Koch, Pavlov, Ehrlich, and Freud. Besides bringing together those who have already won renown by their work the Society has also sponsored useful co-operative studies of its own, as may be seen in the eight reports of the Malaria Committee published between 1900 and 1903, the four reports of the Sleeping Sickness Commissions between 1902 and 1911, and similar work on Malta fever, cataract, kala-azar, filariasis and nephritis, and cholera. A bequest in 1924 enabled the Society to establish its own medical research fund. During the coming week there will be much pride in a great tradition, but the Society's motto, *Nullius in Verba*, is there to remind its Fellows that while tradition may adorn and enrich our lives it may not command. Nor must it ever hinder "those new adventures of the mind in which the Fellowship is so intimately concerned." The Royal Society of London for Improving Natural Knowledge, to give it its full and official title, has a tradition which is unequalled. It is the oldest surviving scientific society in the world, and its official journal, the *Philosophical Transactions*, has by far the longest history among current scientific periodicals. And in the *Transactions* the continuity of the history of science is made manifest.

LIVE POLIOVIRUS VACCINES

The quest for the prevention of poliomyelitis and the control of poliovirus infection has entered a new phase with the use of live vaccines. The report[1] in this journal of the Moscow conference on this subject described the astonishing progress made in the U.S.S.R., where more than 50 million persons have received vaccines prepared from Dr. A. B. Sabin's strains. The safety of the vaccines was upheld, the degree of protection as judged by antibody formation in the population was satisfactory, and poliomyelitis has receded from the areas where the vaccines were used. Short-term assessment of the efficacy of the vaccine seemed to suggest that these vaccines promise eventual "eradication" of the disease.

These remarkable results and others reported from other countries were considered by members attending the Second International Conference on Live Poliovirus Vaccines convened by W.H.O. and the Pan American Health Organization and held in Washington last month. New data concerning laboratory studies of the viruses used as seed for the vaccines, on the serological effect of the vaccines in their human hosts, and on the properties of the viruses excreted by the latter also received detailed consideration. The summary report issued at the close of the conference shows that the need for sober judgment and for scientific common sense is just as great now as when the method of immunization by live poliovirus vaccine was introduced in 1950 by Dr. Hilary Koprowski, whose account of the historical aspects of the development of live virus vaccine in poliomyelitis was published in this journal last week.

Further study of the virus strains used to make the vaccines has confirmed previous findings on their attenuated virulence for the nervous system of the monkey and also the differing order of neurovirulence possessed by the master strains respectively sponsored by A. B. Sabin, H. R. Cox, and H. Koprowski. The proposed "markers," or cultural and other *in vitro* characters of the viruses, exhibit, however, a disappointing degree of correlation with neurovirulence, so that monkey tests still appear to be essential for study of the vaccine strains and of the progeny excreted from the alimentary tracts of the infected human hosts and their contacts. As Dr. Herald Cox and his team point out in their article at p. 188 of the *Journal* this week, a big difficulty confronting investigators is how to predict the behaviour of a virus in a human population from what is known about its behaviour in the laboratory. A bothersome finding has been the discovery of a virus, presumably simian in origin, which is present in many vaccines, including seed strains, and demonstrable only in kidney cultures of monkeys of the species *Cercopithecus aethiops* (vervet or grivet monkeys). The extraordinary difficulty of excluding extraneous agents from live vaccines is thus again demonstrated.

New field trials with all three groups of vaccines were reported at the Washington conference by 24 groups of workers from 13 countries. Again, small-scale trials on fewer than 500 persons proved to be the best from the standpoint of strict surveillance. Nevertheless in nearly all the trials no harmful effects were encountered in either those receiving vaccine or their contacts, and the safety of the vaccines continued to be upheld. However, when such vaccines are used, as they have been, in the face of epidemics or of minor prevalences of poliomyelitis, peculiar difficulties arise in the determination of the cause of the occasional cases of poliomyelitis which arise in those to whom the vaccine is given or their close contacts. In such circumstances it cannot be said that the vaccines can be exonerated from blame either for failure to prevent natural infection or for themselves causing harmful effects. The most exacting of laboratory tests and the strictest possible surveillance

[1] *Brit. med. J.*, 1960, **1**, 1729.
[2] Koprowski, H., ibid., 1960, **2**, 85.

are clearly necessary. In any case some method of precise identification of the vaccine strains and also of their progeny is urgently needed. Certain new "markers" were described at the conference, and it may be hoped that they will prove better tools for "finger-printing" poliovirus than those studied so far. Meanwhile many will disagree with the practice adopted in the U.S.S.R. of assuming that cases of poliomyelitis developing within 21 days after feeding the vaccines are simply examples of infection with wild viruses before the vaccine virus has had time to create immunity.

