

Cases of poisoning by fungi, with remarks / [Alexander Peddie].

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C A S E S
OF
POISONING BY FUNGI,
WITH REMARKS.

By ALEXANDER PEDDIE, M. D.

(*From the Edin. Med. and Surg. Journal, No. 134.*)

CASE I.—Donald M'Bain, aged 57, accompanied by two of his sons, went about five in the morning of the 13th August, to the back of Arthur Seat, for the purpose of gathering mushrooms to fry. Quite ignorant of the difference between poisonous and harmless species, he consumed nearly a dozen of them in the raw state before leaving the spot from which they were taken. In about half an hour afterwards, (eight A. M.) when at Saint Anthony's Well, on his way home, he said to the boys that he saw every thing of a blue colour and in motion; and expressed apprehension as to the cause of his illness, and a desire to vomit. He accordingly tickled his throat with a straw, and succeeded in ejecting several mouthfuls of the fungi. He felt no pain in his stomach or bowels, nor any thing like cramps; but the giddiness was great, and gradually increasing, so that by the time he reached Holyroodhouse he was staggering as if much intoxicated, and was unable to articulate distinctly. When brought to Campbell's Close, at the foot of the Canongate, where he resided, (at half-past eight,) he was so lethargic as to require being carried into his house; and almost immediately afterwards was so insensible, as not to be roused to consciousness by the loudest sounds, or the most violent shaking. An emetic was immediately procured for him at a neighbouring laboratory; but as it failed to operate, notice was sent to Minto House, and Mr Clerk, one of the Dispensary pupils, saw him about half-past nine. Mr Clerk found him quite insensible, affected with great muscular tremor, at times much convulsed, and groaning deeply. A sinapism was applied to the nape of the neck and one to the epigastrium; and an eme-

tic, a drachm of the sulphate of zinc, was given, and repeated again in about a quarter of an hour. As these means failed alike in exciting sensibility or vomiting, I was sent for. On visiting him at half-past ten, I found him in the most profound coma, or in something closely resembling that state, but breathing softly; affected with convulsive movements of the extremities, and with universal *subsultus*, with a cold skin, a pulse beating 68, and very feebly, but regular, and pupils much contracted and quite unaffected by light. Having removed him from bed and supported on a chair, I applied the stomach pump. This operation was continued until two or three gallons of tepid water had passed through the stomach, when the fluid became nearly pure and free from fragments of the fungi, which were at first brought up in great quantities; and before withdrawing the tube two ounces of castor oil, in half an English pint of warm milk, was introduced. During these efforts the pulse rose to 80, but remained weak; and his condition otherwise was quite unchanged.

At eleven, his pulse was 80, weak and sharp. A vein was now opened, and while the stream flowed, the pulse was counted through every quarter of a minute, and its strength carefully watched. Under this treatment it was satisfactory to find the beats gradually rising and becoming more soft and full; but when ten ounces of blood had been obtained, and when the pulse at the wrist, which was now 100, was beginning to fail, the stream was immediately checked, and the patient returned to bed.

By half-past eleven, the pulse had fallen to 88, but was much more soft and full than before. Cold water was now applied to the head, large sinapisms to the feet, and water almost boiling to the inside of the thighs. Until the last remedy was used, no symptom of sensibility had been obtained, but now, when first employed, he moved his legs very slightly, and with each successive application of the hot fluid, those movements became rather stronger, and were occasionally accompanied by low moaning.

At twelve, the pulse was 88, and possessing considerable strength. The boiling water had been constantly applied for the preceding half hour with flannel cloths; but several of the last applications having produced little or no effect in rousing sensibility, and there being as yet no vesications, I now poured the water boiling from the kettle on his thighs; no sooner was this done, than he turned round in bed, threw out his arms, and groaned loudly. On the continuance of the stream for a short time, he was much convulsed, and roared out lustily. His pulse, too, rose to 90.

At half-past twelve, the boiling water was still being applied with flannel cloths; and although the parts were considerably reddened, there was as yet no appearance of vesication. His pulse was 94, the pupils were dilated and distinctly contractile

by the stimulus of light. He groaned frequently, but when spoken to exhibited no symptom of consciousness; and the *subsultus tendinum* continued great, with occasional tetanic spasms of the extremities. The sinapism, which had remained on the nape of the neck since half-past nine, was now removed, as the surface was well reddened and slightly vesicated. The scalding water was still continued to the thighs; and an English pint of hot coffee, along with two ounces of castor oil, was introduced by means of the stomach pump. The passing of the œsophagus tube roused him very much, even to resistance; and after the stimulant was lodged, he roared out in a most furious manner, and became violently convulsed.

At a quarter from one, his sensibility and excitability were much greater; for he rolled more about in bed, cried louder at each application of the hot water, and occasionally muttered,—although quite unintelligibly, when loudly spoken to, or when forcibly shaken. His pulse was now 96, and of considerable strength; the pupils were dilated, but readily contractile; and the surface of the body, although still cold, had become of a higher temperature. The muscular twitchings still continued. As small vesications were now visible on both thighs, the hot water was discontinued.

At one, Professors Syme and Traill visited him; and I was advised by them now to trust chiefly to internal and external stimulation.

At a quarter past one, his symptoms were the same as when last reported,—only he had been lying very quiet. He was soon, however, so much excited by the introduction of the stomach pump as to require restraint; and after I had injected a teaspoonful of the *Tinctura Ammoniacæ Aromatica*, along with a few ounces of hot coffee and milk, he struggled like a furious maniac, and roared out in Gaelic at the full pitch of his voice,—a language, by the way, in which he had not been heard to speak for many years. Cold was now applied to his head more assiduously than before.

At half-past one, he was much more easily roused and irritated when touched or spoken to; continued raving almost incessantly in Gaelic; and seemed to feel pain in the thighs and neck, as was evinced by frequent scratchings of these parts with his fingers. His pulse was 100, and pretty full. Another drachm dose of the *sal volatile* in coffee was now administered, but without requiring the aid of the stomach pump; and it had the effect of the previous one, in inducing a violent paroxysm of roaring and convulsive efforts.

At a quarter from two, he was lying quiet, apparently exhausted by the violent delirium of nearly the last half hour. Frictions,

with warm turpentine, were now applied over the surface of the body, which was still considerably below the natural temperature; and a third dose of the *sal volatile* was given. Again he was much excited by its exhibition, and continued to vociferate loudly in Gaelic, occasionally interspersed with Spanish, which last language it would appear, he had partially acquired during his service in the peninsular war.

At two, he was still very restless, but perfectly manageable, and continued talking loudly and incessantly in Gaelic, imagining himself, as appeared from the interpretation of a person present, in the thick of one of the numerous engagements in which he had really acted during his career as a soldier. Although, however, he did not utter a single syllable in English, he seemed to have the capacity of thinking in it in some measure, for on one occasion he put out his tongue when requested in English to do so. His pulse was still 100; his skin warmer; his pupils widely dilated, but contractile; and the *subsultus tendinum* existed to a considerable degree. A tablespoonful of the following mixture was now ordered to be given every quarter of an hour. \mathcal{R} *Mist. Camphoræ, Alcoholis aa* \mathfrak{z} iv. *Tinct. Ammoniac Aromat.* \mathfrak{z} ss. *Aquæ* \mathfrak{z} ij. *M.*

At half-past two, his symptoms were as last reported. The stimulant mixture was continued, and other two ounces of castor oil given, as the former doses, amounting to four ounces, were yet retained.

