

phenomena revealed by metallic applications. Such is the transfer phenomenon, which was discovered solely by chance, and which patients can neither invent nor simulate.

There is another phenomenon which you will soon witness on many patients I shall present to you, and which bears the same signification as the preceding one. It is a fact connected with hysterical amblyopia to which I called your attention in my last lecture. You know that in hysterical subjects there exists amblyopia on the same side where you find anæsthesia. One of the characters of this amblyopia is achromatopsia, or a narrowing of the field of vision in respect to colours. The narrowing may extend to such a point that the patient loses all notion of colours, and sees objects only with the appearance presented by a sepia painting. Moreover, this particular fact must be noted that the colours disappear according to a mathematical order. Thus violet first disappears, then green, then red, then yellow. Blue is the last, and the patients continue to see it until the completion of the phenomenon, and when they have lost all notion of the other colours. This is a phenomenon, I should say, which an hysterical patient can scarcely guess or be acquainted with. It happened to myself, though I have for a long time been well acquainted with this phenomenon, to make a mistake in remembering the order of colours, which is, as you observe, different from the one presented by the spectrum. Here is an hysterical patient affected with hemianæsthesia and amblyopia of the left side. You remark that with the left eye she has lost all notion of colours. We know that this patient is sensitive to gold; we have proved it on a previous occasion. We apply a plate of metal to her left temple. A quarter of an hour is allowed to elapse. We now pass papers of different colours before the eye which is affected with achromatopsia. And now you see that the perception of colours is coming back according to the regular order. You see it is blue she first discerns, then yellow, then orange, next comes green, and violet is the last she perceives. You must watch narrowly in order to catch all the phases of the phenomenon, as sometimes the reappearance or return of sensibility to colour, produced by the metallic application, takes place with great rapidity. As you see, this is a very demonstrative experiment which generally succeeds very well, and which we have repeatedly verified.² I must, however, remark that some patients present an exception to the rule in this sense, that the notion of red returns regularly to them before that of yellow and blue. But, as I say, this is really an exception; at any rate, it may be asserted that, according to the regular order, green and especially violet are the colours which return the last. If you now remove the plate of metal you will find in a few moments that perception of colours will disappear in the following order: first violet disappears, then green, then red, then yellow; blue persists till the last; finally this also disappears, and the eye returns to the condition in which it was when the patient was presented to you.

Here is another hysterical woman, who has been under treatment the last few weeks, and in whom all the symptoms of the disease—whether by the influence of the treatment or not, I do not know—have been remarkably amended. She has no longer any hemianæsthesia, and has lost all her convulsive fits for a long time. Is she completely cured? Has she ceased to be under the influence of the diathesis? Is she not exposed to a recurrence of her nervous ailments under the action of the first passing emotion? Some observations which we have recently made lead us to think that there exists perhaps a criterion for judging the question, and the fact, if we are not mistaken, is one of importance for the future of the patient. If you remember, this patient has proved sensitive to gold, and she has been treated, apparently successfully, with that metal. Well, we shall now apply some gold pieces to the left arm, this side of her body having been the one originally affected with anæsthesia. Fifteen or twenty minutes elapse after the application, and we then find that the patient complains of discomfort, that she gets drowsy, and presently seems ready to fall asleep. We prick her arm with a needle, and we see that sensibility, which was normal before the application, is now almost completely abolished. There is cause to believe that the patient is still under the influence of the diathesis, or in other words, that she is not yet entirely cured.

(To be continued.)

² The experiment was repeated at a late sitting of the Société de Biologie, M. Bert, Professor of Physiology at the Faculty of Sciences, being present on the occasion.

ON THE MEANS OF PREVENTING THE FORMATION OF CYSTO-PHOSPHATIC DEPOSITS.

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THE operation of lithotripsy is occasionally followed by chronic cystitis with painful symptoms, and by frequently recurring production of the cysto-phosphatic deposits previously described. This condition may persist for a long period, and it may sometimes never wholly disappear. The numerical proportion of these unsatisfactory cases to those which are wholly successful is happily small; and even that may probably be diminished by the exercise of judgment on the part of the operator, and by his conformity to certain rules in operating. There are two points to which it is necessary to pay special attention in order to avoid the unfortunate results in question. The first is, not to apply the crushing operation to any stone of a size beyond that which may be termed strictly moderate, a term which it is difficult to define, but which is designed as a caution against regarding lithotripsy as desirable for calculi of large size; the second is, not to delay unnecessarily subsequent repetitions of the sitting when the stone has once been attacked by the lithotrite.

