It will be seen that the proportion of recoveries to deaths increases according to the earliness of administration. On or before the fourth day the ratio is 11 to 2; fifth day, 15 to 3; sixth day, 17 to 5; fourteenth day, 26 to 11.

Method of Administration.

In 4 cases 50 c.cm. were administered intravenously and the impression formed from the few cases observed is that the intravenous injection produces more rapid and satisfactory results than the subcutaneous. It is not, however, always feasible and in one case (*vide infra*) was followed by undesirable results. In this series of cases the dose used was at first 25 c.cm., but it was found that 50 c.cm. gave much better results. In 5 cases every sample of urine passed was collected for four days after injection and examined. In no case was there any abnormality. The serum was not eliminated as such, nor did it produce any renal irritation.

Undesirable Results.

The most serious was that seen in one case in which within an hour after the injection of serum intravenously a rigor and a temperature of 105.6° occurred. The attack soon passed off, and recovery was normal. Three cases were followed by an abscess at the site of injection. Two other cases showed an erythematous rash on the trunk twelve and fourteen days after injection respectively; this rash may or may not have been produced by the serum. Six cases showed an urticarial rash one, one, two, three, eleven, and twelve days after injection respectively; one of these was followed by a brilliant erythema circinata. Three cases of suppuration occurred, while experience teaches that a much larger proportion of these cases would have under ordinary conditions shown cervical suppuration.

CONCLUSION.

It is difficult with such a small series of cases to give anything more than the impressions of the observer, and it is impossible to detail each of the cases. The recovery-rate is certainly better than usual, and the fact that the earlier the administration of the serum the better are the results is also favourable evidence.

But I could not help being struck with the clinical course of many of the cases that recovered. Within forty-eight hours of the injection the temperature began to fall, became normal in another forty-eight hours, and remained normal, the cervical glands began to subside, the necrosis of the throat began to clear up, and the rhinorrhoea either ceased or lost its purulent character. Not all of the cases showed so satisfactory a course, but most did very much better than would have been expected in the ordinary way without serum injection.

In one case the temperature reaction to the first dose of serum was marked, but the improvement was not sustained. It may be that there was a case of invasion by several types of streptococci, some of which the particular serum used did not affect.

Observation of these 42 cases leaves the distinct impression that the injection of the "antiscarlatinal" serum in large enough doses (not less than 50 c.cm.) and early enough in the disease—that is, as soon as the onset of rhinorrhoea, swelling of cervical glands, and superadded rise of temperature, the signs of septic invasion, occurred—will produce a marked improvement in "septic" cases.

In "toxic" cases little can be said in favour of the use of serum, but here some slight improvement was noticed in 2 cases.

HORSE-POX DIRECTLY TRANSMITTED TO MAN.

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DURING the small-pox epidemic in London in 1901-2 about 10,000 patients were re-examined at the receiving stations, and about 1,000 of these were found not to be suffering from small-pox. The cases included many of great interest and variety. The following is an account of one of the non-small-pox cases which deserves to be placed on record.

F. K., 32 years of age, a stableman, was admitted to the receiving station, South Wharf, Rotherhithe, on March 31st, 1902, certified to be suffering from small-pox.

Condition on Admission.

He complained chiefly of pain in the left arm and arm pit. His temperature was 100.4° F., his pulse 100. He was at work up to March 25th, but first felt out of sorts on March 23rd, when he noticed two red spots on his left arm in the position indicated by 1 and 2 on the diagram. These "spots" became painful and

enlarged, and others appeared in the positions indicated. At the time of admission the rash on which the diagnosis of small-pox had been based was confined to the arms and left hand. It consisted of only eight lesions, of which seven were on the left forearm and hand, and one was on the right arm just above the level of the bend of the elbow. There was severe lymphangitis of both arms, and the axillary glands on both sides, but particularly on the left, were much enlarged and very tender.

The lesions varied in size, but not in type. They resembled the lesion of a primary vaccination about the eighth or ninth day of its development, but they were more severe. The vesicular ring with turbid contents was well raised above the level of the surrounding skin on an indurated and tender base. Within the ring was a brownish-black, slightly depressed crust. In the larger lesions on the arms the diameter of the vesicular ring varied from 12 mm. to 9 mm. In two, situated one on the left forefinger, the other near the base of the left thumb, the vesicle was much smaller. In two to three days after admission the severe pain in the arms abated. The local indurations and lymphangitis gradually disappeared as the lesions crusted and the gland swelling subsided without suppuration. A point to be noted is that for several days the patient had severe constitutional disturbance.

