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MEDICAL FACTS

AND

OBSERVATIONS.

VOL. IV.

MEDICAL FACTS

AND

OBSERVATIONS.

VOLUME THE FOURTH.

L O N D O N :

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CONTENTS.

	Page
I. <i>O</i> BSERVATIONS on the Fevers and Dysentery of hot Climates; and on the Use of Mercury in those Diseases. By Mr. William Boag, Surgeon in the Service of the Honourable East-India Company at Bombay. — — —	I
II. <i>An Account of the successful Treatment of a Case in which the Brachial Artery was divided.</i> By William Adair, Esq. Surgeon General to the Garrison of Gib- raltar. — — —	21
III. <i>An Account of the Effects of Oil of Turpentine in a Case of internal Hæmor- rhage.</i> By the same. — —	25
IV. <i>A Case of Imperforated Anus.</i> By the same. — — —	27
V. <i>Observations on the Pathology and Mode of Treatment of Calculi in general, but</i>	more

	Page
<i>more particularly of Intestinal Calculi; with a Description and Chemical Analysis of the Intestinal Calculi of Horses. By Mr. William Gaitskell, Surgeon at Ro- therhithe.</i>	31
VI. <i>An Account of the good Effects of Opium in a Case of Retention of Urine. By Mr. Alexander Mather, Surgeon at York.</i>	102
VII. <i>A Case of monstrous Birth. By the same.</i>	107
VIII. <i>A Case of Varicose Aneurism. By Mr. H. Park, Surgeon to the Liverpool Infr- mary.</i>	111
IX. <i>An Account of the good Effects of Opium administered in Clysters, in Cases of Menorr- hagia. By Mr. Peter Copland, Surgeon at Swayfield, near Colsterworth, in Lin- colnshire.</i>	118
X. <i>An Account of the good Effects of a Mercurial Snuff in a Case of Gutta Se- rena. By Mr. R. B. Blagden, Surgeon at Petworth, in Sussex.</i>	120

XI. *A Case*

	Page
XI. <i>A Case of Pulmonary Hæmorrhage, with Remarks. By Mr. William Davidson, Apothecary in London.</i>	— — 129
XII. <i>A Case of Psoas Abscess successfully treated. By Mr. William Smith, Surgeon at Bideford, and Member of the Corporation of Surgeons of London.</i>	— 138
XIII. <i>Case of Phlegmonic Inflammation, with Reflections on certain Effects of Heat and Cold on the living System. By Thomas Beddoes, M. D.</i>	— — — 148
XIV. <i>Observations on the good Effects of Caustics in Cases of White Swellings of the Joints. By Mr. Bryan Crowther, Surgeon to Bridewell and Bethlem Hospitals.</i>	157
XV. <i>On the Cure of the Elephantiasis. By At'har Ali' Khán, of Debli. From the Asiatick Researches: or, Transactions of the Society instituted in Bengal, for inquiring into the History and Antiquities, the Arts, Sciences, and Literature of Asia.</i>	— 168
XVI. <i>On the Spikenard of the Ancients. By Sir William Jones, Knt. From the same Work.</i>	— — — 180
XVII. <i>An</i>	

	Page
XVII. <i>An Account of some chemical Experiments on Tabasheer. By James Louis Macie, Esq. F. R. S. From the Philosophical Transactions of the Royal Society of London.</i> — —	193
<i>Catalogue of Books.</i> — —	200
<i>Index.</i> — —	225

MEDICAL FACTS

AND

OBSERVATIONS.

1. *Observations on the Fevers and Dysentery of hot Climates; and on the Use of Mercury in those Diseases. By Mr. William Boag, Surgeon in the Service of the Honourable East-India Company at Bombay. Communicated in a Letter to William Saunders, M. D. Fellow of the College of Physicians, London, and Physician to Guy's Hospital; and by him to Dr. Simmons.*

To Dr. SAUNDERS.

DEAR SIR,

I HAVE intended for some time past to give you a short account of the peculiarities I have observed in the nature and treatment of some of the diseases of this country.

VOL. IV.

B

If

If there be any utility in what I shall relate, I know no one to whom I can address myself so properly as to you, as, I believe, few can make their information upon any medical subject so generally useful.

I mean to confine my remarks chiefly to fevers and to dysenteries, the two principal and most fatal distempers of this, in common with all other hot climates.

It will not be necessary to describe the symptoms of those diseases, as this has been so often done already by different authors, particularly by Sir John Pringle, Dr. Hillary, and Dr. Cleg-horn.

The fevers of hot climates have commonly been described under the names of bilious, remitting, yellow, or putrid fevers; but these terms are, for the most part, ill defined, and some of them seem to express the stage or degree of fever, rather than the kind—Dr. Cleg-horn observing, probably, the objections to which the more common appellations are liable, considers all the fevers of Minorca under the head of tertians. But though he classes them in this manner, he, at the same time, observes the great irregularities to which their paroxysms are subject, how readily they assume a
more

more continued form, and how commonly they alternate with attacks of dysentery. When they put on this irregular appearance they exactly constitute the bilious fevers of other authors, and it is to these fevers, by far the most common in this country, to which I mean to confine my remarks.

The symptoms of dysentery are the same in all countries; the disease can therefore require no discrimination from me. But it will be necessary to make a few short observations upon some theoretical opinions which have been entertained concerning the nature and causes of fevers and dysenteries, in order that the principles may be understood upon which the practice hereafter described is founded.

The fevers of which we are speaking, and dysenteries, have always been observed to prevail in the same seasons; and there is such a general resemblance of character betwixt them, that both ancient and modern authors have considered them as originating from the same causes. Though they differ much in their opinions respecting the nature of those causes, yet this one point of a common origin being established from such united authority, is a step

of some importance in ascertaining the nature of both.

The more ancient physicians, observing the great discharges of bilious matter in those diseases, believed that they originated from redundant or corrupted bile. This opinion was very generally adopted by their successors; but it is now succeeded by the more laboured, though not more satisfactory, theories of modern date.

It would be superfluous for me to give any account of those theories; no one is better acquainted with their fallacy than you are: I will only beg leave to remark, that the total rejection of the ancient doctrine seems to be in some degree owing to writers in general not having had opportunities to observe the fevers and dysenteries in warm climates, where they are infinitely more common than in Europe.

I am very far, however, from believing that bile alone, either redundant or corrupted, is sufficient to produce those fatal distempers; but it must also be confessed, that the bile cannot be in either of those conditions, unless the organ which secretes this fluid be to a certain degree diseased: for I hold it to be a fact as clear and demonstrable as any in physic, that whenever a fluid is secreted by any gland in the
body

body different in quantity and quality from what is natural, the fault is not so much to be looked for in the fluid that is secreted, as in the organ that secretes it. The fluid may produce much disorder in the system, but the source of this disorder is evidently in the gland.

If therefore it can be made to appear that the state of the liver has some connexion with the production of those diseases, it will show that although the ancients did not arrive at the truth, yet they approached towards it.

To illustrate this opinion, I shall beg leave to enumerate the following arguments :

1. In the fevers and dysenteries of hot climates, large and spontaneous discharges of bile frequently happen, commonly to the great relief of the patient.

2. A pain, sometimes dull, sometimes acute, is, for the most part, felt by pressing with the hand upon the region of the liver. As the disease advances this pain increases, and often a tumefaction and hardness become perceptible in that region. This observation is strongly corroborated by Dr. Hillary, in his account of the putrid bilious fever of the island of Barbadoes.

“ We likewise,” says he, “ observe, that
“ the hypochonders, especially the right, and

“ the adjoining præcordia, are most affected
 “ throughout the whole time of the disease,
 “ which is the seat of the liver and gall bladder,
 “ infomuch that Dr. Warren says, it
 “ seems to be the seat and throne of the disease;
 “ and I have always observed that the
 “ sick cannot bear the least pressure of one’s
 “ hand upon the parts where the gall bladder,
 “ and biliary ducts, and liver, are situated.”

This pain, however, is not constantly to be discovered, even by the most careful examination: this may be owing to the insensibility of the liver, or to the diseased part being beyond the reach of pressure with the hand. But it is not uncommon for the disease of the liver to show itself, in this country, by a fixed pain in the top of the shoulder, without any pain being felt in the organ itself.

3. In fevers a yellowness of the skin is often observed, as if the patient were afflicted with the jaundice; hence the name of yellow fever, so common in the West Indies. But this symptom is as often observed in dysentery as in fevers, and, I believe, it can be fairly ascribed to no other cause than to the bile being carried into the circulation in consequence of the diseased state of the liver.

4. If

4. If there be any reason to believe that the liver is affected from the beginning, it will account in the most rational manner for the enlargements in the side so often noticed by authors, after those diseases have continued so long as to become chronic.

5. The most satisfactory way of gaining information concerning the nature of any internal disease is by dissection of the dead subject.

I have opened a number of bodies, and been present at the dissection of a great number more, of those who have died either of fever or of dysentery in this island, where the cases of the patients, previously to their deaths, were accurately taken, and the appearances on dissection carefully noted down.—All that I can attempt in this letter is to state, in a general way, the appearances observed in those dissections.

In the cases both of fever and dysentery the liver was, with two exceptions, constantly found diseased.

In most cases it was much enlarged, sometimes indurated, but more frequently very soft, so as to tear upon a slight touch.

Commonly an abscess had formed in it, sometimes of great extent, and sometimes so

small as only to be detected by a minute inspection.

The diameter of the blood vessels, through the whole substance of this viscus, was commonly found much increased, and their coats proportionably thickened. They were also observed to be, for the most part, empty.

In two cases of dysentery where the patients had coughed up matter for some time before their death, a large abscess in the liver had made its way through the diaphragm into the lungs.

The gall bladder was sometimes very much distended with yellow ropy bile.

The spleen was, in most instances, much enlarged, its texture loosened, and sometimes totally destroyed; the substance remaining having no other appearance than that of a dark coagulum of blood. This was particularly the case in the two instances above mentioned, where no disease was apparent in the liver.

In some instances the pancreas was considerably enlarged and schirrous.

In patients who died of the dysentery the bowels were constantly found much inflamed. In the worst cases, mortification had taken place,

place, especially in the rectum and part of the colon.

In dysenteric patients also the mesenteric glands were commonly seen enlarged.

A degree of inflammation, more or less considerable, was usually observed in the inferior portions of the lungs, contiguous to the diaphragm, and was commonly most remarkable on the right side of the chest.

In Dr. Hunter's Treatise on the Diseases of the Army in Jamaica there is an account of the dissections of twenty-three men who died of what is termed the bilious fever, and in every one of those cases it is said that the liver was more or less diseased.

From the whole of this statement, I think it will be admitted, that the liver or spleen, or most probably both, suffer in the course of these diseases; for from the mutual connexion which subsists betwixt those organs, it is highly probable that the one cannot be diseased without the sympathy of the other: and the facts I have mentioned appear to me sufficiently strong to authorize this conjecture, "that a diseased state of the liver and spleen has an intimate connexion with the production of fevers and dysenteries in hot climates."

It

It is, no doubt, difficult to understand how a disease of those viscera should induce the paroxysms of a fever, nor do I pretend to explain it; but there are many other phenomena of the animal œconomy equally inexplicable. We can sometimes trace the causes of diseases, but it is seldom in our power to ascertain their mode of action.

In the case of dysentery, however, there is not quite so much obscurity.

If it be true that a dysentery can only arise in consequence of some stimulating matter being poured into the alimentary canal, and this seems to be actually the fact, notwithstanding what has been said to the contrary *, it is evident this matter can come but from few sources. It may come from the stomach; it may be secreted by the vessels on the internal surface of the intestines themselves; or it may come from one or more of those glands whose excretory ducts terminate in the duodenum. Of all these sources vitiated bile, from a diseased liver, seems the most remarkable: this, by continually discharging itself through the ductus communis

* Dr. Cullen's First Lines of the Practice of Physic, Vol. III.

choledoëhus into the intestines, will produce that constant irritation, and all those other symptoms, which accompany and characterize the dysentery. Besides, the bowels being now deprived of healthy bile, which is absolutely necessary for the digestion and assimilation of our food into chyle, will lose their natural tone; loss of appetite and indigestion must ensue; and the contents of the stomach, instead of affording nourishment to the body, will become a fresh source of uneasiness and disorder.

The justness of these observations did not escape the penetration of Dr. Cullen, who makes it a question, how far the state of the bile may be connected with the production of dysentery.

Upon exactly similar principles it may be asserted, that a diseased pancreas may produce a dysentery; and, I think, there is great reason to believe that it sometimes does; but probably not so often as a diseased liver.

Some authors have thought that obstructed mesenteric glands are a cause of dysentery, and the appearance of those glands on dissection would seem to countenance this opinion; but I apprehend it is rather an effect than a cause of the disease. The extremities of the lacteals being irritated by the vitiated matter in the intestines,
will

will produce an obstruction and inflammation in the glands of the mesentery, as happens with every other lymphatic gland of the body under like circumstances.

With respect to the exciting causes of the fevers and dysenteries I have little to observe. Those commonly enumerated are, putrid effluvia, obstructed perspiration, intemperance, &c. These, I make no doubt, have considerable influence; but these diseases are so constantly prevalent in this country, that they must depend on some cause equally constant with themselves; this I believe to be the heat of the climate.

It is certain that the bile is more abundantly secreted, and the liver more frequently diseased, in warm latitudes than in Europe. This remark extends with equal truth to the brute creation; the livers of our domestic animals being frequently found after death in a state of suppuration.

Besides, it is an observation agreeable to the experience of all authors, that the diseases of which I am speaking, never make their appearance in Europe but in the hot months of the year; hence it is more than probable that the state of the atmosphere has great influence in producing them.

Most

Most writers have asserted that these diseases are of a very contagious nature ; Dr. Cullen is so strongly prepossessed with this opinion, in the case of dysentery particularly, that in defining this disease, he has chosen to make its contagious nature a part of his definition.

I am, however, very doubtful how far this opinion may be well founded ; I never knew or heard of an instance of either of these diseases running through a family in the manner highly contagious diseases commonly do ; nor does it by any means appear that the attendants on the sick are peculiarly liable to be affected with them. As this, however, is a point not always to be easily ascertained, I will not take upon me to say that they are not in any case, or in any situation, contagious. But it may here be observed, that this climate does not seem favourable either to the production or propagation of infectious diseases. A remarkable instance of this we have in the case of small pox : these commonly prevail here during the cold months of the year, but gradually disappear as the hot season advances.

