

THE CONTROL OF RABIES

A rabid wolf which attacked the village of Sahané in Iran at 1 a.m. on August 22, 1954, did its best to provide clinical material for which the world had waited for several years. A vivid account of events during that night is given by M. Baltazard and M. Bahmanyar¹ of the Institut Pasteur de l'Iran, Tehran. The wolf, which was of exceptional size, first attacked farm guards sleeping in nearby orchards and vineyards; then, penetrating the village itself, it found victims in a blind beggar sleeping in the street and in transport drivers and others sleeping in the open (it was a hot night), as well as people in shops and houses, a gendarme, a dog, and six cows. When this reign of terror had lasted for five hours, a man on horseback was able to kill the exhausted wolf with a farm implement. Sahané is a small place with a filling station on a wild part of the main road from Tehran to Bagdad and Damascus: it was therefore mercifully easy to convey the 29 human victims to Tehran, and most of them arrived there on the following day.

The significance of this event is that it provided for the first time an adequate number of comparable cases to test the value of hyperimmune serum in addition to vaccine in the post-infection prophylaxis of human rabies. Iran had been chosen by the World Health Organization as the venue of this trial because attacks by wolves on human beings are not uncommon and the mortality from rabies after wolf bites is exceptionally high owing to frequent involvement of the head. Photographs of fearful mutilations of the face and scalp illustrate a previous paper by M. Baltazard and M. Ghodssi,² who record that the mortality from rabies after wolf bites, which is about 60% in untreated victims, has been reduced at Tehran by treatment with vaccine alone to 18.5% for all cases and to 28% for those bitten on the head. The cases from Sahané comprised 11 bitten only on the limbs or trunk, and all of them recovered whether given vaccine only or serum in addition. Of 18 with head

wounds, 5 were given vaccine only for 21 days, and 3 died: of 13 also given serum only one died, and he was in a group receiving only a single dose of serum. Five were given serum on the fifth as well as the first day and all recovered. The remaining patient was a boy of 6 with a crushed skull and torn dura mater and signs of meningitis on admission; he had, as the authors remark, received a direct intracranial inoculation. His treatment consisted of penicillin, six doses of serum, and a course of vaccine spread over three weeks, and he also recovered. The preparations made long beforehand for such an event included arrangements for titrating antibody in the serum of patients treated in different ways. Specimens of blood were taken almost daily from these patients, and the sera were sent to the U.S.A., whence K. Habel and H. Koprowski³ report their findings from neutralization tests in mice. In patients treated with daily vaccine only, no antibody appeared in the blood until the nineteenth day or later; on the other hand, in those also given serum it was present from the outset and persisted well, especially in those given two doses. These results, even though the different groups of cases are too small for recovery rates to be strictly significant, should go far to place combined treatment with vaccine and serum on an assured footing.

It was in April, 1950, that the Expert Committee on Rabies of the World Health Organization decided at its first meeting that a trial of hyperimmune serum, such as that just described, should be conducted in Iran. In the report⁴ of this session, attention was also drawn to the necessity for standardizing the antigenic potency of vaccines and to improved methods of doing so, and to measures aimed at the control of rabies in animals, including the immunization of dogs with a vaccine made from the egg-adapted Flur strain. The second report⁵ of this committee was published before the Sahané disaster, and was able to record in connexion with the use of hyperimmune serum only the results of antibody titrations in subjects not exposed to the danger of infection: these showed what in fact was confirmed at Sahané—namely, that antibody after vaccine alone does not appear for fourteen or more days, and that serum bridges this gap without interfering with the active response. This report also contains an account of the strikingly successful results of the mass vaccination of dogs with chick-embryo vaccine in Israel and Malaya.

These and many other matters are dealt with at greater length in an issue⁶ of the *Bulletin of the World Health Organization* devoted entirely to rabies and reprinting a selection of papers on this subject given

¹ Baltazard, M., and Bahmanyar, M., *Bull. Wld Hlth Org.*, 1955, 18, 747.

² ——— and Ghodssi, M., *Ibid.*, 1954, 10, 297.

³ Habel, K., and Koprowski, H., *Ibid.*, 1955, 13, 773.

⁴ *Wld Hlth Org. Techn. Rep. Ser.*, No. 28, Geneva, 1950.

⁵ *Ibid.*, No. 82, Geneva, 1954.

⁶ *Bull. Wld Hlth Org.*, 1954, 10, No. 5.