later research, using improved methods, obtained no more than 30 per cent. of positive cultures by that time.

Loeser⁶ investigated the problem still more thoroughly, finding the uterus sterile immediately after delivery, but gradually becoming infected so that 25 per cent. of all cervical cultures were positive on the first day, 50 per cent. on the second day, and 100 per cent. on the third day of the puerperium, infection of the fundus uteri following later, reaching its height by the fifth day and afterwards diminishing.

This was confirmed by the study we conducted at frequent intervals during ten days of a trial group of 12 cases. We found the uterus to be invaded almost at once, positive cultures being obtained in some cases within five to six hours of delivery; infection increased until the third day, persisted unchanged or diminished slightly by the fifth day, and had almost disappeared by the eighth day. This progressive invasion, culminating at the third to the fifth day, affords a ready explanation of the observed delay in the development of puerperal pyrexia until this time. In one-third of a series of 74 febrile cases analysed by us,⁷ a rise of temperature occurred on the third day, and in two-thirds from the second to the fourth day inclusive.

Everard Williams and Reynolds⁸ have shown that barium sulphate emulsion, dropped into the uterine cavity by means of a specially designed cannula and syringe, gradually passed into the Fallopian tubes and reached the peritoneal cavity through the abdominal ostia. The process was traced by consecutive radiographs. They found by experimental ligation of the tubes that barium salts insufflated into the vagina in rabbits travelled upwards only when the ostia were open. The motive force was held to be an aspiration into the abdominal cavity, and ascending infection of the genital tract was thus explained. It appears, therefore, that the uterus after delivery is inevitably invaded by bacteria from contiguous sources, irrespective of manipulation.

CONCLUSIONS.

1. The organisms recovered from the uterus after labour in the majority of cases of "puerperal pyrexia" are similar to those which are found in normal puerperia. It seems possible that the injuries incidental to prolonged labour or instrumental delivery are the chief factors which determine the minor pathogenicity of which these organisms appear to be capable on occasion.

2. *Streptococcus pyogenes* is occasionally found in the absence of symptoms of disease, but in that case it is always in association with other organisms.

3. When *S. pyogenes* is found in cases of "puerperal pyrexia" the severity of the illness is proportionate to the number of streptococci present. The presence of *S. pyogenes* in the cervix uteri should remove the case from the category of "puerperal pyrexia" and allot it to that of "puerperal fever," to be treated accordingly.

4. A means of differentiating *S. pyogenes* infection from other causes of morbidity is required in cases of doubt and in every case occurring during an outbreak of puerperal sepsis. Bacteriological examination of the cervix uteri is an effective method of diagnosis.

5. The uterus is rapidly invaded by bacteria from contiguous surfaces early in the puerperium.

6. Uterine infection normally increases up to the third or fifth day and afterwards diminishes.

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PURPURA FULMINANS FOLLOWING A MILD CASE OF SCARLET FEVER.

BY

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THE following case of purpura fulminans occurring in the course of scarlet fever is, on account of its rarity, worthy of record.

The patient, a girl of 5 years, was admitted to hospital as a case of scarlet fever. The history was to the effect that three days previously she had an attack of sickness, headache, and sore throat, followed by the appearance of a rash on the trunk and limbs. On examination she appeared thin and under-developed. The cheeks were flushed, and she had definite circumoral pallor. A bright punctate rash was present on the body and limbs. The tongue was coated, though peeling had commenced at the margin, and the papillae were enlarged. The throat was congested and the tonsils were enlarged. There was a slight degree of cervical adenitis. Examination revealed no abnormality of the heart and the lungs. The temperature was 100° F., pulse 124, and respirations 28.

During the succeeding days the child appeared to be quite comfortable. She took her food well and slept well. The pyrexia which was present on admission continued between 99° F. and 100° F. for three days, when it rose to 102° F. This rise coincided with an increase in the size of the cervical glands. On the sixth day the temperature fell to normal and remained so throughout. The cervical adenitis subsided completely in a few days. Apart from this rise of temperature there was absolutely no indication of the approach of the more serious condition.