Much of what I have hitherto said must, no doubt, be considered as matter of speculation ; but in speaking of the practice, I shall lay aside
all

all theory, and merely state what I know from my own observation, assisted also with the experience of others.

At the beginning both of fevers and of dysenteries, the first thing directed is, to evacuate the contents of the alimentary canal by mild remedies, and during their progress to observe that the bowels are always kept in a soluble state. This practice is particularly recommended by Dr. Sydenham and by Sir John Pringle; and coming from such authorities it can require little other recommendation.

After moderate evacuations, if the fever be mild, and especially if it be attended with considerable remissions, the bark will often be sufficient to accomplish a cure.

If, on the contrary, it puts on a more threatening aspect, or has been of some continuance, the bark, though it may be used as an auxiliary, ought not alone to be depended on: the medicine which in this case has been found, from much experience, most certain and efficacious is mercury.

In dysentery also, if the complaint should not yield to similar evacuations, followed by a moderate use of opium, the same remedy ought to be had recourse to.

Supposing

Supposing then, that the use of mercury be judged necessary, which most frequently happens, it may be proper to make a few short observations on the manner of using it, and the effects it produces in these diseases.

1st. It has been found, though I do not pretend to explain the fact, that patients in this country generally require a greater quantity of mercury to produce its usual effects upon the system than in Europe.

2dly. As the liver, both in the fevers and dysenteries, is apt to run very unexpectedly into a state of suppuration, it is of much consequence that the exhibition of the mercury be carried to the necessary length as soon as possible.

The manner, therefore, of using mercury in those complaints in the general hospital here, is, to rub two drachms of the strong mercurial ointment upon the belly, legs, and thighs of the patient, every night and morning, till it sensibly affects the mouth, which commonly happens in three, four, or five days; when the patient will, for the most part, find himself greatly relieved: and if the ointment be continued for a day or two more, no complaint will remain but a sore mouth.

If

If this quantity be not sufficient to affect the mouth speedily, it is either increased, or the internal use of some mild preparation of mercury is joined to the external friction; in this way as much is done in a few days as could be done in a fortnight by following the common method of giving mercury in Europe.

It happens more frequently than might be expected, that it is either very difficult to affect the mouth, or that it cannot be done at all, by the use of mercury in any form.

Whether this depends upon a particular diseased condition of the lymphatic system, or upon the peculiar constitution of the patient, is not easy to determine: but upon whatever cause it may depend, it is a most unfavourable circumstance; so much so, that I do not recollect ever to have seen a patient recover whose mouth could not be touched by the mercury.

I have seen the mercurial ointment employed in the most free manner in the advanced stage of a fever and of a dysentery, and apparently snatch the patient from the grave. It is true I have also seen it fail: the medicine is by no means infallible; but it seems to be by far the most efficacious remedy yet discovered for the cure of these diseases. Upon the whole, it would appear that
the

the due action of this remedy is so much connected with the speedy recovery of the patient, that I think it may be stated as a general rule, “ that the use of mercury should be “ urged with a vigour somewhat proportioned “ to the urgency of the complaint.”

It would carry me far beyond my purpose to mention the different remedies recommended by authors for the relief of particular symptoms:—probably the use of mercury may reduce them within a smaller compass. I would take the liberty of making only one observation, with respect to the use of opium in the dysentery. This medicine is no doubt very necessary in that complaint, but it is always injurious if carried so far as suddenly to check the flux. Here it may be useful to recollect an old maxim in physic, that “ physicians are “ not the directors, but the ministers of nature ;”—the discharge is to a certain degree a salutary effort, and cannot with safety be altogether restrained.

From the view which we have taken of this disease, it will be evident, that the use of astringents, especially at the beginning, is highly improper. But their use seems to have been

for some time past rejected by practitioners, though upon different principles *.

Relapses, both in fevers and dysenteries, are not uncommon. I believe they are frequently brought on by imprudent exposure to the sun, or by some irregularities in diet.

So far as my experience goes, in a public hospital, relapses prove often fatal to the patients. But this observation does not apply to private practice, where the success is much greater.

It appears that a relapse may often be prevented by giving small and repeated doses of mercury, till the patient recovers sufficient strength to take exercise.

It would be unnecessary to say any thing of the treatment of fevers, when they assume a pure intermittent form, as they generally yield to the use of the Bark. When, however, they resist this medicine, I have repeatedly known the combined use of bark and mercury produce the most beneficial effects.

The practice which I have thus briefly endeavoured to describe, may, I make no doubt, be

* Cullen's *Materia Medica*, vol. ii. chap. i.

considered by many as bold and hazardous ; especially by those who believe that mercury putrifies the fluids, and dissolves the blood. These notions are particularly inculcated by some writers on the diseases of warm climates ; but so far as I have been able to remark, in a very extensive use of this medicine, they seem rather to have been formed in the closet, than drawn from observation. Mercury, in all countries, is a dangerous remedy in the hands of the unskilful, but may be both safe and efficacious, when used with prudence and judgment.

No man can form a true conception how far the use of mercury extends in a warm climate, unless he practise in it, and will fairly try its effects.

I have seen patients labouring under asthma and the most obstinate coughs, after having used in vain every medicine generally recommended in such cases, at length completely cured by the free use of mercury ; thus proving in a satisfactory manner, that the disease was seated in the liver, and that the affection of the lungs was merely symptomatic.

I have only further to remark, that the method of treatment of which I have given you

a very imperfect outline, is by no means new. It was the practice of Doctor Paisley, late physician-general at Madras, who was well known over most parts of India, as a man of the first professional abilities. Mr. Scott has contributed to introduce it into Bombay, and has applied it with great success in a very extensive practice. Nor can I conclude this letter without acknowledging my obligations to Mr. Scott, and to Mr. Stewart, both surgeons belonging to this presidency, for an early acquaintance with the diseases of this country.

You will therefore perceive, that if this mode of treatment be entitled to any praise, I claim no share in it.—I have rather related the improvements of others, than my own.

————— *Quæ non fecimus ipsi,
Vix ea nostra voco.*

I am, my dear Sir,

With the greatest respect and
regard,

Your ever obliged Servant,

WILLIAM BOAG.

Bombay,

January 16, 1792.

II. *Ar*

II. *An Account of the successful Treatment of a Case in which the Brachial Artery was divided.*
 By William Adair, Esq. Surgeon General to
 the garrison of Gibraltar. Communicated in a
 Letter to Everard Home, Esq. F. R. S. and
 by him to Dr. Simmons.

ON the 29th of July, 1792, a Genoese, about twenty years of age, by occupation a porter, was, in an affray, stabbed by a Portuguese in several parts of his body, with a jagged-edged long knife or poignard; but none of the wounds were of any consequence, excepting one across the Biceps muscle, just above the usual place of bleeding in the left arm. An empirical practitioner dressed the wounds; and observing a very considerable hæmorrhage from that in the left arm, filled it with lint and flour, and bound it up so tight as to stop the bleeding; but in doing this he had at the same time stopped all circulation in the arm below. Mr. Kidston, surgeon's mate of the sixty-first regiment, happened, about two hours after, to see the man, and finding the extremity of the limb benumbed, cold, and void of circulation, he removed the bandage, and a torrent of blood

C 3 immediately

immediately gushed from the wound. He then made a comprefs on the artery below the axilla, by means of a tourniquet, and fent for me.

It was obvious, that in this cafe the brachial artery was divided, and that confidering the torpid ftate of the arm, either amputation, or an operation the fame as for an aneurifm, muft be immediately performed. On account of the poor man's ftuation, having his fubfiftence to earn by his labour, I determined upon the latter. Accordingly in prefence of Mr. Patrick, furgeon of the fixty-first regiment, and Mr. Kidfton, his mate, (from both of whom I received very great affiftance) I began a piece of very intricate diffection, and took up all the divided blood-veffels completely; but in doing this, I think it right to remark, we lay under very great difadvantages; for the circulation in the arm having been fufpended upwards of two hours, it became neceffary to operate without delay; and we were obliged to operate in a fmall room, with bad light, occafioned partly by the badnefs of the candles, and partly by the heat of the weather and the number of perfons that crowded about us, and rendered the air of the room impure. We had no place but the bed to
lay

lay the patient upon, and there was hardly space sufficient for us to move round it. To these inconveniences must be added another arising from the wound itself, which had been made with a jagged instrument, and penetrated deep into the hollow of the cubit, forming a mangled opening upon the lower edge of the biceps, so that notwithstanding this opening was made free and large, I found it impracticable to separate distinctly the blood-vessels by dissection. I therefore was obliged to take up by the needle every vessel from which, upon slackening the tourniquet, we saw the blood issue; and it was not till we had made six ligatures, that we seemed to be secure against the danger of hæmorrhage, and in making these I have not a doubt that the sheaths and aponeuroses of tendons and muscles, and likewise nerves, were included.

From the beginning of the operation to the final dressing of the arm, took us up an hour and three quarters. The patient behaved with great firmness during the whole of this period. It is now twelve weeks since the operation, and the wound is almost completely healed. No interruption to the progress of the cure has existed for a day, and he has had occasion for no other

medicines than a small quantity of bark, and some vitriolic acid, during the whole of the treatment.

I was in continual apprehension from the season of the year; and the almost absolute certainty of tendinous parts having been taken up by the ligatures, that he would have had a locked jaw; but happily he escaped this symptom, which in this climate, and at this season, has occurred with more frequency, after wounds, than in any other part of the world I have ever been in, and even from the slightest wounds. I have not been able to ascertain the specific time (if such there be) after the infliction of a wound, when we may pretty certainly say there is no danger of this spasm appearing; nor what is the usual time of its coming on: but shall make it my business to attend to both these points,

*Gibraltar,
November 3, 1792.*

III. *An Account of the Effects of Oil of Turpentine in a Case of internal Hæmorrhage. By the same.*

I have lately had an opportunity of proving the efficacy of oil of turpentine in a case of internal hæmorrhage. The patient, Mr. Delamar, of this place, is about forty-eight years of age. He was seized in March last, during a very cool, mild season, with sickness, vomiting, and pain in the lower part of the belly, followed by a discharge, by stool, of not less than a pound of black, coagulated blood, without any appearance of fæces. When I visited him, about three hours after the first stool, he had had two more stools resembling the first, except that the blood voided by the last stool was not coagulated, but frothy and high coloured. His extremities were cold; his pulse, at the wrist, was hardly perceptible; he had a hiccup, and seemed to be in a dying state.

I ordered ten drops of oil of turpentine to be given immediately; and as his stomach, since the attack, had rejected whatever he had taken, I directed the oil to be dissolved with a little

of the yolk of an egg, and diluted with cinnamon water. In this form it was retained ; and a surgeon of one of the regiments here, kindly undertook to sit up with him, and see the same dose repeated every six hours, or oftener, if the hæmorrhage should not abate.

When I visited the patient the next morning, I found that the discharge having diminished after the first dose, the medicine had been repeated only three times, and that there was hardly any blood in a stool he had voided that morning. His pulse was now full, but quick. The medicine was directed to be repeated only twice in twenty-four hours, and the next day it was entirely laid aside. But on that day (being the third from the attack) as he was costive, and had symptoms of fever, I thought it right to direct a gentle laxative medicine to open the bowels. This effect it produced, but it brought on bloody stools again with almost as much violence as at first. They were immediately stopped, however, by the oil of turpentine given in the same dose and form as before. After this I did not venture to prescribe for the patient any laxative medicine, by the mouth, for a considerable time ; but contented myself with recommending the occasional

fional use of clysters, to obviate costiveness, till there seemed to be no longer any danger of the return of the hæmorrhage.

The patient is now perfectly recovered.

Gibraltar,

November 3, 1792.



IV. *A Case of Imperforated Anus. By the same.*

ON the 7th of August 1792, I was called to a child of an officer of this garrison, which had been born thirty hours without having had any evacuation by the anus. Upon examination I found a passage of about two inches at the usual exit of the rectum, but which beyond this was impervious. There was an appearance as if nature had made an attempt at another passage; for at the end of the posterior perinæum, near the os coccygis, was a small sinus, of about half an inch, in a direction towards the rectum. In both these blind passages the cuticle was equally strong as on any other part of the body. There could be no hesitation from which of the two we ought to attempt a
com-

communication with the intestinal canal, and therefore, after examining with a pretty thick bougie, the former and most natural of these passages, I took a middling-sized trocar, and introduced it with the point within the canula, till it reached the end ; then pushing it beyond the canula, and finding that not sufficient, I pushed the trocar forward, till it had completely overcome the resistance. I then left the canula in, and drawing out the trocar, observed the point of it tinged with meconium, This latter circumstance seemed to be a very favourable appearance : but after waiting some time nothing came away through the canula, nor when this was removed did any thing follow but a few drops of blood. I now introduced a proper-sized bougie, which was suffered to remain for some hours ; but when this was drawn out, nothing followed but a few drops of blood. A sponge tent of a proper size was also pushed up, and left in for several hours ; but though it extended the passage more considerably than the bougie had done, no stools followed on its being taken out. The parts after this were left at rest until next day, only a little warm milk was ordered to be thrown up the passage ; and

as

as the child (though its belly was preternaturally full, but not hard, and it had now been fifty-eight hours without any passage by stool, which in this climate, and in the month of August, was very unfavourable), still seemed strong and hearty, we introduced another pretty thick bougie up the passage, and left it there for twenty-four hours. This, when withdrawn was followed by a copious black stool, and that was succeeded by eight more in the course of twelve hours. Next day the evacuations were very frequent, to the amount of sixteen stools, after which they diminished in number, and became of the natural colour. The child now appeared to be going on very well, but soon fell off; the stools became sometimes dark, and sometimes yellow; a feverishness succeeded; the belly continued distended till two days before it died, and then became smaller. The child lived only fifteen days.

I had no opportunity of examining the body, so that the cause of death cannot be ascertained; but the history of the case leads me to consider it as not immediately connected with the consequences of the operation. The child might have been defective in other respects essentially
connected

connected with the vital organs. The operation succeeded perfectly in giving a passage for the contents of the bowels ; and so far this case is deserving of notice, as it may give some information to others who have this operation to perform under similar circumstances. It proves that although the contents do not immediately follow the instrument, nor even the bougie, it is not to discourage the surgeon from future attempts, as persevering in the use of the bougie may be attended by the wished-for success.