I now left him in charge of his friends; and on returning at four found him sitting up in bed, with symptoms ordinarily characteristic of *delirium tremens*. His talk was incessant, and for the most part incoherent. He declared that he never was better in his life, felt no pain, and never had any, but was perfectly happy, and had just returned from a visit to Heaven, &c.

His pulse had now fallen to 96, but was much more full, and the pupils, tongue, and temperature of the surface, were all natural. The bowels were copiously moved about half-past three,—the evacuation being perfectly healthy, and containing no fragments of the fungi. The stimulating mixture was now ordered to be given only once in the hour.

On calling at nine P. M. I found him sitting up in bed, quite sensible and collected, expressing great gratitude for the exertions which he understood had been made for him, and detailing accurately, as has been given above, the time when he went out in the morning, and what he had done and felt before being carried into his own house. He declared that he had not experienced the slightest pain in the stomach or bowels, but that the head alone was affected; that the giddiness was felt within half an hour after the fungi were eaten; and that altogether the effects produced on him, so long as he was conscious, closely resembled those

occasioned by large doses of opium, which drug he had taken several times in his youth. His recollection appeared to have been entirely suspended from the time when he saw his wife in his own close, and when he imagined at the same time that his house, as in a dream, was in a different situation from that which it really occupied, until the afternoon, when he felt his thighs and neck painful, and was aware of being spoken to and made to swallow medicines. Although now, however, perfectly sensible and free from pain, there seemed to be a considerable tendency to cerebral overaction, for he was excessively loquacious and irritable, and his pulse was 90, and very strong. The muscular tremors, too, were yet very considerable. On these accounts the stimulant mixture was discontinued; the head was ordered to be shaved, and cold constantly applied; and although the bowels had within the last three hours been moved several times, an additional purgative was administered.

14th. At half-past 9 A. M. his pulse was 88, full and soft; his tongue was a little red at the tip, but moist; he felt no pain anywhere but in the thighs, on which there were several large vesications, and indeed complained of little but debility. He had not slept during the night, but had been quiet; and his bowels were once very freely moved.

At half-past 6 P. M. I found him sitting at the fireside, complaining only of his thighs and weakness. His pulse was 100, full and soft. The cold was continued to his head; the compound jalap powder was ordered for the bowels; and a saturnine lotion to the thighs.

After this date he had no particular complaint; and no treatment was required excepting to the ulcers of the thighs, which, however, soon healed kindly.

CASE II. Angus M'Bain, aged 15, was with his father and brother* on the morning of the 13th August, but ate only one raw fungus. He felt a little giddiness when at St Anthony's Well; and when his father attempted vomiting by means of a straw, he did so too, and vomited very freely. After this he felt nearly well, excepting slight giddiness, and had no pain, but led his staggering parent home; and it was not until half-past eleven that he became excessively drowsy and unable to sit up. So soon as this approaching narcotism was observed, a grain of the tartrate of antimony, with some sulphate of magnesia, was given in a large quantity of tepid water; but this failing to excite vomiting, the stomach pump was resorted to. He then got an ounce and a half of castor oil in milk, and was ordered out into the open air to be walked about.

* This boy only tasted one; but having spit it out immediately, he did not suffer anything from it.

At 1 p. m. the tendency to sleep and giddiness were gone, but leaving a considerable feeling of weakness.

At 4 he was quite well, and had a free alvine evacuation.

Afterwards no symptom occurred worthy of being noticed.

CASE III. Edward M'Leod, aged 13, West Smith's Close, Grassmarket, went alone about five on the morning of the 22d August, to the same grounds to which the M'Bains had gone, to procure mushrooms, but from false information pulled the wrong species. While on the hill he tasted a raw one ; but finding it rather unpleasant he spit it out, without swallowing a single fragment of it, or even any of the juice. He went home quite well, and breakfasted heartily at 9 o'clock on porridge and milk. At 10 he roasted six of the fungi, and feasted on them after having dressed them with butter and salt. In about half an hour after this repast, he felt exceedingly giddy, and went out to a green at the back of his house, where he lay down for a short while ; but as the giddiness increased, he staggered into the house again, where he vomited a little, and then went to bed, sleep being by this time irresistible. It was now eleven o'clock, when he fell into a profound sleep,—his parents all the while never suspecting that there was anything particularly the matter, as he had complained of no pain ; for although they had seen him cooking and eating his mushrooms, they imagined that he had just been a little sick and fatigued, by having had an earlier and longer walk than usual. He was therefore permitted to sleep on without interruption. At half-past one, however, their fears were suddenly awakened, by his starting up in bed, raving loudly, and tossing his limbs about so much as to require considerable restraint. On application being made at Minto House, he was seen by Dr Brown and Mr Clerk at two o'clock. They found him raving wildly, affected with universal tremor, and occasionally with powerful muscular contractions, having a pulse beating 100, weak, but regular, pupils widely dilated, and a surface rather reduced in temperature. Two tablespoonfuls of mustard were immediately given by Dr B. in a quantity of milk, and thereafter the cold *douche* was administered on his vertex. This latter remedy had a considerable effect in quieting him ; and by means of the former, speedy and free vomiting was induced. As he did not, however, appear to have vomited enough, four grains of the tartrate of antimony were given in a quantity of tepid water.

I saw him at half-past two. The antimony, although given about ten minutes before, had not yet affected him. He required to be held in bed, his pupils were widely dilated, and totally unaffected by light. He was incessantly raving all sorts of nonsense, apparently much alarmed. He was affected with unceasing spasmodic twitchings ; and indeed the vibration of the tendons at the

wrist was so great, as for a while to render the perception of the pulse, which was beating 100, and feebly, rather difficult. The stomach-pump was now applied, and tepid water passed through the stomach until it ceased to be tinged with the mustard given formerly as an emetic. No fragments of fungi, however, were obtained. During the operation of pumping, he resisted much, and raved more fiercely, while, at the same time, the pulse rose to 108, and became rather more full. An attempt was now made to get him to swallow two ounces of castor oil, along with a quantity of milk, but as he refused to admit it into his mouth, the pump was again resorted to.

At three, he was again put to bed, and a large sinapism applied to the inside of each thigh, while cold was applied to the head, and ordered to be assiduously continued.

At half-past three, he was still talking loudly and incoherently; but was not so boisterous, as to need restraint, and the *sub-sultus tendinum* had nearly disappeared. His pupils remained fully dilated, but were slightly, although sluggishly contractile by light, and his pulse was 108, regular, and having more strength. The sinapisms did not yet appear to have been felt, and were therefore allowed to remain. Another ounce of castor oil was given, and afterwards a draught of hot coffee.

At half-past four, he was still incoherent, but more quiet, with a pulse 104, and of good strength. The sinapisms had been felt about four o'clock, and were then removed, as the skin was well reddened.

