Snippets from the Past: Seventy Years Ago in the Journal

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What will epidemiologists in the year 2067 think as they leaf through the two volumes of the Journal published in 1997? Will they find any topics of current interest? As we look back to 1927, we note that the 54 papers in volume 7 included quite a few that are of little interest to most of today’s epidemiologists. For example, nine dealt with parasitology (e.g., “The Viability of Cysts of Giardia lamblia from Man in the Stomach of the Rat” (1)), six with mosquito habits and taxonomy, and six with nasal infections of rabbits (e.g., “Bacteria Occurring in Nasal Cultures from Rabbits and Their Relation to Snuffles and Pneumonia” (2)). While a good case could be made for the value of all 54 articles in the development of public health science, there are several that seem more relevant to recent problems.

Although smallpox has now been eradicated, it was still a serious concern in the United States when volume 7 was published. In 1920, 498 smallpox deaths occurred in the Death Registration Area, and in California alone, 4,486 cases were reported (3). Although most of the cases were mild in nature, virulent outbreaks occurred from time to time. Assurance was needed that vaccines were potent. Back in 1902, Congress had made the regulation of viruses, serums, and toxins a responsibility of the US Public Health Service, then part of the US Treasury Department. Testing of these products was done in its Hygienic Laboratory (4). In 1927, John N. Force, along with James Leake, who was to become a leading authority on smallpox, developed an improved test of the potency of smallpox vaccine (5), a test based on the work of Calmette and Guerin (6), French scientists who later became famous for their tuberculosis vaccine. In this volume of the Journal, Force and Eddie (7) reported on the use of the new test to evaluate smallpox vaccines available commercially in San Francisco, California. Smallpox vaccine was supplied in small capillary tubes and had to be kept on ice to protect its potency. Vaccine from 16 different retail and wholesale dealers was tested. Supplies purchased directly from wholesalers were more potent on average than those obtained from retail sources. Of a total of 60 capillary tubes of vaccine tested, 28 were unsatisfactory, a result that largely explains the many false immune reactions obtained at the time. (A person who did not react to vaccination was considered to be immune.) However, the test, too, had its problems. Rabbits varied in their reaction to the vaccine, as did various sites of inoculation. As a consequence, evaluation of a vaccine required the use of a control vaccine, more than one rabbit, and comparable sites of inoculation for the test and control vaccines.

Polio was also a disease of major concern in 1927. An unusually abrupt epidemic had occurred in Broadstairs, England, in which 61 of 71 cases occurred within a 15-day period (8). The epidemic was also unusual in that it was limited to the village of Broadstairs and largely affected somewhat isolated components of the community and relatively well-to-do persons. This marked localization in time, place, and person suggested that milk was a possible source of infection. (Poor persons at that time and place rarely drank milk.) The source was confirmed by finding that the only common exposure was milk from one particular dealer and only from the unpasteurized portion of his supply.

“Some twenty years ago a group of public-spirited citizens, appalled by the heavy toll claimed each year by typhoid fever in a large American city, held a public exhibit. Silhouettes of every man, woman, and child who had died of the disease during the previous year—more than 500 in all—were cut out of black paper and posted on walls cleared for that purpose in the city art gallery” (9, p. 762). Thus did Persis Putnam, a recent Doctor of Science graduate, introduce her paper on trends in typhoid fever mortality, which had to be limited to the original Death Registration Area, which in 1900 consisted of only 10 states and the District of Columbia, and also to a few large cities for which mortality statistics were available (9). She found that the sharp dip at the turn of the century in the downward mortality trend coincided with puri-
fication of municipal water supplies. There was a worrisome finding, however. In the more recent years, considerable variability was noted in the rates. Whether this was the result of irregularly occurring epidemics that affected rates based on relatively small numbers or whether it was a harbinger of a future slowing of the rate of decline could not be decided. Discussing the results of other investigators, Putnam noted that typhoid mortality increased with decreasing density of population. Consequently, it was clear that the more rural areas still needed pure water supplies and improved sanitation if typhoid fever was to be eliminated to the point where surveillance of carriers would become the principal method of control.

