Bokenham⁵ and Denys of Louvain, working independently, have recommended the immunisation of the animals from which the serum is obtained against all the varieties of streptococcus, and several manufacturing firms have adopted this suggestion. It may therefore be expected that such serums will display a wider range of activity than others which contain merely the antitoxin of a single variety of streptococcus. Another cause of the uncertain action of the serum is pointed out by Bokenham. The antitoxin apparently loses its activity after keeping for a certain time and this observer recommends that the serum should not be more than three or four weeks old.

In the case here described the further rise of temperature after the injection of 25 cubic centimetres of the serum is in accordance with what has been observed in many other cases. In some of these the rise has been so well marked that it may be looked upon as a reaction due to the serum. There is at present no evidence to show whether or not this rise may be looked upon as a favourable sign indicating the activity of the serum but it is possible that further observations may show that the phenomenon has a definite value in prognosis.

Another interesting and important point is the secondary attack of effusion into the tendon sheaths in various parts of the body which occurred several days after the primary symptoms had subsided and while the wound in the finger was in process of healing. On looking back through the cases treated with antitoxin this renewed activity of the poison after a period of quiescence appears to be not at all uncommon. It is noted in many cases that after the temperature has fallen to normal and, convalescence being apparently established, the injections have been discontinued a rise of temperature has suddenly occurred, accompanied by a local recurrence of inflammation, by pain in the joints, phlebitis, or some such symptom. A further injection of antitoxin has in most of these cases readily controlled the symptoms but a secondary attack of this nature has been fatal in at least one case in spite of further administration of the serum. The interval at which this recrudescence has taken place has varied from three to ten days or even longer. The question naturally suggests itself, What is the condition of the streptococci during this period? Are they still circulating in the blood, their activity controlled or neutralised by the antitoxin, or has a fresh infection taken place from the primary focus, or again, to adopt the side-chain theory of Ehrlich, are these secondary attacks merely indicative of a release of the toxin from combination with the antitoxin?

A case of puerperal septicæmia recorded by Dr. Grimsdale of Liverpool⁶ throws some light on this subject. In this case the blood during the height of the fever gave a pure culture of streptococcus. The temperature fell to normal after two injections of ten cubic centimetres of the serum and remained normal for 24 hours, after which it gradually rose to 103°. During the interval of normal temperature the blood was examined bacteriologically and again gave a culture of streptococcus. The injections were resumed and a favourable result was obtained. This observation deserves more prominence than the author has given it, for not only does it disclose the fact that the streptococci are still circulating and potentially active after the general symptoms have disappeared, but it is also a very striking proof of the efficiency of the antitoxin to control their functions. One may judge from such cases that the injections of serum might be continued with benefit for a longer period after the temperature has returned to normal than has hitherto been the custom, and further, that such patients should be carefully watched during convalescence and that in country districts serum should be kept at hand. Salicylates have apparently a beneficial effect on a number of these cases.

There can be little doubt that the most powerful effect of the serum is obtained by injection in the earliest stages of the infection. In my own case the early and rapid convalescence is to be attributed to the prompt use of the antitoxin. Even in the later stages strikingly beneficial results have been obtained but there must be many unrecorded cases in which this resort to the serum at the eleventh hour has proved unavailing. One practitioner confesses with commendable frankness that he was deterred from using the serum for some days by a perusal of the note of directions issued with the antitoxin. The note ran as follows: "In the present state of our knowledge it may be questioned whether the serum treatment of streptococcal infection should be

continued, although some apparently encouraging results have been obtained in this country." The pessimistic tone of this note was no doubt the result of the reports on the earlier cases, in some of which disastrous results were attributed to the use of the serum. Without discussing how far the responsibility for these results rested with the serum it may be said that in the more recently published cases no further ill-effects than a local erythema or an irritating urticaria and in one case "circulatory depression" have been recorded. Blumberg⁷ tells us that even these skin affections may be avoided if the serum be injected entirely into the subcutaneous tissue.

Dosage.—A good result has been ascribed to a single dose of ten cubic centimetres but the total amount used in most cases has varied from 30 to 80 cubic centimetres. In my case Mr. Burghard injected 25 cubic centimetres immediately and ten cubic centimetres for the next two days, a further dose of ten cubic centimetres being used on effusion into the tendon sheaths. No ill-effect followed the injection of 80 cubic centimetres in daily doses of ten cubic centimetres in a woman 71 years of age suffering from very severe erysipelas of the face and scalp.⁸ Dr. Victor Bonney⁹ injected 420 cubic centimetres in 42 injections during 17 days in an obscure case of septicæmia. In another case recorded by Dr. Harold Low¹⁰ 263 cubic centimetres were used altogether, 67 cubic centimetres being injected in 24 hours.