Gibraltar,

November 3, 1792.

V. Obser-

V. *Observations on the Pathology and Mode of Treatment of Calculi in general, but more particularly of Intestinal Calculi; with a Description and Chemical Analysis of the Intestinal Calculi of Horses.* By Mr. William Gaitskell, Surgeon at Rotherhithe. Communicated in a Letter to Mr. William Babington, Apothecary to Guy's Hospital, and by him to Dr. Simmons.

To Mr. BABINGTON.

DEAR SIR,

IT is with great diffidence I think of offering the following observations to the medical reader. Nothing but the importance and curiosity of the subject, the erroneous doctrines which have been entertained concerning it, and a desire of promoting a more accurate investigation of it, could ever have prevailed with me to publish them.

I am well aware that much more is necessary to complete the enquiry than will be found in the following observations; but as my frequent professional avocations will not at present allow

allow me to pursue the enquiry more minutely, I trust this will plead my apology.

I have divided the paper into two sections. In the first I treat of the pathology and mode of treatment of calculi in general, but more particularly of intestinal calculi; and in the second I give a chemical analysis of the intestinal calculi of horses. In the latter of these sections, I may, perhaps, by some be thought censurable, for having noted the materials of composition, without marking more exactly their proportions; but as different stones, chemically examined, differ somewhat in the quantity of their constituent principles, though not in their sensible qualities, I have been less anxious about critical minuteness.

My original design was to have made these observations the subject of a separate publication, and to have requested leave to inscribe it to you, as a small, but sincere, testimony of the respect and esteem I have long entertained for you; but several reasons, and particularly your friendly advice, have induced me rather to solicit a place for it in a work of established reputation. I therefore beg leave to avail myself of your kind offer to transmit it to Doctor Simmons, to be inserted, if he thinks proper, in the Medical Facts and Observations. In
that

that case I hope this letter will be allowed to appear by way of preface to the paper, that I may have an opportunity of expressing publicly the sincerity with which I am, Dear Sir,

Your obliged Friend,
and humble Servant,

WILLIAM GAITSKELL.

Rotherhithe,
May 25, 1793.

SECTION I.

Of the Pathology and Mode of Treatment of Calculi in general, but more particularly of Intestinal Calculi.

NATURAL HISTORY informs us that calculi may be found in the stomachs and intestines of many quadrupeds ; in some fishes, insects, and worms ; and likewise in the human body.

From the intestinal calculi I shall hereafter describe, we may trace their affinity to the laminated stones named Bezoars by the ancients, and which seem to have been no other than these animal concretes*. To prove this more clearly, let us quote

Dr.

* Bezoar stones were first noticed and employed medically by Avenzoar, an Arabian physician, who flourished
VOL. IV. D about

Dr. Lewis's description of them, as " preternatural or morbid concretions formed in the bodies of land animals." Of these, he observes, the oriental is of the size of a kidney bean, of a roundish or oblong rounded figure, of an even smooth surface, and of a shining olive or dark green colour; which, on being broken, appears composed of a number of concentric coats, of which the inner is smooth and glossy as the outer; in the middle, he adds, is either a cavity or some powdery matter, or some small bits of the leaves or stalks of plants, or other like substances *.

This description seems correct, except in limiting these productions to land animals, for they are sometimes met with in fishes. Therefore, to elucidate this subject, I shall enumerate the animals that bezoars are most frequently found in. Among quadrupeds we may reckon

about the eleventh century; but they were first accurately described by Garcias dal Horto, physician to the Portuguese viceroy of the Indies. They took their name from the Persian word *Badzcher*, which signifies antidote, being considered as remedies against poison. Even at this day they are said to be in great esteem among the Persians.

* Lewis's *Materia Medica*, 4to. 1768. p. 138, 139.

the horse, ox, goat, stag, the mountain deer of the Alps, the Brazilian monkey, and the porcupine; among fishes, the *physeter macrocephalus* LINNÆI, or spermaceti whale; among insects the *astacus fluviatilis*, or river crayfish; among crustaceous worms the *concha margaritifera*, or mother of pearl oyster; and lastly, mankind.

The Gentleman's Magazine, vol. vii, p. 448, gives an account of a stone taken out of the stomach of a horse aged seventeen years, the greatest circumference of which was 28 inches, and the least 25. Its figure was an oblong spheroid; its weight 19 pounds avoirdupois.

In the 60th volume of the same work, at page 18, we have a description, with a figure, of a clustered stone, weighing nineteen ounces; and an account of another as big as a penny loaf, like a heap of hardish horse dung, from the intestines of a horse thirty years of age. At page 885, of the same volume, four more intestinal stones are delineated, the first of which weighed one pound ten ounces; the second, two pounds nine ounces; the third, eight ounces; and the fourth, seven pounds fourteen ounces. In the Philosophical Transactions, vol. 48, we have an account of

a mare, from whose body a stone was taken that weighed fifteen pounds twelve ounces. And Ruysch preserved in his collection two calculi, which, with thirty-four others of different sizes, had been voided by a horse in the Emperor's stables at Vienna, in the space of six weeks. The nucleus of one of these stones was found to be a grain of barley*.

Mercatus has described and delineated an oriental concretion of this sort in the Vatican collection †, presented by the King of Portugal to Cardinal Alexandrinus, which weighed somewhat more than four ounces; and also another from an animal of the stag kind, brought to Rome by the Jesuits from Peru, the weight of which was fifty-six ounces ‡.

In the monkey these concretions are found in the stomach, of about the size of an hazel

* Vide Frid. Ruyschii Thesaur. Anatom. secund. p. 39, 4to. Amstel. 1722.

† Mich. Mercati Metallotheca, (Armar. viii. de lapidibus animalibus innatis, cap. i.) folio, Romæ, 1719.

‡ Monardes, in his work, translated by Clusius, under the title of *Simplicium Medicamentorum ex novo Orbe delatorum Historia*, has inserted a letter written to him by a correspondent in Peru, who describes the pouch, communicating with the stomach, in which these concretions are formed.

nut, harder than the other kinds, and of a dark greenish colour, approaching to black. But in the porcupine, they are seated principally in the gall bladder, and are similar to biliary calculi in other animals.

In fishes we may adduce ambergris, as a concretion of the spermaceti whale. Dr. Swediaur, in the seventy-third volume of the Philosophical Transactions, gives a satisfactory history of this animal product, and asserts, that it is found in the belly of the whale, and only of that particular species called by Linnæus *physteter macrocephalus*. He describes it as being situated about six or seven feet from the anus, and never higher up; which, in all probability, says the Doctor, is the intestinum cæcum, hitherto erroneously considered as a peculiar bag for the secretion of this singular substance. Intermixed with this are a number of black spots, apparently the beaks of the *sepia octopodia*, which is the natural food of this species of whale. All whales, it seems, which afford this concretion, are found sickly and emaciated; but healthy whales never produce any *: therefore we may conclude it to be an animal concrete, generated

* See Phil. Transf. vol. 81, page 43.

by disease, and which proves fatal by its mechanical stimulus*.

In the insect we consider oculi cancrorum to be the stony concretion of the cray fish: they are thus described by Doctor Lewis†:—"about
" the size of pease, of a roundish shape, flat-
" ted on one side; in colour white; some-
" times with a reddish, and sometimes with a
" blueish cast;—internally of a leafy texture‡."

In the worm may be instanced the pearly concretions of certain oysters—the *concha margaritifera*. These concretions are of a bright semi-transparent whiteness, and are of two sorts,

* Clusius was of opinion, that ambergris was the indigestible part of the food collected in the stomach of the whale; and Kempfer speaks of it as excrement, and mentions, that the Japanese, for this reason, call it *kusura no fuu*, i. e. whales dung. But, I think, from all whales being found unhealthy in which it is discovered, and the quantity imported being small compared with the quantity that would every where be to be found were it natural *fæces*, in those seas where the spermaceti whale inhabits, we may safely conclude that it is a diseased product, similar to stones in the intestines of horses, and of other animals.

† *Materia Medica*, p. 172.

‡ Geoffroy asserts that cray-fish change their stomachs and intestines at certain periods; that when the stomach is renewed the old one becomes subject to the digestive process: and that after this process concretions are found in the new ones.
—*Suite de la Mat. Med. de M. Geoffroy*, tome i, p. 338.

the

the oriental and occidental. The oriental are of a silver hue; the occidental of an opaque white: and they are found on the inside of the shell*.

In the human body we have too many well recorded facts of intestinal concretions, and the direful effects they are productive of; some of which shall now be selected.

Lanzoni mentions† the case of a woman, in whose stomach were found ten stones, the largest weighing an ounce.

Dr. Coe, in his treatise on biliary concretions, gives an instance of a woman, from whose rectum was extracted a concretion, the nucleus of which was a plumb stone‡. In the Edinburgh Medical Essays§, we have an account

* As neither crabs eyes nor pearls are found in all cray fish or all oysters, and there is no suggesting any use that they can furnish to the œconomy of these animals, we may, perhaps, be justified in concluding that they are formed by disease in their intestines. The positive confirmation of this hypothesis may be difficult, but it may in time perhaps be decided, by the observation of diligent naturalists. See Reaumur's paper on the formation of pearls and shells, in the Memoirs of the Academy of Sciences at Paris, for the year 1717.

† Acta Phys. Med. Nat. Curios. vol. i, p. 117.

‡ Coe on Biliary Concretions, p. 137.

§ Vol. 1. p. 243.

of a similar fact. In this last case the ball was of an irregular cubical shape, and weighed five drachms. In the *Essays and Observations, Physical and Literary*, is the history of a boy who had three stones extracted from the rectum, the nuclei of which were the small bones of sheep's trotters*.

The third volume† of the *Memoirs of the Royal Academy of Surgery at Paris*, contains an account of a woman from whose bowels was taken a stone weighing two ounces two drachms and a half.

In the *Philosophical Transactions*, vol. 27, we have an account of a concretion formed upon a plumb stone, and retained in the intestinum cæcum; and in the *London Medical Journal*, Vol. 6, p. 355, Mr. Johnson, of Lancaster, relates the case of a woman who voided, by stool, a ball of hardened fæces, weighing three quarters of an ounce, the nucleus of which was also a plumb stone.

These facts, (and other similar ones might easily be collected from books) are sufficient to show that intestinal calculi are not limited to

* Vol. 11. p. 345.

† P. 56.

the quadruped; and that they occur more frequently in the human body than has perhaps been generally suspected.

I shall now offer some observations on the formation and growth of animal stones, and on the state of the organs which produce them.

When my mind was first occupied in the investigation of this subject, it was forcibly impressed with a seeming conviction of the truth of the prevailing doctrines, that stone was a calcareous deposition from urine, or calcareous earth secreted with mucus, which for the formation of stone required only a proper nucleus to attract it*. But when I had perused the
work

* It has been supposed by the ancients, and by the most eminent among the moderns, that urine contains the elements of stone, is more or less saturated with calcareous earth, and prepared to accumulate on any insoluble body. The justly celebrated Dr. Black, Professor of Chemistry at Edinburgh, delivers this doctrine. Dr. Monro, Professor of Anatomy there, contends for the same; and Dr. Boerhaave, with his learned commentator, Van Swieten, have been of a similar opinion. But when stones have been discovered where no urine existed, their origin has been ascribed to the
secre-

work lately published by Doctor Austin on this subject, and had repeated some of his experiments, I became convinced of the truth of his opinion : therefore, in viewing the origin of stone, I shall adopt the sentiments of this ingenious writer, and attempt to prove, that concretions in animals are morbid in their origin, that the urine contributes nothing to their formation, that they are composed of a modified mucus, and are not calcareous.

We can hardly believe any organ or organs of an animal body to perform their natural functions, when they become the agents of productions injurious to the system ; therefore, if glands or glandular membranes should so alter the quality of their secreting liquors, as to produce an hurtful instead of useful fluid, we properly nominate it disease. When the salivary glands, under hydrophobic irritation, prepare a poisonous fluid in place of mild saliva ;

secretion of calcareous matter in combination with mucus, which crystallizing on the surface of some nucleus, formed that incrustation called stone. However, we shall see that these opinions are ill founded, raised upon external appearances, and not supported by experiment.

or the glands of the breast a cancerous fluid in place of milk; or the follicles of the urethra an opaque venereal mucus in place of what is innoxious; these are unnatural actions, and morbid products; which, as each differs specifically from the others, assumes some distinguishing character. Upon the same principle, that affection of follicular membranes which secretes mucus with the property of concretion, may be characterised with the epithet *lithic*. The impossibility of describing the peculiar mode of action which the living solids take on, or their peculiar mode of operation in changing the chemical and sensible qualities of their contained juices, is no objection to this reasoning, while the sudden alteration in the quality of secreted liquors by the application of various irritants, gives such strong confirmation of it. From these pathological data we conclude the following to be the construction of stone: A mucus is deposited with the property of coagulating, which envelopes the body that irritated the vessel to produce it—this, when consolidated, becomes the nucleus to a new covering, which consolidating like the former, receives an additional coat; to this is added a fourth, and so

on *gradatim*, till numerous coats are given to it*. That stones are thus generated, and in this way

* This intermitted deposition of coagulating mucus, shows, that the vessels support their actions for a determined time, and then become suspended. After some suspension or diminution of action, the process is restored again; without this, no increase of magnitude could arise, or regular laminae be formed. Sometimes the actions destroy themselves without renewal, in which case the stone is small, and not coated; and sometimes the actions, after temporary subsistence, are destroyed by the application of new stimulants. With respect to the subduction of lithic action by new stimulants, let us quote the words of Dr. Austin: "The removal of a stone by the operation of lithotomy, often proves an effectual and permanent cure. It would not be easy to account for this, if the origin of the stone be referred to the kidneys; and if it be referred to the general state of the habit, such an effect would be absolutely unintelligible. But if the bladder, with the glands and membranes contiguous to it, be the seat of this disease, the change induced in these parts by lithotomy, will be sufficient to account for the cure. For in this operation, the neck of the bladder, the prostate gland, and the lower part of the urethra, are divided; the course of the urine is changed; the stone is extracted; and a large communication made with the open air: thus a long-continued irritation is removed, and a new stimulus applied to these parts. The effects of this are not more evident in the stone than in other diseases of the urinary bladder."

