elevating the nutrition, improving the general condition, and regenerating the blood and bodily fluids. If this view be correct, any procedure which causes destruction of the surrounding capsule, with setting free of the bacilli, carries with it the danger of dissemination. This is illustrated in the general infection following operative treatment of tuberculous bone disease and of fistula-in-ano of tuberculous character.

SURGERY.

UNDER THE CHARGE OF

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THE SUPPOSED CURATIVE EFFECT OF OPERATIONS, PER SE.

Under this title, Dr. J. WILLIAM WHITE, of Philadelphia, contributes a paper to the *Annals of Surgery* for August, 1891, which, not only from its subject, but from the great number of authorities quoted and from the peculiarly rich experience of the writer, makes an article of unusual interest and importance to both surgeon and physician. The author's attention was first directed to this subject by reason of his experience with the operation of trephining for so-called traumatic epilepsy.

During the past five years, with Dr. D. Hayes Agnew, he has trephined in fifteen cases of supposed traumatic epilepsy. All but one recovered from the operation. The patient who perished was an imbecile and a confirmed drunkard, as well as an epileptic. Death occurred from suppression of urine, probably secondary to etherization.

In one case a bullet was found imbedded in the brain substance; in another an irregular portion of the internal table was dissected out from beneath the dura mater, to which it was attached by cicatricial adhesions. In another there were projecting spicules of bone on the internal surface of the button removed and the adjacent portions of the skull. In two, marked sclerosis and thickening of the cranium were observed about the field of operation. In the remaining cases nothing abnormal was seen. Although this was the case, they were, without exception, markedly improved by trephining, in two instances even to the point of apparent cure, no return of symptoms having been observed for eighteen months and for two years after the operation. In the other seven the results were strikingly favorable, convulsions disappearing for weeks or months, although previously of more than daily occurrence.

The author has, in so far as this is possible, classified the cases in which operation *per se* seemed to be the main factor in bringing about a cure. These cases are divided into three groups, in accordance with the anatomical seat of the symptoms or of the supposed disease. This brings them under the following heads:

1. Operations for the relief of nervous phenomena, as epilepsy, insanity, paralysis, etc.
2. Operations for abdominal and pelvic disorders, as peritonitis, tumors, etc.
3. Miscellaneous operations.

This classification is further carried out by grouping together (a) those cases in which nothing whatever was found explanatory of the symptoms; (b) those in which some departure from normal conditions was observed, but was so slight as to be apparently inadequate to explain the symptoms; (c) those cases in which an apparently grave and irremediable condition was disclosed by an exploratory operation, but notably improved or altogether disappeared after mere inspection and handling, no further surgical interference having been thought justifiable.

Under the heading of "Operations for the Relief of Nervous Phenomena," Dr. White has tabulated, including his own service, 154 cases. Many of these are given in detail, and coming as they do from recognized authorities, are of exceeding great interest.

In 56 cases of trephining for epilepsy nothing abnormal was found to account for the symptoms. Nineteen cases were reported in six months or less after operation; 11 cases were reported from one to two years after operation; 1 was reported eight years after operation.

Of these cases 25 were reported as cured; 18 as improved; in 3 it was mentioned that a relapse occurred later.

In 30 cases of ligation of bloodvessels for epilepsy 14 were reported as cured; 15 as improved; 1 died seven days after operation. In the fatal case the right common carotid artery was tied. No fit occurred after the operation.

In 10 cases of castration for epilepsy all were reported as cured. One case was reported four months after operation; 4 cases were reported more than two years after operation; in 5 the time when reported is not mentioned.

In 9 cases of tracheotomy for epilepsy 2 were reported as cured; 6 as improved; 1 as much improved, though death in this case followed in two months after the operation.

In 24 cases of removal of the superior cervical ganglia of the sympathetic nerves 6 remained well at the end of three years; 10 were improved; 5 remained unimproved; 2 died soon after the operation, but not from its direct effect.