At half-past six, I found him in a sound natural sleep, into which he had fallen only a few minutes before. *The pupils were contracted*, but a little further contractile by light, and his pulse was 90, full, but very irregular. On being roused, however, which required forcible shaking, the pupils became *widely dilated*, and very little affected by light, while the pulse rose to 100, and became quite regular. When now roused he answered questions, but in a careless manner, and for the most part incoherently; and when left to himself was quite unintelligible. He complained very much of his thighs. As his bowels had not yet been moved, an ounce more of castor oil was ordered, and his attendants were desired to continue the cold to his head, and to shake him up out of sleep at short intervals.

At ten he was almost well, being perfectly coherent, having a pulse at 90, full but soft, and having had his bowels freely moved.

On calling next morning I found that he had passed a very quiet night; that his pulse was 80, soft and full; that his tongue was quite natural; and that his bowels were free. Indeed he complained of nothing besides weakness and his thighs, which were much inflamed, and a little swollen. An account of himself

before losing recollection on the previous morning was now accurately given by him, and was precisely as has been stated at the commencement of the case.

On the 25th, he was at his out-door play as formerly.

The accuracy of the above reports may be implicitly relied on, as they are drawn from copious notes taken on the spot at the times to which they refer,—no particular, however trifling, having been left to recollection; and they are now given in all their minuteness of detail, from the conviction, that, if otherwise narrated, they would be deprived of interest and importance.

With regard to the particular species of fungus made use of in the foregoing cases, I have to state, that a specimen was taken from the stock brought home by the M'Bains, (all the individual plants of which were of the same kind,) and examined by Dr Greville, whose intimate knowledge of cryptogamic plants cannot be questioned, and by him pronounced to be the *Agaricus procerus*.* Dr G. being from home when the third case occurred, I was deprived of an opinion regarding those used at that time; but I am convinced, from careful comparative examination, that they were precisely the same agarics as those used in the first and second cases, and, moreover, additional evidence as to their identity may be derived from the circumstances, that the habitat was the same, and the effects produced in the different cases were very much alike, notwithstanding the different states and quantities in which they were used, and the difference of age and constitution of those who partook of them. I may further state, that, in order to avoid the possibility of blame being attached to the wrong fungus, I went on a subsequent day to the back of Arthur Seat in company with the subjects of the above cases, and having procured specimens of the species, which they unhesitatingly attested to be the only ones made use of, sent them to Dr Greville, who returned the same answer as before. On these grounds then, the *Agaricus procerus* is assumed to have been the noxious fungus used in all of the above cases; and it now becomes a matter of no small interest, that the same fungus has been mentioned by various authors† as an edible one; and by others‡ at least, it has not been included in the list of those esteemed poisonous. Since, therefore, this particular agaric produced such deleterious effects in three (or at least in two) distinct cases, where difference

* "*Agaricus procerus elatus, pileo squamoso, late umbonato, rufescente—cinereo, lamellis albidis, remotis, stipite annulo mobili, bulboso.*"

† Persoon, *Traité sur les champignons comestibles*, p. 157. Greville, *Memoirs of the Wernerian Society*, Vol. iv, p. 353. Christison on Poisons, 2d edit. p. 769.

‡ Orfila, *Toxicologie Générale*, ed. seconde, Tome ii. 385–411. Fodere, *Médecine Légal*, Tome iv. seconde partim, chap. iii. p. 57.

of ages, constitution, and habit, renders the inference of a peculiar but common idiosyncrasy an extremely improbable conjecture; and since the poisonous principle or principles contained in it produced nearly identical effects when subjected to culinary preparation, as well as when used in the raw state, (for had it been used raw on all the occasions, the matter would have been very different,) it follows, that it ought to be viewed with suspicion in this country at least,—even although it has found its way to continental tables * in the forms of *fricassées*, or as ingredients in *sauces*.

As to the nature and effects of the poison brought into action in the above cases, some interesting topics for remark present themselves. The poisonous fungi have by all writers on poisons been arranged with the narcotico-acrids,—a class of poisons which excite at once narcotism and irritation, which produce a local irritating effect, as well as an effect on the brain and nervous system generally. This arrangement, however, has been qualified by the assertion, that the *modus operandi* in different cases, even with the same poisonous plant, may be various,—in one acting more or less narcotically, and in another producing a greater or less degree of irritation; and likewise that these effects vary according to the size of the dose,—the larger quantity being more narcotic, and the smaller more irritant.†

Whether this rule can be assumed as a general one or not, the cases at present under analysis, although resulting from the use of three different quantities of the fungi, were all cases of pure narcotism; for in none of them was the slightest pain of the stomach or bowels complained of, nor indeed was there any symptom present during the whole affection indicating irritation of the mucous surface, but every feature in them attested an impression made on the nervous system alone.

It has been stated by various writers on poisons, when remarking on the general rule that narcotic and narcotico-acrid poisons produce their effects on the system in a very short space of time, that the poisonous fungi must be considered as exceptions, as they “seldom begin to act for several hours, sometimes for not less

* Dr Greville, Mem. Wer. Soc. Vol. iv. p. 353, and in the private note to the author, accompanying his opinion on the specimens of the Fungi transmitted to him. In stating this, however, it ought to be remarked, that difference of climate is well known to change materially the qualities of other species of fungi,—as in the case of the *Agaricus piperatus* and the *Amanita muscaria*,—the first of which is eaten with impunity in Prussia and Russia, (Haller, Hist. Stirp. Helv. Indig. ii. 328.) although poisonous in France, and the last virulently noxious in France and in this country, although affording a common intoxicating beverage to the people of Kamschatka, (Dr Langsdorf, Annalen der Wetterauischen Gesellschaft für die gesammte Naturkunde.)

† Christison on Poisons, p. 717.

than a day and a-half" after being taken. * To this statement the above cases present some contradiction, for in all of them the effects began to be developed within the space of half an hour.

With regard to the kind of impression produced by the poisons on the brain and nervous system generally, the above cases present several curious circumstances for consideration. The stupor in case No. 1 was much more profound than that observed in any of the cases of narcotic poisoning with which I am acquainted; for while in general a look or word, momentary it may be, is obtained from those poisoned with opium, and other narcotics, affording proof that they may be roused from the stupor, if not already moribund, yet in this instance a very long time elapsed before the slightest symptom of sensibility could be obtained, in spite of loud speaking, forcible shaking, and various other means even more powerfully rousing. Indeed in this case it was not like the common narcotic lethargy, but more resembled coma, wanting the stertorous breathing; and this state was still further remarkable from its being accompanied by muscular twitchings and spasms in addition to the contracted pupil, the low feeble pulse, and the cold surface. The convulsions and severe tetanic spasms too, which occasionally occurred during the development of sensibility, and the boisterous delirium which followed them, gave a singular character to the whole case. The order in which those phenomena occurred seems different, so far as I am aware, from that hitherto observed in cases of narcotic or narcotico-acrid poisoning. In such the delirium has invariably preceded convulsions and stupor, but in cases No. 1 and 3 it was subsequent. Instead of the sedative stage following that of excitement, the reverse happened; and if there really was excitement prior to the stupor, the case is rendered more curious from the recurrence of it afterwards,—which excitement too, could not altogether be the effect of the stimulating remedies employed, as the delirium occurred in case No. 3, before any medicines were given at all. Indeed, from all the circumstances in cases No. 1 and 3, the idea does not seem inadmissible, that more than one poisonous principle existed in the fungi; and that after one of these had exerted a full narcotic influence, another was eliminated, by which the energies of the brain and general nervous system were excited, and thrown into disorder.

