the patient in such a case that his annoyance from this cause will pass off.

A very interesting experiment may be tried in the artificial production of double vision by the prism, which depends upon the fact that you cannot see double with one eye only. Soldiers, wishing to obtain their discharge, sometimes feign blindness of one eye, and it may be very difficult to tell whether their assertion is true or otherwise. If, without appearing to doubt it, you place a prism and a piece of coloured glass before the sound eye, and inquire as to double vision, you will get the information you want. If the amaurosis is real, but one object will be seen, and that coloured; and if the man complain of seeing two, it is quite certain that he has visual power in both eyes. You may, indeed, ascertain whether his sight is good or imperfect in the eye which he feigns to be blind, by getting him to describe the degree of distinctness with which he sees the uncoloured image as compared with the other, the uncoloured one being, of course, the image seen by the eye he professes to be blind of.

As to the dilatation of the pupil in the case of the man, it depends upon suspension of functions of the sphincter muscle of the iris consequent on paralysis of the third nerve. It is a tolerably constant symptom in association with ptosis and eversion of the globe, but is not often seen to such a degree as we have it here presented.

A Lecture

ON URINARY CALCULI.

BY

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[Concluded from p. 59.]

On the Importance of the Administration of increased Quantities of Fluids in certain Calculous and other Affections.

I HAVE already adverted to the importance of increasing the quantity of fluid taken by persons who suffer from certain varieties of urinary deposits. This principle has been fully recognised by Prout and many practical physicians who have had experience in treating cases of this class; but the remedy, perhaps from its very simplicity, has certainly not received the attention at the hands of many practitioners that it deserves. There are conditions of the system which are very much influenced by the dilution of the blood, and many of the chemical decompositions going on are promoted by an increase in the quantity of fluid. Some changes will not take place unless the solutions of the substances be very dilute. Many comparatively insoluble matters are slowly dissolved away by the frequent renewal of the fluid in contact with them. Even silica is capable of being dissolved in water; and it is from a solution containing so slight a trace that the substance can only be detected at all by operating upon very large quantities, that the whole of the silicious matter contributing in so important a degree to give firmness to the stems of grasses is deposited. The amount of water that must pass through the tissues of the plant during its growth, and give up its silicious matter, must be enormous,

since the quantity dissolved in each pint of fluid taken up by the roots is so very small. On the same principle, by causing much liquid to traverse the tissues of a living animal, comparatively insoluble substances may be washed out. It is doubtful if that abundant deposition of urate of soda which is from time to time met with in almost all parts of the body, in certain cases, would have occurred at all, if the fluids had been constantly maintained in a proper state of dilution; and, when these crystals have been deposited, we endeavour to remove them, or prevent further deposition, by diluting the fluids of the body, and by endeavouring to increase the solubility of the urate. We are perhaps too apt, in many chronic cases, to put patients upon a plan of treatment for so short a time as a few days or weeks; and our patients are often unreasonable enough to expect that remedies will remove in a week matter which has been slowly accumulating perhaps for years. It is chronic cases of this kind which receive such real benefit from the comparatively prolonged course to which they are subjected in a German bath or hydro-pathic establishment; and it too often happens that, in endeavouring to perform quickly by remedies that which it is only possible to effect by giving large quantities of fluid during a considerable period of time, we disappoint ourselves and our patients; and perhaps in the end they attribute to some quack remedy or system, to which they have subsequently had recourse, a favourable result which is really due to the water they have drank and the hygienic rules to which they have been subjected, instead of to the nostrums they have swallowed.

In certain case of gout, in chronic rheumatism, and in many cases where uric acid and urates are constantly deposited in the urine or in the tissues of the body, the most important of all things is to ensure the thorough washing out of the system. Exercise when it can be taken, hot baths, Turkish baths, etc., by promoting sweating, excite thirst; and thus more fluid is ingested, which is soon got rid of by various emunctories, carrying out with it insoluble substances, the fluid removed being soon replaced by a fresh quantity. In the frequent repetition of these processes from time to time, a vast quantity of fluid is made to pass through the body, with the most beneficial effect.

