VACCINATION AND TETANUS.

BY

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AMERICAN medical periodicals reaching this country have very occasionally contained references to the occurrence of tetanus after vaccination. These references have always been puzzling to readers on this side of the Atlantic. Dr. T. D. Acland, in reporting on the sequelæ of vaccination to the Royal Commission, made mention of tetanus,¹ and in an article by him entitled "Vaccinia in man" published in Allbutt and Rolleston's *System of Medicine*,² while pointing out that tetanus may follow an accidental infection of any wound, he stated that as a complication of vaccination it was of the utmost rarity, and that he was acquainted with only one case in more than five million consecutive vaccinations in this country. Even in that case there was no evidence that the tetanus was invaccinated.

Much light is now thrown on the possibility of the occurrence of post-vaccinal tetanus in America, in an article by Dr. Charles Armstrong, of the United States Public Health Service, in the *Weekly Public Health Report* of that service dated June 26th, 1925.³ The article is entitled "Tetanus following use of bunion pads as vaccination dressing." It states that eleven cases of post-vaccinal tetanus which followed the use of bunion pads as a dressing have been investigated.

The eleven cases were distributed over seven States—two in 1921, five in 1924, and four (down to May 20th) in 1925. Of the eleven cases nine proved fatal. Bunion pads of the same varieties and from the same sources as those used in the cases which developed tetanus were collected and examined. In addition, 186 similar pads were purchased in Washington, D.C., and examined. In about 25 per cent. of these pads the tetanus organism was found. "The criterion of infection of the pads was the development, on glucose broth or meat mash media, of an organism morphologically like tetanus, which developed a toxin lethal for mice and neutralizable with tetanus antitoxin." Six medical practitioners in whose practice seven of the above-mentioned cases of post-vaccinal tetanus occurred estimated that they had vaccinated about 700 persons on whom bunion pads were used as a dressing in 1924-25 whilst the cases of tetanus were developing. If 25 per cent. of these pads were contaminated by tetanus, then about 4 per cent. of the cases in which the risk was run developed the disease. Of the total eleven cases, nine were primary vaccinations. Whether the other two were primary is not known. In all the eleven the cross-patch or scarification method of insertion was employed.

As regards the vaccine virus used, the report states that inquiries were made. The product of three different manufacturers had been used, in two cases, five cases, and three or four cases respectively. For only one case could the exact lot of virus be definitely ascertained. "Bulk samples of this lot were carefully retested by different workers using various methods, but no tetanus could be demonstrated." In other instances it was possible to determine that the virus must have been from one of several lots, but similar sampling and testing demonstrated no tetanus. Also among some 25,000 vaccinations in 1924-25, in the localities where the seven tetanus cases specially dealt with had occurred, no definite case of tetanus developed, though in one instance of a severe leg vaccination antitoxin was given on account of pain and stiffness in the neck, and prompt recovery was

regarded as indicating that the ailment was probably not tetanus. Notes are given of each of the eleven cases, and in several of them it is clear that the vaccination had not followed a normal course, but had been followed by an open discharging sore, which might be infected by the tetanus organism if present. The ages of the cases ranged from 6 to 30 years; nine were males and two were females; in nine cases the bunion pad was applied at the time of vaccination, and in two on the fourth day afterwards. The interval between vaccination and the onset of tetanus was 12, 15, 16, 19, 20, 20, 23, 24, and 28 days respectively in nine cases. In two the interval was uncertain. One case was vaccinated on the thigh, all others on the arm. Dr. Armstrong's conclusion is: "The facts revealed by this investigation . . . clearly indicate that the use of bunion pads as vaccination dressings should be strongly advised against."

Concerning bunion pads as a vaccination dressing in this country I have asked a London public vaccinator of the highest standing and long experience. He tells me that he has never seen or heard of such a dressing. But it happens that in 1902⁴ the *Lancet* published a report of singular interest in its bearing on this question. Drs. William Findlay and J. W. Findlay of Glasgow there gave a full account of a case of post-vaccinal tetanus in their practice. A revaccination was done midway between the knee and the ankle of a young woman, who preferred that site to the arm in order to avoid interference with her work, and "a large adhesive thick felt or bunion plaster was then applied around the vaccination mark and was kept in position by a strip of adhesive plaster, the object being to prevent any contact of stocking or clothes with the wound on the way from the surgery to her home until it was quite dry." The vaccination had been done with calf lymph, and several others had been vaccinated from the same tube, with no subsequent tetanus. In a careful study of the case—the woman recovered under treatment—the authors suggest the patient's own skin as the source of infection; the long trailing dress might have swept up dirt from the earth. They regret that the vaccination was covered up at the beginning and the dressing kept on through misapprehension. It is not surprising that at the date they did not discuss the possibility of the bunion pad being responsible. They found reference in medical literature to ten other cases of post-vaccinal tetanus. Six or seven of them were in America and two in the West Indies, but they had not access to the journals in which these were reported.

Dr. Armstrong's article indicates unequivocally the bunion pad and not the vaccine as responsible for the tetanus. The remarkable coincidence of the use of a bunion plaster in what seems perhaps the only case reported in this country since Dr. Acland wrote is of manifest significance, but, remote though the chance appears of the relevance of the important American discovery to conditions here, it suggests that the matter should, without loss of time, be the subject of investigation in two directions: one as to whether in fact the tetanus organism can be found in bunion or corn plasters or other adhesive plasters on sale here; the other as to whether such plasters are used in connexion with vaccination. The Ministry of Health would naturally be the body to make such investigation. It was the Local Government Board and the Ministry which, during the war,⁵ established the fact that imported shaving brushes were in some cases infected with anthrax, the administrative result being that orders were subsequently issued prohibiting further importation, while every endeavour was made to trace brushes belonging to consignments known to be infected, and to secure the destruction of brushes already on sale. A circular issued in 1921 dealt with the disinfection of hair used for the manufacture of shaving brushes in this country. If it were found that any kind of corn or other plasters carry the tetanus organism, then, independently of vaccination, such plasters should be prohibited.

¹ Case X, Appendix IX, Royal Commission on Vaccination, p. 6.

² Vol. II, 1905 edition, p. 709.

³ Washington: Government Printing Office. 1925. Issued by the Treasury Department.

⁴ *Lancet*, 1902, vol. i, pp. 506-10 (referred to in a footnote to Dr. Armstrong's article).

⁵ Report by Francis J. H. Coutts, M.D. New Series (L.G.B.), No. 112, 1917.