In 6 cases of incision of the scalp for epilepsy nothing was found to account for the symptoms. Three of these cases were reported as cured at the end of one year; 2 were reported as cured at the end of two years; 2 other cases, almost similar, were reported as cured.

Twelve cases of epilepsy are reported as cured by such operations as stretching of the sciatic nerve, excision of the musculo-cutaneous nerve, cauterization of the larynx, circumcision, application of a seton to the back of the neck,

tenotomy of the external recti muscles, burning of the scalp, puncture of the heart, etc.

Thirteen cases of spontaneous or accidental cures of epilepsy are also reported, at a time varying from two months to five years after the traumatism, which was a fall, a burn, a wound, an amputation for intercurrent injury or disease, etc.

Passing from the cerebral to the spinal region, Dr. White cites an illustrative case of his own. A man aged fifty-five years was attacked on December 25, 1887, with severe pains in his arms and shoulders. A few days later there was weakness of the thighs, spreading rapidly down the legs to the feet, and upward on the body to the nipple line. In eight days there was absolute paralysis of the parts involved, including both sphincters, while at the same time the paralyzed parts became the seat of profound anæsthesia. Girdle pains developed, bedsores made their appearance, percussion of the spine over the third and fourth vertebræ became painful. The reflexes were exaggerated, and light blows on the head in the direction of the spinal axis gave rise to frightful exacerbations of the girdle pains. In spite of every remedial measure these symptoms increased in severity for ten months. An exploratory operation was then undertaken. Dr. White removed the spines and laminae of the first five dorsal vertebræ, opened the slightly thickened dura, separated some firm adhesions to the subjacent pia mater, explored the cord, and having failed to discover any serious pathological changes, closed the wounds in the dura and soft parts.

The girdle pains had entirely disappeared by the following day, sensation began to return in the feet the day after, voluntary motion in the toes after the eighth day, and so one symptom after another disappeared until the patient completely recovered, and is now earning his living by manual labor.

In the list of abdominal and pelvic disorders apparently cured by operation *per se* a number of extraordinary cases are cited. The experience of Tait, who has more than once drawn attention to the astonishing disappearance of tumors, often of large size, after a mere exploratory incision, and the corroborative testimony of Von Mosetig, are cited at length. Koenig's analysis of 131 cases of tubercular peritonitis treated by abdominal incision is carefully discussed.

In response to letters of inquiry upon the subject, Dr. White received many communications from prominent operators, the great majority of them containing notes of cases not previously published.

Among the signers of these letters are to be found the names of Goodell, Hirst, Battey, Roswell Park, Lusk, Cheever, Chas. T. Parkes, Cabot, Hunter McGuire, Nancrede, Weir, Stimson, and many others of equal note.

Under the heading of Miscellaneous Operations the author has given several of very diverse character.

First are quoted cases of osteomalacia, cured, after weeks or months of confinement in bed, by either oöphorectomy or Cæsarean section.

Passing to another subject, the question of graduated tenotomy of the eye muscles for the relief of severe nervous symptoms is carefully discussed. The author freely acknowledges the value of tenotomies, both complete and graduated, in the restoration of equilibrium in badly balanced ocular muscles, but he is none the less convinced that in numbers of instances of reported cures

of chronic chorea, *petit mal*, and even delusional insanity, the effect of the operation *per se* is in large measure the potent cause of the supposed cure. This belief is founded not alone on theory but upon the fact that in certain cases of reflex nervous troubles a cessation of the symptoms has followed the tenotomy, although this has not produced perfect equilibrium. Again, the relapses which may take place after a perfectly successful series of tenotomies would indicate that the nervous phenomena attributed to the insufficiency, for the relief of which the operations were made, were not correctly so attributed, and that the temporary relief must be ascribed to some cause other than the restoration of an imperfect balance of the external ocular muscles.

In seeking for a reasonable explanation of the phenomena observed in the above cases, the author has formulated the conditions which are common to nearly all of them. These are:

1. Anæsthesia.
2. Psychical influence, or so-called mental impression.
3. Relief of tension.
4. Reflex action or the "reaction of traumatism."

