IMMUNITY REACTION FOLLOWING VACCINATION AGAINST SMALLPOX AND POST-VACCINAL ENCEPHALITIS

The Permanent Committee of the Office international d'Hygiène publique at its October 1946 session decided to pass to the Interim Commission of the World Health Organization a number of urgent questions which figured on its agenda. Among these questions were "the immunity reaction after vaccination against smallpox" and "post-vaccinal encephalitis".

These two subjects are of first importance: the former because of the question of the meaning to be attached to the terms laid down in the International Sanitary Convention of 21 June 1926, as modified by that of 1944, for registration of the result of Jennerian vaccinations and revaccinations in the International Certificate of smallpox vaccination; the latter, because of the frequency and the gravity, especially in certain countries and at certain ages, of post-vaccinal encephalitis.

These questions were examined by the Committee on Epidemiology and Quarantine of the Interim Commission of the World Health Organization during its third and fourth sessions, and were dealt with in a number of papers. Although the subjects are still being studied, it seems useful to publish in the Bulletin of the WHO the following documents relating to them.

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1 See Procès-verbaux de la session d'octobre 1946 du Comité permanent de l'Office international d'Hygiène publique, p. 81.

2 Since the fourth session, the new designation of this Committee is "Committee on Technical Questions".
NOTE ON THE "IMMUNITY REACTION"
FOLLOWING VACCINATION AGAINST SMALLPOX

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In the paper on this subject presented by Dr. Stock to the Permanent Committee of the Office international d'Hygiène publique, at its October 1946 session, the conclusion was reached that "it proved impossible to develop completely objective criteria of the immune reaction". This conclusion was based on the fact that, from observations made on 1,364 UNRRA personnel vaccinated each with one drop of heated and one of active lymph and examined on the third and eighth days thereafter, very considerable difficulty was experienced in deciding what constituted an immune reaction; indeed without the help of the control insertion of killed lymph it would have been virtually impossible.

In the above series of tests carried out at the Wellcome Research Institution, London, it was found that in susceptible persons the killed lymph produced a marked local reaction which is quite unrelated to the level of protection as shown by the subsequent development of accelerated reactions or primary vaccinias.

To the whole subject of "immune or immediate reaction" the following further observations are germane:

"Immune or immediate reaction" is by many regarded as evidence of a high degree of immunity to smallpox and reaches its maximum within 72 hours.

But of 19 proved cases of smallpox vaccinated by Illingsworth and Oliver one to fourteen days after the appearance of the rash, 16 showed the "immune reaction" in 48 hours, in comparison with control uninoculated scratches.

Again the term "immune reaction" is not accepted by Marsden, who regards it as a misnomer; in his view it indicates only sensitization to lymph and not immunity—although it is often given by immune subjects. In Marsden's words: "Those who

References:

2 Illingsworth and Oliver (1944) Lancet, 2, 681.
4 Marsden (1944) Lancet, 2, 805.
show it should be vaccinated again and again; otherwise some of them will die of smallpox as soon as they are exposed to it.”

Further in regard to sensitivity and immunity to vaccine virus, CRAIGIE ¹ states: “Elementary bodies of vaccinia washed and killed by formalin elicit an ‘early reaction’ in individuals previously vaccinated, but no skin reaction in those not previously vaccinated. This reaction is a specific response to the virus antigen in those sensitized by previous vaccination. Sensitivity and immunity to vaccine virus are not necessarily related except in so far as they have a common origin in previous vaccination.”

Should later consensus prove to be that “immune reaction” is no guarantee of immunity to smallpox, then obviously there could be no justification for the retention of the term on International Certificates of Vaccination such as are recommended by the International Sanitary Conventions of 1944. And in this connexion also the demand of the present International Certificate that a statement of “no reaction” will not be accepted seems—as already pointed out in the paper read by Dr. Stock—difficult to justify in view of the fact that there are individuals who fail to “take”, even on repeated inoculation, and are yet immune.

Reference:
¹ CRAIGIE (1933) Canad. publ. Hlth. J. 24, 72.