The only other remark which I shall offer on the phenomena observed in cases No. 1 and 2, is on the curious changes in the condition of the pupil. In the elder M'Bain's case, *during the stage of perfect insensibility*, the pupils were *very much contracted*, and were *unaffected by light*; but when *the system was roused to the fury of delirium*, they became both *widely dilated*,

* Christison on Poisons, p. 530; also Orfila, Tome ii. p. 409, edit. seconde. Beck's Medical Jurisprudence, p. 937, last edition.

and were to a considerable degree sensible. In the boy M'Leod's case, it is unfortunate that the state of the pupils could not be ascertained during his sopor. When seen first, however, and while he was in the height of delirium, they were *widely dilated but quite unaffected by light*, and only increased in contractility as the delirium passed away. Another singular phenomenon of M'Leod's pupils was that which was observed at half-past six (P. M.) Such changes as the last, however, I have of late very frequently observed in the course of different affections of the head, particularly in those of children. When asleep or lying quiet, the functions of the brain being undisturbed, the pupils are often contracted to a very small size ; but when the patient is roused by any sort of irritation, more especially by forcible pressure on the epigastrium, the pupils may be suddenly dilated to their full extent, and often while in this state refuse to contract even by the most powerful stimulus of light. This curious vacillation of the pupils, and indeed their very variable phenomena in different states of disease, only shows that symptoms derived from the state of the pupils cannot, in the present state of our knowledge, be much depended on as precise and invariable indications of particular cerebral conditions.

It would be superfluous to enter particularly into the nature of the treatment pursued in the above cases ; but it may not be useless to call attention to some of the remedies employed, and to the effects which they produced. The *emetics* of zinc and antimony failed to act, while the mustard one had the desired effect, most probably because it was hot and stimulating. The *stomach-pump* secured the best results. By no other means could the contents of the stomach in case No. 1 have been discharged ; and by it even a great many fragments of the fungi were brought up. And although the virulent properties of the poison had evidently been extracted, and perhaps entirely conveyed into the circulating system, yet the operation was a powerful means of excitation, on the first introduction causing a rise of the pulse from 68 to 80, and on the second occasion, while the stupor still existed to a considerable degree, rousing the patient to active resistance ; and in case No. 3 this last effect was likewise sufficiently produced. On this principle I used it lately in three very desperate but ultimately successful cases from poisoning by laudanum,—not with the hope of extracting the smallest quantity of the drug, which had already too evidently produced its full constitutional effect, but as one of the best means in itself for exciting the patients, and at the same time securing a safe passage for other remedies into the stomach which could not otherwise have been obtained. The *bleeding* in M'Bain's case was an experiment, but apparently justified by the indications of cerebral congestion present, and the result showed the efficacy

of the practice. The *counter-irritation* employed in case No. 1 was perhaps the most powerful agent in procuring a first step in the return of sensibility, and in securing the patient likewise against future mischief. The boiling water, although a severe remedy in appearance and in after consequences, seemed called for by the urgency of the case, and the immediate and subsequent effects demonstrate clearly enough the advantages obtained from it. The large sinapisms in No. 3 were of great utility. It is certainly not presuming too much to conclude, that convalescence in both of these cases would neither have been so speedy nor complete had it not been for the extent and permanency of the irritation obtained. The admirable effects of the *internal stimulants*, viz. the coffee, the ammonia, and the spirits and camphor given in case No. 1, appear so obvious from the various reports as to render any comment unnecessary. As to the *purgatives*, the castor oil was preferred, and exhibited along with milk, on the supposition that there might have been an acrid as well as a narcotic principle in the fungi, from which it was necessary to shield the stomach and bowels, while at the same time it seemed best fitted for acting speedily downwards. It was rather interesting that the torpor of the bowels should have been so great in both cases as to require in the first one six ounces, and in the third four ounces, before an evacuation could be procured. In conclusion, whether owing to the plan of treatment adopted or not, it certainly is not the least striking feature in cases 1 and 3, that there should have been so early a restoration to health when the poison acted so speedily and violently; and even although there had been subsequently a very material derangement of the constitution, such could not have been wondered at, considering the number and kind of remedies which it was necessary to employ.

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3.

PRACTICAL OBSERVATIONS

ON THE

TREATMENT

OF

STRICTURE OF THE URETHRA.

By MR. URE.

[From the London Medical Gazette.]

PRACTICAL OBSERVATIONS,

&c.

By stricture is meant such a morbid contraction of the urethra in one or more points as impedes or obstructs the flow of urine.

The canal of the urethra has, in the natural state, a diameter of about four lines nearly all its length; but its orifice is usually narrower, being only two-and-a-half or three lines in diameter.

Strictures have been divided into two kinds: the one spasmodic or inflammatory, susceptible of spontaneous resolution; the other chronic, depending on organic change. The latter present every variety of texture, from simple swelling of the mucous membrane to callous thickening consisting of dense gristly-like substance. The most common form is that which resembles the effect of a thread tied round the canal; though by irritation or improper treatment, it will ere long pass into the indurated state just described.

The more prominent local symptoms of the chronic variety are—a slight discharge of matter from the urethra, and a frequent desire to evacuate the urine, which issues in drops, or in a forked, twisted, wiry, or thread-like stream.

As a great proportion of the fatal diseases of the bladder may be traced to this source, I have been induced to draw up the following observations, with the view of pointing attention to certain

modes of treatment in which, perhaps, some novelty may be found.

I. *Of dilatation.*—This plan is adapted to the majority of cases, and deserves the preference whenever it is practicable. Its application, however, requires both skill and consideration, much more, indeed, than is commonly supposed.

When a bougie or sound is introduced along the urethra, it determines, independently of any mechanical operation, a distinct physiological effect, characterized in the first instance by a modification of the sensibility, a quickening of the capillary circulation, attended with augmented secretion; but afterwards by subsidence of irritation, and restoration of the healthy condition of the part. The process of methodical dilatation ought to be conducted as gradually and cautiously as possible, commencing with slender gum-elastic or catgut bougies, which will pass through the stricture without producing pain or hæmorrhage. M. Beniqué has devised the following ingenious method of penetrating narrow, and otherwise impervious, strictures*. He employs a curved metallic tube (*b*), whose anterior extremity is a little widened, in order to give in that point adequate thickness

* De la Rétention d'Urine, p. 14.

to the metal. A mandrel (c), accurately adjusted, converts the end of the tube into a smooth and rounded sound, presenting no inequalities capable of injuring the passage it has to traverse.