On the morning of the twenty-first day of illness an alteration was noted in the general appearance of the patient. She was now dull and listless and very pale. The pulse, though not increased in rate, was softer than it had been previously. Examination showed areas of ecchymosis over (1) both trochanteric regions, (2) the lateral surfaces of the thighs, (3) the posterior surfaces of the calves. These areas were of a deep purple colour with a narrow bluish margin, and the outline presented a definite scalloped appearance. On palpation there was no tenderness and the affected parts were rough and indurated. On the posterior surface of the left calf the condition had advanced further and a large vesicle had formed on the area of ecchymosis. When seen later in the day the child had become much worse. The pulse rate was increased and the breathing was rapid and shallow. The areas of ecchymosis, especially those on the upper part of the legs, had increased greatly in size. During the night the condition progressed rapidly and the child died the next morning.

Post-mortem Findings.

At the post-mortem examination the following points were noted. The areas of ecchymosis extended over part of the anterior, the lateral, and the posterior surfaces of both thighs, and reached from the level of the great trochanter to within two inches of the knee-joints and spread over the posterior and inner surfaces of both calves. There was also an area on the sacral region. An incision was made across one of the areas so as to involve both affected and unaffected parts, and it was found that the affected tissue was deeply injected. The demarcation of affected from unaffected tissue was as well defined in the deeper tissues as on the surface. On examination of the various organs there was no evidence of any internal haemorrhage. The heart, lungs, liver, spleen, kidneys, and bladder all appeared quite normal. In the stomach and intestine there was not the slightest evidence of petechial haemorrhages.

Discussion.

The remarkable feature of the case was that the rapidly fatal condition followed on a very mild attack of scarlet fever. Further, there was an entire absence of any haemorrhage such as bleeding from the gums or from any other mucous surface, haematemesis, melaena, or haematuria.

Other points of interest were the occurrence of the condition at the end of the third week, the sudden onset with no premonitory symptoms, and the very short duration of the purpuric condition. The ecchymosis was confined to the lower limbs and was more or less symmetrical.

A few somewhat similar cases have been recorded. Kerr¹ reported a few cases of purpura haemorrhagica, all of

which, however, were associated with haematemesis and haematuria, and followed cases of septic scarlet fever. Goodall and Washbourn² have recorded four cases of fulminating purpura haemorrhagica, and they regarded the condition as a rare complication of scarlet fever. The cases of Rolleston and McCririck³ were characterized by the absence of haemorrhage from mucous membranes, and in this respect they resembled the one under discussion. However, the period of illness from the first appearance of ecchymosis till the fatal termination was in the present case extremely short. The total duration was only thirty hours. These features bring the present case into the category of purpura fulminans.

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A CASE OF ELEPHANTIASIS NEUROMATOSA.

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VON RECKLINGHAUSEN in 1882 drew attention to an association of lesions affecting the skin and nervous system—namely, soft tumours of molluscum fibrosum, cutaneous pigmentation (freckles and maculae) scattered all over the body, and multiple fibrous tumours of nerves. Since then two other manifestations, occasionally present, were found to be classifiable in the same group—namely, plexiform neuro-fibroma and elephantiasis neuromatosa of Virchow.

Diffuse neuro-fibromatosis, or von Recklinghausen's disease, consists essentially of a diffuse overgrowth of the connective tissue of the nerves, especially that of the endoneurium separating out the nerve fibres. The fibrous overgrowth may be confined to a single nerve or a plexus, or it may be generalized to include cranial, spinal, and sympathetic nerves—large or small, superficial or deep. When the small nerves in the skin and subcutaneous tissues are affected the overgrowth spreads beyond the nerve filament in which it originates, causing soft fibrous tumours of the skin (molluscum fibrosum), which may be few and widely spread, or so abundant as to cover every inch of an individual except his palms and soles. They vary from the size of a pin's head to a fig, and may be sessile or pedunculated.