The fact that the lesions were confined to the left arm and hand (there was only one on the right arm), their uniform type and synchronous development, and above all their resemblance to the lesions of a primary vaccination, suggested that they were due to inoculation.

History.

He stated that for some time before the onset of his illness he had been engaged in treating a horse suffering from "ulcers of the mouth and throat." The treatment consisted partly in washing out the mouth, and for the purpose he used an ordinary syringe. The horse's head was raised and held in the usual way. The man held the charged syringe in his left hand, while he pressed home the piston with the right. His left forearm and hand were fully exposed to the stream of fluid returning from the horse's mouth. His right hand and arm were out of the way of the return stream, and were exposed only to the fluid which might splash or trickle along the outside of the syringe. This appears to explain the severe affection of the left arm and the comparative immunity of the right. The attitude of the arms in using the syringe, and the man's habit of keeping his shirt-sleeves rolled above the elbow when at work, probably accounts for the grouping of the lesions below the elbow, and the complete immunity of the left upper arm.

The patient had been successfully vaccinated in infancy and not since. He was vaccinated at the receiving station on three occasions with lymph of two strains known to be potent, but on no occasion did any reaction follow.

Consideration of all the circumstances of the case led to the diagnosis of horse-pox.

From time to time, since Jenner's and Loy's work, other cases have been reported of the direct transmission of the disease to man from a horse suffering from "sore heels." Eighteen months after the occurrence of the case F. K., my attention was called to a similar case which had been reported to the Clinical Society of London by Mr. John Langton in 1877, a case indeed so similar, that the coloured plate which accompanies the report in volume x of the *Clinical Society's Transactions*, might serve, with but slight alteration, for the case now recorded. In Mr. Langton's case, however, the horse from which the disease was contracted was "suffering from inflammation of the legs and cracked heels," and no eruption or ulceration in the mouth was noted. In the case here described the patient did not say that the horse was suffering from any other local condition of the nature of "sore heels" or "grease," but

unfortunately the veterinary surgeon who was in attendance was unable to give any accurate information on this point.

Still it appears almost certain that the man derived the infection directly from the "ulcers" in the horse's mouth, so that the case resembles the one investigated by Bouley in 1863, and reported by him at the time to the French Academy of Medicine. Bouley was then engaged in experimenting on the possibility of transmitting diseases of the horse to other animals by inoculation. His horse had pustules in the mouth but no eruption elsewhere, and at first he described the condition as an "aphthous stomatitis." By inoculation of the matter from the pustules he produced "true pustules of cow-pox," from which he subsequently inoculated an infant of 11 months. Bouley afterwards recognized that the condition in his horse was not an aphthous stomatitis, but that it was one of the possible local manifestations of the same horse disease as was dealt with by Jenner and Loy, and shown by the latter to be a constitutional disease.

I am indebted to Dr. W. M. C. Wanklyn for permission to publish the notes of F. K.

PRIMARY PNEUMOCOCCIC PERITONITIS.

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I wish to thank Dr. Archibald Cuff for his excellent paper on Primary Pneumococcal Peritonitis in the JOURNAL of April 18th, and to supplement it by two cases that have come under my own observation.

CASE I.—A girl, aged 8 years, was suddenly taken ill during the night with severe abdominal pain, prostration, and restlessness. When I saw her next morning she looked flushed, had somewhat hurried breathing, and looked ill. Abdominal pain was evidently severe and definitely located in the right inguinal region, there was marked tenderness and rigidity, and she lay with the thigh flexed. The temperature was 103° and pulse quick. The general aspect was, however, most suggestive of pneumonia, and the chest was carefully examined without result. Next day the condition was much the same and I felt very anxious, still suspecting pneumonia, but fearing to allow an acute appendicitis, which it entirely resembled, to go wrong without the chance of operation. Early next morning, still finding no physical signs of pneumonia and the patient obviously getting worse, I sent her to hospital with a diagnosis of acute appendicitis, stating in my letter that I had endeavoured to eliminate all other possible conditions, including pneumonia. Two days later I received a note from the hospital surgeon, stating that his diagnosis was pneumonia, though even then the physical signs were very indefinite; two days later they became more pronounced and the patient was removed to the medical wards. The following week I saw the patient in hospital and was surprised to find her still very ill, with high temperature, and still almost wholly complaining of abdominal symptoms; the abdomen was now somewhat distended. There had been something of a crisis, but the temperature speedily rose again and continued high but very irregular. An extension of pneumonia to the left lung was suspected, but there were no physical signs, and the temperature was essentially a pus temperature. Empyema was negatived after use of the exploring needle. Things went on much in the same way for several days more, the abdomen increasing in size, when the surgeon under whose care I originally sent her was asked to see her again. By abdominal incision he evacuated, as he described it, "not pints, but gallons of pus pneumococcal in origin." Recovery was speedy and complete.

