

PUBLIC HEALTH

Radioactive Sewage Gain

► RADIOACTIVITY in the Los Angeles area sewage systems increased some 30 times above normal during 1962 and 1963 after the United States and Russia conducted nuclear tests in the atmosphere, an environmental health engineer at the California Institute of Technology, Pasadena, reported.

"The measurements reflect radioactive bomb debris that has contaminated water supplies and other elements of the human environment and that the population has been exposed to by drinking, eating and bathing," said Dr. Andrew L. Gram. "During the past two years the radioactivity of both water and sewage has gradually dropped almost to the pre-1961 level."

The monitoring at Hyperion and 11 other area sewage treatment plants also disclosed the occasional dumping of radioactive wastes into the sewage system by some industries. The monitoring program was sponsored by the Atomic Energy Commission and U.S. Public Health Service and was carried out by the California Institute of Technology and the Scripps Institution of Oceanography at La Jolla.

The highest radioactive readings occurred during the winter and spring months of the two years, Dr. Gram said the reason apparently is that wind and rain during the winters increased the fallout rate.

"The general level of radioactivity in sewage closely matched that in the domestic water supply," he said, "and therefore is representative of that to which the population has been exposed."

The concentrations of radioactivity found in the treatment plants was thousands of times below the maximum permissible concentration established by the International Commission on Radiological Protection, the engineer said.

However, he pointed out that the amounts of radioactive isotopes that passed through people is not known.

It is assumed that some radioactive debris remained in the people. For instance, such isotopes as strontium 90 and cesium 137 are bone seekers.

After leaving the sewage treatment plant, the radioactive debris entered the ocean, where it was dispersed. Dr. Gram said the amounts are much too small to present a hazard to sea life, with one possible exception.

Miniature sea life could consume the radioactive debris and this sea life could be eaten by fish. Thus the concentration of the debris again could be built up.

The treatment plant monitoring system recorded sudden increases in such isotopes as cesium 137. Although this is a fission

product from atomic explosions, it also is a waste product from industries that manufacture radioactively-tagged compounds used in medicine and research. Sudden increases in such isotopes as cesium 137 and cobalt 60 indicate the dumping of radioactive wastes into the sewage system, Dr. Gram said. It is legally permissible to dump very small amounts into the sewage.

Several isotopes were monitored, including these fallout products: zirconium-niobium 95, with a half-life of 65 days; ruthenium 103, half-life of 40 days; cesium 137, half-life of 30 years; cerium 141, half-life of 33 days; iodine 131, half-life of eight days; and carbon 14, half-life of 5,570 years.

These isotopes all are emitters of powerful gamma rays, which are more penetrating than the alpha and beta rays emitted by some radioactive isotopes.

Evaporated samples of sewage were placed atop a sodium-iodide scintillation crystal. Each gamma ray from a sample causes the crystal to emit a tiny flash of light which is picked up by a photoelectric tube and recorded.

The equipment recorded such nonfission debris isotopes as radioactive potassium 40 and cobalt 60. Their rates did not increase but remained fairly constant throughout the research program.

The project was begun by Dr. T. R. Folsom, a physicist from Scripps Institution of Oceanography; was conducted by Dr. G. J. Mohanrao, a California Institute of Technology sanitary engineer; and was concluded by Dr. Gram.

• Science News Letter, 88:143 August 28, 1965

GEOPHYSICS

Underwater Landslides Discovered Near Hawaii

► GIANT UNDERWATER landslides have been discovered near the Hawaiian Islands, rising thousands of feet above the ocean floor.

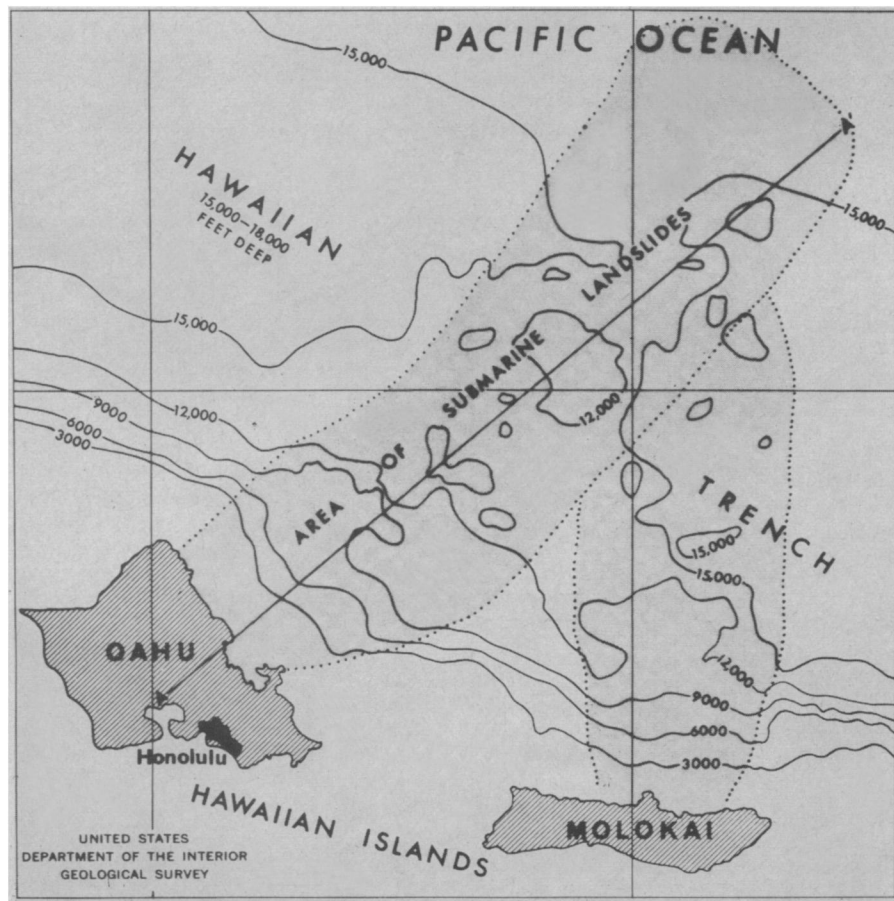
Dr. James C. Moore, a Department of Interior Survey geologist and volcano expert did not rule out the possible volcanic origin of these features but suggested that evidence favored the "slide" theory.

"Not only does the general topographic form of these features strongly resemble that of landslides on the continent, but the position of the steep slopes of the Hawaiian volcanoes is favorable to landsliding."

The submarine slides, similar to those found on the land, extend 100 miles northeast from the Island of Oahu and north of Molokai, Hawaii, reported the Department of Interior's Geological Survey.

The formations caused by the slides resemble undersea mountains, called seamounts, and cover a 1,000-square-mile area down the slope of the Hawaiian Ridge and extending out onto the adjacent ocean floor. Some of the flat-top formations tilt either toward or away from the Ridge and measure from 5 to 16 miles long and 3 to 9 miles wide. The Hawaiian Ridge is one of the earth's youngest and steepest major topographic features and is therefore a region favorable to large-scale landsliding.

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AREA OF THE SUBMARINE LANDSLIDES NEAR HAWAII