

DRINKING water throughout the United States is contaminated with trace amounts of organic chemicals, some of which are suspected carcinogens, according to a survey of drinking-water quality in 79 cities. The survey, carried out by the Environmental Protection Agency (EPA), indicates in particular that chloroform is an almost universal contaminant—it was found in samples of drinking water from all 79 cities, in amounts ranging from 'barely detectable' to 311 parts per billion.

Moreover, a more intensive survey of drinking water in five cities—Miami, Seattle, Ottumwa, Philadelphia and Cincinnati—has turned up evidence of a wide range of chemicals in the water supply. Thirty-five different organic chemicals have been detected in Miami's drinking water, for example, and thirty-six have been found in Philadelphia's.

Just how great a hazard to health those contaminants may be is a matter of some debate, but Russell Train, the Administrator of the EPA, said last week that "even at these low levels, the chemicals are a matter of some concern". The National Academy of Sciences is now evaluating the health hazards, and a special advisory committee has been established by the EPA to help determine national standards for drinking-water supplies.

The EPA survey looked specifically for six different chemicals in drinking water—chloroform, bromodichloromethane, dibromochloromethane, 1,2-dichloroethane, bromoform and carbon tetrachloride. Chloroform was the most ubiquitous, but bromodichloromethane and dibromochloromethane were also present in almost all the samples tested.

Officials of the EPA have expressed surprise at the widespread occurrence of the contaminants, and Train summed up the findings thus: "Our basic conclusion... is that the problem of organic chemicals in public water supply systems exists throughout the country."

The survey does not identify the sources of the contaminants but there is strong evidence that the chlorination process, which is the most widely used purification method for drinking water, may itself be responsible. A survey of raw, untreated water showed no trace of the six chemicals in 30 of the cities and extremely low concentrations in the other 49. But at least one of the chemicals was present in every sample of treated water that was tested.

The EPA's findings are likely to rekindle the smouldering debate about whether or not there is a safe level of exposure to carcinogens below which no health hazards are encountered. It should be noted, however, that the

food and drug laws in the United States are based on the assumption that there is no such no-effect level, since they specify that no chemical which raises cancer in test animals can be added to foodstuffs. The extension of that concept to drinking water would, however, prove difficult, for Train noted last week that although several promising processes for water treatment are being developed, "we simply do not have a single proven method for dealing with all aspects of the organics problem".

The immediate effect of the EPA's

## Washington seen

by Colin Norman



findings is likely to be a boom in the market for bottled water, but tests by both the EPA and the Food and Drug Administration have shown in the past that many varieties of bottled water are no 'purer' than tap water.

● The job market for scientists and engineers who have PhD degrees is likely to deteriorate during the next 10 years, according to a survey soon to be released by the National Science Foundation (NSF). According to projections of the likely output from graduate departments of universities in the United States, there will be between 375,000 and 400,000 scientists and engineers with PhDs by 1985, but only about 295,000 are likely to be employed in jobs related to science and engineering.

Those predictions "indicate a trend toward increasing imbalances between supply and utilisation... of science and engineering doctorates, possibly in some outright unemployment", the report states. But it adds that although the magnitude of the unemployment is difficult to project, it "is expected to be relatively small since individuals with doctorate education are likely to find some sort of employment—possibly in non-science and engineering activities or in underutilisation of their training".

The NSF's projections indicate that the widest divergence between supply and demand for PhDs is likely to be found in the social sciences, whereas the life sciences are likely to be almost in balance.

A prime reason for the deteriorating

job market is the fact that there is expected to be a decrease in enrolment in universities and four-year colleges, which are traditionally the biggest employers of science PhDs. Consequently, the projections indicate that a smaller proportion of PhDs will be engaged in academic research and development in 1985, and that as many as 20% will not be involved with science and engineering at all.

In fact, the projections suggest that almost half of all new job openings for PhD scientists and engineers in the next decade will be in activities unrelated to research and development. The report suggests that such a shift "has major educational implications for institutions as well as for students".

● President Ford has at last signed an executive order to set the seal on the ratification by the United States of the Geneva Protocol, which outlaws the first use in war of chemical weapons. The executive order, which establishes a "national policy" under which the United States has renounced the first use of herbicides and riot control agents in war, had been bottled up for almost three months in the Justice Department, and formal ratification of the protocol by the United States was being held up until Ford signed it. The order, in short, allows the Administration to hang on to its belief that herbicides and riot control agents are not strictly covered by the protocol, but the United States has renounced their first use anyway.

● The Energy Research and Development Administration (ERDA) has backed off from a plan to store radioactive waste material from nuclear power plants in temporary above-ground storage facilities, and has decided that the whole matter requires more study. The move, announced last week by ERDA Administrator Dr Robert Seamans, follows widespread criticism of the plan by a number of environmental organisations. Although the temporary storage scheme has not been dropped entirely, ERDA may well move straight to a permanent disposal operation, consisting of burying the wastes deep in a salt mine. A promising site is under study in New Mexico, but it will take many years to carry out tests there. The original idea was to store the waste material in temporary facilities until a permanent disposal site had been found and tested, and ERDA had asked Congress for \$5 million to start constructing the above-ground facilities next year. Seamans said, in a letter to the Joint Committee on Atomic Energy, that no decision would be made until 1976 about how the waste disposal operation should proceed.