I do not doubt that a true pneumonia did exist in this case, but I feel equally certain that the peritoneum was also attacked from the very beginning of the illness, and in any case there was a genuine pneumococcal peritonitis.

CASE II.—Not long afterwards a child 4 years old, a relative of my own, was taken ill during the night with severe abdominal pain, again definitely located in the right inguinal region. When the doctor saw her next day he recognized the seriousness of the attack, and from the situation of the pain with tenderness and rigidity he suspected acute appendicitis, and called in a surgeon, who reserved his judgement, and advised against operation. Two days later I was asked to see her, and on entering the room I was struck by her appearance; it seemed so typical of pneumonia—flushed cheeks, hurried breathing, and herpetic eruption on the lips; there was an occasional short cough. The pain complained of was entirely abdominal in the right inguinal region, where there was marked tenderness and resistance and sense of fullness.

Thorough examination of the chest failed to discover definite signs of pneumonia, though I satisfied myself that over a small area near the base the respiratory sounds were not quite pure. The temperature was high and the pulse quick. I saw her again on the eighth day of illness, when she looked much better, and the temperature was 99°. This certainly looked like a definite pneumonic crisis, but there were no further physical signs of pneumonia to be elicited on examination of the chest and the abdominal symptoms and signs persisted. The temperature rose again the same night; it continued to be irregular and the abdomen increased in size and fluid formed. We again had a surgeon to see her, some of the abdominal fluid was removed by an exploring needle and found to be a pure culture of the pneumococcus. The abdomen was incised and drained and the patient made a speedy and complete recovery.

Here, again, I think there can be no doubt that the peritoneum was attacked from the very beginning; I think the right lung was also invaded, but that view was not supported by the other doctors who examined her and not by the doctor under whose care she was throughout and who gave her the most devoted and anxious attention. In both these cases the general aspect was most striking, being so characteristic of ordinary pneumonia, including the herpetic rash in one case. The imperfect crisis is also worth noting, especially in the second case, if the peritoneum was alone attacked.

I am rather surprised at the bad prognosis which Dr. Cuff gives in these cases. Both my cases did very well, though they looked very ill before operation. Simple incision and drainage relieved them at once, and they recovered without untoward symptoms, just as does empyema when it follows pneumonia. I can scarcely believe that they are nearly as dangerous as septic peritonitis.

The great point, however, is that cases of primary pneumococcal peritonitis occur, and that we cannot afford to ignore them. Though in all cases of peritonitis one must still make every effort to discover a probable local origin—a centre of infection—it is well to keep this possible origin in mind.

I do not know what significance is to be placed on the fact that in both my cases the symptoms were located in the right inguinal region long before the peritonitis became generalized.

MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL.

CASE OF CHLORODYNE POISONING.

I was called to Mrs. T. B., aged 50, wife of a coal-heaver, at 7.30 a.m. on April 25th. She was said to have been found lying on the floor of the day room "stiff and cold." There was a bottle in the room containing 3ss of liquid having the odour and appearance of chlorodyne; there was also a diluted mixture of the same in a teacup. The patient's breath smelt of chloroform, the skin was of an ashy grey tint, the pupils were equal, moderately contracted, and did not react to light. She answered questions when spoken to loudly. The pulse was regular and of fair volume. Zinc sulphate ℥j was given without result, ol. ricini 3j, and also a teacupful of strong coffee and liq. strych. m℥ by mouth. At 9.30 the patient could not be roused, and the tint of the skin was greyer. There had been no emesis nor any action of bowels. A pint of urine was drawn off by catheter to prevent involuntary micturition. The pulse was regular and of good volume; there was slight conjunctival reflex, but she was quite unconscious except for an occasional opening of eyes. Liq. strych. m℥ was injected under the skin, and the stomach washed out. At 11.30 solution of potassium permanganate (gr. v in 3iv of water) was poured into the stomach and retained there for half an hour, when it was removed by a second washing out, and half a pint of strong coffee was given through tube. An enema of brandy (3ss in water 3iv) was given and retained. The pulse at 12.30 was still good, 128. About 3 p.m. the patient recovered consciousness sufficiently to recognize her daughter and to drink some tea.

She stated that she had been taking chlorodyne "for years" for sleeplessness. She is in the habit of drinking strong tea without milk at all three meals, and eats little.

Farnham.

T. F. HUGH SMITH.