one procedure will respect the desires of one patient and the other those of the other patient.

Three recent successful Cæsarean operations in Philadelphia, one by Dr. Goodell, the second by Dr. Kelly, and the third by Dr. Anna Broomall, give promise that the future American statistics for this operation will be much more favorable than they have been. But just as in the past years one occasionally heard of a woman escaping ovariectomy by giving birth to a child, in defiance of the diagnosis, so now there will be instances of women who in their perversity disappoint Cæsareans by the same natural process. Yet errors of diagnosis and proposed treatment put aside, there can be no question that craniotomy is steadily having its field more and more restricted; nevertheless that it will entirely disappear unless for hydrocephalus, and that according to Mr. Tait's prediction in two years, few are sanguine enough to believe.

What ought we to tell a patient when election must be made between craniotomy and a Cæsarean section? Answering from Leopold's statistics, 8.6 per cent. perish, whereas only 2.8 per cent., or a little more than one fourth as many die after craniotomy. Theoretically all the children are saved by the Cæsarean operation, but Leopold's statistics show that 13 per cent. are lost. These are the facts from which her conclusion may be drawn, not urged, but only advised by the obstetrician as to which he believes the better. It is probable the majority of women will select that which is least perilous to their lives.

It is probable that amputation of the pregnant uterus is destined to occupy a more prominent place than it yet has, and it may be a large experience, and that of many, will confirm the position which Mr. Tait has assigned it. The simple method of performing it advised by him, will certainly commend it to all practitioners. He declares it "the easiest operation in abdominal surgery, and every country practitioner ought to be able and always ready to perform it. No special instruments are required—nothing but a knife, a piece of rubber drainage tube, two or three knitting needles, and a little perchloride of iron."

The future will soon answer the question as to whether hysterectomy or hysterotomy will save the larger number of patients, and have a mortality more nearly that of craniotomy; by that answer the obstetrician will have clearer guidance than he now has in one of the most important questions belonging to the casuistry of obstetrics.

INTUBATION IN ITALY.—The first intubation of the larynx for croup in Italy was recently performed by Dr. Egidi, of Naples, who still holds that tracheotomy is usually the preferable operation.

POLIOMYELITIS ANTERIOR ACUTA.

Read in the Section of the Diseases of Children at the Fortieth Annual Meeting of the American Medical Association, June, 1889.

BY S. P. DEAHOFÉ, M.D.,
OF POTSDAM, OHIO.

When I received a letter from your President inviting me to write a paper for this Section I was at a loss for a subject to write upon. A short time after, while sitting in my office, a little boy came limping into the room; his atrophied leg with marked talipes valgus at once attracted my notice and suggested a subject. Although a difficult one to write upon on account of my limited experience with the disease, five cases only having fallen under my personal observation, it has been an exceedingly interesting as well as a painful one, and if I can say anything that will call forth a discussion that will throw more light on the nature and treatment of this malady I shall feel myself doubly repaid. I refer to poliomyelitis anterior acuta or infantile paralysis as it is commonly called. I shall confine myself to a consideration of the disease as found in early life, recognizing at the same time that the disease is encountered up to sixty years of age.

Poliomyelitis anterior acuta, as the name implies, is an acute inflammatory affection of the anterior cornua of the gray matter of the cord, the ganglion cells probably being the starting point. As yet there is very little known concerning the etiology proper other than it is to be found during the first three years of life. Various causes have been assigned such as cold, dentition, summer heat, acute febrile affections, the exanthemata, traumatism and a specific agent as yet an unknown member of the pathogenic bacteria.

Cold, as well as dentition and summer heat must be assigned as doubtful causes. Cold certainly can no more act as a causal agent than it does in rheumatism and pneumonia. A causative relation is supposed to exist between the affection and the exanthemata owing to its frequent occurrence during convalescence from them.

Loomis classifies traumatisms with the doubtful causes, but Jacobi says they have a more decided influence than is generally assigned to them. As to a specific microbe being the cause, nothing definite is known but the theory, to me, seems plausible. That a specific germ may gain entrance to and affect the motor regions of the cord is not impossible. Hydrophobia and tetanus are examples of the predilection exhibited for the motor regions by some specific infecting agent.

That the influence of heredity cannot be traced is an important negative fact.

Important changes are found by the aid of the microscope in the anterior horns of gray matter in the cervical and dorso-lumbar enlargements, consisting of an inflammatory softening. In the early stage all the changes of acute interstitial inflammation will be seen.