Austin on Stone, p. 76.

augmented,

augmented, appears from their concentrated structure; all stones, of whatever size, when sawed through the centre, displaying an arrangement of circles, and this with very few exceptions.

That concretions can be formed without the aid of urine, we have shown from a variety of facts. The urine can exert no influence in cavities where it has no access, therefore it can contribute nothing to the formation of stone in the cavities of the intestines, gall bladder, bronchial vesicles, salivary ducts, or follicles of the skin; yet, all these, and many more, have been the seats of stone, not differing from those discovered in the urinary organs.

Let us now examine another opinion, whether there be an acid *sui generis*, secreted from the blood, called the lithic acid of Scheele and Bergman, with the property of coagulating the animal matter it combines with?

Mr. Scheele asserts, that all calculi taken from the bladder or kidneys, have this acid in their composition*, the remainder being salts of the urine and animal earth; but Dr. Austin, in his

* The nature of the lithic acid of Scheele will be more particularly noticed in the chemical analysis of stone.

accurate analysis of calculi, was unable to trace this acid; even the urinous crusts of walls, selected for the purpose, and sublimed in a retort, were not able to afford it him : therefore, he concludes, that it only appears in some calculi, is deficient in others, and not necessary to the formation of any.

An anonymous but ingenious author, in the year 1787, published a work in confirmation of the universality of this acid, entitled, “ A Treatise upon Gout and upon Gravel, in which the Sources of each are investigated,” and he attempts to prove, that the lithic acid is always present in the system; that it is in combination with animal earth; and can be precipitated from this earth in a concrete state, by the introduction of any other acids, whether mineral, vegetable, or ærial. This writer goes farther, and asserts, that the animal earth is sometimes supersaturated with it, in which case the acid will be precipitated spontaneously; that conveyed through the kidneys it forms gravel in the bladder; or if detained in the blood-vessels, gout. The following are his words :
 “ A precipitation of the concreting acid in the
 “ fluids is attended with prejudice to other
 “ parts of the system, as well as to the urinary
 “ pas-

“ passages. As soon as the acid has been detached from the substance with which it was combined, it becomes a species of matter to the action of which the body is unaccustomed; and when the redundancy is very considerable, a deposition of the particles will take place in the blood-vessels, so as to give an interruption to the freedom of circulation. In consequence of this interruption, there frequently arises a peculiar affection of the inflammatory kind, and that affection is gout *.”

If this hypothesis were just, I should suspect, that in tropical climates, where acids are freely employed, gout and stone would be frequent occurrences; but experience shows us quite the reverse; for in those climates where the natives subsist principally upon vegetables and fruits, these diseases are rare to be met with†.

More-

* See pages 63 and 64 of the work here referred to.

† Dr. Moseley mentions the stone in warm climates as a very uncommon disease, and relates the remarkable circumstance of the benefit of changing the climate in this affection. It is the case of an officer of the 79th regiment, who had been greatly afflicted with the stone in England; but by going to Jamaica, and residing there three years, the disease gradually

Moreover, in northern climates, where both these diseases are prevalent, acids are most sparingly employed ; while animal food, which is powerfully alkalescent, is liberally used, without proving an antidote to either. Besides, many people have been martyrs to arthritic affections without any concretions being formed in their bodies ; and when they be formed, it is not experimentally proved, that the acid of Scheele makes part of this compound *.

I have

gradually diminished, and entirely left him. The stone was so large, and the disease so violent in England, that, on examination, Mr. Pott recommended the extracting it by lithotomy, to which the officer consented, but which operation was fortunately avoided by his being suddenly obliged to join his regiment.

* Mr. Watson, in his paper on the dissection of a gentleman who died of the gout, draws the following conclusions on arthritis, and its concretions :

“ Is it not remarkable,” says Mr. Watson, “ where we
“ had so much of the distemper, that there should have
“ been no marks of it in any of the hollow viscera ; neither
“ in the kidneys, liver, spleen, or pancreas ?

“ It has been, I believe, a pretty common opinion, that
“ those who have gouty concretions in their joints, are very
“ liable to the stone in the bladder and kidneys ; as if the
“ one disease were generally productive of the other.

“ Is not this pronouncing rather too much ? For of all
“ the patients cut in our hospitals, men, women, and chil-
“ dren,

I have repeated the author's experiments of precipitating some crystalline particles from urine (called the lithic or concreting acid) by means of the muriatic acid, and have uniformly succeeded. The vitriolic and nitrous acids produce the same precipitation, with some little difference in colour; that by the muriatic being orange coloured, while the other two are of a

“dren, how few do we meet with that have even the slightest indication of gout about them?”

“Both the gout and the stone are morbid secretions, and may possibly exist together in one and the same subject; but differ essentially in their material principles, and have very different tendencies. The calculous matter is formed in the urinary passages—the gouty deposits itself generally on bones, cartilages, membranes, and lymphatic glands. The gouty seems to be a kind of earth, different from that which generally forms a stone in the urinary bladder, for it never appears lamellated, or to have any kind of nucleus, but is white, soft, and uniform throughout: it may be dissolved, and being ground down by the motion of a joint, readily mixes with the synovia, forming a smooth creamy fluid.

“The gouty earth is then a kind of greasy bole, which may easily be made to mix with oil and water, which in general the calculous cannot be made to do; so that in every respect, in colour, form, and consistence, it seems to differ essentially from that which lays the foundation, and causes the increase of the stone in the bladder.”—

Med. Communications, vol. 1. art. 3.

pale yellow. With the acetous acid I have also succeeded.

The most healthy urine contains this particular powder, or concreting acid, as it is called, in solution, which may be precipitated in the quantity of about half a grain from six ounces of urine, in the space of twenty-four hours, by thirty drops of either of the concentrated mineral acids. My solution of this powder in the nitrous acid has not furnished the phænomena described by Scheele as peculiarly characteristic of lithic acid, viz. a deliquescent red mass, communicating its colour to linen : therefore my conclusion is, that whether it be lithic acid, or some other acid united with animal mucus, it may contribute a part to the compound of concretions in the urinary bladder, but seems no way necessary to the act of concretion, as these substances can be perfected without it, and are frequently seated where the urine can have no influence in their production.

When foreign bodies obtain admission into the bladder, as bougies, catheters, &c. an incrustation is observed to take place ; but this incrustation is not lithic crystals, but follicular mucus. The follicles become stimulated to more copious secretion. This secretion is not
natural.

natural mucus, but mucus changed in its properties *. The change takes place where the stimulus is applied, and becomes limited or extended, according to the diathesis of the part, and morbid irritability of the bladder. Sometimes the whole internal membrane of this muscular cavity is covered with a stony crust, and sometimes only a small portion of it partakes of the affection.

I have attempted the formation of artificial calculi, by suspending something insoluble in urine; but have never been able to effect it.

* Van Helmont was of opinion, that a coagulating principle was derived from the urine, and was peculiar to the human urine alone; this coagulating principle, however, is not resident in the urine, but in combination with mucus.

We need not be surpris'd at the vessels of animals secreting fluids with the property of coagulating, when we see vegetables, as the *arundo bambos* of Linnæus, produce concretions similar to flint. It has been lately proved by chemical analysis, that the Tabasher, found in the joints of the female bamboo, and so accurately described by Dr. Ruffel in the 80th volume of the Philosophical Transactions, is truly filiceous. And in Dr. Pitcairn's hot-house at Islington, there was lately a bamboo, containing a filiceous pebble in the joint of it, formed by the juice secreted from its vessels.—See Phil. Transf. vol. 80, 81.

A piece of slate pencil, appended to a string, was steeped in a phial of urine; the urine, to prevent decomposition by putrefaction, as well as to correspond more exactly with what ought to take place in the bladder, was renewed three times a day for a month; at the expiration of which no incrustation had taken place. This being repeated, and the time of suspension extended, was followed with similar consequences: therefore I conclude, that the following assertion of Baron Van Swieten is probably conjecture without proof: “ If the smallest quill be dipped in
 “ healthy urine fresh made, it acquires a crust
 “ of very soft sand, which adheres to it; and
 “ when fresh urine is again poured on it,
 “ increases in quantity. Thus the stone may
 “ be generated out of the body, namely, when
 “ another solid body is put into the urine;
 “ to which, as to a basis, the elements of
 “ the stone are collected, and adhere. Whence
 “ the material cause of the stone exists even in
 “ the most wholesome and sound fluids of the
 “ body, but an indissoluble substance, existing
 “ in some particular place in the body, affords
 “ the occasional cause, attracting to itself the
 “ elements of the stone, even in persons in
 “ whom

“ whom no propensity to the stone was ever observed *.”

But what the urine of a calculous patient may contribute to the augmentation of stone in the bladder, I have never had an opportunity to experience—that something may be added, we have the authority of Doctor Austin for : he took two stones of equal size—one was placed in mucus from the bladder of a calculous patient, the other in urine decanted from this mucus, and ten times as much in quantity. In the latter it received some augmentation—in the former considerably more ; and in every respect similar to what the patient had discharged from his bladder †.

Having now adduced many facts in support of my opinion, that concretions may be formed in animals without the aid of urine, that they are morbid in their origin, and composed of a coagulating mucus, I shall proceed, in the next place to consider what may be the symptoms they are fitted to produce, and the remedies adapted to relieve them.

* Van Swieten's Comment. vol. 16 of the English Transl. 8vo. Lond. p. 113.

† Austin on the Stone, p. 9.

WERE this subject to be discussed fully, it would lead to a wide field of enquiry ; I shall therefore confine myself to the following points of view—the presence of stones in the alimentary canal, their effects on the system, and the particular modes of relief in such cases. My pathology of the origin of stones has been more extensive than this, from an hypothesis of its being one species of action, and one species of product ; but my pathology of symptoms will be more limited, as every different situation has different symptoms, and requires some variation of treatment.

As my specimens were extracted from horses, my intention was, to have treated of the symptoms produced in this species of animal alone; but want of information excludes this attempt, and obliges me to consider them in man, and apply them analogically to the quadruped. This application will probably not be considered as improper, when we reflect, that many diseases in the horse quadruped have the same source, progress, and termination, as in the human body; among which may
be

be enumerated, that which I propose to describe, the stone colic, or *colica calculosa* of Doctor Cullen. It is thus defined by that late sensible and ingenious nosologist, “dolor abdominis, “præcipue circa umbilicum torquens; vomitus; alvus adstricta; cum duritie in quadam “parte abdominis fixa; calculis quondam “per anum dejectis.” Syn. Nosol. Meth. Gen. 59, Spec. 7.

That this definition is accurate and comprehensive, the following cases will illustrate.

Doctor Monro, professor of anatomy at Edinburgh, was consulted in the case of a gentleman, who had a hard tumour under the ribs on the left side. It had been taken for a diseased spleen; was attended with pain, and with many grievous symptoms. The Doctor asserted the disease to be an intestinal stone, for which he ordered the patient oily purgatives, linseed tea, solutions of soap, and change of posture. The stone removed, and got into the zygmoid flexure of the colon, where it was detained, and proved fatal. Here was the “durities in quadam parte “abdominis fixa.”

Doctor Coe relates the case of a “woman, “who was thought to be afflicted with a nervous colick, and made use of medicines

“ proper for that disorder, from which she
 “ reaped some benefit. The symptoms after-
 “ wards changing, it was judged that a stone
 “ was passing from the kidneys to the bladder,
 “ which diagnosis seemed to be confirmed by
 “ this circumstance, that after a few days she
 “ found relief, but also felt a weight about the
 “ lower part of her belly. After some inter-
 “ val of time, she was seized with a sudden
 “ violent inclination to go to stool, and the sen-
 “ sation of weight increased very much ; at the
 “ same time she felt a violent pain in the mid-
 “ dle of the gut rectum ; prodigious, but use-
 “ less efforts to go to stool, next followed, at-
 “ tended with cold sweats and faintings. She
 “ felt an hard body in the gut rectum, which
 “ catching hold of, and at the same time strain-
 “ ing with all her force, it at length came
 “ away with the stool, and being examined
 “ by a physician present, was found to be a
 “ stone of the intestinal kind, containing in its
 “ centre, for a nucleus, a small biliary stone,
 “ round which the other calculous matter had
 “ grown *.”

* Coë on biliary concretions, p. 37.

The subject of the case I have already referred to in the *Edinburgh Medical Essays*, vol. i. p. 243, and which I am induced to quote here more at large, was a girl, twelve years of age, who had been afflicted for six years with most acute pains in her belly, which returned by fits with extreme violence, and were increased from the use of acids, or any thing that was sour, or hard of digestion. These pains used to abate if the body were naturally open, or made so by means of laxative medicines, or clysters. At length she was seized with a more excruciating fit of her disorder than she had hitherto experienced, attended with violent retchings and an obstinate costiveness. Dr. Simson, who relates the case, being called in, tried many things without success, so that for almost three weeks together the patient was in perpetual torment, and from pain and want of sleep and nourishment, became totally emaciated; though before a healthy fresh-complexioned girl. At length, when a cure of so obstinate a disease was almost despaired of, she began to vomit bile of a deep yellowish colour; she was advised to drink plentifully of warm water, and frequently; which she readily did. After having vomited six or seven times, she had a plentiful stool, and felt
an

an hard substance pass through the anus, which, upon examination, proved to be a stone of an irregular cubical figure, four inches in circumference, and which weighed five drachms. In the centre was a plumb stone, to which the calculous matter had concreted in layers.

This case, and the preceding one from Coe, comprehend both the genus *colica*, and its particular species *calculosa*. But the species is not completely defined, as there is a want of the “durities in quadam parte abdominis fixa,” yet it is very well characterized, by the “calculus per anum dejectis.” Therefore we have the specific distinction of colic as complete as the nature of the case will admit; for in no one instance are the characters of disease so fully united, as to display themselves in every patient*.

