HERPES ZOSTER: ITS CAUSE, AND ASSOCIATION WITH VARICELLA.

BY

R. CRANSTON LOW, M.B., F.R.C.P.,

ASSISTANT PHYSICIAN TO SKIN DEPARTMENT, ROYAL INFIRMARY,
EDINBURGH.

BEFORE passing to the discussion of the probable cause of herpes zoster and the relation of that disease to varicella, I shall give a short note of cases which have come under my notice. My experience is limited to three observations.

CASE I.

In October, 1915, I was asked to see a gentleman suffering from herpes zoster affecting the skin area supplied by the first division of the fifth nerve of the right side. He had a very severe attack, the whole right side of the face being swollen and oedematous, the right eye completely closed, and the right side of the forehead and anterior part of the scalp covered with a sloughing and suppurating crusted eruption. Although the eyelids were very swollen and the conjunctiva oedematous and injected, there was no eruption on or ulceration of the cornea. The pain was intense, accompanied by sleeplessness and a general feeling of depression. The patient was a strong otherwise healthy man, aged 43. He made a slow recovery, the eye giving trouble for some time. Now (three years later) a scar is visible at the site of the previous eruption, and there is still a considerable degree of anaesthesia of that area. I inquired as to whether he had been in contact with a case of herpes zoster or varicella, but could trace no source of infection. He had never suffered from chicken-pox. Thirteen days after the patient showed the first signs of herpes zoster two of his children developed typical chicken-pox, and a fortnight after that other two also showed the same disease. These children were attending school when attacked, but so far as is known had not been in contact with any case of chicken-pox.

CASE II.

Some months ago a patient under Dr. Norman Walker's charge in the skin wards of the Royal Infirmary, Edinburgh, suffering from lupus vulgaris developed a typical right-sided thoracic herpes zoster. Two days later a child in the same ward suffering from seborrhoeic dermatitis developed chicken-pox. Both these patients had been in hospital for several weeks previously, so that the infection was probably brought into the ward by visitors.

CASE III.

On October 24th, 1918, a child was admitted to the children's ward of the Deaconess Hospital suffering from typical herpes zoster on the right side of the body. On November 12th (that is, nineteen days later) another child in the same ward developed typical chicken-pox. This child had been in the ward since October 21st.

These three observations are very similar to many which have been recorded within recent years. Bókay³¹ of Budapest was the first to draw attention to the possible association of herpes zoster and varicella. In 1892 he suggested that the virus of varicella might in certain circumstances, instead of producing a generalized eruption, cause a zoster eruption, and in 1909 he reported further cases (nine in all). In all these nine cases one member of a family or patient in a ward developed herpes zoster, and at intervals varying from eight to seventeen days one or more members of the same household or ward developed chicken-pox. Since Bókay's observations similar cases of herpes zoster followed by varicella have been reported by Hepworth,¹ Orr,¹³ Heim,²⁸ Cressy,³ Bruce,⁵ Roberts,⁶ Harrison,⁷ Oakes,⁸ Coates,⁹ Wilson,¹⁰ Milne,¹² Busfield,¹⁴ Bartlett,¹⁶ Coleman,⁴⁰ and le Feuvre.³⁵ The number of such cases must be well over fifty by now. In all, no other source of infection except the herpes was to be found. This is particularly noticeable in le Feuvre's nine cases, some of whom lived in the country many miles from the nearest town. In all the recorded cases the chicken-pox eruption appeared in from eight to twenty-one days after contact with a case of herpes zoster—that is, within the ordinary incubation period of chicken-pox.

The converse condition, namely, a case of chicken-pox followed by a case of herpes zoster, has also been observed, although not so frequently. Such cases are recorded by Dando,¹⁵ Hepworth,¹ Aikman,³⁴ and Savill.⁴¹ In these cases one member or members of the household had chicken-pox, and another developed herpes zoster later. Assuming the chicken-pox to be the source of infection the herpes zoster developed in most cases in from two to five weeks after exposure to the chicken-pox.