Plexiform neuro-fibroma is a fibromatosis affecting a group of contiguous nerves, commonly those of the head and neck (fifth and superficial cervical). Commencing shortly after birth, it gradually forms a pendulous mass composed of convoluted, thickened, or beaded nerve cords held together by connective tissue.

FIG. 1.—The patient. Note the pendulous scalp in the occipital region and subcutaneous nodules in the affected limb.

Elephantiasis neuromatosa of Virchow is closely allied to plexiform neuro-fibroma and molluscum fibrosum. Here the fibromatosis of the cutaneous nerves merges into a diffuse overgrowth of the skin and subcutaneous tissue, uniformly enlarging the affected region, such as a limb, as in other forms of elephantiasis. The overlying skin may be normal, thickened, or pigmented, and may sometimes

contain palpably thickened and coiled nerves, as in plexiform neuroma. The condition is usually congenital and starts at a pigmented spot or a molluscum fibrosum.

In many cases of neuro-fibromatosis death results from sarcoma, the change manifesting itself clinically by rapid enlargement of the lesions. The only treatment is excision of removable masses.

The case here reported is remarkable for the colossal growth of a limb.

The patient, a male Tamil, looks more like a boy of 15 than the man of 20 he is said to be. His outstanding feature is the gigantic size of the left lower limb, which forms a pendulous mass representing about a third of his body weight, and prevents

FIG. 2.—The affected portion of the limb before amputation.

him from walking except with the very greatest difficulty. The abnormality is said to have been present at birth and to have progressed with the growth of the boy, especially during the last fifteen years. In addition, he presents the following lesions: small, soft, freely movable, painless, subcutaneous tumours scattered all over the body, particularly on the abdomen, but absent in the palms and soles; a small pachydermatocoele of the occipital scalp; pigmentation of the skin in the form of freckles and larger maculae—the palms are pigmented, the soles less so; pigmentation of the mucous membrane of the mouth, and muddy discoloration of the conjunctivae as in argyrosis. He complains of some pain in the affected limb. His mental faculties are not impaired.

Skiagraphy showed a marked atrophy of the epiphyses and smaller bones resulting in distorted outlines. The shafts of the long bones showed an irregularly distributed thickening of the cortex, and greater elongation than on the sound side.

Treatment consisted of amputation at the upper third of the thigh, under spinal anaesthesia. Considering the amount of tissue removed the patient stood the operation very well. The amputated limb weighed 35 lb., the rest of the patient 65 lb.

Dissection of the Amputated Limb.—Apart from the enormous increase in the connective tissue of the soft parts there was also an increase in the bony development, as evidenced by the greater length of the affected limb. The normal tibia (right) was 12 inches long, the abnormal one 15½ inches. The normal fibula was 12 inches, the abnormal one 16½ inches, its lower end curving round the astragalus like a smoker's pipe bowl, and thrusting up the foot bones into a position of talipes equinus (Fig. 3). The skeleton of the affected foot was only a quarter of an inch longer than the other. Both tibia and fibula were bowed, rough, and pitted, the latter especially about its middle. The periarterial sympathetics of the femoral artery at the site of amputation were visibly enlarged. Professor A. G. Smith, to whom I sent a section of it, reported as follows:

"The lumen of the artery seemed to be small. It, and to a lesser extent the vein, were completely ensheathed in a mass of flattened, hypertrophied, tortuous nerve cords—evidently greatly enlarged periarterial sympathetics. The individual nerve bundles were clearly to be distinguished."

Histological examination by Professor Ellison confirmed that the hypertrophied nerves belonged to the autonomic system. He said they were the finest example of non-medullated nerve tissue he had ever seen.

FIG. 3.—Skeleton of amputated limb.