

of artificial fever or the induction of anaphylactic shock, increase the incidence of cholesterol lesions in the aorta. Evidently, the mechanism involved in the production of atherosclerosis in the rabbit by cholesterol feeding is not a simple one.

As a result of the earlier work on experimental atherosclerosis in this species, some investigators have placed emphasis on the importance of cholesterol as an etiologic factor in human atherosclerosis. Indeed, some believe that hypercholesterolemia is a primary etiologic factor in spontaneous atherosclerosis of man. However, a number of attempts to demonstrate such a relationship in patients have not yielded conclusive results, partly because of the extremely wide variation in serum cholesterol found in normal persons and partly because of the fact that during life the disease is recognized only after the process has advanced so far that secondary functional disturbances, which themselves alter the serum cholesterol level, vitiate the results. Obviously, it is necessary to make the comparison during the early stages of the disease when the deposits are in process of formation. However, this approach to the question is complicated by the fact that patients in the early stage of atherosclerosis are rarely seen, since symptoms which would cause them to consult a physician usually do not develop then. Also the diagnosis of the disease at that stage is exceedingly difficult. In fact, the degree of atherosclerosis can be established with certainty only by a direct examination of the vessels, a procedure necessarily limited to necropsy material.

Recently⁴ this problem has been approached in a way that appears to be free from the objections cited. A comparison of the concentration of cholesterol in the blood serum with the lipid content of the intima of the aorta was made on necropsy material taken from persons who had died suddenly, in most instances as a result of automobile accidents. A total of 123 cases, some with varying degrees of atherosclerosis, were selected for study; no material was taken from subjects in whom pathologic processes other than atherosclerosis were found. The values obtained gave no indication whatever of a correlation between the concentration of cholesterol in the serum and the lipid content of the aorta, even in subjects with a marked degree of atherosclerosis. Indeed, the average and the variations in the amounts of cholesterol in the serum were practically identical with those usually found in normal healthy subjects. The foregoing results, both in rabbits with experimental atherosclerosis and in man with varying degrees of spontaneous atherosclerosis, clearly indicate that factors other than the concentration of cholesterol in the blood must be involved as etiologic agents in the production of the lesions characteristic of this disease.

4. Landé, K. E., and Sperry, W. M.: Human Atherosclerosis in Relation to the Cholesterol Content of the Blood Serum, *Arch. Path.* 22: 301 (Sept.) 1936.

EXPERIMENTAL EPIDEMIOLOGY

The study of experimental epidemics recently reported by Greenwood, Hill, Topley and Wilson¹ involves observations extending over some fifteen years and the use of between 100,000 and 200,000 mice. Their methods were adequately controlled and ably presented. In fact, so carefully was their technic developed that it usually proved possible to maintain herds of mice for months or years without the accidental introduction of any extraneous infection.

In one series of observations, six different epidemics of pasteurellosis were under simultaneous observation. In the long continued epidemics under these experimental conditions, no tendency for periods of high or low mortality to recur at definite seasons of the year was noted. Uncontaminated animals were introduced to many of their herds of infected mice at stated intervals. The great majority of such mice were infected shortly after entrance, so that the reacting system at any moment contained a relatively small proportion of animals presenting a virgin soil. After the first wave of disease and death that always follows the aggregation of an infected herd, the epidemics settled into a state of unstable equilibrium. With a small number of daily uninfected immigrants, the mortality curves tended to show relatively wide and relatively regular fluctuations.

The observations on ectromelia—a virus disease of mice—gave encouraging results, which accorded with the general experience that antiviral immunity is as a rule more effective than antibacterial immunity. In this disease, even under the severest conditions of prolonged exposure, a relatively high degree of protection could be attained.

The general conclusions resulting from this important study are carefully restricted to mice. The authors were careful to maintain a cautious attitude toward any interpretation applied to problems of human epidemiology. The general character of the epidemic process, as revealed in herds of mice living in close and continuous contact and subject to the continuous or intermittent migration of susceptibles, reveals that the disease, under these circumstances, will never normally die out. The form of the mortality curve depends, in the main, on the rate of immigration. The average death rate over any long period is probably not highly correlated with the immigration rate. The condition of equilibrium, though it may be continued for long periods, is fundamentally unstable and may be seriously disturbed by some extrinsic or intrinsic factor. In epidemics initiated by virulent and infective strains of *Bacterium aertrycke*, *Pasteurella muriseptica* or the virus of ectromelia, the rate of mortality during the early days of herd life is high. At later cage ages the level of mortality decreases. The expectation of

1. Greenwood, Major; Hill, A. B.; Topley, W. W. C., and Wilson, J.: *Experimental Epidemiology*; Medical Research Council Special Report Series, No. 209, London, His Majesty's Stationery Office, 1936.

life of the surviving mice rises continuously after the twentieth to thirtieth day of cage life, which, while greatly in excess of that of new entrants, never reaches the limited expectation of life of normal mice living in the same environment but not exposed to contact with an infective disease. It seems certain that selection, both by death of the more susceptible and by natural immunization, plays a part in the increased resistance of surviving mice. No evidence is obtainable that any change in the standard diet exerts a favorable influence on the course of mortality, although a known effect of A avitaminosis in lowering the resistance of animals cannot be denied. The experiments concerning the influence of bacteriophage on mouse typhoid yielded entirely negative results.