The question of dosage must, of course, be judged by the nature of each case and the effect obtained by the injection, but it is important to know that large doses spread over several days have been used without ill-effect, the more so that the following note is issued in regard to dosage by the makers: "The dose mentioned (10 c.c.) is recorded as one which has been administered with apparent benefit; but it is not stated in the sense of a distinct recommendation. All responsibility for dose rests upon the medical practitioner." The most rational method would seem to be that of a large injection (from 20 to 25 cubic centimetres) on the first occasion, followed by smaller doses as the case may require, and one must further remember that, as has been pointed out above, there is danger of recrudescence if the administration be too early stopped.

The following conclusions may be drawn from this and other recently reported cases and investigations:—

1. That injection of antistreptococcal serum in cases of pure streptococcal infection has been followed by strikingly beneficial results.
2. That variability in the results of the serum in proved streptococcal infection has been due to the selective activity displayed by the antitoxin of each variety of streptococcus or to the serum being used too late in the case or having lost its activity from staleness.
3. That more uniform results are likely to be obtained from the present "compound" antistreptococcal serum than from the earlier forms, from the prompt injection of serum at the commencement instead of near the close of a severe infection, and from the use only of serum which has been recently prepared.
4. That the initial dose may with benefit be increased and that a large quantity spread over several days causes no ill-effect.
5. That the administration of the serum should be continued for some days after the general symptoms have disappeared and a recrudescence thus avoided.

Cavendish-place, W.

Clinical Notes: MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

SPONTANEOUS RUPTURE OF THE HEART IN AN INSANE PATIENT.

BY H. KERR, M.D. GLASG.,

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THIS is a rare occurrence considering the frequency of degeneration of the heart muscle in the insane. According to the returns of the causes of death in the reports of the

⁷ Berliner Klinische Wochenschrift, Feb. 4th, 1901.

⁸ Brit. Med. Jour., vol. i., 1901, p. 1078.

⁹ Ibid., vol. i., 1900, p. 1342.

¹⁰ THE LANCET, March 19th, 1898, p. 780.

⁵ Brit. Med. Jour., vol. ii., 1900, p. 1078.

⁶ THE LANCET, Jan. 21st, 1899, p. 165.

Commissioners in Lunacy for the years 1902 and 1903 it occurred nine times in 18,601 deaths and of these four cases were those of males and five were those of females, showing that sex has little to do with its incidence.

In the present case the patient was a man, aged 76 years, who died in the Bucks County Asylum after 14 months' residence. Mentally he was somewhat depressed and suicidal on admission, his condition passing into one of mild dementia. Physically he was rather feeble but stout and flabby. The pulse was regular but weak, the heart sounds were feeble and distant in character, and cardiac dulness was considerably increased. There was nothing of importance in the subsequent history of the case and the patient appeared as usual on the night of his death. He was found dead on the floor of his room, having apparently got out of bed and collapsed.

At the post-mortem examination the pericardium was found to be much distended with blood-clot and fluid. In the heart a small tear was found in the left ventricle, anteriorly, at the lower end near the apex in the long axis of the organ and plugged with blood clot. Internally the tear was found to be somewhat smaller than externally. The heart was much hypertrophied (weight 18½ ounces), more especially the left ventricle, the muscle was soft, fatty, and very friable, while the valves and coronary arteries were atheromatous. The immediate cause of the rupture could not be determined, the factor of extra strain or stress being practically eliminated.

Stone, Bucks.

A CASE OF VARIOLA FOLLOWING AN UNUSUAL COURSE.

BY RICHARD ROLFE, M.B. CANTAB.,
MEDICAL OFFICER OF AVONMOUTH HOSPITAL, BRISTOL.

