertaken in order to answer the questions.

The conference was backed by the well-funded U.S. Office of Education, which probably means, above all, that the promised re-evaluation of Indian education will actually be forthcoming.

Several years ago, Congress told the Bureau of Indian Affairs to do the same status study and then neglected to appropriate money. Because it has always been hampered by limited funds, the Bureau tends to react defensively to any criticism of the way Indian education has been handled.

"We were there when the sand was blowing under the door," says Philleo Nash, former Commissioner of the Bureau. He said a very good education system was established during the Kennedy years, but it hasn't had time to show results.

"If we had been spending money for the past 75 years at the level we are doing today, we wouldn't need a conference," he says.

The Bureau would not readily pass over the education of 50,000 Indian children to the Office of Education, he declares, but it welcomes the cooperation. Another 100,000 reservation children are attending state public schools.

Actually, young Indian leaders and a good number of anthropologists are calling for more basic reform than the Bureau has yet provided.

Representative of this group is Robert A. Roessel, an educator who, with poverty war money, runs a highly-applauded demonstration school at Roughrock, Arizona, 120 miles from Gallup.

Describing the failures of traditional education, Roessel says white society has tried to impose its own values, telling the Indians they should "eat green leafy vegetables, sleep on a bed and brush their teeth. In short, we try to make white men out of Indians."

According to his own research, Indian parents want their children to have a rudimentary knowledge of money so they cannot be cheated, an English vocabulary of 50 words to use at the trading post, and courses in cooking, nutrition and automechanics.

In his opinion and the opinion of Dr. Sol Tax, Dean of University Extension at the University of Chicago, Indians on the reservation simply do not want to be white men or they would not stay on the reservation.

They don't want what they consider the values of an "avaricious society," says Dr. Tax, who is also an anthropologist. "We have said, if you want bread, you must have white ways. The Indian has said, 'Then I won't eat.'"