

jections were reached, the systemic effect of mercury soon became apparent as pyalism, intestinal irritation and occasional tremor, which, however, soon subsided on ceasing with the injections, administration of potassium chlorate and occasionally the exhibition of potassium iodide, which, although acting as an adjuvant in the treatment did not serve to augment the systemic effect of the mercuric bichloride, but rather diminished its characteristic symptoms. Stimulation by milk punches, supporting treatment with ferrous iodide, were often found of great utility, but generally after twenty-four to thirty daily injections, the syphilitic symptoms had disappeared, and where the increasing dose had been persistently continued, the relapses proved a rare exception indeed. I attribute the effect of this treatment to a formation of mercuric albuminate in the cellular tissue, which, insoluble to the liquids of the organism, gradually dissolved under the peptonizing action found everywhere in the body, and thus produced a peptonized mercuric albuminate readily assimilable and eliminable in and through all parts of the body.

I am led to this inference from the fact, that otherwise toxic doses, were innocent if injected under the skin, and if it were not for local irritation I think even larger doses than I have mentioned could be borne without toxic effect. The local effect of the injections seems to bear out my views. Even large doses produce, at best, a lump which, though producing a somewhat erythematous condition of the skin, never suppurates or gives rise to deeper inflammation. I am free to say that in the thousands of injections I have so made, I have never met with an abscess or serious inflammation, though the lumps of mercuric albuminate could be detected for several days. The only precaution I observe is to use a clean gold needle, and to inject deep enough into the sub-cellular or connective tissue where there is plenty of free and convertible albuminous substance. Though the pain in these injections is always a disadvantage, if the solution is sufficiently dilute it will be lessened to a considerable degree, or augmented if more concentrated. No addition of any kind has in my hands lessened this, although I have with advantage administered $\frac{1}{4}$ of a grain ($1\frac{1}{2}$ centigrammes) of morphine sulphate into the arm hypodermatically prior to the injection of the corrosive sublimate. I regard it as necessary, to bring syphilis to an abeyance and to obviate an early relapse, to constantly increase the strength of the mercuric chloride until its constitutional symptoms, and then continuing with its use in a less vigorous manner until all symptoms have disappeared, sustaining the patient during this period with aliment, stimulants and medication. Conducted in this manner, I regard the treatment of syphilis by hypodermatic injections of corrosive sublimate, as more rapid, reliable, cleanly and less dangerous than either the internal exhibition of mercurials or iodides, or the combination of the two; or the nasty, filthy, inunction treatment, either with or without variations. In no cases have I found it necessary to use more than twenty to thirty injections, though I have frequently continued the after treatment for a month or two with decided doses of potassium iodide.

THE VALUE OF CARBOLIZED WATER FOR THE PREVENTION OF SHOCK IN LITHOLOPAXY, WITH THE RESULTS OF NINETEEN CASES.

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Presented to the Section of Surgery and Anatomy of American Medical Association, May, 1884.

The power of carbolic acid to benumb the sensibility of the nerves, when applied locally, is well known. For several years I have acted on this hint in the new operation of litholopaxy, with the view of blunting the impressibility of the urethral and vesical nerves, so as to make them tolerate the prolonged use of instruments without shock. For this purpose I provide a large supply of warm carbolized water, of the strength of from $1\frac{1}{2}$ to 2 per cent., and use this exclusively, both to distend the bladder during the crushing of the stone and to wash out the fragments. The result is so gratifying that I cannot but attach great value to this method. I have tried it in nineteen cases, with only one death. The patients averaged nearly 60 years of age, and most of the stones were large. One patient of the age of 69 years, with a stone weighing over $2\frac{1}{2}$ ounces, was under the operation for about an hour and a half. There was not even a chill following this severe procedure, and he recovered without a single dangerous symptom.

One stone in a young man was of oxalate of lime and over an inch in diameter, and so hard that the first fracture required nearly the entire strength of my hands. He recovered without difficulty, and walked about town in eight days. Other cases were equally striking.

The acid seems to act favorably by blunting the nervous susceptibility to shock, and also by leaving the bladder in a thoroughly antiseptic condition, highly favorable for preventing inflammatory action.

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PAINLESS INCISIONS BY INSTRUMENTS ADVANCING WITH A SLOW, IMPERCEPTIBLE MOTION.

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At a former meeting I called the attention of the Association to the painlessness of incisions and injuries when made by circular saws, bullets and other objects moving at a rate exceeding 200 feet in a second. I also detailed some experiments with a revolving knife made to move by a powerful spring at a similar velocity.

A careful study of certain classes of surgical injuries, seems to show that pain exists only when the traumatic agent moves at a certain intermediate range of velocity, and that wounds made by objects moving on the one hand at a very high speed, or, on the other hand, at a very slow, imperceptible rate of motion, are nearly painless—often entirely so.