Work reported at the Washington conference on the degree of spread of excreted viruses from vaccinated persons suggests that this is indeed limited. Though this itself limits the likelihood of the progeny of the vaccine viruses showing increased virulence it may also mean that the degree of immunization of the community from a single mass-feeding is deceptively small. Perhaps this is the reason for the disappointing experiences in Nicaragua and Costa Rica.

In Nicaragua, tens of thousands of doses of vaccine of all three types of poliovirus were given to children in the district of Managua before May, 1959, and one year after the occurrence of a Type 2 epidemic in the area. Yet a considerable incidence of Type 1 poliomyelitis occurred between November, 1959, and May, 1960, though those who had received oral vaccines some months before experienced a lower attack-rate than the unvaccinated. In Costa Rica similarly, a mass campaign of immunization with mono- and trivalent vaccine in 1959 was followed in the next twelve months by a disappointingly large number of cases of suspected poliomyelitis, some of which were certainly due to infection by polioviruses.

These experiences contrast with the low incidence of poliomyelitis reported thus far from areas in Europe including Czechoslovakia and Poland, as well as in the U.S.S.R., where mass immunization with oral vaccines was effected in 1959 and early in 1960. The conference was undoubtedly wise in concluding that in so variable a disease as poliomyelitis definite conclusions concerning the efficacy of live virus vaccines cannot be reached on short periods of observation.

Perhaps the difficulties already known to exist in establishing infection with the vaccine virus when the host is already infected with another enterovirus and the relatively low incidence of contact infections have been the chief reasons for the adoption of the policy of re-feeding oral vaccines to those to whom they have already been given in the U.S.S.R. Dr. Sabin's own study at Toluca, Mexico, has shown that repeated mass feeding can be used to establish infection with poliovirus even when other enteroviruses exist in the community at the time. But he has also shown that the carrier rate for polioviruses of all types in such a community quickly falls to very much lower levels than before the mass use of the vaccines. The latter may block natural transmission of wild poliovirus for a time, but the data from Mexico and also from Czechoslovakia suggest that vaccine viruses speedily disappear from the community. The duration of the herd immunity which they induce is a matter which cannot at present be assessed. With all these considerations in mind, the report of the W.H.O. Expert Committee on Poliomyelitis, which met in Washington after the conference, will be awaited with great interest.

ANEURIN BEVAN

Of all the long line of Ministers of Health since the first appointment of Dr. (subsequently Viscount) Addison in 1919, Mr. Bevan stands out towering above the rest in his impact upon the medical profession, not only because he put the final stone upon a building the foundations of which had been laid by others, but also because he attracted in the medical profession, as he did in political life, profound admiration on the one side and the sharpest antagonism on the other. His name is indissolubly connected with the National Health Service, and the impression is gained from the numerous accounts of his career and leading articles in the national press that he was its sole architect. This claim needs to be put into perspective.

The National Health Service had its roots in the National Insurance Acts introduced by another great Welsh politician, David Lloyd George, in 1911, when the controversy between the medical profession and the State was far more acrid than it was over the passing of the two National Health Service Acts in 1946 and 1947 and their coming into operation on July 5, 1948. The historian who will be able to view these events dispassionately in the future may come to the conclusion that after 1911 the principal architect of the National Health Service was the medical profession itself. Between the two wars the policy of the British Medical Association was to extend National Health Insurance in two directions —one to include the dependants of the insured, and the other to include in medical benefits consultant and specialist services. Then in the dark and forbidding days of the second world war the British Medical Association set up a planning commission to study the future development of the medical services in

[1] *Brit. med. J.*, 1942, **1**, 743.