Whenever the stricture offers to the sound such resistance as moderate pressure will not overcome, it is to be there fixed, the contained mandrel withdrawn, and replaced by a bundle of parallel bougies, the number of which will be greater, and the diameter smaller, in proportion to the development of the stricture. As soon as the end of this bundle meets the obstacle, we keep the tube with one hand in the same position, while with the other we endeavour to push gently one of the bougies forwards through the stricture. Should the first fail, we try the rest in succession, till we accomplish the desired object. This done, we draw out the rest of the bundle, and then the metallic tube. The bougies ought to project four or five inches from the external orifice of the tube, to allow freedom of manipulation.

In this way a bougie has been presented to every point of the opposing surface, without subjecting the patient to annoyance from necessity of repetition. When the stricture resembles a cone, whose base is directed towards the meatus, and whose truncated apex gives exit to the urine, M. Beniqué replaces the mandrel, not with a bundle, but with one, or at most two bougies. The chief advantage of this plan is its counteracting the resiliency of the bougie.

The annexed figures represent the application of the instrument.

At first, especially with irritable subjects, the introduction of a bougie should be only momentary, though it may afterwards be prolonged to a few minutes. Having derived the full benefit from the use of the more slender instruments, others should be passed commensurate in size with the progress of dilatation. Bougies that are cylindrical to within about an inch from the extremity destined to enter the bladder answer well; but when the stricture is situate in, or beyond the bend of the urethra, the gum-elastic sounds, *à courbure naturelle*, are preferable, as they are not susceptible of injuring the urethra. The temporary dilatation, performed at suitable intervals, is more beneficial than the permanent, recommended by several eminent surgeons.

For when a bougie is too frequently introduced, or too long kept in, the urethra, constantly irritated by the presence of a foreign body, re-acts, and renders nugatory the effects of treatment.

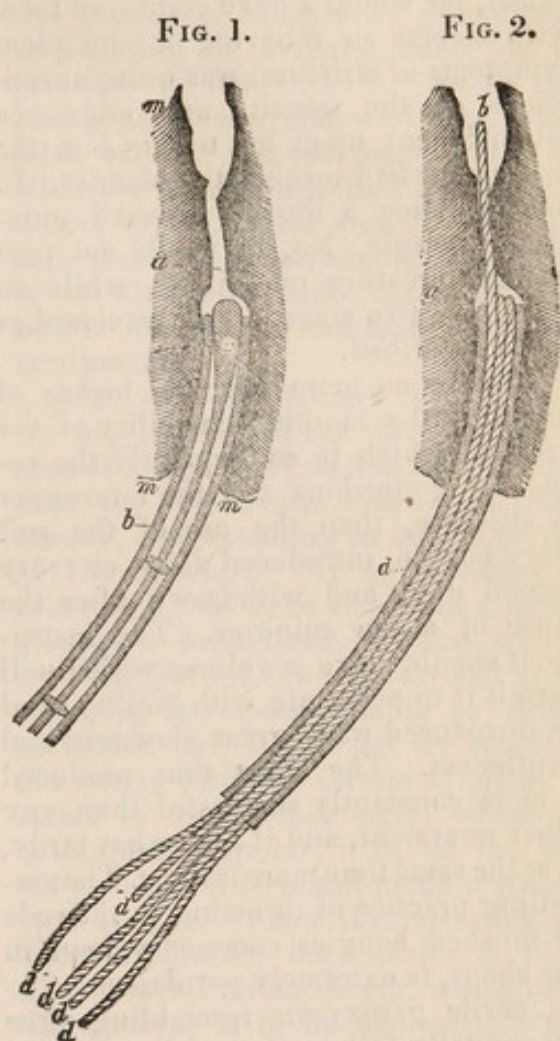


FIG. 1. — *m, m, m*, Section of a stricture whose orifice, *a*, is not situated in the centre of the canal.

b, A metallic canula, closed by a moveable obturator, *c*.

FIG. 2.—The obturator has been taken out, and replaced with a bundle of small catgut bougies, *d, d, d, d*. Each has been individually advanced in succession; one of them, *b*, having penetrated the stricture, has passed beyond it.

In many instances the persevering use of these instruments will effect a perfect cure in a few weeks; in other cases months will elapse ere the patient derives the wished-for relief. One of the best means of accomplishing the dilatation is by the softened ivory bougies, which I was led to try at the suggestion of Dr. Güterbock, of Berlin. These, consisting of condensed gelatine, are somewhat elastic, and extremely tough, so that there is no risk

of their breaking. They present the essential attributes of a bougie in the highest possible degree. Nothing can exceed their pliancy and lubricity; and the ease with which they glide along the urethra is very remarkable. A field-officer, for whom I have employed them with success in relieving the incipient symptoms of stricture, was quite unconscious of the transit, and expressed astonishment upon my telling him the instrument had reached the bladder. In this instance a highly polished gum-elastic bougie, No. 4, would not pass without creating uneasiness, while an ivory one, two sizes larger, traversed as above described.

There is no more effectual means of subduing the morbid sensibility of the urethra, which is so frequently the sequel of gonorrhœa and the forerunner of stricture, than the use of the soft ivory bougie, introduced daily, or every second day, and withdrawn after the lapse of a few minutes. The instrument should have a volume which will permit it to penetrate with facility, and be introduced with great slowness and gentleness. The effect thus produced is more constantly successful than any other treatment, and if somewhat tardy, is at the same time more lasting. The prevailing practice of thrusting in the rude ill-finished bougies commonly kept in the shops, is extremely pernicious.

Febrile paroxysms resembling ague occasionally follow the passage of instruments into the urethra; these may be prevented by leaving one of the soft-ivory catheters in the bladder. This may be worn for days without the patient being scarcely conscious of its presence. It is, moreover, less prone to become encrusted with urinary deposits than those made of gum-elastic or metal*.

M. Civiale advises, in order to avoid, during our manipulations, the mucous lacunæ, which, he says, for the most part occupy the dorsal surface of the canal, to press the end of the instrument, especially if it be small, to one or other side, or towards the inferior than the superior surface†. This counsel is di-

rectly the reverse of what is commonly prescribed.

I need scarcely observe, that the presence of active inflammation contra-indicates all instrumental interference. Stricture depending on this cause must be combated by abstraction of blood, opiates, and the warm bath. Tampering with bougies aggravates the symptoms and tortures the patient.

II. *On the application of nitrate of silver.*—Every surgeon conversant with the treatment of stricture must have occasionally met with cases where mechanical dilatation, however long continued, or skilfully performed, has failed to effect a cure. Many of these may be radically overcome by the judicious application of nitrate of silver. The method of lateral cauterization, as originally proposed by Ducamp, in the year 1822, and the subsequent modifications introduced into this system by M. Lallemand, are objectionable, because they involve the risk of the escharotic acting upon sound parts*. The cauterization supposed to have been performed upon the internal surface of the stricture, observes M. Civiale†, has been only expended upon a spot anterior to it. If the instrument be pushed with force, or made to execute repeated movements of rotation, its extremity injures and perforates the sides of the urethra. Hence the numerous false passages that have been discovered; hence the attacks of hæmorrhage, often sufficiently copious to awaken the utmost anxiety and alarm‡. Besides, the *cuvette*, in many instances, does not slide forwards, and thus the contained nitrate, instead of being concentrated upon the stricture, dissolves, and combines with the mucus, in which the conductor is bathed. The effect is then null, or nearly so; for while the greater portion of the solution is lodged in the tube, the remainder comes in contact with merely the anterior part of the urethra. The

* Leroy, in Bulletin de l'Académie Royale de Médecine, tom. iii. p. 256.