These influences were operative in the majority of cases, although not one of them, except the last, applies to the whole list.

With the idea that it was conceivable that a disease of the nerve centres not reached by ordinary drugs might be affected by agents of such volatility and diffusibility as ether and chloroform, the author instituted a series of observations upon a number of epileptics in various stages of the disease. All other treatment was withdrawn, ether was given to the production of full anæsthesia at intervals of from forty-eight to seventy-two hours. The results were either entirely negative, or in consequence of the withdrawal of their bromides the patients grew worse.

Since in the great majority of cases upon which Dr. White bases his paper there were either undoubted symptoms, such as are habitually associated with organic disease, or there was demonstrable and unmistakable evidence of such disease, it is necessary to believe, in considering the psychical influence of operation, that powerful impressions acting upon the emotional or intellectual nature may affect the organic processes of secretion, nutrition, etc., and may arrest pathological changes and bring about reparative or recuperative action. Cases are cited in which such influences are clearly set forth.

The author holds that the normal equilibrium which we witness between the cerebro-spinal and the sympathetic systems as respects their influence upon the bloodvessels is obviously more or less interfered with when the brain transmits a more than wonted impulse, allowing the unrestrained action or paralyzing the influence of the sympathetic vasomotor nerve. In this relation the author narrates some remarkable cases of hypnotism, and quotes some striking examples of the influence of the central nervous system upon the body.

Belief is expressed that in many of the cases described there can be little doubt that relief of tension is an important factor in amelioration or cure. If it is assumed that preternatural tension exists in the cranial cavity, this would be relieved to an extent by trephining, and there would be but few exceptions to the rule, that in each case something was done which lessened tension in

the cavity or organ of the body. There are other cases, however, in which no such relief was obtained, and yet cure resulted from operation. A diminution of the tension would manifestly alter the blood-supply to any important organ in the body, and with it the nutritive processes, local and general. Beyond this nothing definite can be said except as it applies to cases of ascites, in which, as in cases of hydrarthrosis, one tapping may prove permanently curative because the original source of irritation and hypersecretion has already disappeared.

Under the head of Reflex Action, the author includes the "reaction of traumatism," as well as the effects of revulsion and counter-irritation.

Verneuil has long since shown that very slight traumatism sometimes excites in the entire economy a general perturbation, and sometimes, by selection of the weak point, a sudden aggravation of lesions that are only slight or have slumbered. This same excitement, usually prejudicial, may occasionally be curative. In the case of spinal surgery above detailed, Dr. White believes that the local shock of the operation was promptly followed by a corresponding reaction in which the vitality of the tissues was raised sufficiently high to determine a return to the normal state. In this relation the reciprocal influence of one portion of the body on another is briefly discussed.

In considering abdominal tumors, attention is called to the possibility of the spontaneous disappearance of such tumors, the relation of this disappearance to the operation being coincidental; cases are cited in point. As to the cure or amelioration of growths thought to be malignant by merely exploratory operation, a long search through the literature of the subject has met with but little success.

The cure of tuberculosis of the peritoneum as the result of exploratory incision is explained on the ground that the removal of ascitic fluid allows the peritoneal surfaces to fall together and to acquire adhesions. The tubercles are then shut in between the coils of intestine, the omentum, and the abdominal wall. They are thus surrounded by tissues in a high degree of activity, which can now throw around them the limiting zone of young cells and eventually fibrous tissue, which, if the tuberculous process is not too far advanced, may effectually resist it and may cause it to retrograde, the process being analogous to that which we see imperfectly going on around a cancerous growth.

As a result of a study of the subject, the author believes the following conclusions are warranted:

1. There are large numbers of cases of different grades of severity and varying character which seem to be benefited by operation alone, some of them by almost any operation.
2. These cases include chiefly epilepsy, certain abdominal tumors, and peritoneal effusions and tubercle, though the improvement in the latter is, perhaps, to be explained on general principles.
3. Of the possible factors which, by reason of their constancy, must be considered, anesthesia seems least likely to have been effective. The other three—viz., psychical influence, relief of tension, and reflex action—may enter in varying degrees into the therapeutics of these cases, and taken together, serve to render the occurrence of occasional cures less mysterious.