Other animals become great sufferers from the mechanical irritation of calculous concretions

* Dr. Cullen has reduced the number of his species of colic as much as possible, and in this he seems to be right; but when he asserts that his seventh species, or *colica calculosa*, admits of no difference of treatment from the *callosa* and *stercorea*, in this I beg leave to dissent from him, because the species in question requires all the treatment competent to the other two, and some treatment peculiar to itself.

in the intestines, particularly when of large size, and the animal incapable of discharging them. Thus whales, whose intestines contain ambergris, are always found sickly and emaciated * ; and horses, whose intestines contain large stones, are often found to die of enteritis †. As mechanical irritation, long continued, may destroy life, without previous inflammation, and as this seems to happen frequently to the whale ‡, sometimes to the horse, and also to the human subject, the following interesting narrative of its effects upon a shark, is selected by way of illustration.—“ Some fishermen, fishing in the
 “ river Thames, near Poplar, with much difficulty drew into their boat a shark, yet
 “ alive, but apparently very sickly ; it was taken
 “ ashore, and being opened, in its belly were
 “ found a silver watch, a metal chain, and a
 “ cornelian seal, together with several small

* See Philosophical Transactions, vol. 81, where there is an account of 362 ounces of ambergris, taken out of the bowels of a female spermaceti whale ; the animal was old, and much emaciated.

† Gent. Magazine, vol. 60, p. 18, 895.

‡ The physeter macrocephalus Linnæi, is the only species of whale in which ambergris is found, and which is therefore the subject of this disease.

“ pieces

“ pieces of gold lace, supposed to have be-
 “ longed to some young gentleman, who was
 “ unfortunate enough to fall overboard, but
 “ that the other parts had either been digested,
 “ or otherwise voided, but the watch and gold
 “ lace not being able to pass through it, the
 “ fish had thereby become sickly, and would
 “ in all probability very soon have died *.”

The stomach and intestines of most animals seem endowed with such exquisite sensibility, and such general influence on all the other functions of the system, that we need not wonder at these mischiefs—and the cases we have selected show, that the human subject, horse quadruped, and a certain species of whale fish, are the most frequent objects of it; therefore it behoves the medical practitioner to discriminate the presence of intestinal calculi in the human body, while the veterinary practitioner discriminates their presence in the quadruped.

Horses are known to be sometimes attacked with severe colicky affections; and if, during a paroxysm, some concretions should be evacuated with their excrement, the disease be-

* Doddsley's Annual Register, chronicle part, page 227, year 1787.

comes evident, and justifies the idea of unevacuated concretions being the cause of it. When small, they are seldom productive of uneasiness, being for the most part rejected with the fæces; but when large, collected in numbers, detained in the stomach, intestinum cœcum, or zygmoid flexure of the colon, the parts become incapable of relief, and art must be called in to afford it.

In contributing this relief, let us take nature for our guide, and pursue the path she so wisely points out. We perceive the stomach and intestines of the human subject roused by nature to evacuate indigestible substances, as soon as they become hurtful by their presence; therefore, when the husks of grapes, plumbs, currants, the stones of any of these fruits, or marbles, dumps, pieces of money, or other insoluble bodies, are received into these cavities, they soon become stimulated to reject them—this induces us, when the powers of nature prove inadequate, to employ remedies adapted to accomplish it; and these remedies are purgatives: therefore, by analogy we infer, the same applications to be proper in the colica calculosa of horses. With the administration of purgatives to horses in this disease, it will be
advisable

advisable to combine diluents of the mucilaginous or oily kind, both given by the mouth, and injected by the anus.—Besides, it will be prudent, if tension of the abdomen, and unabating pain be present, to let copious bleeding be premised. The diluents will be of great utility, both in a mechanical and chemical view—for by their bulk they will tend to propel the concretions toward the anus, and by their chemical operation on the mucus which always surrounds these concretions, they will loosen their attachment to the intestine, and in this way facilitate their expulsion*. The purgatives to be made choice of, may be soap and aloes, calomel and jalap, or glauher's salt largely diluted, interposing an opiate to diminish the constrictions, if inflammation should not prohibit it.

Should these remedies fail in their effect, and no symptoms of actual inflammation be present,

* Diluents should always be largely employed.—They should be thrown in to the quantity of some gallons by the anus, and an infusion of oatmeal, or bran tea, will be very suitable for this purpose. To these may be added some culinary salt, or a solution of soap, to promote the peristaltic motion of the intestines.

but the animal continue to languish *, two other modes may be adopted—either the extirpation of the stone by mechanical means, or its solution in the body by solvents.

The mechanical means may be fourfold—dilution, excision, the hand, and forceps. The first has been already spoken of; the second must be extremely hazardous, unless performed on the verge of the anus; the third and fourth can only be practicable when the stone gets into the rectum, and then they may be employed with advantage. Hardened horse dung in the dry belly ache has often been extracted by the hand of the farrier, when the gut was incapable of expelling it; the same has been effected in the human body: I have given assistance with the hand and scoop, when the patient has been in the greatest distress, and the gut so weakened by distention, that the most violent strainings were

* Van Swieten mentions that whole oats are sometimes the nuclei of concretions in horses, and asserts, as a well-known fact, that grooms mix straw cut small with the oats which they give their horses, that those animals may be made to chew the oats, which otherwise they would swallow whole: without this precaution, these animals are frequently observed to languish and decay. See his Commentaries, Sect. 1414.

unable

unable to procure relief. Clysters were in this case ineffectual, being instantly returned upon injection; however, in every instance, they merit trial and repetition; for, if hardened excrement be the cause, they may soften and divide it; if calculus, they may stimulate the intestine to expel it.

Previously to the introduction of the hand, warm oil should be thrown up, and the hand well lubricated with the same; this will allay irritation, and prepare the parts for the easy expulsion of the substance.

The case related in the *Essays and Observations*, physical and literary, and which I have likewise referred to in a former page of this paper, was that of a boy who, “ after eating
 “ sheep’s and lamb’s trotters greedily, and
 “ swallowing some of the small bones, languished in a shocking manner for six years,
 “ being afflicted during the whole of that time
 “ with frequent and violent pains in his bowels,
 “ till at length three stony balls being extracted from the anus with a pair of forceps,
 “ and two others being voided by stool, he got
 “ rid of all his complaints, and in a short time
 “ recovered his health and strength. Upon
 “ breaking

“ breaking two of these stones, a small flat
 “ bone was found to be the nucleus*.”

When the stone exhibits no visible mark of its presence, either by external protuberance, detention in the rectum, or expulsion of small ones, but yet, from the frequent returns of colic, constipation of the bowels, and abdominal distention, irregular fever, and daily emaciation, there is reason to suspect its existence; after trying the power of purgatives, we should aim at its solution by suitable remedies. †.

The action of solvents is two fold; they either act on the surface of the stone directly as menstrua, causing it to waste, and be evacuated, in every cavity where they have access; or they act on the membranes which generate it, diminishing the lithic irritation, and sometimes totally destroying it. In fact, if this class of

* In the third volume of the Memoirs of the Academy of Surgery at Paris, p. 56, is an account of a stone weighing two ounces two drachms and a half, which being too large to be extracted by the forceps, required several incisions previously to be made in the anus.

† This attempt at solution points out the necessity of distinguishing the calculous colic, as it harasses for years before it destroys, and may chance to be relieved by suitable menstrua.

remedies can prove useful, and in some instances they have shewn themselves so, after passing the whole round of circulation, previously to the exertion of their powers, how much more may we expect from them, when employed with concentrated influence, on calculi seated in the intestines ?

These antilithics and solvents are caustic fixed alkali, caustic mineral alkali, lime water, soap, beards of leeks, and uva ursi. The four first, are properly solvents, though they sometimes act on the membranes. The two last, are more properly antilithics, as they act primarily on the membranes, while their chemical action is unknown.

Before we employ any of the alkalies as solvents, it will be right to adopt the rule of Mr. Lane, who recommends, if any stones be evacuated, to try the power of chemical menstrua, prior to the internal exhibition of them; for this gentleman found, that different stones were differently acted on; and that different laminæ of the same stone were differently affected by the same agent*.

* See the experiments of Mr. Lane in the Philosophical Transactions, Vol. LXXXI, and in the Medical Facts and Observations, Vol. III.

Doctor Austin observes *, that “ if we consult authors on the effects of alkaline substances and lime water in this disease, we shall find, that they sometimes afford relief to the painful symptoms of the stone, without effecting a solution of it; that sometimes they radically cure the disorder, by dissolving the stone, and removing the disposition to generate stone; and that at other times they are attended with no beneficial effects.”

The same author quotes from Dr. Whytt, the facts respecting the solvent powers of lime water and soap, in the case of the Right Rev. Dr. Newcome, Lord Bishop of Landaff. This prelate, while drinking two English quarts of lime water daily, for the cure of the stone in the bladder, poured his urine every morning and evening upon a piece of human calculus, weighing thirty-one grains; by which in the space of four months it was reduced to three pieces, weighing in all only six grains. Upon one of these pieces, weighing 2. 31 grains, he caused to be daily poured, for two months, the fresh urine of a person who drank no lime water; at the end of which time, the piece was

* Austin on the Stone, p. 85, 90.

found to weigh 2. 56 grains, having increased in weight a quarter of a grain. This same piece being afterward steeped in the Bishop's urine (who continued to drink lime water as above) from June 24th to July 9th, was in those few days quite crumbled into powder*.

“ Since this experiment,” observes Dr. Whytt, “ shews, beyond dispute, that lime water, “ unassisted by soap, can communicate to the “ urine a power of dissolving the stone out of “ the body, it can scarcely be doubted, that it “ must have the like effect on it when lodged “ in the bladder. And that the dissolution of “ the stone in the bladder has been completed “ by soap alone, appeared evidently in the case “ of the Rev. Mr. Matthew Simson, Minister “ of Pancaitland, near Edinburgh; an account “ of which will soon be made public by Doctor “ Austin, who opened his body after death. “ Mr. Simson had, from 1730, been afflicted “ in a less or greater degree with the symptoms

* The person who tried the solvent powers of his urine upon this calculus, without drinking lime water, should have taken the same bulk of pure soft water, and then marked its effects; probably the solution might have been equally well effected as by the Bishop's urine, who had drank the lime water, as pure water shows some degree of action on calculus.

“ of a stone in the bladder, and in November
 “ 1735, was founded by Doctor Drummond
 “ of Perth, and Mr. Balderston, Surgeon, in
 “ Edinburgh; by whom a stone was not only
 “ plainly felt, but also by the patient himself.
 “ In February 1737 he began to take soap, and
 “ after 1743, never had any gravelish symp-
 “ toms. He died in May 1756, and when his
 “ bladder was looked into, there was neither
 “ stone nor gravel found in it*.”

Now such facts as these concerning the power of lithic menstua, upon stones most incommo-
 diously situated for their action, should flatter
 us with the most pleasing expectations, and in-
 duce us to prescribe them in cases where their
 influence may be more powerful, as in the
 colica calculosa of horses.

In the exhibition of these solvents to horses,
 the caustic vegetable alkali, or lime water, may
 be given in the form of a mash, but if soap is
 preferred, it may be conveniently given in balls,
 moderately softened. But among the class of
 solvents, the most active is the caustic mineral
 alkali, as will be shewn under the chemical ana-
 lysis, therefore, this seems the most eligible to

* See Whytt's Works, 4to, Edin. 1768, p. 447.

be made choice of. It may be incorporated with bran into a mash, or with oil into a soap; and dilution should be employed to assist it *.

The two last remedies I propose to make mention of may rather be named antilithics

* There are two medicines of very great repute unnoticed in my class of lithontriptics, I mean, the aerial acid and the aerial mephitic alkali; the first recommended by Drs. Hulme and Dobson, the latter by Dr. Falconer—They are both medicines of great value, and highly deserving of notice; but as I have not been able to ascertain the lithontriptic powers of these remedies sufficiently to speak decidedly concerning them, particularly the latter, I have purposely omitted the consideration of them. But for those who may wish to make trial of the latter, or mephitic alkaline water, the following is the mode of preparing it: take an ounce, troy weight, of dry salt of tartar, put it into an open earthen vessel, pour on it somewhat more than two quarts of the softest water that can be procured, and stir them well together; after standing twenty-four hours, the clear part is carefully to be poured off, free from any insoluble residuum that may remain, and put into the middle part of one of the glass machines for impregnating water with fixed air, and exposed to a stream of that fluid. After the water has remained in that situation twenty-four hours, it will be fit for use, and should then be carefully bottled off into clear bottles, well corked, and set with the bottom upwards, in a cool place. Half a pint of this has been taken three times a day in calculous cases without disagreeing with the stomach,

than

than solvents; these remedies are the beards of leeks and uva urfi.

The beards of leeks have been a long while known among paupers, and several of them have informed me, upon enquiry, that they have experienced great relief from their use—some have assured me of their being cured by them, after having had the stone for years; and others have had their pains mitigated, and the stones evacuated with ease, when every thing else had been useless *. I have had some little experience of their powers in moderating the sufferings of patients, by checking the severity of paroxysms, and lessening the frequency of returns, therefore, am induced to assent to these assertions. A gentleman of veracity, and who had for years been afflicted with the stone, and was advised to the operation of lithotomy, assures me, that an infusion of the beards of leeks, recommended to him by Mr. Cline, has afforded him the most essential relief †. It has enabled

* A handful of the beards of leeks may be infused in a pint of hot water, and the whole of this quantity taken daily.

† Two years have elapsed since this gentleman, Mr. Brifon, began to take the remedy, and the paroxysms, which

enabled him to use exercise on horseback, or in a carriage, without the smallest inconvenience; while previously to this, he was unable to use either, without bloody water, mucous discharges, tenesmus, and other distressing symptoms.

I have been lately informed, that the beads of leeks have been introduced into our hospitals, and that many trials have been made with them, and much relief experienced from them; if succeeding trials should confirm this, they will be a valuable medicine in lithiasis, whether intestinal, vesicular, or renal. In horses I should imagine the dose to be limited from two to four quarts of infusion; while a pint seems sufficient in the human subject.

The next antilithic is uva ursi, on the action of which Dr. Cullen, who classes it among the astringents, has the following observations:

“ In mentioning the general effects of astringents, I must not omit their singular power of relieving the symptoms which attend the presence of a calculus in the urinary passages *.”

before were frequent and severe, are now long in their intervals, and too inconsiderable to be noticed.

* We may safely infer their power when calculus is seated in other passages.