Later new connective tissue is developed and a sclerotic process is established, the multipolar ganglion cells have wasted and many have disappeared while those remaining are in various stages of degeneration, some have lost their processes and remain as irregular spherical masses of pigment. Whether poliomyelitis anterior acuta is an interstitial or a parenchymatous inflammation, the most careful microscopical examination fails to decide. The majority favor the view that the starting point is in the ganglion cells. Hyperplasia of the neuroglia in the anterior columns results in more or less atrophy of the nerve fibres. The anterior nerve roots are thin, atrophied and translucent and more or less degeneration takes place in the filaments of the peripheral nerves. The muscles which are implicated undergo serious alterations which consist in fibroid changes and atrophy; sometimes they undergo fatty degeneration. The bones of the paralyzed members are retarded in development and the tendons become atrophied. Important changes occur in the joints; the ligaments are relaxed, the articular surfaces atrophied and the articulations relaxed by reason of which great deformities are produced.

The usual onset of the disease is a fever which lasts two or three days or even more, but it may begin abruptly; the child goes to bed in the evening perfectly well, sleeps quietly through the night and awakens in the morning paralyzed. The fever may be accompanied with headache, backache, pain in the extremities, vertigo and even convulsions; or there may be merely nausea and vomiting. The paralysis is almost always at its maximum when first discovered. Most frequently the muscles of one or both lower extremities are affected; according to Duchenne, the right more frequently than the left, in the proportion of twenty-five to seven. Other observers have noticed it more frequently of the left. Four out of my five cases were of the right lower extremity. Sensibility is not affected.

The bladder may participate in the paralysis, and the urine be retained, as in my first case, or there may be incontinence; but the bladder is not permanently affected. Smith says: "The bladder and lower bowels remain unaffected, since only the muscles of volition are involved;" but as will be noticed in the history of my first case, the bladder is sometimes affected.

The tendon and other reflexes of the paralyzed parts are lost and the electro-contraction to the Faradic current is abolished. The temperature of the affected parts falls below normal, the parts being cold to the touch.

The number of muscles paralyzed varies in different cases. Only a single muscle or group of muscles may be affected, again both extensor and flexor muscles of one or more limbs may be affected. The single muscle most frequently

affected is the extensor longus digitorum, and the group most frequently affected is the extensors of the toes and the flexors of the foot.

The following is a typical case:

Case 1.—Aubrey D., aged two years and ten months. Previous to present sickness, which occurred in September, 1882, he was in perfect health, had never had any serious sickness, nor any recent injuries. His mother noticed that the child was not as playful as common, that he did not amuse himself, that he was inclined to sit, rather than run about playing with the other children. Upon urging the little fellow to go and play he replied that he could hardly walk.

My attention was then called to the child and upon examination I found his temperature 101° ; no other symptoms presented themselves, and thinking that possibly it might be malaria, I gave the child some quinine.

The next day the child was no better, temperature 100° in the morning and 101° in the evening. He complained considerably of pain in his limbs when required to walk, which led me to think of rheumatism. Quinine was continued. Third day: child no better, temperature about the same as the day before, pains in the lower limbs increased especially in the region of the right hip. Not another symptom presented itself that I could perceive and I was at a loss for a diagnosis.

I saw the child at 9 P.M. and nothing further had developed. He slept well during the night, and next morning I saw the child early and lifted him from his bed myself, whereupon he cried loudly with pain in the right hip. I began a careful examination, and upon taking hold of the right foot I found it cold and limp. The diagnosis was clear and I found myself confronted by a disease which I felt that I could not do as much for as I would have liked.

The child could not move a muscle below the hip, and the entire limb was cold. There was retention of the urine, but this yielded to warm hip baths. The pain in the region of the hip gradually disappeared in three or four days. The child was kept at rest in the recumbent position; the hot douche to the spine, with artificial heat to the paralyzed limb constituted the treatment for the first week, after which he was given iron as a tonic with strychnine according to the formula of Prof. Hammond.

R.—Strych. sulph. gr. j.
 Ferri pyrophos. ss.
 Acidi phos. dil. ss.
 Syr. zingib. ʒ iijss.

M. S. twenty minims three times daily.

Friction to the paralyzed member, together with electricity was perseveringly employed; but unfortunately, through the advice of a distinguished medical gentleman, the induced current only was applied.

The flexors and extensors of the leg soon regained their power of motion and in about four weeks the patient was able to crawl about the room. The extensor proprius pollicis was the first muscle of the leg to regain partially the power of motion. Other muscles in turn gradually regained some power of motion, and in two months the little fellow began to try to walk.