† Op. cit. p. 234.

‡ At page 36 of M. Lallemand's work, entitled "Observations sur les Maladies des Organes Genito-urinaires," we find a case recorded, in which "acute pain, accompanied with frequent calls to void urine, hæmorrhage, and constriction of the sphincters of the anus," followed the introduction of his port-caustic; and in the Sixth Observation, that "urgent desire to evacuate the contents of the bladder, with complete retention, prolonged and violent rigors, and acute pain about the bladder and kidneys" ensued, in consequence of cauterizing a healthy part of the urethra.

* These instruments are prepared by removing the earthy constituents of ivory. Before being used they ought to be immersed for several hours in water, and well smeared over with cerate. They are not expensive.

† Traité sur les Maladies des Organes Genito-urinaires, p. 200.

practitioner in this way, contrary to his intention, operates from before backwards. Hence the disease is often materially aggravated and rendered incurable; the frequent repetition of the practice giving rise to an irregularly thickened state of the parietes of the canal, sometimes pervading the greater part of its extent. This is attended with a troublesome discharge of matter; and paroxysms of agonizing pain referred to the neck of the bladder, the prostate gland, the spermatic cord, or the testicles, whereby the patient is rendered miserable for the remainder of his days.

To obviate these serious objections various improvements have been suggested in the construction of instruments, among which we would enumerate those of M. Pasquier and of M. Leroy d'Etiolles, as being well adapted for effecting the application with safety and precision.

As it is essential, in the first instance, to obtain a correct knowledge of the nature, extent, and situation of the stricture, I shall describe the method, *par empreinte*, as now generally practised in Paris*. A yellow wax bougie, having an equivalent volume to the width of the stricture (as nearly as can be estimated), is to be passed along the urethra into the bladder. It should be grasped by the stricture, but not forcibly. In general these soft bougies can be introduced with considerable facility. In the event of failure, a slight preliminary dilatation may be procured by means of the slender gum-elastic bougies formerly mentioned. Having reached its proper destination, the soft bougie is left *in situ* for the space of ten or fifteen minutes, after which it is withdrawn by a quick movement. The part which had been grasped by the stricture will be found to present a corresponding mark, amounting sometimes to a notch, sometimes to a mere dimple, scarcely visible to the naked eye, but which may be detected by gliding the finger along its surface. According to the form and situation of this impression, we are enabled to determine the dimensions and direction of the stricture, and also its distance from the orifice of the urethra. Nor are we liable to receive a fallacious indentation from the

natural curve of the urethra under the pubis, from lacunæ or false passages, or to mistake a spasmodic for an organic stricture, as has occasionally happened with other emplastie instruments.

M. Leroy employs for the exploration graduated bougies of gum-elastic, terminating in a round knob, on the principle of Sir C. Bell. These may enable us to recognize well the valvular folds of the mucous membrane; but when the lateral projection is but a fraction of the transverse area of the tube, and the stricture terminates posteriorly in an elongated cone, the indications will be less precise and more difficult of attainment.

After this preliminary investigation, we may, provided the stricture has an area of a line or a line and a half, introduce the port-caustic with its platinum *cuvette*, corresponding in length to that of the stricture. It is necessary in every case that there should be a partial dilatation beforehand. When we are satisfied that the tube has arrived at the obstacle, the *cuvette* is to be slowly protruded and then fixed by means of the screw, with the nitrate of silver directed to the affected part; where the stricture is annular, it is, on the contrary, to be left free, and made to revolve upon its axis. After this operation has lasted a minute, the *cuvette* is to be drawn back into its sheath, which, with the urethra, is to be depressed before removal. By this manœuvre the mucus, should it contain any portion of dissolved nitrate, will flow into the tube; thus all risk of its irritating the healthy surface is prevented. The application so conducted is productive of little or no uneasiness, not more than follows the introduction of an ordinary bougie.

The annexed figure (3) represents the two ends of the instrument in question: *c, d*, are the extremities of the elastic tube; *b*, the head of platinum or gold, fastened by a pin; *e*, the metallic tube attached to the other end of the elastic one; *f*, the screw passing through both tubes; *a*, the platinum spoon or *cuvette* upon its thin elastic stem, which plays freely within the tube *c, d*, and whose other end *g* is continued into *h*, a quadrilateral rod upon which the screw *f* can be made to press.

The instrument recommended by Mons. Leroy for the retrograde application, consists of a curved tube, *a, a*, fig. 4, made of silver, or of gum elastic,

* This method is by no means new, a description of it being given in Lemonnier's *Traité sur la Maladie Vénérienne*, printed in 1689.

FIG. 3.

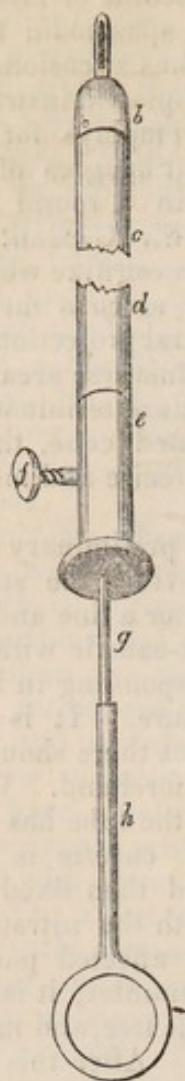
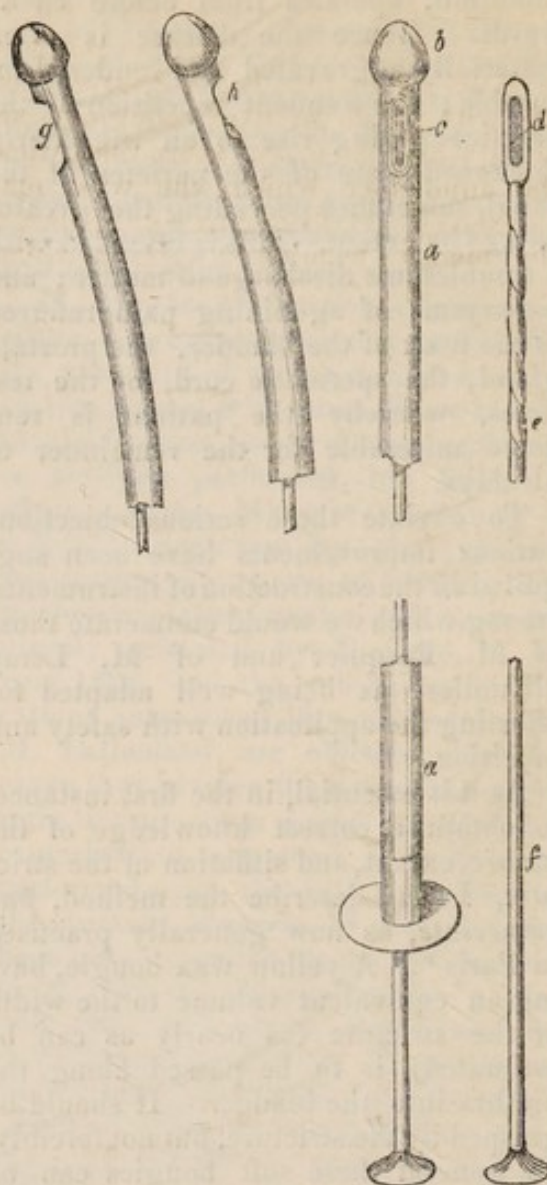


