PUBLIC HEALTH

Ultraviolet Water Purifier

➤ HARNESSING GERM-KILLING ultraviolet light to purify water for drinking and other domestic use is being attempted by a number of devices now on the market.

So far as can be learned, none of them overcome certain fundamental objections that lead health authorities to frown on them. They raise questions such as the following:

How is the owner of one of these ultraviolet water purifying devices to know when the gadget is not working? It may blow a tube or the electric power that keeps the light burning may be off momentarily. If this does occur, does the device have a mechanism for automatically shutting off impure water before it reaches the home tap?

Ultraviolet light can kill germs, but to be effective for this it must be able to penetrate the material to be purified. It does not penetrate more than half an inch. So water to be purified by ultraviolet would have to flow in a very thin sheet over very clear glass in order to have the ultraviolet reach through to kill all possible germs.

Since ground water usually leaves a deposit of minerals and other solid matter, the glass presumably would have to be cleaned at frequent intervals to let all the ultraviolet light through. With very turbid water, ultraviolet light might not work at all as a purifier.

Third difficulty is the lack of a simple, fast test for determining whether the water has really been purified. To make certain of this, a sample of water believed purified would have to be taken to a laboratory for testing, which would take two or three days. When chlorine is used to purify water, all that is necessary is a test to determine how much chlorine is in the water. This can be done in a few minutes and if it shows the necessary amount, the user knows his water is safe.

Final objection to ultraviolet light as a water purifier is the lack of residual effect that chlorination has. In other words, if the water stands after it has passed over the ultraviolet light, there is nothing to protect it from subsequent contamination. When water has been purified by chlorine, residual chlorine continues to protect it.

At present, public health authorities in the United States do not accept ultraviolet light for purificaion of municipal water supplies and question its value for individual water supplies, such as wells and cisterns. Obviously, they would be interested in an ultraviolet water purification method that does not have the defects given above.

Ultraviolet light is used in some European countries for public water supplies, presumably because of objection to the chlorine taste in chlorinated water.

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MARINE BIOLOGY

Sea Productivity Mystery

➤ THE SEA may be an enormous source of human food, but the amount of life oceans can support is still a mystery.

With populations outgrowing food supplies in many parts of the world, some scientists are looking to the sea to fill the gap between human food needs and land productivity.

The productivity of the sea is primarily dependent on the efficiency of microscopic plants in converting nutrients in the water into food. An attempt to measure the growth of these basic plants will be made by Ralph F. Vaccaro of the Woods Hole Oceanographic Institute, Woods Hole, Mass., during a two-month scientific cruise in West Indian waters.

Carefully measured amounts of carbon 14, a radioactive substance, will be added to water samples collected from the ocean at depths down to 450 feet. Below that depth sunlight does not penetrate sufficiently to sustain plant growth.

The samples will then be lowered in bottles to the same depths from which they were collected and allowed to "incubate" for 24 hours. Each sample will then be strained to separate out the tiny plants.

The plants will be placed in a Geiger counter that measures the amount of radioactive material present. The carbon 14 content will indicate the rate of plant growth during the 24-hour period.

Part of this work will be done over the Brownson Deep, north of Puerto Rico, the deepest place in the Atlantic Ocean. Here a sounding of 27,500 feet has been made.

In addition to work with microscopic plants, scientists on the cruise will try to find what type of water fills this great hole in the floor of the Atlantic. Very few such observations have been made in the Brownson Deep.

Several years ago, two hydrographic observations there indicated that cold water from the Antarctic is found below a depth of about 16,000 feet.

A specially constructed winch on the deck of one of the vessels contains enough wire to reach the deepest spots. With this equipment, observations will be made at very great depths, while the scientists hope the wire doesn't break, dropping their expensive instruments.

Dr. J. Brackett Hersey is chief scientist on the cruise. The two vessels are the Atlantis and the Bear. They will stop in Miami before sailing to the West Indies.

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The average person ate 75 pounds of *beef* last year, setting a new record.