The muscles of the leg and foot had become markedly atrophied, and to-day the ligaments of the knee and ankle are relaxed permitting hyper-extension of the leg and considerable talipes valgus. The temperature of the limb still remains below the normal.

I will not trouble you with lengthy histories of my other cases; suffice it to say, that in

Case 2 the paralysis was noticed in the morning when the child, a boy of two years, was taken from his bed, having been apparently well when put to bed the evening before. The right lower extremity was paralyzed, and marked atrophy of the entire limb remains. The child walks fairly well. No deformity other than the atrophy.

Case 3.—A female, aged 18 months, was taken from the county infirmary by a lady who, thinking the trouble could be easily relieved, brought her to me. Here again the paralysis was of the right lower extremity, but only the flexors of the foot, and extensors of the toes were paralyzed. The onset is not known.

Case 4.—A female, aged 7 months when afflicted. Was brought to me for treatment some months after. The parents stated that the child had been sick, had had fever, and upon the recovery from the fever remained helpless. In this case both upper and lower extremities were paralyzed. Treatment was of no avail, and marked contractures with great deformities developed later on.

Case 5.—A female aged 2 years 6 months. After an attack of fever which lasted several days the parents noticed that their child could not use her right leg. My attention was called to the case, and I found paralysis of both flexor and extensor muscles of the foot and toes. Electricity with iron and strychnine constituted the chief treatment with a not very flattering result. The child is now able to run about but considerable atrophy and talipes varus remain.

The diagnosis ought to be, and doubtless with all of you is easy; but my observation is that many general practitioners are unable to differentiate it from other affections; for during my connection with my first case, a number of physicians saw the case with me and their diagnosis varied from worms and biliousness to rheumatism. I fancy I hear some one say, surely those physicians were very ignorant. Not so, for one of them was, and is to-day a professor in a medical college in good standing. If such men overlook the disease it may be well for us to notice some

of the more important diagnostic points. In the first place it might be mistaken for paralysis of a temporary nature; here there will be no softening nor atrophy. There will be no change in electro-muscular contractility, and recovery may be expected in twenty to thirty days. Again it may be mistaken for rachitis, but here again there is no change in the electro-muscular contractility and there co-exists certain changes that cannot fail to determine the nature of the disease. In hemiplegia there will be loss of intelligence and speech, paralysis of one side of the face, strabismus, and generally dilated pupils, electrical contractility normal, absence of fever and muscular atrophy. In myelitis sensibility as well as motility is affected; genito-urinary complications and trophic disturbances such as acute bed sores, oedema of the paralyzed limbs and effusions into the joints are sufficient to differentiate it. Progressive muscular atrophy may usually be known by the age, the slowness of development, and in turn the affection of isolated groups of the muscles. Diphtheritic paralysis may be known by the previous history, by the paralysis of the soft palate, absence of atrophy, and preservation of Faradic reaction.

During the initial stage, before paralysis has occurred the treatment must be purely symptomatic, since a diagnosis is impossible. After paralysis has occurred, and the diagnosis is clear, the most important element in the treatment is rest in a recumbent position. In this I believe all authors agree, but in the further treatment there does not seem to be the harmony of opinion that might be desired. To prevent further destruction of the gray matter, Bartholow recommends quinia and belladonna; hot douche to the spine; the application of galvanism, inverse current, stable, large volume and low intensity, together with rest. Althaus recommends hypodermatic injections of ergotin repeated once or twice daily. Hammond says ergot is the only medicine capable of cutting short the disease or limiting its lesions. Brown-Séquard praises the belladonna treatment. Loomis, in his third edition speaking of the treatment with ergot and belladonna says he has never obtained any positive results from their use. Simon advises cutaneous revulsives. Loomis says they are contra-indicated. Erb recommends central galvanization as an antiphlogistic remedy for the myelitis and places a large anode over the spine at the supposed seat of the lesion and the cathode over the abdomen. His method is intended as a sedative to the local inflammation. Loomis again says electricity is contra-indicated.

Allen Starr, in an article on "Electricity as a Therapeutic Agent," in the *Medical News*, March 30th, 1889, in speaking of the use of electricity in infantile paralysis says: "There may be an object in reducing congestion; but it is not cer-

tain that this can be accomplished for any length of time by electricity. After the acute stage is over, spontaneous recovery will occur in a greater or less degree in many cases. Is this aided by the application of electricity to the spinal cord? I have yet to be convinced that it is, though I admit that I still employ the agent in deference to the opinion of certain authorities." Further on he says "Experience does not confirm the statements of some text-books, and of those whose interests lie in the direction of its use."