“ Among

“ Among the dissertations of De Heucher,
 “ formerly a Professor at Wittemburg, there
 “ is one under this title, *Calculus per ad-*
 “ *stringentia pellendus*. In this he shows,
 “ that almost at all times, and by the most
 “ eminent physicians, astringents have been
 “ employed in calculous cases. He is, indeed,
 “ intent upon shewing, that astringents have
 “ been employed in promoting the excretion
 “ of calculi; but I presume that, in the cases
 “ in which those remedies appeared successful,
 “ the calculous matter was only supposed to be
 “ evacuated, because the patient was relieved
 “ from the symptoms that he formerly laboured
 “ under. But we now know that these symp-
 “ toms may be relieved without the stones
 “ having been dissolved or evacuated. A proof
 “ of this appears in the use of the leaves of
 “ the uva ursi, which not only from the expe-
 “ riments of the late Mr. De Haen, but also
 “ from my own, I have found to be
 “ often powerful in relieving the symptoms of
 “ calculus. This plant is manifestly a powerful
 “ astringent; and in what manner this and
 “ other astringents are useful in the cases men-
 “ tioned, may be difficult to explain; but I
 “ shall offer a conjecture on this subject: I sup-
 “ pose

“ pose their effect to depend upon their absorbing
 “ acid in the stomach. Their powerful attrac-
 “ tion of acid we have mentioned above ; and
 “ that thereby they may be useful in calculous
 “ cases, is rendered probable by this, that the
 “ medicines which of late have been found the
 “ most powerful in relieving the symptoms of
 “ calculus, are a variety of alkalines, which
 “ are known to do this without their acting at
 “ all in dissolving the stone *.”

Many authors, besides Dr. Cullen, relate instances of relief in calculous cases from medicines not lithontriptic ; therefore, as they have no operation on the stone, they probably operate on the membranes, by destroying the specific irritation. Perhaps future inquiries may lead us to remedies fitted to prevent the predisposition to concretion, as well as to destroy the act of concretion when assumed. It has clearly been proved that this disease is the effect of irritation, of the mechanical kind, on membranes predisposed to be affected ; without this, mechanical irritation would always produce stone, and every stone have a nucleus ; instead of which, we find stones can be generated with-

* *Materia Medica*, Vol. II. p. 12.

out nuclei, and not generated when nuclei are present to produce them. Besides, fœtusses have been found with stones in their bladder*, and parents have transmitted the constitutional predisposition to their offspring.

I shall here conclude the pathology, and mode of treatment of calculi in general, and of intestinal calculi in particular; and shall now consider their chemical properties, or the materials of which they are composed.

SECTION II.

Chemical Analysis of the intestinal Calculi of Horses.

The intestinal calculi employed in these experiments were given to me by a person who obtains his livelihood by slaughtering horses. The specimens I have procured from him may be divided into three classes.

The first class includes forty stones, of various sizes and shape, taken from the colon of a horse. They have smooth surfaces, and readily

* Doctor Monro and Mr. Cline both mention in their Lectures to have seen stones in the urinary bladder of the fœtus; and Van Swieten relates the same.

take a polish; are of a dark-brown colour, and hard in their texture, but do not strike fire with steel. The smallest weighs one scruple, the largest two ounces. In the smaller sort the figure is pyramidal, in the larger, rhomboidal, with deep impressions on the surface. They are brittle, and split by slight percussion, the fracture terminating with the external lamina; but if the stroke applied be considerable, the stones become cleaved in two, and discover in their centre a nucleus, which, in some, is an irregular pebble, in others a particle of iron*: round this the laminae are accumulated, and their composition is beautifully regular, being striated crystals curiously interwoven; their colour is brown and yellow.

Fig. 1, of Plate 1, represents one of the largest of these stones. A transverse section of it shows the elegant arrangement of its crystals, in regular radii from the centre to the circumference. Its weight is an ounce and a half.

Fig. 2 (Plate 1) is an oval calculus, composed of numerous concentrated coats. A portion of it is broken off to show this, and the

* The nucleus is not an invariable attendant, though observable in most of them.



Jos. Cristal del.



T. Ravenhill sculp.

3

Aug 5.

"

line of demarkation displays its thickness. Its weight is two ounces.

Fig. 3 (Plate I.) is a quadrangular stone belonging to this class of specimens.

Figures 4 and 5 (Plate I.) show two sections of stony shells, broken from an entire oval stone. The smooth internal concave surface, and the radiated edge, with lines of separation at right angles, display its concentrated structure and mode of crystallization.

The second class includes but one stone, six pounds in weight, of a pale ash colour, rough on its surface, and found solitary in the great intestine*. It is pyramidal in its form; hath three flat sides and three rounded edges; a flat base, and obtuse apex. It seems to be composed of innumerable lamellæ, disposed in circles from the centre to the circumference, without any discernible nucleus. The density is different in different parts: about one inch from the surface it is solid and compact; the next inch and a half is spongy; from this to the centre, it is as condensed as marble. Vide Plate II.

* I am unacquainted with the age, feed, or peculiar sufferings of the animal from which this stone was taken; but am informed that it excited inflammation, and proved fatal.

Fig. 1 * shows its radiated and laminated appearance internally; Fig. 2 exhibits its external surface. At one angle several laminæ are removed to show that the deep-seated coats are similar to the more superficial ones.

The third class includes two stones. The first of these (Fig. 3, Plate II.) is of a clay colour; and approaches in figure to an irregular sphere. It is rough on its surface and friable in its texture; and is divided by a transverse section to show the irregularities of its internal structure. Its weight is ten ounces. Of the second calculus of this class two figures are given (see Figures 6 and 7 of Plate I.) This is also of a clay colour, is irregularly rounded, spongy in its texture, without lamellæ, and bespangled with many black glistening crystals. Fig. 6 shows its nucleus, which proved to be a harness button. The weight of this calculus is seven ounces.

All these calculi, compared with distilled water, possess the same specific gravity, being as 86 to 72.

* This and the other two figures of Plate II. are on a reduced scale of half their natural diameter: but all the figures of Plate I. are of their full size.

EXPERI-

Fig 1.



Fig 2.

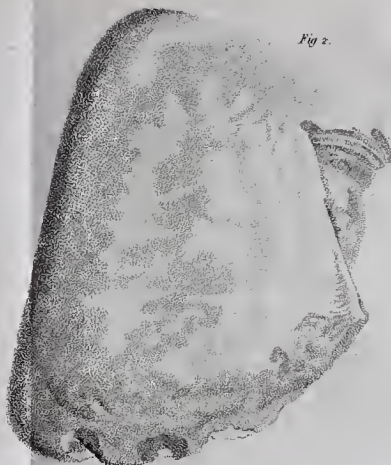


Fig 3.



EXPERIMENT I.

Action of Heat on Intestinal Calculus.

ONE drachm of intestinal calculus, calcined for the space of four hours, in an open crucible, was reduced to a black gritty powder, and deprived of half its weight.

The same weight of calculus, with twice its weight of charcoal, calcined for the same space of time, produced an ash-coloured calx, not susceptible of attraction to the magnet. When a few grains of salt of tartar were added to the mixture, or the black flux was employed in place of charcoal, no particles of metal were discoverable.

Twenty grains of calculus, in fine powder, being sprinkled upon red hot iron, did not smoke, nor sparkle, nor smell; but rolled upon the surface of the metal, and became changed to a dark brown granulated powder; half its weight being evaporated.

Ten grains of calculus, and one scruple of nitre, being triturated together in a mortar, were projected into a red hot crucible; a few red

sparks were thrown up, and a slight hissing noise was heard, but no active deflagration was observed. What remained in the crucible was hard and tough, of a pale ash colour, of little taste, and difficult solubility in water.

By the action of heat so uniformly dissipating one half of the weight of the calculus, and leaving the remainder a charred cinder, we may conclude some dry, oily, inflammable matter, and a large share of sublimable matter, to be resident in these concretions: but nothing metallic like iron; for after calcination with charcoal, they displayed no attraction to the magnet.

EXPERIMENT II.

Action of Vitriolic Acid on Intestinal Calculus.

HALF an ounce of concentrated vitriolic acid by weight, being poured upon half a drachm of powdered calculus, excited no effervescence; but the acid lost its colour and transparency, was changed to a deep black, and coagulated.

Six

Six drachms more of the acid being added, produced fluidity, and reduced the coagulum to the consistence of coffee grounds. This being diluted with one ounce and a half of distilled water, some slight effervescence arose, and much heat was generated; the colour changed to a dark brown, and fluidity was greatly increased; while the mixture separated into two parts, one a light brown transparent liquid, the other a collection of dark brown flocculi, which floated upon the surface of the liquid.

In two days one half of these flocculi subsided, but the remainder continued in suspension. By agitating the phial, and then suffering the mixture to settle, the whole of the flocculi were precipitated. The fluid part was now separated by filtration, and the flocculi collected on the filter.

These flocculi were viscid, of the consistence and colour of thin treacle, of an acid taste, empyreumatic smell, and incapable of desiccation by heat. While exposed to heat they exhaled a most fetid and sulphureous smell, and the filter paper became sticky and glutinous.

Some of these flocculi, collected by filtration were lixiviated with distilled water, but no sort of solution was effected. When alcohol was employed in place of water, one half of the flocculi were dissolved, and conveyed through the pores of the filter. What remained unattacked by the alcohol was dark coloured, and capable of deficcation, but adhered so firmly to the paper, that no separation could be effected.

A filtered solution of calculus in vitriolic acid precipitated a pale brown powder, on saturating the acid with caustic vegetable alkali. This powder, when properly lixiviated and dried, amounted to three grains; and, when dissolved in dilute vitriolic acid, tasted very styptic and aluminous.

Another solution of calculus in concentrated vitriolic acid was diluted with two ounces of distilled water, the feculent matter separated by filtration, and the solution evaporated; when some crystals were formed, small, yellowish, and transparent, styptic to the taste, with a slight degree of bitterness. In attempting to evaporate to dryness, they melted into a dark-brown oil, very sulphureous and offensive.

Two

Two scruples of calculus put into a glass retort, were exposed to the heat of a spirit lamp, with one ounce weight of concentrated vitriolic acid, when the retort became filled with a white cloud, and the acid was converted into that which is volatile and sulphureous.

If we attend to the phenomena presented by these experiments, we may observe phlogiston and argillaceous earth to be two of the constituent parts of calculus. The conversion of the acid into a black coagulum, and this, on the application of heat, being changed into volatile sulphureous acid, demonstrate the existence of phlogiston *; while the styptic taste of the dilute solution, and the aluminous salt formed by evaporation, demonstrate the existence of clay. The bitterness attending this salt may be attributed to the presence of magnesia.

* In the present state of chemistry I may be criticized, perhaps, for employing the term phlogiston, or attempting to explain any of these phenomena by its agency; but as many chemical philosophers in this country have not yet rejected the phlogiston of Stahl for the pneumatic system of Lavoisier, I hope to be excused in the choice of it.

EXPERIMENT III.

Action of nitrous Acid on intestinal Calculus.

Half an ounce of fuming nitrous acid being poured upon half a drachm of calculus, some slight effervescence arose, and the acid was changed to a deep orange colour, with a copious discharge of red vapours. After the dissipation of the vapour, the whole of the calculus was in solution, and the mixture became yellow and transparent. One ounce of distilled water being added, a violent effervescence arose, and the colour became changed to green. When the effervescence ceased, the yellow colour was assumed again. In a few days, some pale yellow flocculi were separated, which were inconsiderable in quantity, and gradually subsided. The solution was passed through a filter, and then decomposed by the caustic vegetable alkali, though every alkali was in possession of this property. The precipitate was washed, and dried; when it amounted to twenty grains. If aërial alkali were employed, the powder acquired eight grains in weight; and if this again
were

were dissolved in an acid, the eight grains were dissipated in gas.

This precipitate was insoluble in water, alcohol, or caustic volatile alkali; but was soluble in lime water, caustic vegetable alkali, and caustic mineral alkali; also in dilute vitriolic acid. With the alkalies it produced no change in their causticity, and a large quantity was necessary for solution. With the dilute vitriolic acid it produced a very styptic and aluminous compound.

To a solution of calculus in nitrous acid some phlogisticated alkali was added, to mark the presence of iron, but no blue powder was precipitated; neither could calcareous earth be detected, either by the acid of sugar, or concentrated acid of vitriol.

Forty grains of calculus were dissolved in half an ounce of aqua fortis, this quantity of calculus being as much as the acid would take up. The solution, upon being evaporated in a glass saucer, crystallized into a lemon-coloured salt. This salt, by exposure to the atmosphere, attracted humidity, and one half melted into a pale yellow transparent liquid; while the other, in form of a whitish cake, was firmly adherent to the glass. The liquid part,

amounting to two drachms, was decanted off, and tasted extremely bitter, like a strong infusion of orange peel. Two ounces of distilled water being added to it, produced no alteration of its transparency ; but *oleum tartari per deliquium* being dropped in, it instantly became turbid, and a quantity of white powder was precipitated. This powder, which, after lixiviation and drying, amounted to sixteen grains, was as white as milk, and very similar to magnesia. Diluted vitriolic acid was poured upon this precipitate, when a slight effervescence arose, and three grains of gas were dissipated, which had probably been absorbed from the alkali. The solution was slowly effected, and though excess of acid was employed, one grain resisted its action. After filtration and slow evaporation, some transparent white crystals were formed, very bitter, styptic, and acidulous.

As the nitrous acid, according to Bergman and Scheele, is capable of decomposing urinary calculi, and separating an acid, *sui generis*, called the acid of calculus, in form of rose-coloured crystals, soluble in water, and capable

ble of staining animal substances red; and as these celebrated chemists have attributed the formation of calculus to the presence of this acid in union with animal earth, I have bestowed peculiar attention, in my analysis of intestinal calculus, to look for the acid they describe. To discover this, some nitrous acid was saturated with intestinal calculus, and though the solution was transparent, and of a pale yellow, yet, upon application to the skin, no red coloured spots were formed, which should have been effected, had the lithic acid been present: besides, the skin was irritated considerably, spotted yellow instead of red, and incapable of ablution by water; while the rose-coloured spots described by Scheele, were soluble in water, and no way irritating to the skin.