Further, the cases of herpes zoster and a varicella-like eruption occurring in the same individual must be mentioned. Such cases have been recorded from time to time

in the medical literature under the title "herpes zoster generalisatus." One of the most typical of these cases is that published by Pernet²⁶ in which a typical left-sided herpes zoster affecting the third, fourth, and fifth dorsal segments occurred. In addition aberrant vesicles occurred in large numbers on the trunk, limbs, scalp, and face. This general eruption was described as looking like a bad attack of varicella. Parkes Weber,²⁵ le Feuvre,³⁵ Colombini,⁴⁷ Leredde,³⁰ Molonié,⁴⁸ Haslund,⁴³ Jeanselme,³⁶ Ffrench,³⁰ Arkwright,²⁹ Beyer,³² Fasal,³³ Nobl,³⁷ Minet and Leclercq,⁴⁶ Touraine,⁴⁴ Tryb,⁴⁹ and Fischl,⁴³ have reported similar cases. In nearly all the herpes zoster appeared first and was followed in four or five days by a general vesicular eruption. In almost all the reports the lesions are described as indistinguishable from those of varicella.

Taking into consideration the facts above stated—namely, (1) that herpes zoster in a household is frequently followed by a case or cases of chicken-pox, (2) that cases of chicken-pox may be followed by cases of herpes zoster in the same house, and (3) that cases of herpes zoster, in addition to the ordinary lesions, may show an eruption similar to chicken-pox—one is almost forced to conclude that these two diseases are probably due to the same virus. I would go further, and suggest that in herpes zoster the infection is probably local, through the nose, along the lymphatics, round the olfactory nerves, as has been shown to be the mode of infection with the virus of anterior poliomyelitis, a disease which has many points of analogy with herpes zoster. Once the virus reaches the meninges and cerebro-spinal fluid it is easy for it to get to the ganglia on the sensory nerve trunks. In chicken-pox there is probably a blood infection with the virus. In the cases which show both herpes zoster and a varicella-like eruption, the virus probably attacks the ganglia first, and thence, four or five days later, gets into the general circulation, producing the generalized eruption.

There are certain facts which point to the eruption in varicella not being, primarily at least, due to the virus settling in the end capillaries of the skin but in the nerve endings or minute nerve twigs in the skin. Microscopically the vesicle in herpes zoster is somewhat similar to that seen in the early stages of varicella. The lesions in chicken-pox often occur in groups, suggesting that a small branch of a peripheral nerve is the seat of a focus of infection. Many of the chicken-pox lesions also show a vesicle with no inflammatory halo around it. This same kind of lesion is seen in pemphigus and dermatitis herpetiformis, which are generally considered to be toxic nerve lesions.

As yet in neither herpes zoster nor varicella has any definite causal organism been discovered. In a list of diseases due to filter-passing ultra-microscopic viruses Flexner in his Huxley lecture²⁴ mentions poliomyelitis and vaccinia. The first of these is analogous to herpes zoster in many particulars, and vaccinia lesions in their early stages are similar to those of chicken-pox. Therefore it is possible that the virus of herpes zoster and of chicken-pox belong to the same group of organisms.

The question of epidemics of these diseases must now be considered. It is, of course, admitted that chicken-pox occurs in epidemics. Similarly, no one will deny that herpes zoster also occurs in epidemic form. If herpes zoster and varicella have a common origin, one would expect simultaneous epidemics to occur. Unfortunately, there is very little information to be got on this point. The only instance I can find in the literature is that recorded by Heim.²⁸ He reported simultaneous epidemics of herpes zoster and varicella in Budapest during April and May, 1912. As neither disease is notifiable, statistics on which to base an opinion are wanting, and the fact that Heim's report is the only one on record is no proof that such simultaneous epidemics do not frequently occur.

The question of the immunity produced by an attack of herpes zoster or varicella is important. An attack of chicken pox usually conveys immunity to that disease for life. Similarly, one attack of herpes zoster is rarely followed by another. Most of the recurrent attacks of herpetic eruption are not true herpes zoster due to an acute lesion in the ganglia, but are recurrent attacks of peripheral neuritis due to pressure by a tumour on nerves, causing an eruption in the distribution of these nerves.

If herpes zoster and varicella are the same infection, it might be expected that an attack of the one disease would produce immunity against the other. A certain number of cases are recorded, and I have myself seen one a few days ago, in which an adult, who had suffered from chicken-pox in childhood, developed herpes zoster, so that it must be admitted that an attack of varicella does not necessarily protect the individual against herpes zoster. I can find no record of a case of herpes zoster developing chicken-pox later on, and in no case of herpes zoster associated with a generalized varicella-like eruption has a previous attack of chicken-pox been recorded. That might mean that an attack of herpes zoster protects the individual against chicken-pox, but individuals who have herpes zoster are in many cases past the age when they are likely to take chicken-pox.

Further knowledge on this question of immunity is required. As both varicella and herpes zoster are seen more frequently by the general practitioner than by the dermatologist, much light might be thrown on the subject if practitioners made a point of inquiring in all cases of herpes zoster and chicken-pox as to previous attacks of either disease.

