FROM GENEVA

Mussels in the pipeline

"It's no good just killing them and having dead blighters in the pipe."

William Wood, an engineer with the World Health Organization's Environmental Sanitation Division, has had a look at a jarful of trouble for water systems—Drissensia polymorpha, or zebra mussels.

The jar of mussels came from Turkey, but millions of such small mollusks grow in public water systems in various areas throughout the world, materially cutting their efficiency—and hurting efforts to provide plentiful, clean water.

Killing the blighters won't do the job, but so far, he says, no other feasible solution is readily at hand.

The fast-growing water program of the United Nations agency now has 128 civil engineers and scientific consultants in the field on more than 30 water projects around the world. Britisher Wood is responsible for Europe and the Middle East.

Turkey needs help particularly because the mussels, about one-inch long, are narrowing water main diameters drastically and roughing the bores which must remain smooth for good carrying capacity.

"The Americans have similar trouble with the so-called Asiatic clam in the Far West," Wood says. Other clogging mollusks are reportedly common throughout the Middle East and widespread across Europe.

They carry no danger of disease, as far as anyone knows.

But no one has really checked to see what bacteria can breed inside the zebra mussels.

The mechanical problem starts with free-swimming larvae entering the water pipes. Their invasions apparently vary with the season, weather, even time of day.

Wood and his colleagues think that careful research projects might reveal times when specialists could stop mussel entry. If there were a peak period, they could stop the water flow then.

Another hunch: the young may travel only at certain depths, and engineers might set the intakes above or below them.

WHO technical assistance to Turkey hopefully will produce useful information for the other nations. The Russians, with similar troubles in the Caucasus, have done good work in this field, says Wood.

A chlorination system, they find, is the best defense. The Turks will adopt such a technique, temporarily at least.

Other research suggests the possibility of special coatings for pipes to prevent mollusks from clinging.

"But we must learn more about these creatures," Wood says. "They are too small for screens.

"Of course if water treatment plants were near the sources, there'd be no problem. They don't go through the usual treatment works. But we can't put treatment plants everywhere.

"In Turkey they're usually about 40 kilometers away from the intake. It's like New York, where all the raw water is brought down a long pipeline and treated near town." *David Alan Ehrlich*

NEW ZEALAND

Nuclear age begins; long pull ahead

Mountainous New Zealand now produces 84 percent of its electricity by water power, the rest from fossil fuel. But the demands projected for the future far outstrip these sources, so the islands are going nuclear.

Within 10 years, for example, the power demands of the city of Auckland alone will equal the present needs of the whole country.

So New Zealand plans to begin nuclear energy generation with a station tentatively sited in the Hauraki Gulf area about 1977. E. B. Mackenzie, general manager of the New Zealand Electricity Department, recently completed a world trip investigating the advantages of nuclear power.

The type of reactor which appears most suitable for local conditions is a Canadian design using unenriched uranium as fuel and heavy water for the moderator, he reports.

This combination permits fuel manufacture procedures simple enough to be carried out in New Zealand. It also allows the use of a low-cost fuel which does not need to be treated after irradiation, thus avoiding transport to a treatment plant.

Besides these advantages, Mackenzie says, this type of reactor is economical, when designed to generate in the vicinity of 250 megawatts. Since New Zealand's first nuclear station may contain four machines of this size, the cost of fuel at a 70 percent load factor would be $11.2 million a year in overseas funds for an enriched fuel.

The unenriched fuel, on the other hand, would cost $8.4 million a year, half of which would be spent in New Zealand during its manufacture.

While the capital cost of this type of reactor may be higher than an enriched-fuel machine, when its whole life is considered the fuel costs become the paramount concern.

As well as having these immediate advantages, this reactor produces, as (*see p. 475*)