were widely separated at the knees, and the buttocks were unduly prominent posteriorly, while the limbs were neither inverted nor everted. In the gluteal region, behind the trochanters, which were placed above the normal level, no tumours could be felt or be rendered prominent by inversion of the limbs, as in traumatic and pathological dislocations of the hip. Traction of the limbs, while the child lay on her back, did not alter their length, or cause the trochanters to descend from their abnormal level. The child had been born without any delay or abnormality in the labour, head foremost. The dissection exposed the gluteal muscles greatly wasted, particularly the *maximi*. The capsular ligaments were entire, and greatly thickened posteriorly, where they supported the heads of the femora, and separated them from the innominate bones. On the right side, the ligamentum teres was absent, its attachment to the head of the bone being represented by a flattened tuft of tissue. On the opposite side, the ligament was present, greatly elongated and reduced to a thin flat band, but still normal in its attachments. The anterior and inner parts of the capsular ligaments were stretched from their normal attachment to the pelvis across the sites of the acetabula, which were represented only by shallow depressions filled with red fatty tissue, similar to the Haversian bodies of joints in structure. The heads of the femora were small and deformed, but a section exposed the osseous centres of the epiphyses regularly developed. The axes of the necks and heads of the femora were directed forwards as it rotated through a full quarter of a circle beyond the normal bearing, hence the fact that the limbs were not inverted, and that no tumours projected in the gluteal regions behind the trochanters. The junction of the elements of the innominate bones in the site of the acetabula were normal, and the pelvis was regularly formed, except for such features as were present constantly in this deformity, the projection of the anterior spines of the ilia and of the tuberosities of the ischia, and the deep groovings for the psoas and iliac tendons, etc. Asked by a member to state his opinion on the etiology of the deformity, Dr. Bennett stated that he contented himself with an attempt to ascertain the facts rather than to formulate a theory. He considered that this specimen excluded the theories of arrest of development of the bones, and the injury of tedious or difficult labour, or breech-presentation during birth. He regretted that he had not been able to obtain the spinal cord, although probably a search there would have been negative.

Mr. KETLEY (London) had observed dislocation or displacement of the hip in cases of infantile paralysis, but they had appeared to him to present features rather contrasting with than resembling those of congenital dislocation.

Mr. MAYO ROBSON (Leeds) asked Mr. Adams if the spinal cord and electrical reaction of the muscles had been examined in any of his cases. He believed that such cases were due to anterior polio-myelitis either before or subsequent to birth, and that the dislocation was secondary, the wasting of the acetabulum being due to non-use. He mentioned a case of congenital dislocation of the humerus, in which he had been consulted lately, where there was paralysis of the deltoid, and a congenital dislocation of the hip where there was paralysis of the glutei. Treatment was best carried out by a high shoe to correct the tendency to lateral deformity, and by massage and galvanism to improve the muscles.

Mr. BERNARD ROTH (London) had seen several patients with all the symptoms of so-called congenital dislocation of the hip-joint, which occurred after some serious illness prolonged through many months, such as spinal meningitis, rheumatic fever and its sequelæ, etc.; and yet these patients had no deformity at birth, and for the first few years of life.

Mr. NOBLE SMITH (London) considered that the interesting specimen exhibited by Professor Bennett supported the theory of the causation of congenital dislocation of the hip which Mr. Adams held in conjunction with the majority of other surgeons, the displaced acetabulum being covered with cartilage, and the capsule entire. He thought that the theory of congenital malformation was also supported by the cases of similar displacements in other joints, especially of those which had been recorded as occurring in the shoulder. The cases recorded by Mr. Robert Smith of Dublin were cases in point. Upon the other hand, the evidence with regard to breech-presentations was much against that theory, as Mr. Adams had shown. Mr. Noble Smith referred to a case of very slight displacement of the hip-joint in which the head of the femur was distinctly small, and the acetabulum apparently deficient. The left limb was alone affected, and every part of that limb was small, causing much shortening of the leg, which shortening had been attributed entirely to the displacement, whereas it was evidently dependent more upon congenital deficiency of the whole limb than upon the partial dislocation.