You would be surprised how very little fluid some persons take, as a rule; and this fluid, small as it is, is often saturated with soluble substances. The fluid thus introduced is, in many persons who live well, barely sufficient to hold the various compounds in solution while undergoing chemical change. Many dislike to drink water, and not a few have a strong prejudice against it; and these are often the very individuals whom we find suffering from gout, rheumatic pains in the muscular and fibrous tissues, and various forms of urinary deposits. They will receive the greatest benefit from moderate sweating and alkalies dissolved in a large quantity of water. You will seldom find difficulty in prevailing on patients to take Seltzer, Vichy, or other alkaline waters daily, although it would be useless to recommend them to take pure water. They can take them with their wine at dinner, the last thing at night, and perhaps the first thing in the morning. People who live well, or rather too well, will soon find out that they must continue this plan, and take now and then small doses of alkalies. It is quite superfluous for me to enter into the minute details applicable in individual cases; but I cannot too strongly recommend you to study very carefully the different symptoms in cases of this class; for I feel sure that much permanent relief may be afforded such patients by explaining to them the importance of constantly attending to simple rules based on the principles to which I have adverted. Although I may have been somewhat tedious, I feel sure that you will not think that I have dwelt longer on these points than their practical importance demands; and I am convinced that we

shall practise our profession with greater advantage to our patients, and advance its interests more, by studying carefully the nature of the actual processes going on in disease, and considering how these processes are to be modified by simple means and a few remedies whose action is certain and well understood, than by hunting for new specific medicines, or combining together a great number of compounds, many of which are completely modified as soon as they enter the stomach, and are certainly destroyed long ere they reach the part of the organism where we desire that they should exert their specific influence.

On the Methods of Dissolving Urinary Calculi. I can only offer a very few remarks on this important and interesting subject. Many of the observations which I have made with reference to the prevention or removal of urinary deposits are also applicable to calculi of allied composition. When a uric acid or urate of ammonia calculus, for instance, has been deposited, it may be dissolved, or its increase may be prevented, by producing alterations in the chemical composition of the urine. This may be effected by alterations in diet, and by the administration of various remedies, especially alkalies and the salts of the vegetable acids.

It is possible also in certain cases to dissolve the stone by injecting solvents into the bladder. In many cases, however, all our attempts to remove the stone by effecting its solution will be ineffectual, and we shall have to call in the assistance of the surgeon, who may remove the stone entire by lithotomy, or may crush it into several small pieces, which escape by the ordinary channel.

Mere dilution of the urine will sometimes exert a considerable influence upon a calculus; and it is possible that some calculi may have been entirely dissolved in this manner. An acid state of urine would tend gradually to dissolve a phosphatic calculus; and it is very possible that, if a feebly alkaline condition of the urine could be maintained for a considerable time, an impression might be made upon calculi composed of different forms of urates, or even upon an uric acid calculus. The irregularities often seen upon the surfaces of such calculi have been very properly termed "water-worn", and clearly indicate that the urine has exerted, for a time at least, a solvent action. Although in certain cases it would undoubtedly be right to adopt for a time treatment of this kind, we must not look forward to the result with any great degree of confidence; at best, such changes are doubtful, tedious, and very uncertain.

Many attempts have been made to dissolve the calculus by injecting fluids, which exert a solvent power upon the stone, into the bladder. The most convenient plan is to inject the fluid through a double catheter for half an hour every two or three days, or more frequently. Dr. Willis has recommended that the fluid should be placed in a reservoir at a sufficient height above the patient, and connected with the catheter by a tube provided with a stop-cock, by which means the flow of the solvent may be carefully regulated. In carrying out this plan, it is very important that the solution should be so weak as to prevent all chance of the mucous membrane of the bladder being injured. Sir Benjamin Brodie showed that phosphatic calculi might be greatly reduced in size, or entirely dissolved, by injecting a weak solution of nitric acid (2 to 2½ minims of strong nitric acid to an ounce of distilled water). Such a solution would also act very favourably in removing the sharp edges of fragments remaining in the bladder after the operation of lithotripsy.

The objection to the use of alkalies in attempting to effect the solution of uric acid or urates is, that the phosphates are precipitated from the urine, and the calculus protected from the further action of the solvent.

The most ingenious plan for dissolving calculi was

that proposed some years since by Dr. Hoskins, who employed a weak solution of acetate of lead (one grain to the ounce) with a mere trace of free acetic acid. With a phosphatic stone, double decomposition occurs. Phosphate of lead, in the form of a fine granular precipitate, and an acetate of lime and magnesia, are formed. The solution, it need hardly be said, does not produce any irritation or unfavourable action upon the bladder.