When discussing the cause of herpes zoster the cases which occur whilst arsenic is being taken must not be ignored. In such cases the question arises whether the arsenic produces an arsenical neuritis with the eruption in the distribution of the nerve or whether the arsenic makes the individual's nervous system more susceptible to infection with herpes zoster. The latter would seem to be the more probable explanation, because even although the patient continues to take the arsenic, the herpes zoster runs a normal course, heals up, and does not recur, as one would expect, if an arsenical neuritis were the cause. Further, Parkes Weber²⁵ reports an instance in which a patient was taking arsenic and developed herpes zoster with a generalized varicella-like eruption, and another patient from the same ward developed chicken-pox fifteen days later. Therefore I am inclined to consider arsenic, like exposure to cold, worry, and so on, as merely a predisposing cause to infection with the unknown virus.

REFERENCES.

- [The first twenty-four references are to the BRITISH MEDICAL JOURNAL of the dates given.]
- ¹ J. Hepworth, October 10th, 1918. ² J. A. W. Pereira, May 1st, 1915.
 - ³ A. Z. Cressy, August 23rd, 1913. ⁴ J. D. Halstead, August 23rd, 1913.
 - ⁵ E. J. Bruce, August 30th, 1913. ⁶ G. E. Roberts, August 30th, 1913.
 - ⁷ E. Harrison, August 30th, 1913. ⁸ H. Oakes, August 30th, 1913.
 - ⁹ W. H. Coates, August 30th, 1913. ¹⁰ H. S. Wilson, August 30th, 1913.
 - ¹¹ A. Savill, October 4th, 1913. ¹² J. A. Milne, October 4th, 1913.
 - ¹³ J. Orr, October 18th, 1913. ¹⁴ J. Busfield, October 25th, 1913.
 - ¹⁵ E. A. Dando, November 15th, 1913. ¹⁶ J. H. Bartlett, November 15th, 1913.
 - ¹⁷ B. Jones, May 24th, 1913. ¹⁸ G. C. Walker, May 31st, 1913.
 - ¹⁹ Parkes Weber, February 15th, 1913. ²⁰ Ffrench, 1899, vol. i, p. 388.
 - ²¹ Le Feuvre, 1915, vol. i, p. 15. ²² Distin, 1915, vol. i, p. 633.
 - ²³ H. Taylor, 1889, vol. ii, p. 13.
 - ²⁴ S. Flexner, 1912, vol. ii, p. 1261.
 - ²⁵ Parkes Weber, *Internat. Clinics*, 1916, vol. iii, Series 26.
 - ²⁶ Pernet, *Brit. Journ. Dermatol.*, October, 1914, p. 399.
 - ²⁷ Dopfer, *Presse médicale*, 1910, p. 162.
 - ²⁸ P. Heim, *Berl. klin. Woch.*, December 9th, 1912, p. 2349.
 - ²⁹ Arkwright, *St. Bartholomew's Hosp. Journal*, 1900, vol. vii, p. 172.
 - ³⁰ Jeanselme and Lerédde, *Bull. Soc. méd. des Hôp. de Paris*, 1893, vol. xv, p. 619.
 - ³¹ Bokay, *Wien. klin. Woch.*, September 30th, 1909.
 - ³² R. Beyer, *Archiv f. Derm. u. Syph.*, 1906, vol. 78, p. 233.
 - ³³ H. Fasal, *ibid.*, 1909, vol. 95, p. 27.
 - ³⁴ Le Feuvre, *Med. Journ. of S. Africa*, 1911, vol. ix, p. 177.
 - ³⁵ Le Feuvre, *ibid.*, 1918, p. 133.
 - ³⁶ Schamberg, *Journ. Amer. Med. Assoc.*, 1910, vol. 54, p. 532.
 - ³⁷ Nobl, *Wien. klin. Woch.*, 1911, p. 14.
 - ³⁸ Barber, *Guy's Hosp. Gazette*, September 23rd, 1916.
 - ³⁹ J. N. Watson, *ibid.*, April 24th, 1915.
 - ⁴⁰ F. J. Coleman, *ibid.*, May 10th, 1913.
 - ⁴¹ R. S. Wainwright, *ibid.*, May 10th, 1913.
 - ⁴² F. Heatherley, *ibid.*, April 25th, 1914.
 - ⁴³ F. Fischl, *Archiv f. Derm. u. Syph.*, 1913, p. 553.
 - ⁴⁴ Jeanselme and Touraine, *Soc. franc. de derm. et de syph.*, July 2nd, 1914.
 - ⁴⁵ F. Steuer, *Wien. klin. Woch.*, 1911, p. 1167.
 - ⁴⁶ Minet and Leclercq, *La Clinique*, 1911, p. 101.
 - ⁴⁷ Colombini, *Mrazek's Handbuch der Hautkrankheiten*, vol. i, p. 692.
 - ⁴⁸ Molonié, *Thèse de Paris*, 1895-96, No. 97.
 - ⁴⁹ Tryb, *Dermat. Wochenschr.*, 1914, p. 983.

