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By JANE E. BRODY

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Studies of U.S. Drinking Water to Focus on Chemical and Mineral Contaminants

By JANE E. BRODY

For more than half a century, making water safe for drinking has consisted primarily of controlling a variety of disease-producing bacteria that can cause epidemics if they contaminate public water supplies.

Now, however, with such organisms fairly well under control, attention has turned to a long list of potentially dangerous chemicals and minerals that are finding their way into the drinking water of millions of Americans. In fact, the very method used for controlling bacteria — chlorination — appears to contaminate drinking water with chemicals that could be hazardous to health.

Many of the substances being found in water supplies around the country are known or suspected cancer-causing agents; some may cause birth defects; others may act as insidious poisons affecting the heart, liver, kidneys or other organs. Since these substances probably would not produce any discernible health effects until decades

after exposure to them began, any "epidemics" they may cause could easily go undetected.

The presence of these contaminants reflects the increasing complexity of our society, permeated as it is with a wide array of industrial and agricultural chemicals and manufactured materials that can seep, often undetected, into public and private water supplies. The very pipes through which most water supplies flow may be a source of contamination with dangerous substances.

Potential drinking water contaminants under study by Government, university and industrial scientists include such known hazards as asbestos, pesticides, nitrates, arsenic, mercury, and lead. Two new studies of municipal drinking waters just released by the Environmental Protection Agency added to the list 60-odd organic chemicals, including chloroform, carbon tetrachloride and other known or suspected cancer-causing agents.

Several of these chemicals are

apparently formed during chlorination in a reaction of chlorine with organic chemicals that are already contaminating the water.

In response to these findings, Russell E. Train, administrator of the environmental agency, said that he was ordering an immediate nationwide study to determine the concentration and potential effects of certain organic chemicals in drinking water.

Problems With Lead

But the problem of chemical and mineral contamination of drinking water is hardly a new issue. One theory of the decline and fall of Rome holds that the Romans may have been suffering from chronic lead poisoning from their lead-lined water pipes. Lead poisoning from water was not unusual in this century. A few old cities, including Boston, still have lead service pipes in water systems that serve millions of Americans.

The replacements for lead pipes have also been seen as creating possible hazards. Gal-

vanized pipe — iron covered with a protective layer of zinc — contains a contaminant, cadmium, which can be leached into the water. Cadmium, as well as other inorganic chemicals, is now under study by the National Heart and Lung Institute and others as a possible cause of heart disease.

Dr. Gordon Robeck, director of the E.P.A.'s National Environmental Research Center in Cincinnati, said, "We are trying to find out how inorganic chemicals increase in quantity as they are pumped through metal, plastic and lead pipes, where and why it's happening and how to engineer our way out of the problem."

Asbestos Cement Pipes

A substitute for iron, asbestos cement pipe, has also come under suspicion. Over 200,000 miles of asbestos-containing pipe carry water to American consumers, and preliminary studies by the largest manufacturer of this pipe, the Johns-Manville Company, indicate that small amounts of the can-

cer-causing mineral may enter the water from the pipe.

Also, substitutes for asbestos cement, polyvinyl chloride and other plastic pipes, are being studied to see how much of various chemicals—including the cancer-causing vinyl chloride and toxic plasticizers—may enter the water that flows through them.

Leaching from water pipes is probably far less serious a problem, however, than leaching of hazardous chemicals from the general environment—from fields sprayed with insecticides and herbicides and treated with nitrate fertilizers that seep into ground water and run off into waterways, from industrial wastes dumped into the waterways that eventually become the sources of drinking water.

In various studies, potentially dangerous levels of such chemicals—including arsenic, mercury, and nitrates—have been found in drinking water.

All told, though, relatively little is known about how much of which chemicals are in the

nation's 40,000 community water supplies, and even less is known about what risk these levels may present to human health. Studies by E.P.A. and the scientists it sponsors are seeking answers to such questions, although some environmentalists have called the \$5-million a year now devoted to this effort a "piddling" amount.

Dr. Robeck is optimistic that once all the facts are in, particular ways will be found to control those substances that appear to be public health problems. Among possible approaches he suggested were changing the acidity or the hardness of the water to inhibit leaching from pipes, using methods other than chlorination for disinfection, and passing water supplies through activated carbon filters to remove organic contaminants.

Many such inexpensive techniques are already available and have been promoted by the environmental agency for years, to no avail. Currently, the agency can do little to enforce its recommendations,