On Dissolving Calculi by Electrolysis. Attempts have been made to disintegrate and effect the solution of calculi in the living body by the aid of galvanism. MM. Prevost and Dumas (*Annales de Chimie*, vol. xxiii, p. 202, 1823) employed electricity for the purpose of disintegrating phosphatic calculi, by the mechanical action of the gases set free in the electrolysis of water; but only a grain per hour was thus removed. The solution of the calculus was not attempted in those experiments. Dr. Ludwig Melicher (*Oesterreich. Medicin. Jahrbuch*, 1848, vol. i, p. 154) tried to dissolve a calculus by the aid of electricity. It is said that two experiments on the living body were successful. (Quoted by Dr. Benoe Jones).

The latest, as well as the most successful, efforts have been made by Dr. Benoe Jones, who employed a solution of nitrate of potash, and decomposed this by the aid of a powerful galvanic battery. The nitric acid set free at the positive electrode would decompose the uric acid exposed to its influence, and the potassa evolved at the negative electrode would dissolve it, so that an uric acid calculus placed between them would be disintegrated at both points. The battery employed was from five to twenty pairs of Grove's plates. From 2 to 9 grains of uric acid calculus were dissolved per hour at the temperature of the body. Of oxalate of lime, $\frac{1}{4}$ grain to 2 grains per hour only were dissolved. The action was four times as slow as upon uric acid calculi. Of oxalate of lime and uric acid, in alternating layers, $\frac{1}{4}$ to 5 grains were dissolved per hour. Of phosphatic calculi upwards of 25 grains were dissolved per hour.

Lithotomy and Lithotripsy. This is a part of the subject which I am quite incompetent to discuss, but there are one or two recent modifications in the operation to which I may be permitted to advert very briefly. The operation of lithotomy which is usually performed by most surgeons in the present day is the lateral one. For a discussion of the various important points connected with this operation, I must refer you to Professor Ferguson's treatise on *Practical Surgery*.

Some time since, the median operation was performed with considerable success by Mr. Allarton. Its principal advantages seem to be, that the levator and prostatic capsule and plexus escape injury, while the course into the bladder is most direct. There is also the advantage, that the knife is not used either to notch the prostate or to open the bladder. On the other hand, there seems to be considerable chance of injuring the ejaculatory ducts; and a surgical friend tells me that there is a want of space in manipulating with the forceps, and in seizing and extracting the stone, and that there is also some risk, especially in children, of injuring the bulb of the urethra or the rectum. This operation is described in the *Lancet*, 1859, vol. i, page 122. See also Mr. Allarton's work on *Lithotomy Simplified*. London: Ash and Flint. 1854.

In connection with the subject of lithotomy, I may remark that, in a recent improvement in the manner of carrying out the lateral operation, by Mr. Wood, the injurious effects which sometimes result from the division of the prostate and levator ani with the knife are altogether avoided. Mr. Wood employs a staff composed of two blades, which can be separated from each other while the instrument is held in position. Dilatation of the urethra is readily effected by allowing the finger to slide in between the blades. In the single case in

which this operation has been performed in the living subject, it seemed to have succeeded admirably (*Med. Times and Gaz.*, Dec. 22nd, 1860).

The principal advantages of this over the ordinary lateral and median operations respectively are that, as the knife does not enter the bladder at all, neither the prostatic veins nor the fascial capsule are injured, nor can the ejaculatory ducts be cut. The levator ani cannot be divided, and all chance of the extravasation of urine into the pelvic areolar tissue is avoided. The form of the external incision is such that more room is given than in the ordinary operation, while injury to all important vessels and other structures is avoided. By this proceeding, the dilatation necessary for the extraction of the stone is much more easily effected than in the median operation.

Of late years lithotripsy appears to have been carried out very successfully in numerous cases in which the operation of lithotomy would have been practised formerly. The number of fatal cases resulting from lithotomy is considerably greater than that obtained from an analysis of the cases of lithotripsy to which I have been able to refer. Neither does it appear that stones of very large size may not be crushed with safety; and, as far as I can learn, setting aside a few exceptional cases, it would seem that lithotomy afforded but a poor chance of safety where lithotripsy could not be confidently recommended. These remarks, I need hardly say, apply only to adults. In children lithotomy is so safe an operation, while the small size of the urethra and other circumstances are unfavourable to lithotripsy, that it is not likely that surgeons will have recourse to any other proceeding.

The experience especially of Sir Benjamin Brodie, Mr. Charles Hawkins, and Mr. Prescott Hewett has proved that, when performed with care, lithotripsy is a most successful operation. Mr. Hawkins tells me that he has operated with success even in cases of stricture and irritable bladder, and has performed lithotripsy where lithotomy could not have been undertaken. (See a case reported in the *Transactions of the Royal Medical and Chirurgical Society for 1859*). On the subject of lithotripsy, I must refer you to Sir B. Brodie's paper in the twentieth volume of the *Transactions of the Royal Medical and Chirurgical Society*, in the concluding paragraph of which are these words, "My own experience has certainly led me to the conclusion that lithotripsy, if prudently and carefully performed, with a due attention to minute circumstances, is liable to a smaller objection than almost any other of the capital operations of surgery."

