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the west ward and those in the west ward to the east, but they continued to receive the same diets. By the end of 1906, among 120 patients eating uncured rice, there had been 34 cases of beriberi and 18 deaths. Among the 123 patients assigned to cured rice, there had been only 2 cases and no deaths, and both cases had been manifested at the time the patients were admitted to the asylum.

—B. MacMahon and T. Pugh, *Epidemiology*

5. In England, which imports most of its sucrose [sugar], records of the last 100 years show a steady increase in per capita consumption of sucrose, from about 20 pounds per year in 1820 to over 100 pounds per year today. Present consumption of sucrose in the United States is about the same. This represents 15 to 20 percent of an individual's caloric requirements. Concomitant with this increased consumption of sucrose has been an almost parallel rise in the prevalence of caries [cavities]. Conversely, surveys in Europe and Japan demonstrated that caries were dramatically reduced during periods of wartime restrictions of sugar, syrup, and all sugar products.

—E. Newburn, "Sugar and Dental Caries: A Review of Human Studies," *Science,* 1982, 217: 418–23.

6. In the newspapers several years ago, there was a story about a doctor in New Jersey who was suspected of—and later tried and acquitted for—murdering a number of patients in a private hospital. Empty vials that had contained curare ("arrow poison") were found in the doctor's locker. The doctor claimed that the curare was used for experiments on dogs, but the man who was supposed to have supplied the dogs denied that he had given or sold any dogs to the doctor. The bodies of the patients, all of whom had been in the hospital for minor operations and who had been in good health otherwise, were exhumed. Sophisticated tests found traces of curare in each of the bodies. On the basis of this evidence, other doctors at the hospital and the authorities insisted that a warrant be issued for the arrest of the suspect.

7. An alarming number of malignant skin cancer cases have been discovered among members of the District of Columbia Police Dept. who were repeatedly exposed to tear gas during the riots and demonstrations of 1968–1971 here.

Dr. Robert F. Dyer, director of the D.C. Police and Firemen's Clinic, said Thursday that one chemical component of tear gas apparently causes cancer.

"Over the past five years I personally have collected a series of 12 patrolmen with malignant melanoma [a form of skin cancer], which in a group of 4,800 men is higher than I would expect," Dyer said.

All 12 officers reported being present at one or more of the many riots and demonstrations quelled with tear gas between 1968 and 1971, he said.

—*Washington Star*

8. Aspirin, taken in large doses by sufferers of arthritis, is being looked at for its effect on the liver.

Gall [the physician conducting the research] said his interest in aspirin and the liver began when a 20-year arthritis sufferer, who had taken aspirin for many years, was found to have high levels of an enzyme in her blood, usually one indicator of hepatitis, a disease of the liver.

When doctors took the woman off aspirin, the high enzyme levels dropped back to normal, Gall said. The test was conducted several times, and each time, the high enzyme levels corresponded to the times when aspirin was taken.

—*Arizona Daily Star*

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9. A federal study of 46 cities has concluded that fluoridating water to prevent tooth decay has no adverse effect on public health.

The study by the Center for Disease Control in Atlanta was undertaken to investigate claims that fluoridation is linked to higher cancer rates.

"There is no evidence to suggest that fluoridation does any harm," Dr. J. David Erickson, who conducted the study, said in an interview.

Erickson studied the causes of death of 922,000 people over three years in 46 American cities—24 of them with fluoridated water and 22 without.

After taking into account differences in race, age, sex, education, and population density between the people in the two groups of cities, Erickson found that there was virtually no difference in the death rates. There were 1,124 deaths per 100,000 persons per year in the cities with fluoridated water and 1,137 in those without.

The death rate from cancer was 195 in cities with fluoride and 197 in the cities without.

—Associated Press

10. In a study at Vipeholm, a mental institution in southern Sweden, 436 adult patients on a nutritionally adequate diet were observed for several years. They were found to develop caries [cavities] at a slow rate. Subsequently, the patients were divided into nine groups to compare the effect of various changes in their carbohydrate intake. Sucrose was included in the diet as toffee, chocolate, or caramel, in bread, or in liquid form. Caries increased significantly when food containing sucrose was ingested between meals. Not only the frequency but the form in which sucrose was ingested was important: sticky or adhesive forms were more cariogenic [cavity-producing] than forms which were rapidly cleared from the mouth. After two years on the test diets, the patients were again placed on the control diet, and the caries activity reverted to the pretest pattern.

—E. Newburn, *Science,* 1982, 217:419

III. CONTROLLED EXPERIMENTS

Careful readers will have noticed that *controlled experiments,* which were mentioned in Chapter 3 in connection with preventing bias, were involved in several of the examples and exercises pertaining to Mill's methods. The use of controlled experiments is closely related to Mill's Joint Method of Agreement and Difference. In a controlled experiment, the investigator selects two groups that are similar to one another, except with respect to the antecedent circumstance believed to be causally related to the condition under investigation.

For example, in a controlled experiment to study the effects of a birth-control hormone on brain development in rats, two groups of 100 laboratory rats might be selected from the quite uniform population of laboratory rats. The two groups would be given the same treatment in all respects, except that the experimental group would be given doses of the birth-control hormone with their food and the control group would not be given that hormone. If retarded brain development (or a higher rate of retarded brain development) occurs after this treatment in the experimental group but fails to occur in the control group, then this evidence would provide support for the claim that the birth-control hormone is the cause of the retardation in the experimental group.

In addition, since the experimental group of rats presumably is a representative sample of laboratory rats, what happens to them in the experiment provides a basis for generalizing to what would happen to any laboratory rats that