Gowers says, "Electricity has been strongly advocated and largely used in the treatment of infantile paralysis, and there is reason to believe that it is useful, although its influence has been much exaggerated." In no sense is it a curative agent, and there is no evidence that its application to the spine is capable of increasing the degree or accelerating the course of the recovery of the nerve elements. Nor is it easy to obtain evidence of its influence over the muscles. If the wasting is rapid, this progresses in spite of daily and sedulous applications."

My experience with the agent corresponds with Erb, who remarks that "Its results are not precisely brilliant." Since the electro contractility to the Faradic current is abolished, it is useless to apply it, except to those muscles which are imperfectly paralyzed and the interrupted galvanic current should be used until the contractility returns sufficiently to react to the Faradic current when that should be used. But little benefit can be expected if the muscles have entirely lost their contractility. The utility of the Faradic current is a stimulus to muscles imperfectly paralyzed, but liable to degenerate from inaction and to take the place of the galvanic current when the contractility returns.

A valuable aid to electricity is strychnia, especially when given hypodermatically. It should not be thus given more than two or three times a week. In nearly every case tonics are indicated, such as iron, quinine, arsenic and phosphorus, and the formula of Hammond as given in the history of my first case is an excellent one.

DR. KING, of Chicago, had observed three cases in adults during the last winter. In adults it was possible to elicit symptoms that could not be learned from children. Pain is a very prominent feature in adults; not so marked in children. Temporary paralysis of the bladder is always present but it quickly passes off, showing that the fibres to the detrusor muscles are not in the anterior horns but are affected by collateral hyperæmia. Tactile sensation was unaltered. Electricity is keenly felt by children and on this account this agent cannot be thoroughly used in the treatment.

DR. PETER HOOPER, of Philadelphia, said that in his experience electricity was useless. Hypodermic injections of strychnine and massage were best.

A CASE OF DRAINAGE OF PULMONARY CAVITY, WITH A RIB-CUTTER DEvised FOR THE OPERATION.

Read in the Section of Surgery and Anatomy at the Fortieth Annual Meeting of the American Medical Association, June, 1889.

BY C. DENISON, M.D.,
OF DENVER, COL.

November 5, 1888, A. C. L., age 26, teacher, single, Cheshire, Conn., and Tilton, N. H.; father died of consumption at the age of 70, and the disease was prevalent on father's side.

The patient had left side pneumonia last April and was five weeks in bed. The attack commenced with a chill and the crisis came in six days. There was rusty sputum and probably some pleurisy complicating the pneumonia. According to the attending physician, Dr. W. C. Williams, of Cheshire, Conn., resolution was slow and the lung did not clear up well. There were no hæmorrhages, but he lost flesh and had night-sweats at times during the summer, and after his arrival in Colorado, which was five weeks ago, felt elevation by increased dyspnoea. Has had chills, afternoon hectic, and now expectorates profusely a yellowish-white sputum, he thinks one-half pint a day. He believes he has improved here, especially in appetite and digestion. Usual weight, 150; on arrival in Colorado, 125; height, 6 feet; spirometrical record now 120 cubic inches; pulse, 108; respiration, 28; temperature, 3 P.M., 100° F.; expansion, 31 and 32½ inches; emaciation considerable; depression is marked, and there is almost no movement on left side. Some air enters the left scapular and interscapular regions, but otherwise dulness predominates on that side. Slight "cracked metal" sound on stethoscopic percussion in the lower and posterior part of the axillary space. On the right side there is some broncho-vesicular breathing in the inframammary region.

Diagnosis: Pneumonic phthisis, third stage left, first (?) right. Gave treatment for night sweats and put the patient on Gardner's syrup hydriodic acid and syr. hypophosphites comp. N. F.

Reëxamination January 14, 1889. Been in Denver, out on Humboldt street, in the outskirts of the city. Been constantly expectorating mornings; has gained in weight, now 138 lbs.; sleeps well and appetite good, but not so well for the last two weeks; bowels at times loose; coughs during the daytime, and has afternoon chills and hectic; pulse, 110; respiration, 40; temperature, 101⅓°, 2 P.M., and expansion 31 and 32⅓ inches; left lung sinking in size; moist crackles left infrascapular, absence of respiratory murmur left lower axillary space; cavernous breathing apparently superficial left infrascapular, with "cracked metal" sound, showing excavation near the sur-