Putnam later became a statistician with the Milbank Foundation. Among other achievements, she conducted a pioneering community study of tuberculosis in Cattaraugus County, New York. In this volume of the Journal, she published the results of her doctoral dissertation entitled, “Sex Differences in Pulmonary Tuberculosis Deaths” (10). This was an attempt to disentangle the biologic and environmental effects on tuberculosis during the period 1870–1920 in the Death Registration Area of the United States. During this period, there was a general decline in death rates for both sexes and at all ages. This decline was attributed to improvements in general hygiene and socioeconomic status. The fact that female deaths exceeded male deaths during the entire period was felt to be due to biologic differences between the sexes, since the ratio of female to male deaths did not vary with environmental changes. An excess among older men that began in 1890, on the other hand, was considered likely to be the result of increasing environmental hazards for this age-sex group.

Rheumatic fever, like tuberculosis, is a disease whose decline began before the introduction of antibiotics. It gradually became relatively uncommon, and recently has shown signs of resurgence (11). Reginald Atwater’s review in this volume of the Journal was an update for the United States of two “exhaustive treatises” on the epidemiology of rheumatic fever (12), namely those by August Hirsch in 1886 (13) and Sir Arthur Newsholme in 1895 (14). Noting the similarities in occurrence by time, place, and person between rheumatic fever and scarlet fever, chorea, erysipelas, septicemia, and puerperal fever, Atwater concluded that “acute rheumatic fever appears to be related to the family of streptococcal infections . . .” (12, p. 368).

The paper by Fred Soper (15), an early proponent of disease elimination, was a response to a request by S. T. Darling (16). To buttress his theory that the parasites people harbored would provide clues to their geographic origins, Darling asked Soper to conduct a hookworm survey among an isolated tribe of Indians living in the remote Gran Chaco area of Paraguay. Soper found the population to be heavily parasitized with hookworms, almost all of which were Ancylostoma duodenale (15). The few Necator americanus worms were attributed to rare introductions from outside areas where Necator had been the dominant species ever since its introduction from Africa as a consequence of the slave trade. Ancylostoma worms could have come from Europe, but other evidence suggested a much earlier introduction, probably from Asia or the western Pacific. If they were from Asia via the Behring Strait, the migration must have been amazingly rapid, since hookworms do not spread from host to host in cold climates, or else the climate there must have been warm, which seems unlikely in view of the extent of glaciation in North America. The hookworms thus seem to support Thor Heyerdahl’s theory of migration to South America from the western Pacific.

Batchelor’s paper, “The Relative Toxicity of Benzol and Its Higher Homologues” (17), presents findings of a study done for the Committee on Benzol of the National Safety Council. The material was also used for Batchelor’s Doctor of Public Health thesis. In this paper, he pointed out that the hazards associated with exposure to benzol (benzene) were already well known but that knowledge of the relative toxicity of benzene, toluene (methylbenzene), and xylene (ethylbenzene) was scanty and unclear. He used intraperitoneal injections of these three solvents to mimic catastrophic exposures, subcutaneous injections of the solvents in olive oil to represent more chronic exposures, and inhalation for 18–20 hours a day to simulate acute, moderate, and chronic exposures. It is presumed that he used rats. Only once is that word used in place of “animals,” and that single use is in the section on inhalation experiments. At moderate air concentrations of approximately 1,000 parts per million (resembling “possible industrial conditions”), benzene caused moderate weight loss, moderate neurotoxic symptoms, and marked reduction in white blood cells. At half this concentration, symptoms and weight loss were almost absent, but white blood cell reduction was even more marked. Toluene exposures were appreciably less toxic than was benzene at both concentrations, while xylene showed no demonstrable symptoms or weight loss and almost no reduction in white blood cells. The conclusions were obvious: Toluene and xylene were far safer than the very dangerous benzene.
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REFERENCES