



3-D X-RAYS—Flat shadows pop up in sharp contrast in the three-dimensional X-ray movies developed at the University of Washington School of Medicine in Seattle. The revolving polarized glass plate on the left of the machine polarizes alternate frames of the film in the opposite direction. Al Nash uses conventional 3-D glasses to get the depth illusion.

CHEMISTRY

Seek "Red Tide" Poison

Bacteriological warfare experts are testing samples of the organism causing the fish-killing "red-tide," in a joint effort with biologists to isolate the poison factor.

► BACTERIOLOGICAL WARFARE experts in the Army Chemical Warfare laboratories have joined forces with biologists of the U. S. Fish and Wildlife Service to isolate the mysterious poison in the "red tides" that have killed billions of pounds of fish in the Gulf of Mexico in recent years.

Working on the theory that the Army specialists know more about poisons than anyone else in the country, Howard E. Eckles, chief of the marine fisheries section of the Fish and Wildlife Service, reports that scientists are shipping samples of *Gymnodinium brevis*, the microscopic organism which causes the so-called tide, from the Gulf to Camp Detrick, Md., for chemical analysis.

Rumors have circulated in Washington that the Army was interested in the organism as a possible instrument in bacteriological warfare. Mr. Eckles discounted the rumor entirely.

"We want to know what the poison is that kills the fish and they have the equipment to find out," was his comment.

In 1949, some scientists advanced the theory that the fish were killed by the lack

of oxygen in the water during the evil-smelling tide. This theory has been abandoned and biologists are now convinced that the organism gives off a poison which kills the fish.

The organism is neither a plant nor an animal, but falls in between and is technically called a dinoflagellate. Under certain conditions, it suddenly bursts into bloom causing the fish-killing patches known as red tide.

Scientists in the Fish and Wildlife Service have on two occasions killed off small patches with copper sulfate crystals. One ton of crystals costing \$275 will clear up a patch approximately three-quarters of a mile square, but this method is effective only in the earliest stages of a bloom. When the patches grow to cover many square miles of the sea, the copper sulfate cannot be used to control the organism.

Albert Collier, a marine biologist, has found that the *Gymnodinium brevis* is usually present in water near the shore in non-poisonous concentrations. An unusually heavy rain or river run-off that lowers the salt content of the water, coupled with still

air, are the conditions necessary for a bloom. During a bloom the number of individuals per quart of water explodes from 1,000 to 60 million or more, each about one-thousandth of an inch long. A squall or storm that mixes the red tide patch with normal sea water clears up the condition.

Scientists are now establishing a series of tests that will make it possible to detect the start of a bloom. Use of the copper sulfate crystals at the early stage may eliminate the problem in the future.

The organism's poison is so toxic that winds blowing from the infested area carry an odorless vapor that causes irritations characteristic of very severe hay fever. When chemically treated, the thick water may be diluted as much as 1,000 to one and still kill fish in pools within an hour.

No evidence has ever been presented that the huge losses have affected the total fish population. The indirect economic effects to the tourist industry when tons of dead fish are piled on beaches and the health hazards have been two of the main spurs to the research work.

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VITAL STATISTICS

Population to Triple in Latin America by 2000

► THE POPULATION of Latin America, including the West Indies, will triple in 47 years if the present growth rate continues, Robert C. Cook, director of the Population Reference Bureau, Inc., in Washington, predicts.

Latin America is "the world's most explosive area of population growth," he states. Its growth rate is two and a half percent annually, compared to slightly more than one percent each year for the world, and one and seven-tenths percent for the U. S.

Mr. Cook estimates that the total population of Latin America is now about 173,000,000, which is approximately equal to the combined totals of the United States and Canada. If the hemisphere's present growth rates continue to the year 2000, the population score would stand at 250,000,000 for North America, 550,000,000 for Latin America and the West Indies.

Even faster growth is possible, Mr. Cook foresees, because death rates, which have shown some decline, could be "drastically" reduced by modern medicine in most South American countries.

"The traditionally high birth rates are expected to remain high for some time to come," Mr. Cook states. "If high fertility persists and mortality sharply declines, present rates of growth will skyrocket in many countries."

He finds that if the death rates should fall to the level of those in the United States, the Latin American rate of population growth would increase to three and three-tenths percent annually. With such a rate, the population would pass the billion mark soon after the year 2000.

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