4. The theory of accident or coincidence scarcely explains the facts satisfactorily.

DEEP URETHRAL MEDICATION IN THE TREATMENT OF URETHRAL CATARRH.

Some practical suggestions for deep urethral medication in the treatment of posterior urethral catarrh are made by KEYES (*Medical Record*, vol. xv., No. 4), whose position as a genito-urinary surgeon is such as to entitle any of his writings to careful consideration.

He again calls attention to the fact that it is impossible to say exactly what a stricture is, since every natural undulation of the canal may be so classed by the physician who is properly impregnated with the large-calibre stricture idea, and hence he is sure to find what he looks for in every case of gleet.

Keyes states that the vast majority of chronic gleet cases have already been cut anteriorly in the urethra from nine to eleven times, and that very few of them have been tested to ascertain whether they have posterior urethritis or not. He states that one may easily learn how to cure many, and diagnose all, cases. Where the trouble is due to anterior urethral catarrh, caused by stricture, granulations, or what not, the source of the pus may be demonstrated without the endoscope by gentle, thorough, hot irrigation of the anterior urethra by means of a soft catheter passed into the sinus of the bulb, and the immediate subsequent use of the simple metallic bulbous bougie, provided the meatus be reasonably large; for if the pus comes from granular or strictured portions of the pendulous urethra, the irrigation will only wash away what lies loose in the canal, and the bulb will subsequently bring forth upon its shoulder soft muco-purulent clots, generally tinged with blood, which have been scraped off the excoriated areas from around which the inflamed mucous membrane secretes whatever free pus exists. There may be tight areas, which the bulb will detect; but if there be not a granulating surface upon the tight area or behind it, which the bloody muco-purulent clots on the shoulder of the bulb will demonstrate, or their absence disprove, then the cutting of such tight areas will not favorably modify gleet in most instances. Even though there may be some tight areas and a moderate condition of granulation, if there is also posterior urethritis the cutting of the tight areas, although it may greatly moderate, will not cure the gleet, and this should be told a patient before such operation is undertaken.

When there is posterior urethritis the quantity of pus lying in the urethra behind the bulbo-membranous junction is disproportionately great when compared with the amount of gleety discharge that appears at the meatus. This may be readily demonstrated. If the urethra be milked by firm pressure with the finger, from the perineum forward, until all the pus that will come be squeezed out, and then the patient be instructed to urinate in two parts, into separate glasses, if he have even moderate posterior urethritis the quantity of pus mixed with the first urinary gush, representing the washing out of the deep urethra, will be disproportionately great when compared with what has flowed out spontaneously from the meatus or been milked out by the physician before the urinary act, as shown by gross inspection of the specimen. And if the grade of posterior urethritis be intense, not only will the first

urinary gush be purulent, but also the entire secondary flow will be turbid with pus. In case of doubt, the anterior urethra may be irrigated before the urinary test is applied. The pus may, of course, come from the prostate gland or the seminal vesicles; but this may be demonstrated by milking of these organs by means of a finger in the rectum, between the first and second urinary flows, urine being retained in the bladder to be ejected in a third urinary discharge, and the specimens to be examined microscopically after settling.

The clinical picture of posterior urethritis is fairly typical. After the subsidence of an acute attack of gonorrhœa, which has, perhaps, been complicated by cystitis or vesical irritability, there follows a mild gleet. So long as the patient uses an injection, his urethra remains dry and he thinks himself cured. On leaving off this treatment, however, the discharge reappears, sometimes accompanied by discomforting sensations in the anterior urethra near the meatus, or referred to the perineum, and sometimes accompanied by urinary urgency and precipitancy. Wines, spirits, or indulgence in sexual intercourse promptly aggravate the gleet. Most of these cases have the anterior urethra widely cut for a close stricture of large calibre, and are subsequently treated by large sounds, often with much benefit; frequently, however, the passage of these instruments aggravates the discharge and lights up either cystitis, prostatitis, or epididymitis. Most of these cases ultimately get well, and without local treatment.