FIG. 4.



surmounted like his exploratory bougies, with a small knob *b*, close to which is an elongated aperture, *c*, about half an inch in length, for the purpose of allowing the contents of the *cuvette* to come in contact with the stricture. The *cuvette*, *d*, which is nearly half an inch long, is attached by one extremity to a silver rod, *e, f*, about ten inches long, whereof three and a half inches, *e*, is spiral, in order to impart flexibility and the power of rotation in a curve. The above part, instead of being spiral, is sometimes chain-work. A silver canula is preferable to one of gum-elastic, as the *cuvette* is apt to tilt out of the eye of the latter, and do mischief. The instrument is to be introduced beyond the most remote stricture, and then partially withdrawn, until the knob, *b*, is felt to hitch against the distant margin. The *cuvette* containing the fused nitrate of silver, inserted with its convex metallic surface to the notch, is then to be turned round till the nitrate faces the stricture; it is to be thus retained for a minute, and straightway restored to its former position, and removed with

its canula. The operator must be provided with two separate canulas, one having a superior, the other an inferior aperture, to suit the direction of the stricture. In every case we ought to be quite certain that we have passed the extreme obstacle, before the nitrate of silver is permitted to act.

Immediately after the application has been made, the patient voids urine better than before; but on the day following there sometimes ensues a degree of retention, from closure of the canal by a plug of coagulated mucus. This is easily removed by injecting a little tepid water from a gum-elastic syringe, furnished with a long, narrow, softened ivory tube. The introduction of a bougie for this purpose is both painful and hazardous. About the second or third day, some sloughy shreds are voided along with the urine. We have now to repeat the passing of the soft bougie, to ascertain whether the stricture be completely overcome; persevering in

the use of the nitrate of silver till no trace is left upon the wax. We may even determine this by the relative facility with which an ivory bougie passes along; and if so, we spare the patient the annoyance which the wax may cause while traversing the under part of the mucous membrane. It is seldom that a single application suffices; in the majority of cases, it must be renewed at intervals of four or five days for some weeks, until a No. 6 bougie will pass. But we must be guided by the result, discontinuing the practice whenever we perceive that the patient ceases to derive benefit; otherwise its protracted use cannot fail to do harm*.

As a general rule, the application ought to be confined to cases in which the stricture is of limited extent. Where there is general callous thickening, it is inappropriate. It is not intended that the nitrate of silver should destroy the stricture, as may happen; it merely induces some change in the vital actions of the part, which is followed by relaxation of the narrowed portion. No satisfactory explanation has yet been offered of its *modus operandi*.

We usually remark, soon after its employment, a mucous or purulent discharge, which commonly subsides, of its own accord, in a few days. In some rare instances, the gleet which had previously accompanied the stricture becomes greatly increased in quantity, and continues so for a considerable time. More generally, however, chronic discharges of long standing disappear entirely upon its removal.

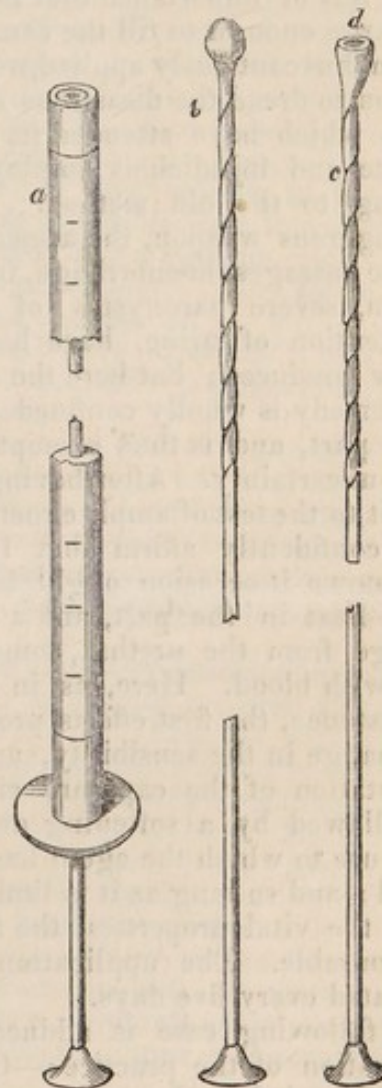
To complete the cure, ivory bougies, or gum-elastic sounds, having the natural curvature, ought for some time to be daily introduced for a few minutes, progressively augmenting in size till we come to a diameter of $2\frac{1}{2}$ or 3 lines. By and by they may be passed twice a week, and ultimately every eight or ten days. The subsequent dilatation is always necessary to protect against a relapse.

There is another form of stricture, in which the urine may percolate through

the obstacle, while even capillary bougies cannot be introduced, or, if so, but partially, penetrating, as it were, a spongy mass, and giving rise to hæmorrhage. Here we must have recourse to the *direct* application of nitrate of silver, on the principle recommended by Ambrose Paré, and afterwards adopted by Mr. Hunter and his follower, Sir Everard Home, but practised in a much improved manner*.

The instrument I have found best suited for this purpose was first shewn to me by M. Leroy d'Etiolles, along with several other ingenious contrivances for the treatment of urethral diseases. It does not differ materially from that of M. Labat. It consists of a flexible canula (*a*, fig. 5), graduated into

FIG. 5.



inches and fractions of an inch, surmounted by a platinum ferrule, and of two silver rods, partly spiral, whereof one (*b*) terminates in an oblong knob,

* For ulceration of the mucous membrane of the urethra, characterized by pain experienced in particular points of the canal during the passage of an instrument or the evacuation of urine, the momentary application of nitrate of silver is a most valuable remedy. I succeeded in curing, by two applications, an intractable case of this kind, where the patient had been long needlessly tormented with the introduction of bougies, by a surgeon of repute.

* This method is also adapted to cases of very thin valvular stricture, almost membraniform, which the sound or bougie passes with a slight jerk, and beyond which the resistance ceases entirely to be felt.

while to the other (c) is attached a little platinum cup (d), for holding the fused nitrate of silver. The cup cannot pass beyond the rim of the ferrule. The chief improvement in this instrument is the adaptation of the spiral.

It is introduced containing the rod (b), whereby the orifice is closed so as to present a hemispherical surface. As soon as it has arrived at the stricture, the rod is withdrawn, to make way for the capsule with the nitrate of silver. While this is being done, the end of the canula must be kept steadily against the stricture. The nitrate of silver now in contact with the part, is to remain from 30 to 60 seconds, and is then to be removed; and after depressing the urethra for a reason formerly assigned, the canula may be taken out. To ensure success, it is of importance that the latter be large enough to fill the canal.