The carefully developed technic, the close control and the conservatism in interpreting their results in the light of human epidemics are especially commendable in this important contribution. It is a well balanced, stimulating study.

Current Comment

"HEALTH ADVICE SHOULD BE AS FREE AS AIR AND WATER"

The title here quoted appears as that of an editorial by Bernarr Macfadden in his magazine called *Liberty*. Our old friend who used to exalt muscles is now worried because people let money creep into their affairs. He says "we have allowed business to creep into everything." He worries because there is business in religion and even romance is often commercialized. "There are women," he says, "who go into court and sue for breach of promise." He even mentions the fact that if a woman loses her husband as a result of romantic attraction from some other source there is often a suit for money damages! Now those familiar with newspaper records of old "bodylove" Macfadden's career in the courts devoted to marital upsets will realize that thus far he has been talking right out of his own experience. But he turns his attention next to the matter of health and disease and he insists that "the healers, whether osteopaths, chiropractors, or whatever they be—should be paid by the government." He doesn't like competition between various systems of doctoring. He thinks that with competition removed "all would work together for the purpose of making the patient healthy and strong." He says that "for more than fifty years" he has "been teaching health building and many of the simple procedures that have proved invaluable are not recognized by the public. People everywhere should have the advantage of these invaluable truths." O. K., Mr. Bernarr Macfadden! Why not use part of the magnificent Macfadden fortune, erected by the sale of physical culture hokum to the suckers who purchased the Macfadden courses, and the "dumbbells" who purchased the dumb-bells and the nature cure addicts who purchased the nostrums—why not use that now to give away these marvelous truths and procedures to all the people? If health advice—

even the kind of bad advice you have been selling—should be as free as air and water, why don't you give them yours instead of selling it? Maybe, after all, Mr. Macfadden, muscle and not mind or morals is your special field!

PARALYTIC AND PREPARALYTIC POLIOMYELITIS

According to a note in *Public Health Reports*,¹ two states have already instituted a classification for reporting cases of poliomyelitis into paralytic and preparalytic or nonparalytic types. The Department of Public Health of Massachusetts placed this classification in effect at the beginning of the present year. Effective October 20, a similar division was to be reported in the state of Tennessee. The number of cases of preparalytic poliomyelitis which are included in the total reported for that disease will be stated in each weekly report. These are nonfatal cases of poliomyelitis that have not shown definite muscular weakness. Because of the variability and uncertainty in recognition of nonparalytic poliomyelitis, it is believed that for recording and comparing intensity of spread of poliomyelitis only the paralytic cases should be counted when such distinction is possible. Any notable number of nonparalytic cases will be reported separately. There is no intention in this procedure to minimize the importance of the preparalytic or nonparalytic cases from the point of view of the spread of the disease or the necessity for medical care.

POLYAVITAMINOSIS AND ASULFUROSIS

The synergistic action of vitamins A and B has been recognized for a considerable period. A disease has been described which is distinct from pellagra and beriberi, is due to A and B avitaminosis and is characterized by lesions of the mucous membranes and skin, associated with or followed by disorders of the nervous system. Wright,¹ who has recently discussed the clinical and pathogenic aspects of this disorder, points out that the distribution of the epithelial lesions, which are the earliest evidence of the disease, is important. The tongue, lips, angles of the mouth, scrotum or vulva, and conjunctiva are the sites of earliest predilection. The reason for this localization, he believes, is that these are the areas richest in certain special cutaneous sense organs called end-bulbs, which are also found in the sheaths of nerve trunks, synovial membranes and intestinal mucosa. These end-bulbs are sense organs, composed of modified epithelial cells, in which the delicate terminations of the nerve filaments end. Observations on prisoners in the Freetown Gaol in Sierra Leone indicate that a diet containing an excess of starches tends to produce evidence of this clinical syndrome. Furthermore, prompt cure could be obtained by increasing either of the vitamins or the two together. Because of the evidence that lack of sulfur also plays a part in the deficiency, it was decided to use organic sulfur as a therapeutic agent in the treatment of "A and B avitaminosis disease" in Sierra Leone. Response of some of the patients to sulfur therapy was prompt

1. Paralytic and Nonparalytic (Preparalytic) Poliomyelitis, *Pub. Health Rep.* 51:1556 (Nov. 6) 1936.

1. Wright, E. J.: Polyavitaminosis and Asulfurosis, *Brit. M. J.* 2:707 (Oct. 10) 1936.