Practical application of this law has long been made in surgery, where a fine rubber thread is made slowly and painlessly to cut through the sphincter in cases of *fistula in ano*, or to divide the pedicle of a tumor.

I have lately commenced experiments with an instrument having an exactly measured and very slow rate of motion.

The apparatus is a thin sharp knife made to advance with a spring, whose velocity is held in check and regulated by an attached watch movement. When applied to the surface with bandages, the knife advances into the flesh of the patient with a perfectly regular motion at the rate of one inch in six hours.

The instrument having been only recently finished, I can as yet report but few experiments, but I have gone far enough to prove that at this velocity there is no clearly defined pain, but only a slight sense of uneasiness, which does not even prevent the patient from falling asleep, if he happens to be so inclined, as he was in one of my cases.

My theory is that at this slow rate the pressure of the thin advancing blade benumbs each nerve twig before it actually divides it, as slow pressure on any larger nerve deprives it of sensibility, and that the slight uneasiness before mentioned is caused by this slow pressure, and not by the actual division of the nerve fibres.

Although the painlessness obtained by high and low velocities can never entirely supersede the regular anæsthetics, yet I hope to show at a future meeting that there is a wide group of minor operations where this principle is applicable for the prevention of surgical pain, and to present instruments of practical value for this purpose.

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MEDICAL PROGRESS.

SURGERY.

THE SURGICAL AND ORTHOPEDIC TREATMENT OF INFANTILE PARALYSIS.—Bernard Roth, F.R.C.S., in a paper read before the British Medical Association (*British Medical Journal*), gives special attention to the use of massage and movements, both voluntary and involuntary, in the treatment of infantile paralysis after the acute stage has passed, to improve the power of those affected muscles which have still some voluntary power left; and to prevent the onset of any deformity, or, if this has already occurred, to reduce it to a minimum. The first thing done is to correct the lowering of temperature, nearly always present, of the limb or limbs. If one leg is affected, the parents should be told not to be satisfied unless it is as warm as the healthy one; quick sponging with tepid water, good rubbing and drying, and extra clothing, such as loosely knitted woolen stockings, thick cloth leggings, or, best of all, cloth leggings lined with cat skin or other fur. Baths 98–100° F. for 10–20 minutes every evening. A small barrel on end answers admirably. This to be followed by a rapid sponging of the whole body with cold water.

Massage more frequently an hour twice daily by *kneading*, a combination of grasping, and large pinching and pressure, with the two hands used alternately, one after the other, so that whatever is left of the wasted muscle is thoroughly squeezed and moved about. The skin to be protected from abrasion by lubrication with olive oil, or vaseline.

Circular friction by the thumb is done as follows: The operator's thumb-end is firmly placed on any given spot, and while considerable pressure is exerted, describes small circles, ten times from right to left, and ten times from left to right. A spot an inch higher or lower, or to one side, is then treated in the same way, and so on until every part of the muscle has been thoroughly manipulated.

Fulling acts less directly on the muscles, but rather on the whole of the tissues of the paralytic limb; it is effected by rapid to-and-fro alternate gliding of the two palms on opposite sides of the limb, which is at the same time as firmly compressed as possible. If the leg is to be "fulled," the operator begins close to the groin and gradually works his way down to the foot, moving the hands rapidly to and fro the whole time. The first time, the hands should be on the outer and inner aspect of the leg; the next, they should be placed higher on one side and lower on the other; the third time, this position is reversed; and, finally, the hands are placed posteriorly and anteriorly to the limb. After five minutes of such manipulation a dozen or two firm *strokings-down* of the leg end the rubbing.

With this the so-called Swedish exercises or medical gymnastics makes the treatment complete. The latter varies according to the part to be influenced and consists in making each muscle or group of muscles contract and then gradually relax, at first actively and then against resistance by the surgeon. With the *hip-joint* the patient lies prone and raises the leg, with the knee kept extended, from off the ground—if too weak, the hand under the knee assists the movement. Circumduction follows of the hip from right to left, and *vice versa*, ten or twelve times each way—its severity being increased by pressure of the hand against the back of the heel. *Knee-joint*. Here the patient lying supine has the knees flexed, and the legs hanging vertically over the end of the padded table on which he lies, and exercises the extensors by slowly extending one knee, when too weak the foot is supported. *Ankle-joint*. Here the leg is supported on a chair, the foot projecting; flexion, extension, adduction, abduction and circumduction are executed either voluntarily by the patient or passively by the surgeon. The *shoulder-joint*. The patient lying on the back, circumduction from before backwards, the elbow and wrist being kept extended voluntarily or by a wooden splint. To bring the scapular muscles into action, the patient, lying supine, with the arms down by the side of the trunk, or abducted at right angles to the body, or extended upwards by the side of the head, is told to resist the arms being brought forward from either of the above positions, and then voluntarily returned to the initial position against gradually yielding resistance. *Elbow-joint*. The upper arm being fixed against the table, flexion or extension is easily resisted by the