DOES KOCH'S COMMA-BACILLUS PRODUCE A PECULIAR POISON?

By JULES BERDEZ, of Lausanne.

NICATI and Rietsch, then Pouchet (*Bullet. de l'Acad.*, 1884 and 1885), have found poisonous substances in the liquids which had been used as nutrient media for pure cultures of Koch's comma-bacillus. At the request of Dr. Klein, we have repeated these experiments in the laboratory of the Brown Institution. Flasks of alkaline broth having been inoculated with comma-bacillus, were left in the incubator, some for four days, others for twenty days. During the first days, a live form of turbidity is produced in the flasks by the growth of the comma-bacilli, but afterwards the liquid becomes clear, and a white deposit appears on the bottom of the flask. Such broth does not smell offensively even after twenty days' cultivation; its reaction becomes slightly acid.

One part of the contents of each flask is then precipitated by basic acetate of lead, then the excess of lead eliminated by sulphuretted hydrogen. The liquid, in this way deprived of peptones and albumen, possesses toxic properties. Injected in the dorsal lymph-sac of a frog, it causes symptoms of paralysis after five minutes; the leaps of the animal become shorter and lower, and the animal soon creeps along enfeebled in all its limbs; the front legs place themselves in flexion, the back ones in extension; the reflexes are at first diminished, then disappear altogether, except in some groups of muscles. The respiration becomes slower in a few minutes, and, in about a quarter of an hour, it, as well as the movement of the heart, stops altogether. The faradisation of the spinal cord does not produce contraction of muscles, but the direct excitation of the nerves does. The effect of strychnine is considerably diminished during this intoxication. We were not able to note anything concerning the pupil.

Another part of the contents of the flasks was simply heated to a temperature approaching the ebullition of the fluid, then filtered and condensed to a small volume by evaporation. By means of a high temperature, the bacilli become matted together in the shape of small flakes, and can be then easily separated by filtration, they remaining on the filter without passing through it or obstructing its pores. The filtrate, treated in the same way as the first portion, that is, the unfiltered culture-broth, yields substances of the same toxic effect as described above.

In order to ascertain whether these properties are peculiar to broth in which Koch's comma-bacilli have been cultivated, we have inoculated alkaline-broth with pure cultures of an ordinary moving form of bacillus subtilis. These cultivations, treated in the same way as those of Koch's comma-bacillus, have also yielded toxic substances, which in frogs produce the same symptoms of central paralysis. The only difference that we could observe in these last experiments was that the broth, after some days' cultivation, remained alkaline, and smelt like glue.

The toxic principle is by no means easily dissolved in absolute alcohol. We have not succeeded in producing poisoning with alcoholic extracts. It seems, however, to be more or less soluble in chloroform.

The toxic principle seems to be produced in the cultures in very small quantities; we have not obtained enough to provoke certain symptoms of poisoning in rabbits and guinea-pigs, nor to isolate it in a pure state. In the same way as Koch's comma-bacillus and ordinary mobile bacillus subtilis, Finkler's comma-bacillus was also tested. Alkaline broth was inoculated from a pure cultivation of Finkler's comma-bacillus, and placed in the incubator for several days. The fluid was then subjected to evaporation, and when sufficiently concentrated, was tested on frogs. The symptoms of poisoning produced were the same as those produced in the two former instances. It follows, then, from these experiments, that the power to produce in alkaline broth substances which possess poisonous properties affecting the central nervous system is not peculiar to Koch's comma-bacillus, as is maintained by Nicati and Rietsch, and as is also implied by Klebs and Lauze (*Corresp.-Blatt für Schw. Aerzte*, No. 11 1885), but that it shares this with a common septic bacillus subtilis, and also Finkler's comma-bacillus. It appears very probable that these toxic substances are identical with the ptomaines, isolated and investigated by Brieger (*Die Ptomaine*, Berlin, 1885), and obtained by putrefaction of proteid materials.