THE following case presents some very unusual features and, perhaps, similar cases may in part account for the difficulty which is too often experienced in checking an epidemic of small-pox. The patient, a man, aged 30 years, had been vaccinated in infancy and showed four well-marked scars on his left arm. He had by an oversight not been revaccinated, though revaccination had been offered to him and he had been warned of the necessity for it. On Oct. 31st and Nov. 1st he was exposed to infection by entering huts from which small-pox patients were being removed and by helping in their removal. On the evening of Nov. 11th he began to feel out of sorts and on the morning of the 12th he came to me for treatment, complaining of headache and pains in the back and limbs. His temperature was normal. He was sent home to bed and given a saline mixture every four hours. On the 13th he was very ill. The pains in his back and limbs had increased so that he could get no rest; his head also ached. His tongue was thickly furred, he was parched with thirst, and there was complete anorexia. His pulse was full and bounding and his temperature, taken in the axilla, was 103.8° F. He presented all the features of moderately severe initial fever of variola and was removed to a temporary isolation hospital. During the night his temperature fell to normal and he felt quite comfortable when seen in the morning. A careful examination showed no rash on any part of his body. As the onset of his illness had been so typical and the date of his sickening corresponded so exactly with the usual incubation period of small-pox Dr. D. S. Davies, medical officer of health of Bristol, who kindly saw him for me, regarded the case as one of variola sine eruptione and the patient was therefore kept isolated. On the 16th he was revaccinated in three places on his left arm, lymph obtained from Messrs. Ferris and Co. being used. This was done for diagnostic reasons. His temperature remained normal and he felt quite well. On the 18th a few papules appeared about his arms and legs, on his scalp, and the back of his neck. These became vesicular the same day but there was no rise of temperature. At the same time the patient complained of some irritation at the site of his vaccination and all three places swelled a little and looked as if about to take. This swelling, however, passed off in a very few hours. On the 19th there were some 18 or 19 spots on the patient. They were vesicular and were surrounded by a zone of induration. Dr. Davies again saw the case and pronounced it to be undoubtedly

one of modified variola. During the next few days several of the spots dried up and disappeared but others, especially two on the left hand, one on the left leg, and one under the sole of the right foot, ran a typical course, becoming pustular and only disappearing after a full fortnight. During this time the vaccination marks several times swelled up slightly and caused some irritation. Nothing very definite happened, however, till Dec. 2nd, 16 days after vaccination, on which day one of the marks assumed the form of a definite vaccine vesicle of quite average size. This occurred just at the time that the variola spots were drying up and seems to indicate that the toxin of variola had held the vaccine, which had been introduced too late to prevent an attack of small-pox, in an inert condition without destroying it until the variola had exhausted itself.

I have to thank Dr. Davies for seeing the case for me and for allowing his name to appear in this account, thereby dispelling any doubt which might arise as to the nature of the rash. Such a case as this might very easily be looked upon as one of influenza; and even if the patient were known to have been in contact with small-pox when no rash was discoverable on the third or fourth day and he appeared well and had a *normal temperature*, a busy practitioner could hardly be expected to follow the case up and would probably dismiss it as cured with possibly disastrous results to unprotected persons who came in contact with it.

During the summer there have been two or three slight outbreaks of small-pox in this locality. Most of the cases have been of an exceedingly mild type with initial symptoms not more marked than in the case described and in many of them the number of spots was very limited. Such unusually modified cases appear to approach the "vanishing point" of variola when the disease no longer becomes recognisable.

Avonmouth.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv., Proœmium.

LEEDS GENERAL INFIRMARY.

A CASE OF ACUTE INVERSION OF THE UTERUS.

(Under the care of Dr. J. B. HELLIER.)

THE patient was a woman, aged 20 years, and was taken into the Leeds General Infirmary from a village about six miles distant on the evening of Nov. 28th, 1904, with inverted uterus. She had been married two and a quarter years. Her first confinement had been difficult; she was in labour three days and had flooding afterwards. On the morning of the day of admission her second labour began at 3 A.M. and she was delivered of a living child at 8.30 A.M., a midwife being in attendance. A medical man was called in after labour and he found the uterus inverted and prolapsed lying on the bed with the placenta attached to it, but there did not seem to have been much loss of blood. He peeled the placenta off and, as he thought, reduced the inversion. Subsequently the patient had much vomiting and the uterus again appeared outside. She was then taken in a cab to the infirmary. On admission she was found to be a poorly nourished but not otherwise unhealthy young woman. She was pale but not blanched; the pulse was 150 and the urine was normal. Dr. Hellier saw her at 10.30 P.M. Chloroform was administered and she was then placed in the lithotomy position and the parts were thoroughly disinfected. The inverted fundus was grasped with the right hand, pressure being made with the finger tips on the periphery of the tumour; at the same time counter-pressure was made with the left hand above the pubes. A few minutes of such bimanual taxis sufficed to reduce the inversion. The surface where the placenta had been attached was rather ragged in appearance but there were no fragments of placenta left adherent. The patient improved rapidly after the operation. On the fourth day the temperature rose to 101° F. and the discharge was a little