These rules are established by practical experience of the operation; but the correctness of the principles enforced is also exemplified by the pathological observations described in the preceding paper. That which has happened to patients who are troubled long after the operation with recurring concretions is, without doubt, a serious injury to the mucous membrane of the bladder, permitting a phosphatic deposit to adhere to some portion of its surface. This deposit increases by aggregation, and is detached in some form as a concretion, which produces symptoms relieved only by its removal. The process is repeated periodically, sometimes with lengthening intervals of time, and with a tendency to cease, if due care be taken, although the term of recovery is often a long one. In other cases, the tendency steadily increases, and the opposite condition follows.

In speaking of injury to the mucous membrane, I by no means imply injury through the use of instruments. Little harm occurs from the modern lithotrite in delicate and careful hands, a remark which does not apply to instruments of early construction. With the latter, injury was often inflicted on the bladder, and strong objections were long entertained to the operation on that account, and very justly so. The causes of injury to the membrane already described as resulting in loss of polish and in roughness, which attracts phosphatic precipitate, are threefold.

First: This morbid change may be caused by the long residence in the bladder of any calculus, particularly one with harsh, uneven surface, and so may have already taken place before the patient seeks relief from the surgeon. In this stage, whatever may be the composition of the stone, the enveloping crust is phosphatic, and the symptoms are severe. Such a condition is no doubt best met by lithotomy, under almost any circumstances.

Secondly: The bladder being healthy, an operator may crush a stone, say of uric acid, but of a size which, although quite within the mechanical power of the lithotrite to crush safely, is still too large to be disposed of in four or even five sittings. There is then some risk that from much contact between the sharp angles of broken stone and the mucous membrane of the bladder, which must take place, abrasions commence, all of which do not heal, and the inner coat is left, at the conclusion of the process, bruised, sore, and slow to recover the natural condition. This might probably have been regained after two or three sittings; but four, five, or six have been more than the membrane could sustain with impunity. With a stone of this size also it is probable that lithotomy would offer equal, if not better, chances of a successful result.

Thirdly: The bladder being healthy at the outset, and the stone not necessarily being large, but one well adapted for successful treatment by lithotripsy, the operator may per-

mit considerable intervals of time to elapse between each sitting. He may do this in the hope of diminishing irritation or inflammation resulting from the previous sitting, desiring not to arouse more disturbance, as he may think, by again applying the lithotrite; and many days may be allowed to elapse in an attempt to combat the existing troubles by rest, medicine, baths, &c. Meantime there is prolonged contact between the rough fragments and the mucous membrane, and damage to the latter is surely taking place. The best remedy in such circumstances is again to crush and so reduce the irritating fragments to fine débris, which, moreover, is largely removed at the same time. I have often seen urine which had been purulent and bloody for days become almost clear within four hours after the use of the lithotrite. At every point of contact between the numerous sharp angles of broken fragments and the delicate lining of the bladder, a minute ulceration commences, and gives issue to a little blood; no sooner are the fragments crushed than the wounded points rapidly heal, and the bleeding ceases. But if the intervals between each crushing are prolonged, dangerous contact is prolonged also, and by repetitions of this error the bladder is brought into a condition in which more or less permanent mischief is sustained, and the phosphatic trouble commences its chronic course. In order to avoid this, then, I repeat that it is essential not to prolong the intervals between each sitting beyond two or three days, unless there is some more important reason for doing so than the presence of cystitis, which is, on the contrary, a ground not for delay but for action. Indeed, no occurrence except repeated attacks of fever or severe orchitis should postpone the use of the lithotrite when the operation has once been commenced.

The next practical question for consideration is the treatment of the bladder itself when phosphatic deposits and concretions are formed there, and show a tendency to remain, or, after expulsion, to be again produced.

The first condition indisputably necessary to success is that the organ, if incapable of emptying itself, should be artificially emptied by the patient in the easiest manner, as often in the twenty-four hours as his comfort demands, and never less than twice a day, however small the quantity left behind. Next, as organs thus affected are by no means always quite emptied, even by the catheter, a small quantity of warm water should be injected once, twice, or thrice daily after catheterism, to wash out the remaining urine if any such there be, and the phosphatic precipitate which will be certainly found therein. For this purpose the four-ounce indiarubber bottle with brass nozzle and stopcock is the best instrument; one-third only of its contents is to be injected at a time, and this quantity is to run out before the succeeding third is introduced. To the water should be always added either carbolic acid in the proportion of one grain to the ounce, or the solution of permanganate of potash (Condy's) six or eight minims to the ounce. Either of these disinfectant solutions, the first-named being perhaps mostly preferable, should be employed as preliminary to all other injections; they are not in the slightest degree irritant to the bladder, and they deodorise and cleanse the interior. Further, and this is a fact of some importance, carbolic acid does not decompose any solution of metallic salts which it may be desirable to inject immediately afterwards. It ought not to be necessary to add, in passing, that all instruments should be placed, before and after use, in a bath of carbolic acid solution, but double the strength of that mentioned above. This, of course, relates to all instruments which are at any time or for any purpose to be introduced into the urinary passages.