Rest, balsams, alkalies, demulcent drinks, counter-irritations, change of air, treating of the anterior urethra, iron in chronic cases, all of these are potential, and most of these can be happily combined with local posterior treatment. Some few cases are positively unsuited to local treatment and get worse under it. Most tubercular cases, and some simple inflammatory and some ordinary gonorrhœal cases, can be classed in this group. When the treatment disagrees, symptoms become so promptly and obviously aggravated that the futility of repeating applications is at once clear. There is no danger of producing cystitis or epididymitis if instruments are used carefully and not inserted too far; the risk incurred of occasioning these symptoms is vastly less than in treating the disease with anterior injections or sounds and internal medication. The instrument employed is founded upon Ultzmann's model, differing from the latter in being made in one piece. The syringe has only one minute opening at the tip. The latter may be inserted just within the hole in the triangular ligament, that is a trifle beyond the bulbo-membranous junction. The membranous urethra grasps the tip of the instrument, and the contents of the syringe, twenty minims, or more, may be gently thrown in; the entire injection will flow backward along the membranous urethra, through the prostate, and into the bladder, with as little violence as possible, not one drop escaping at the meatus upon the withdrawal of the syringe. Instead of using a few drops of strong solution it is better to use a larger quantity of a mild solution. The entire contents of the syringe should be used in every instance, excepting when nitrate of silver is employed in a strength greater than ten grains to the ounce. The strength of a given substance is increased gradually after establishing tolerance to milder strengths. When the source of the flow of pus is reasonably well forward in the urethra

the injection may be made before the patient urinates; when the inflammation extends further backward, and the supply of pus is considerable, the patient should urinate just before making the injection, so that the fluid will flow into the bladder and become thoroughly applied to the mucous membrane at the internal prostatic urethral orifice, without being diluted or neutralized by coming in contact with urine in the bladder at this point.

In suitable cases the free pus disappears from the second urinary flow, then it disappears entirely from the urine, some shreds still remaining. These are attacked by increasing the strength of the injected fluid, or if there be some stricture in the membranous urethra by the use of sounds, after the catarrhal surface has been modified by the previous employment of injections, combined often with anterior astringent injections, which the patient himself administers.

After an extensive use of the various remedies which have the reputc of controlling the flow of pus from mucous membranes, Keyes relies almost exclusively upon four substances—sulphate of thallin, sulphate of copper, glycerole of tannin, and nitrate of silver.

The sulphate of thallin is bland and practically unirritating, and may be used up to a saturated solution, which is about twenty-four per cent. It is suitable in all the acuter forms of inflammation (except cases of acute frank, recent gonorrhœal cystitis, in which the nitrate of silver has the preference), and is the substance which should first be used in a watery solution of about three per cent., increasing at each injection up to six, nine, and even twelve per cent. The last-named strength will usually accomplish all that this drug can do in reducing the free secretion of pus. The intervals between injection should be two, three, or four days, according to the effect. The treatment causes practically no discomfort, and the injection may be retained as long as the patient chooses.

The sulphate of copper is used in the strength of one per cent. in pure glycerin. This solution is given in water, commencing with about one grain to the ounce and working up rapidly to full strength. This drug is markedly astringent in suitable cases.

Where a more astringent effect is aimed at than that produced by copper, the glycerole-tannin may be employed. This substance is too thick to be sucked readily into a syringe. It is thinned by the addition of water.

Nitrate of silver is exceedingly valuable in gonorrhœal cystitis, and is most useful when copper and tannin prove inefficient. The first injection should be of the strength of about one grain to the ounce. The applications are made from three to eight days apart, and are increased in strength to ten grains to the ounce. This is the harshest of the applications, but carefully used is free from danger of producing complication, and is very efficient. Thallin and nitrate of silver should not be used in the same syringe, as a black solution is made which is difficult to wash out.