CURIOUS MARINE PHENOMENON. Captain Trébuchet states that on the night of August 26th, 1860, while tacking to reach Amboyna, lying at about twenty miles E.N.E., he and his crew witnessed the curious spectacle of the Milky Sea, which the Dutch call the Winter Sea, because both the sky and the waters present the appearance of fields covered with snow. The phenomenon lasted from seven p.m. until the return of daylight. They at first attributed it to the reflection of the moon, then only three days old; but, as the appearance continued after the moon had set, this explanation had to be discarded. A bucketful of sea water being drawn up and examined, it was found to contain about 200 groups of animalculæ of the same thickness (that of a hair) but of different lengths, varying between one and two-tenths of a millimètre, and adhering to each other by tens and twenties, like strings of beads. These insects emitted a fixed light similar to that of the firefly or glow-worm; and it was admitted on all hands that the white appearance of the sea could only be attributed to these minute creatures, the numbers of which must therefore exceed all imagination.

Illustrations

OF

HOSPITAL PRACTICE:

METROPOLITAN AND PROVINCIAL.

ST. MARY'S HOSPITAL.

IDIOPATHIC NEPHRITIS.

Under the care of E. H. SIEVEKING, M.D.

THE interest attaching to the following case consists in the fact of its occurring at an unusually early age. Calculous nephritis and the nephritis of scarlet fever are met with at all ages; but acute idiopathic and desquamative nephritis is more commonly due to causes that affect mainly the adult or the later periods of childhood.

Eliza N., aged 4. Feb. 28th. Never was seriously ill, not having had scarlet fever, measles, or whooping-cough. A week before applying for advice, she was noticed to have ascarides; but she has only appeared ailing for three days. Two days ago, she had a swelling at the right side of the neck. Since yesterday, the urine has been dark brown, and contains a large quantity of albumen. There is no scarlet-fever rash. The bowels are open; the tongue white; pulse 120; skin hot. There is a hard tumour, apparently glandular, at the right angle of the jaw, not very painful.

℞ Hydrar. chlorid. gr. ij; pulv. jalapæ gr. vj. M. Ft. pulvis statim sumendus.

℞ Sodæ carbonatis ʒiij; spir. ætheris nitr. ʒiv; liquor. ammon. acetat. ʒj; syrapi ʒj; aquæ ʒvj. M. Sumat cochleare medium tertiâ quâque horâ.

March 2nd. Yesterday the urine was much clearer, and contained little albumen; to-day, it contains rather more. The patient is rather drowsy. Urine scanty; bowels open. The tumour of the jaw is smaller and softer.

March 3rd. She is less cheerful; the urine still dark and scanty; the bowels open. There is much thirst.

℞ Potassæ nitratis ʒij; oxymellis scillæ, syrapi glycyrrhizæ, aa ʒvj; aquæ carui ʒivss. M. Sumat ʒij tertiis horis.

Habeat pulv. rhei et magnes. gr. x alternâ mane.

March 4th. Since yesterday, there has been constant sickness, both after food and medicine. The bowels are well open. She is still rather drowsy, but appears more lively this morning. There is no œdema of feet, face, or abdomen. The urine, which is scanty, contains a large amount of lithates and some albumen, though less of the latter than at the first examination. The urine obtained for examination was only passed after much coaxing, not from dysuria, but from apparent insensibility; it is strongly acid; and the sediment is found, under the microscope, to contain much renal epithelium and tubular casts.

Applicentur irudines quatuor lumbis, regioni renum.

March 7th. The urine is still turbid, but contains no albumen; it is more copious, and of pale yellow colour. The microscope shows the sediment to consist of little else than uric acid crystals, and a very small number of casts enveloping small corpuscles, apparently pus. The sediment looked quite flocculent; still it contained little epithelium, and the quantity of crystals was quite surprising.

Repetatur mistura, addendo tincturæ ferri muriatis ʒj. Repetantur balneum calidum et pulvis.

March 11th. The urine has a slight flocculent sediment, leaving the supernatant fluid clear, and more normal in colour than it has yet been. There is no trace of albumen. The urine is more copious. The sediment consists almost exclusively of minute lozenge-