The bladder being thus kept in good sanitary condition, the next consideration is, what agents are to be employed to promote healing action in the diseased mucous membrane? The best are salts of silver, copper, and lead, very weak solutions of which should be used at the first occasion of applying them, watching carefully the result before augmenting their strength, and doing so very gradually. The nitrate of silver should at first not exceed in strength the proportion of one grain to four ounces of distilled water; even one to six ounces is preferable if a patient is more than usually susceptible. It should always be preceded by a cleansing or deodorising injection, to remove from the surface to be acted upon the muco-pus which is coagulated by the solution of silver, and tends to hinder contact with the agent. This injection is to be employed in the gentle manner directed above for the first application. If very little inconvenience follows, a slightly stronger solution should be used

after an interval of two or three days, always avoiding an increase in strength sufficient to produce any severe or long-continued pain.

Sulphate of copper should be applied in the same proportion—viz., one grain to six or four ounces of distilled water. An acetate of lead solution of the same strength is a valuable agent, to be used daily, or even twice a day, by the patient himself; but the sulphate of copper, like the nitrate of silver, is to be repeated only every alternate or third day, according to results. It may be remarked here that in the treatment of chronic vesical hæmorrhage by astringent injections, such as the solution of matico, or of perchloride of iron, the same rule in relation to the carbolic acid solution, and to the manner of injecting, should be followed. In the last-named condition, also, the temperature of the injection may be lowered to 40° or 50° F., while, in relation to the subject under consideration, the temperature should not differ greatly from that of the body.

For the removal of small concretions, the eight-ounce elastic bottle, with a large brass nozzle overlapping a No. 10 or 11 gum catheter (described in THE LANCET of Jan. 8th, 1876), produces an excellent current, not only inwards but outwards, by expansion of the bottle; and Mr. Clover's aspirator, so useful for débris in lithotripsy, or for removing last fragments, is equally valuable here. But the object of the injections above described is not to remove deposits from the bladder, but solely for the purpose of acting on the mucous membrane, so as to hinder their formation, and aid in producing a healthy surface, to which they will no longer adhere. By systematically carrying out the plan laid down as soon as they appear, whether after lithotripsy or in connexion with chronic disease of the bladder and prostate, the complaint can generally be greatly mitigated, and sometimes it is effectually cured.

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ON CHANGES IN THE NERVOUS SYSTEM IN DIABETES.

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(Concluded from p. 118).

OTHER remarks may be briefly dismissed. I describe with measurements and figures a sufficiently obvious condition of enlargement of the canal of the cord. Far from asserting that this is present in every case, it is related as especial to two, and is none the less a fact because it did not come under the observation of Drs. Taylor and Goodhart. The dilatation may not have been present in their cases, or, if the cords were examined in but a few places, it may have been overlooked. The condition does not occur in every region any more than in every case. And the same remarks apply *mutato nomine* to other points of criticism. I describe a condition which is too obvious to admit of any but wilful misrepresentation; it does not come under the notice of Drs. Taylor and Goodhart, and is therefore ignored, as though no observations were to be accepted without a certificate from them. I described and represented in an accurate woodcut a collection of blood-corpuscles outside their proper vessels. The state of things is sufficiently obvious. If I cannot be trusted to have seen it when I say I have, I have spent much labour to little purpose. I will here add that not only have I seen extravasated corpuscles under the microscope, but I have in diabetes seen with the naked eye extravasated blood under the pia mater close to the fourth ventricle.

A condition which is pathologically akin to extravasation meets with a better reception. The accumulation of blood-crystals outside the bloodvessels—a sign probably of corpuscular escape, though not necessarily by rupture—is somewhat grudgingly admitted.

Some of the remarks upon which I have commented would have had more weight had their authors taken the very obvious precaution of looking at the preparations which they were about to criticise. I need scarcely say that they are, and have been, heartily at the service of any inquirer. To present to those who have not seen the testimony of