Another portion of nitrated solution of intestinal calculus was evaporated to dryness, which, if the lithic acid were present, should have left a rose coloured salt; but, in place of this, yellow-coloured crystals were formed, one half of which was nitrated magnesia, the remainder an insipid white concrete, neither calcareous, aluminous, nor magnesian. The anonymous author, already quoted, in his new Theory of the Gout and of the Stone, relates,

that the lithic acid is contained in the healthiest urine, and is separable from the same, in a crystalline form, by means of any other acid. To examine this precipitate, I collected ten grains, by adding a few drops of marine acid to eight ounces of recent urine, and frequently repeating the experiment. But after being collected, washed, and dried, instead of possessing the properties of an acid, it was insoluble in water, insipid to the taste, and changed the blue infusion of red-cabbage leaf, green; and instead of forming rose-coloured crystals after solution and evaporation in nitrous acid, a yellowish white powder was left, which appeared to be animal earth. It presented phenomena very similar to the coagulable lymph of the blood; for it changed vitriolic acid black, and dissolved; admitted of dilution with water to a certain extent, beyond which the acid was abstracted, and most of the earth precipitated. The precipitate of urine was found soluble in the three mineral acids concentrated, and decomposable by dilution with water; and coagulable lymph, similarly treated, was found equally soluble in the concentrated acids, and equally decomposable by water.

EXPE-

EXPERIMENT IV.

Action of Muriatic Acid on Intestinal Calculus.

Half an ounce of concentrated muriatic acid being poured upon half a drachm of powdered calculus, the acid became dark brown, and little of the stone was taken up. This being diluted with one ounce measure of distilled water, some slight effervescence arose; the colour changed to a light brown, and the mixture became transparent. In a few minutes it grew turbid, and many brown flakes were separated and deposited at the bottom of the phial. The solution being filtered, and then decomposed by aerial vegetable alkali, eighteen grains of light brown precipitate were collected, which, when dissolved in dilute vitriolic acid, tasted very styp-tic and aluminous. This aluminous liquid was afterwards decomposed by pure magnesia, when an ash-coloured power subsided, which proved to be argillaceous.

In the experiments of Scheele on urinary calculus with muriatic acid, he found this acid incapable of producing solution, whether it be concentrated or diluted; but in my experiments with this acid on intestinal calculus, ten grains in thirty were taken up, whether the acid were concentrated or diluted, cold or exposed to heat. Eighteen grains were specified to have been precipitated, but eight of these were the ærial acid absorbed from the alkali employed.

EXPERIMENT V.

Action of Acetous Acid on Intestinal Calculus.

Six drachms of distilled vinegar, digested with thirty grains of calculus, became dark brown, and turbid. When distilled water was added to the mixture, a slight effervescence took place, the colour became paler, with quick separation of sediment. The mixture being filtered, was decomposed by the vegetable alkali, when a light brown powder was precipitated, amounting to fourteen grains. This,
dissolved

dissolved in weak vitriolic acid, was styptic, bitter, and aluminous.

One scruple of calculus was digested four-and-twenty hours with half an ounce of distilled vinegar. This was filtered, and the clear liquor evaporated, when six grains of a pale brown salt were collected, without any sensible taste, but completely soluble in two-ounce measures of distilled water.

EXPERIMENT VI.

Action of Aërial Acid on Intestinal Calculus.

Ten grains of each specimen of calculus, digested three days in ten ounces of distilled water impregnated with fixed air, were completely dissolved by the menstruum, excepting one grain.

EXPERIMENT VII.

Action of Aërial Vegetable Alkali on Intestinal Calculus.

Twenty grains of calculus were triturated in a mortar with twenty grains of salt of tartar,
and

and four ounces of distilled water. The mixture was filtered through blotting paper, and the residuum, when dried, amounted to fifteen grains. These fifteen grains being triturated with the same weight of salt of tartar, and four fresh ounces of distilled water, only two grains passed through the filter. By repeating this experiment seven times more, with the same weight of alkali as of stone, and four ounces of water with each trituration, the whole of the calculus was in solution; so that thirty-six ounces of water with 101 grains of Alkali, were requisite for the solution of twenty grains of calculus, aided by repeated triturations.

Though aerial vegetable alkali, aided by trituration, rendered calculus soluble in water, yet a saturated solution of the same alkali in water had no solvent power, when the trituration was omitted. This is similar to what happens in the action of magnesia on Peruvian bark, (remarked by my late worthy and ingenious friend, Dr. Skeete *) for magnesia, whether calcined

* Experiments and Observations on Quilled and Red Peruvian Bark. 8vo. London, 1786, p. 54.

or uncalcined, promoted the solution of the active parts of bark in water, if assisted by trituration, but shewed no sort of solvent influence on bark by simple maceration in a phial.

When calculus was triturated with dry alkali, and a few drops of water were superadded, a volatile alkaline odour was evolved ; but if quick lime were added instead of vegetable alkali, in the proportion of four scruples of lime to two scruples of stone, and heat applied to the retort, some caustic volatile alkali was collected.

Volatile alkali is a salt abundant in animal matter, and mostly neutralized by the acid of phosphorus ; and according to the experiments of Scheele, Bergman, Higgins, and Austin, on human calculus, it is found to be part of its compound ; therefore, intestinal calculus of the quadruped being an animal production, the presence of this salt might be expected.

EXPERIMENT VIII.

Action of Caustic Vegetable Alkali on Intestinal Calculus.

Forty grains of solid calculus infused in six ounces of caustic vegetable alkali, imparted a
deep

deep-brown colour to the lixivium, and lost twenty-five grains of its weight; but no complete solution could be effected. If the alkaline lixivium were diluted with five times its weight of water, the external surface became bleached, without one grain diminution in weight.

EXPERIMENT IX.

Action of Caustic Mineral Alkali on Intestinal Calculus.

A small calculus, of a brown colour, and weighing thirty-three grains, was digested three days, in two ounces of caustic mineral alkali; when the external surface became pale, was reduced into white flocculi, and separated by the slightest agitation. The calculus being removed from the lixivium, well washed in distilled water, and dried, was found seven grains diminished in weight: the external lamina was in solution, the next separated in flakes, and the third lost its colour and texture. The remaining twenty-six grains were returned into the phial, and digested two days with one ounce of fresh alkali; when the surface of the calculus, which

which was deeply corroded, separated from the interior lamina, leaving a dark brown central body, bestudded with numerous spiculæ of white, transparent, and oblong crystals. These crystals, mildly saline in their taste, were a pure *sal sodæ*, which only could have been formed by the attraction of the alkali to some mephitic acid contained in the substance of the stone, as the air of the atmosphere was excluded. By repeated applications of fresh caustic alkali, the residue of the calculus was dissolved, excepting three grains, which no quantity of alkali would act on.

As the caustic mineral alkali seemed a powerful solvent of calculus, and promised to be a good lithontriptic, I attempted to ascertain its power in dilution. For this purpose, seven grains of solid calculus were infused twenty-four hours in one ounce measure of this alkali and four ounce measures of distilled water, when the calculus lost one grain in weight: by the second application one grain more; by the third two grains and an half; by the fourth half a grain; by the fifth one grain; and one grain remained unaffected.

EXPERI-

EXPERIMENT X.

Action of Caustic Volatile Alkali on Intestinal Calculus.

Twenty grains of solid calculus, macerated in two ounces of caustic volatile alkali, were not in the smallest degree lessened in weight, nor changed in colour or texture. The same quantity of calculus in fine powder, being macerated together for three days, was two grains diminished in weight, but no farther solution could be effected.

EXPERIMENT XI.

Action of Lime Water on Intestinal Calculus.

Eight grains of dark-brown calculus, infused in eight ounce measures of recent lime water, lost nothing of their weight or colour; but eight grains of ash-coloured calculus, infused in eight ounce measures of lime water, were three grains lessened in weight. The grey coloured calculus

calculus lost two grains in weight, but no farther solution could be effected.

From these experiments with alkaline salts and lime water, we may observe the mineral and vegetable alkalies to be powerful solvents, while caustic volatile alkali and lime water are considerably inferior in their powers.

The solubility of intestinal calculus by alkaline salts shows its great affinity to the urinary calculus of the human body, analyzed by Scheele, Bergman, Lane, Higgins, and Austin. All these chemical philosophers found the human calculus soluble in alkaline menstrua and lime water; but this solubility was not uniform; for it differed in different calculi, and in different laminæ of the same calculus. But one thing may be worthy of notice, that the mineral alkali was always the most powerful agent, and the facility of solution was always in proportion to their volatility by fire.

Some calculi are with difficulty soluble in alkaline lixivia; for Dr. Black had a calculus from the human bladder, of an ounce weight, which took two years to complete its solution; and he has seen patients, under an alkaline me-

dicinal course which had no obvious solvent effects.

EXPERIMENTS XII. XIII.

Action of Water on Intestinal Calculus.

First, *Cold Water*—Half a drachm of calculus in powder, infused three days in two ounce measures of distilled water, and agitated, shewed no disposition for solution. After agitation it separated into two distinct parts, one a fine light brown powder, capable of being ten minutes suspended; the other a dark brown heavy powder, which quickly precipitated to the bottom. The liquid part with the light coloured powder in suspension, was decanted from the dross, and then filtered, dried, and carefully weighed, when it amounted to twelve grains: while the heavy brown powder, similarly examined, weighed eighteen grains; which added to the other made thirty grains, being the amount of the quantity infused.

Eight grains of calculus being infused in eight ounces of cold water for three days, one grain appeared in solution; but no additional quantity
of

of water seemed capable of dissolving the remainder.

Secondly, *Boiling Water*—Twelve grains of powdered calculus boiled in a florentine flask with twelve ounces of distilled water, dissolved two grains, which passed through the pores of the filter; but no farther solution could be effected.

The watery solution was divided into five distinct portions, and caused the following metallic precipitations; extract of lead white; vitriol of iron light grey; vitriol of zinc milk white; vitriol of copper green: and when mixed with lime water, the latter immediately became turbid, without any sensible diminution of causticity.

From the action of fire and acids upon these specimens of intestinal calculus, they appear to be composed of the following substances, variously proportioned and combined, viz. dry animal oil—animal gelatinous matter—volatile alkali—argillaceous earth and magnesia. I also suspected phosphorus acid to be present from the result of the following experiment:

H 2

Some

Some powdered calculus, charcoal dust, and salt of tartar, were put into a two-ounce phial. This was placed in a large crucible, and the spaces filled up between the phial and sides of the crucible with sand. After two hours exposure to a cinder fire in a common bath stove, the sides of the phial in contact with the ingredients, and the ingredients themselves, became one solid vitrified mass.

My suspicion, however, with respect to the existence of phosphoric acid in these concretions, has since been proved to be not well founded, by the following experiment, made at Guy's Hospital, by my ingenious friend Mr. Babington.

Six ounces of dark brown calculus, in powder, were put into a florentine flask, with four ounces of concentrated vitriolic acid, and twice that weight of distilled water—The mixture was exposed to heat, and gently boiled for about thirty minutes, after which it was immediately filtered. The flask was now washed with eight fresh ounces of distilled water, which being gently heated, were thrown into the filter with the former. The clear solution, amounting to somewhat more than a pint, was unavoidably left for about two days, when it was decanted for the purpose of being
 evapo-

evaporated; and the bottle was found incruusted with a collection of most beautiful crystals.—These crystals, perfectly transparent, were white in colour, and variously shaped—easily soluble, and when put upon the tongue tasted mildly saline and bitter. Their upper surface was thickly beset with needle-shaped spiculæ, or white, transparent, and hair-like crystals, which were quite insipid, difficultly soluble in water, and decomposable by acid of sugar. To prove the basis of the larger crystals, a few grains were triturated with quick-lime, when a pungent odour was evolved, which proved to be volatile alkali. Therefore volatile alkali, and vitriolic acid formed the compound of the larger crystals; while calcareous earth, and the same acid, formed the composition of the spiculæ. But as Epsom salt was suspected to be present in the larger crystals, from the bitterness of their taste, some crystals were dissolved in water, and then decomposed by vegetable alkali, when a milk white powder was dropped, which re-dissolved in vitriolic acid, and proved to be pure magnesia.

The filtered liquor of vitriolic solution, after decantation from the crystals, was evaporated to the consistence of a syrup, then mixed with

charcoal dust, and distilled in a retort ; but though much volatile sulphureous acid, and hepar of sulphur came over, nothing like phosphorus was discernible. Therefore a large share of phlogiston, volatile alkali, and magnesia, were discoverable in this stone, but only a very minute portion of lime, and no sensible quantity of phosphorus.

VI. *An Account of the good Effects of Opium in a Case of retention of Urine. By Mr. Alexander Mather, Surgeon at York. Communicated in a Letter to Mr. John Pearson, Surgeon of the Lock Hospital and Public Dispensary, in London ; and by him to Dr. Simmons.*

To Mr. PEARSON.

SIR,

THE mode of treatment adopted in the following case, was suggested by the successful treatment of an affection of the same kind of which you have given an account in the sixth volume of Medical Observations
 2 and

and Inquiries; I therefore think it right to transmit to you an account of the case, as it affords another striking instance of the good effects of opium in cases of retention of urine from a spasmodic constriction of the *sphincter vesicæ*. If you think it worthy of being communicated to the public, as a supplement to your valuable paper, it is much at your service.

I am, &c.

ALEXANDER MATHER.

York,
September 8th, 1792.

C A S E.

Mr. D——, of B——, who had formerly been subject more than once to gonorrhœa, being on a visit to a friend about seven miles from York, in the evening of a Sunday in the beginning of June, 1791, was seized with a frequent inclination to make water, accompanied at first with a slight degree of straining and pain about the neck of the bladder. In a little time the motions became more frequent, and the straining and pain greater; very little urine passed, and about six in the evening he could not part

H 4

with

with a drop, and the straining and pain were very violent. Having had two attacks of this kind before, one of which had continued thirty-two hours, and remembering that opium had then been given him to the amount of sixty drops, he took twenty-five drops of laudanum, and soon after fifteen more, and sent for me.— I took with me three grains of extract of opium.