When thus cautiously applied, we have no reason to dread the disastrous consequences which have attended its indiscriminate and injudicious employment according to the old method. With that dangerous weapon, the armed bougie, false passages, hæmorrhage, intense irritation, severe paroxysms of fever, and retention of urine, have been repeatedly produced; but here the action of the remedy is wholly confined to the affected part, and is thus exempt from peril or uncertainty. After having submitted it to the test of ample experience, I can confidently affirm that I have never known it occasion ought beyond a little heat in the part, and a slight discharge from the urethra, sometimes tinged with blood. Here, as in every other instance, the first effects produced are a change in the sensibility, and an augmentation of the capillary circulation, followed by a softening down of the texture to which the agent has been directed; and so long as it is limited to modify the vital properties, the results are favourable. The application may be repeated every five days.

The following case is adduced, in corroboration of the practice:—On the 29th of March last, I was requested by Mr. Hering, a gentleman practising in Foley Place, to see Mr. D—, labouring under obstinate stricture. This

patient is 46 years of age. He has had gonorrhœa twice or thrice; the last time was in the year 1830. Twelve months prior to that date, he was obliged, on returning from a hot climate, to submit to treatment for some obstruction of the urinary passages. For two or three years back he has been subject to irritation of the urethra, accompanied with a gleet discharge. When I saw him, he complained of frequent calls to make water, which he voided in a forked, ^{or} twisted, and small stream. On endeavouring to introduce a small or moderate-sized bougie, it was arrested by a spongy substance, and gave rise to pain and hæmorrhage. I may observe, that repeated attempts had been made to effect a cure by means of bougies previously, but in vain. On more minute examination, I found the stricture was situated about five inches and a half from the external meatus; there was, in addition, a slight narrowing, about three inches and a half from the same point. Having determined on the antero-posterior application of the nitrate of silver, I commenced at once with the principal stricture, in the manner above described, renewing the practice at suitable intervals for a few weeks. During this period, the patient was so little incommoded as to be able to return home to the country each time, and pursue his ordinary avocations. On the 20th of May, I passed with ease a No. 4 gum-elastic bougie; and, in the course of other eight days, a No. 8 gum-elastic sound, *à courbure naturelle*, having previously discontinued the use of the nitrate of silver. Since then I have occasionally introduced, and always with the utmost facility, the soft ivory bougies, both strictures having quite disappeared.

From the preceding observations it appears that, under ordinary circumstances, stricture may be cured without subjecting the patient to pain or inconvenience.

The most efficient means of relieving the severer forms of retention of urine, connected with this disease, I propose to consider in another paper.

13, Charlotte Street,
Bedford Square, July 17, 1839.

NEW REMEDIES FOR GOUT.

*Extracted from a paper in the Medical Gazette of November 8, entitled
"Researches on Gout."*

BY ALEXANDER URE,

Fellow of the Royal College of Surgeons of England, Surgeon to the Westminster
General Dispensary, and Hon. Member of the Pharmaceutical Society.

MANGANESE, in the state of proto-carbonate, is present in the waters of Marienbad, Carlsbad, and other German springs, whither gouty invalids annually resort in quest of health; in the state of oxide, it forms one of the normal constituents of the bones. It was first shown by M. C. G. Gmelin, of Tübingen (*Versuche über die Wirkungen des Baryts, &c.*, 1824, p. 96), that the manganese salts when injected into the blood-vessels augmented the biliary secretion to such a degree, as to produce a deep yellow staining of the coats of the intestines, and of the great vessels in the vicinity. According to M. A. Barbet (*Journal de Chimie Médicale*, tome v., p. 534), muriate of manganese forms a main ingredient of a nostrum sold in Paris, under the name of the deobstruent powder of Rouvière. This, taken for a few days, is said to procure abundant bilious evacuations.

If a drachm of sulphate of manganese be dissolved in about half a pint of water, and swallowed before breakfast, it will generally occasion after the lapse of an hour or so, one or more liquid stools.

Sulphate of manganese has a cooling and bitter taste, resembling that of Glauber salt. Dr. Thomson (*Chemistry of Inorganic Bodies*, vol. ii., p. 587) says, "It may be administered as a cathartic, in doses of from half an ounce to an ounce." I have always found a much smaller quantity suffice, and should be reluctant to give it to that extent. It acts most efficiently when dissolved in a considerable quantity of water. On particular occasions, infusion of senna furnishes a useful adjunct.

In order to abate the erethism of the vessels of the gouty articulation, to further the absorption of effused fluids, and to arrest the recurrence of attacks which, in the long run, lead to distortion and ankylosis, the topical employment of Acetic Ether and Rectified Coal Naphtha will be found highly serviceable. The former was first introduced to the notice of the profession by M. Sedillot, in the *Transactions of the Medical Society of Paris* (No. x., Mess. An. 5), but never seems to have attracted attention here. Acetic ether generally determines a speedy sedative agency in the more acute stage of the malady, when applied with gentle friction over the whole of the affected surface, to the amount of half an ounce every twelve hours, provided after each friction the patient is kept warm in bed. In the sub-acute form of the disease, I have witnessed very beneficial effects from simply pencilling over the part with a camel-hair brush dipped in naphtha*.

* Care must be had not to confound this with a spirit sold under the same name, used for making hatters' varnish, and lately introduced as a medicine. The properties of the two are quite dissimilar.

In some instances, indeed, this seemed to have the power of warding off an impending paroxysm. I was first led to try it in gouty cases, from being told by an extensive manufacturer of the article near Birmingham, that affections of the joints were unknown among his workmen, while they were common enough among the operatives of other factories in the neighbourhood.

Coal naphtha is a pure hydro-carbon, almost identical in nature and properties with the naphtha which occurs native on the shores of the Caspian sea, in Persia, and other countries of Asia. The latter, alluded to by Herodotus, has been used from a remote period by some of the nations of the east, against the very ailment in question. Thus, Dioscorides (Lib. i. c. 85) says, "Podagris articulorum doloribus lethargisque prodest;" and Bontius (*Hist. Nat.* p. 17), in describing what he calls "a noble species of naphtha" brought from Sumatra, and highly prized for its medicinal virtues by the Javanese, concludes as follows: "Partibus affectis illitum miraculi instar ægros consolatur."

Naphtha topically applied imparts a feeling of warmth, sometimes accompanied with slight tingling. It acts obviously upon the principle of a mild but penetrating counter-stimulant, determining contraction of the capillaries, increase in the rapidity of their circulation, and progressive absorption of liquid effusion.

As a remedial agent, seemingly endowed with qualities capable of counter-acting and removing tophaceous deposition, Silicate of Potash, the *liquor of flints* of the older chemists, deserves a trial. This salt passes through the system unchanged, and can be detected in the urine of animals to which it has been given by the mouth. It exercises a very powerful solvent action upon the urate of soda. I have prescribed it for one or two patients in doses of ten and fifteen grains twice a day, dissolved in six or eight ounces of water, with apparent benefit.