PUBLIC MEASURES FOR THE PREVENTION OF TUBERCULOSIS.

BY

LIEUT.-COLONEL NATHAN RAW, C.M.G., M.P., M.D.,
O.C. AND SENIOR PHYSICIAN, LIVERPOOL HOSPITAL, FRANCE.

THE spread of tuberculosis in any community can only be checked by public measures forming a co-ordinated scheme for attack on the disease. Tuberculosis being to a large extent a disease of ignorance and misery, our efforts to prevent it must be directed towards the social conditions and insanitary surroundings of the poor. It is essential to establish very close co-operation between voluntary action and Government and municipal efforts.

The general measures for the control of tuberculosis may be stated under the following heads:

Voluntary and Compulsory Notification.

Tuberculosis being essentially an infectious disease it is desirable that complete notification of all cases should be made to the officials who are responsible for the public health, so that they may be informed as accurately as possible as to every person infected with the disease.

In England voluntary notification has been superseded by compulsory notification, at least as far as pulmonary tuberculosis is concerned, and although it is open to question whether it is desirable to notify the private patients of a medical man, yet if a certain amount of discretion is exercised there can be no doubt that compulsory notification is in the general interest of the community, although it may press hardly on individuals. An order from the Local Government Board for England and Wales compels the notification of every inmate of a public institution suffering from any form of tuberculosis. This notification must be made on special forms by the physician attending the case; for this he receives the small fee of 1s. As soon as notification is received by the health officer a visit is paid to the home of the patient, and a careful inquiry as to his personal condition and surroundings made. If, in the opinion of the health officer, his home surroundings are such as to make it unsafe for him to remain, power is given to remove the patient to some institution, but this power is very rarely exercised.

In large cities where a great amount of overcrowding exists, the treatment of the advanced case of tuberculosis is of supreme importance. If he is allowed to live in the same dwelling and share the same room as his wife and children, it will almost certainly happen that one or all of his family will become infected. Therefore it is absolutely necessary that he should be removed to some safer surroundings unless he is able to have a room to himself and to look after his own personal cleanliness. It is no use to keep a patient in a sanatorium for six months and then discharge him as incurable, to spend the rest of his life in an overcrowded cottage or tenement where he may spread the infection to a new generation. Provision ought to be made, either by Government or by the municipality, for the detention and comfortable treatment of all cases of incurable tuberculosis. I am not in favour of exercising compulsory powers of removal from a man's own home, but if it is for the protection of healthy people, then removal ought to be made compulsory; but I think it will be some time before public opinion is ripe for such measures.

The health authority will disinfect and clean the clothing and bedding of any notified case, and then will also carefully disinfect the house in which he has lived. Very often the patients complain of this attention to their homes and their clothing, but it is essential that it should be done for the protection of the future residents of the house. It is also the practice to notify to the health authorities any change of address of a tuberculous person, so that they may keep in touch with any house in which he may live.

On the whole, compulsory notification will prove useful in the fight against the disease, but it should only be used in a wise and gentle manner, as otherwise it is liable to cause personal discomfort, and may have the effect of ostracizing the patient from society. If it is pushed too far it may also have the effect of preventing him from earning his livelihood by reason of his fellow-workers having a fear of infection in the workshop or factory. Although many countries are still doubtful as to the wisdom of enforcing compulsory notification, yet from the point of view of suppression of an infectious disease it cannot be denied that with care and consideration the compulsory notification of tuberculosis is bound to do good.

Removal of Affected Children from School and Home.

The medical inspection of school children is now thorough and complete in Great Britain, as in many other countries, with the result that a fair number of children of school age are recognized as suffering from pulmonary tuberculosis, although this number is not so large as one might be inclined to expect. Pulmonary tuberculosis is comparatively uncommon amongst school children; the other forms of tuberculosis are more often seen. A child suffering from open tuberculosis should at once be removed from school, mainly for the protection of the other