When I arrived, about eight o'clock in the evening, I found him, every four or five minutes, seized with a dreadful spasm, occasioning an involuntary and ineffectual effort to make water: the agony and straining resembled much the pains of a woman in labour. I gave him immediately a grain of opium and threw up an emollient clyster, and directed him to sit over the steam of water, as means that were most readily obtained. He seemed at first to be relieved, but the spasms afterwards returned with greater violence than before. At this time there was no considerable tension of the bladder, and as every circumstance indicated the disease to be purely spasmodic, I did not think proper to attempt to use the catheter, lest the evil should be increased. The practicability of introducing it into the bladder was also very dubious; for it was with the greatest difficulty that the pipe
used

used for the clyster could be passed into the rectum; and during its stay there the spasms recurred with greater violence. For these reasons, I determined to depend entirely on opium, and to give it in such quantity, and at such intervals, as the urgency of the case seemed to require, *i. e.* till the contractile power of the *sphincter vesicæ* should be suspended: I therefore gave him within the hour another grain of opium, and desired that fifteen or twenty drops of laudanum should be administered every hour, or, if the violence of the spasms should continue, every half hour, and requested to be informed in the course of the night if he was not relieved.

At two o'clock in the morning I received information that he was no better. I immediately went to him, and, arriving about three, I found he had insensibly parted with a little urine, but had not slept at all. The plan I had recommended had been diligently pursued.

As the spasms still recurred, though more slightly than when I saw him before, I gave him another grain of opium. After this he fell asleep, and continued dozing near an hour, during which time about a pint and a half of urine insensibly flowed from him. When he first fell asleep the spasms left him and returned

no

no more ; but though he did not sleep much after the first hour, his urine continued to flow without his knowledge, and equally so whether he was asleep or not. Nine hours elapsed after the complaint became violent before he found relief, and in that time he took three grains of extract of opium, and seventy-five drops of tincture of opium, prepared according to the London Pharmacopœia. The opium, though given thus freely, left no stupor or even drowsiness. He had less sleep than usual in the ensuing twenty hours, and his pulse was not at all affected till after the last grain of opium was given ; and then it only became softer and weaker than natural, and remained so during the ensuing day. Forty drops more of the tincture of opium were given in the course of the next day and night by way of prevention, and this quantity kept up rather a copious perspiration while the patient was in bed. When he rose the next morning (Tuesday) he was as well as he had been before this attack, if we except a very slight degree of languor.

The effect of the opium in this instance was equally decisive and pleasing ; and I am inclined to think that the complaint would have given way still sooner if the medicine had been given
more

more liberally at first. But till we have more experiments to ascertain the quantity of opium that may with safety be given in spasmodic diseases, it will perhaps be most prudent to exhibit it at first, in small doses and at short intervals. I think it right to remark, however, that from the instances of such affections in various parts of the body that have come under my observation, I have learned that opium may be given to suspend spasm in abundantly more liberal quantities without producing its usual narcotic effects, than in any other disease in which it is administered.

VII. *A Case of monstrous Birth. By the same.*

HISTORIES of monstrous births seem to become interesting in proportion as they add to the varieties in this way already described, or as they tend to afford useful hints to the practitioner of midwifery in similar cases. Considered in the latter point of view, the following case

case may, perhaps, be deemed worthy of being recorded.

In the evening of August 16th, 1789, I was called to the wife of a miller in this town who had gone her full time. She informed me that she had had no pain, but that having felt an inclination to make water, she had got up, and immediately felt something drop into the vagina. On examining her I found the foot of a child without the os externum; another foot in the imperfectly dilated os uteri; and a third limb presenting itself a little higher up. Being unwilling to occasion unnecessary pain to the patient, I did not attempt to ascertain what this last was, but conjecturing that it was a hand that had slipped into the pelvis, and that it would not impede the progress of the labour as a foot presentation, I waited patiently for the coming on of the pains. In a short time they came on, and on examining during a pain, I was surprized to find that the highest limb seemed to descend in an equal proportion with the rest. I now thought it proper to ascertain whether it was a hand, and by the help of slow and weak pains, was soon convinced that it was a third foot. As the circumstances of the case were uncommon, and I had reason to think there was something pre-
ternatural

ternatural in the form of the fœtus, I requested the assistance of a gentleman who had had considerable practice in midwifery. He was soon convinced that three feet presented ; and supposing that two children had slipped together into the pelvis, advised me to advance the two first feet and retard the other as much as possible, lest, by descending together, the bodies might be so compressed in the pelvis as to make the delivery very difficult. This I accordingly, by gentle means, attempted to do, but was more and more convinced of a preternatural formation of the fœtus, the three limbs descending still together : I therefore soon desisted, wishing to leave the case to nature ; but the gentleman I had called in still maintaining his opinion, made likewise an attempt to return the highest limb, and for some time used considerable force for that purpose, but without effect. During his efforts a fourth foot came within reach ; and we now agreed to leave the case to nature.

In order to watch the progress of so curious a labour I continued at the bed side, and the pains increasing, I plainly perceived the fourth foot descend with the others, and when it reached the os externum I drew it down to the same length, and passing my hand between the two
pair

pair of legs, I felt the junction of two bodies at the navel; I therefore enclosed the four limbs in a cloth, and was pleased to find the fœtus descend easily with every pain.

Fearing some obstruction at the shoulders, (if this mal-conformation of parts should extend to them,) as soon as the bodies were advanced to the ribs I sought for the arms and successively brought down four. I then immediately passed my finger above the brim of the pelvis and soon found a mouth, by which I brought down a head into the cavity of the pelvis; it passed the os externum very easily, and was immediately followed by another head presenting to us two male children completely and naturally formed in every part, except that at the top of the sternum a junction of their bodies began, which was continued down to the navel. They were supported in the uterus by one umbilical cord which was attached to one large placenta. The cord terminated exactly in the center of the angle made by the junction of the bellies of the two children.

Being desirous of retaining intire so extraordinary a fœtus, I did not examine the structure of any of the internal parts; but it is evident that there is only one sternum common to both,
and

and that the ribs rise by one origin from it, and then divaricate to form a separate thorax to each child. The children were each as large as many are from single births of nine months, but not so large singly as the former children of the same woman had been.

York,
September 8th, 1792.

VIII. *A Case of Varicose Aneurism.* By Mr. H. Park, Surgeon to the Liverpool Infirmary.

JOHN HARTLEY, a youth about twenty years of age, presented himself at the Liverpool Infirmary in May, 1791. His account of himself was, that he had been bled in the right arm in the preceding January; that he had more than usual pain at the time, and thought he had been pricked too deep; that he continued his work (that of a wheelwright) for a week after the operation, and then perceived a small hard tumor immediately under the orifice, which
had

had gradually increased to its present size, which was somewhat larger than a walnut. It was then as soft as aneurismal tumors generally are; had an evident pulsation, and on pressure, or on holding up the arm, disappeared in a considerable degree, but not entirely; from which it was evident, that the whole of the blood contained in the tumor was not in a state of fluidity, but that some coagulum was formed. The peculiar thrilling sensation, so accurately described by Doctors Hunter and Cleghorn, was very plainly perceptible more than half way up to the axilla, and the basilic vein was a good deal distended, but not in the degree which they describe in their cases* of varicose aneurism, the tumor being still on the increase, though slowly. On the whole, though there was no room to doubt that some part of the blood that was thrown out from the trunk of the artery was received, and did return, by the trunk of the vein, yet there was reason to fear that this did not take place in a sufficient degree to secure the patient from the necessity of undergoing an operation at no very distant period; and therefore a guarded opinion was given him, with

* See Medical Obs. and Inq. Vol. II. and III.

directions to refrain from any laborious employment, and to let us see him again if any material change should take place. He called again at the Infirmary a few months afterwards, when it was evident that the tumor was still increasing faster than the distention of the vein.

On the 21st of January following he came into the Infirmary in considerable pain, from a high inflammation upon the arm, with evident marks of suppuration having taken place, and of the tumor being on the point of bursting; this he attributed to accidental cold; but it was probably owing to the sudden increase of the tumor, which had grown rather rapidly during the last month, and was now larger than an ordinary man's hand. An emollient poultice was applied, and a tourniquet was put loosely round the arm, with directions that he should be closely watched day and night. The next morning the skin opened, a small quantity of pus was discharged, the tumor subsided a little, and the patient became considerably easier.

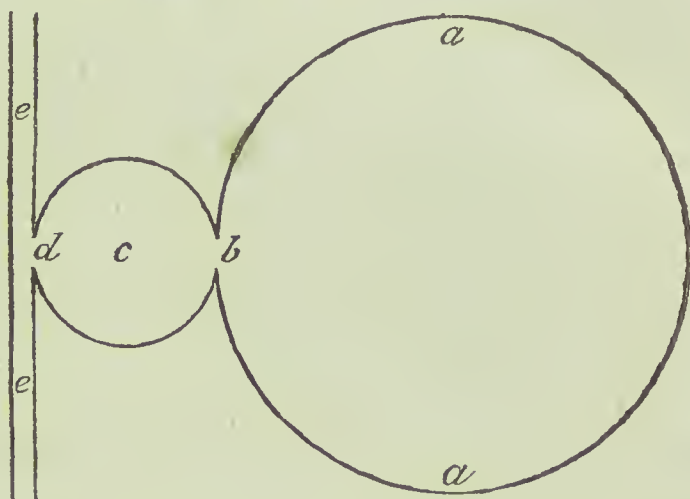
On the 24th in the evening the blood burst forth with considerable force, the tourniquet was tightened, and the Surgeons were called as soon as possible; some time, however, was unavoidably lost. On opening the sac, and re-

moving the coagulum, of which there was a considerable quantity, an orifice was discovered at the bottom of the cavity, not larger than is usually made in venesection, from which arterial blood flowed on loosening the tourniquet. A probe introduced into this orifice sunk nearly an inch deep, but would not pass much more than half an inch upwards or downwards, therefore we did not choose to venture a ligature till we were more sure of the artery; believing there must be an inner cyst. This orifice was cautiously enlarged with the scissars, and was found to lead into a deeper cavity, large enough to contain a moderate sized nutmeg; in this there was not any coagulum, but at the bottom of it was discovered another orifice, of about the same size as the former; and a probe, introduced into this, passed readily upwards and downwards in the cavity of the artery. Directed by this probe, a ligature was passed underneath the artery, above the orifice, and tied. On loosening the tourniquet the blood flowed out as freely as before; another ligature was passed in the same manner below the orifice, and tied; and on loosening the tourniquet now, no farther hæmorrhage appeared.

I should

I should have mentioned that early in the operation an external branch of the artery bled freely, and was tied.

A section of these cysts would exhibit some such appearance as this :



a a, the first or outer cyst, *b*, the orifice leading into the second or deeper cyst, *c*, at the bottom of which was seen the orifice *d*, leading into the cavity of the artery marked *e e*.

We kept the wound open more than half an hour, (waiting to see if any more hæmorrhage would take place) and then it was closed up as easily as possible, by merely bringing the edges together by means of long slips of adhesive plaster.

The next day the œdematous swelling that had taken place in consequence of the long

continuance of the tourniquet, in the space of time between the bursting out of the blood and the conclusion of the operation, was considerably diminished; there was comfortable warmth and feeling in the fore arm, and a faint pulsation in the radial artery. After this nothing remarkable occurred during the cure, excepting that the patient was so much threatened with symptoms of phthisis pulmonalis, as to make it necessary to send him into the country as soon as the wound was reduced into a small compass;—and that the upper ligature was thirteen weeks before it came away.

At the time of writing this (September 29th) the patient is perfectly well, has a good pulsation at the wrist, though not quite so strong as in the other, but the arm is equally strong and muscular, and has perfect motion; and he follows the trade of a ship carpenter, to which he has lately bound himself.

It will probably be asked, if this was really in any degree a case of varicose aneurism, where was the vein? and, if it was situated between the outer and inner cysts, why was it not discovered? and possibly I might be critic enough to ask these questions myself, had this operation been performed by any other person; but I
must

must beg leave to submit the following considerations to experienced and unprejudiced practitioners. First, the inflammation and suppuration had contributed to occasion some degree of confusion of parts. Secondly, the outer cyst was so thick as to prevent any vessels from being visible that might run underneath it. Thirdly, the two sides of the vein, when it was empty, might very readily be so closely pressed together as to admit of a probe passing through its very center into the inner cyst without the cavity of the vein being ever discovered; and if such was the situation of the vein, it is, perhaps, happy for the patient it was not discovered; as there might have been some danger of its misleading us to tie it instead of the artery. I must beg it may be farther considered, that the patient had been distressed by having the tourniquet unavoidably kept on the arm a considerable time before the operation could be begun; that it was obliged to be performed by candle light, and proved very tedious and perplexing; and that the patient was very much exhausted: under which circumstances, I conceive, I shall stand perfectly excusable in attending only to the main object of my pursuit, viz. to discover and secure the wound in the

I 3

artery,

artery, and so terminate my patient's sufferings with as much expedition as could be consistent with perfect safety

As Dr. Hunter judiciously and humanely published his cases with a view to prevent patients being unnecessarily exposed to a severe operation, so I think it incumbent on me to state the above, as a caution to inexperienced practitioners, whenever they meet with such appearances as the Doctor has described, but in a less degree, to be well assured that the veins will really dilate sufficiently to take off the whole of the blood poured out by the artery, before they give such a prognostic as may lull the patient into a delusive and dangerous security.



IX. *An Account of the good Effects of Opium, administered in Clysters, in Cases of Menorrhagia. By Mr. Peter Copland, Surgeon at Swayfield, near Colsterworth, in Lincolnshire.*

CASE I.

A woman at Colsterworth aged thirty-two years, and who had had four children, was attacked

“ tion, is attended with, or preceded by, an acute
 “ pain, not inflammatory, in the lower part of
 “ the back or belly, and returns with greater
 “ violence ; as often as the pain returns or in-
 “ creases, opium will prove a more effectual
 “ remedy than any of the astringents.”—I there-
 fore, in imitation of the treatment used in the
 case there described *, directed that fifty drops
 of tincture of opium should be mixed with a
 large tea cupful of cold water, and adminis-
 tered every night as a clyster ; and that costive-
 ness should be obviated by the occasional use
 of laxative clysters. The reduced state of the
 patient, from the long continuance of the hæ-
 morrhage, induced me to continue the use of
 astringents also in the day time.

From the first employment of the anodyne
 clyster she experienced much relief. It was
 repeated at first every night, then every se-
 cond night, and afterwards occasionally till the
 twenty-seventh of November, when she was
 quite well.

Being much struck with the alteration that
 succeeded the administration of the anodyne
 clyster in this case, I determined to give it a

* See the edition of his works, in 4to. p. 661.

further

further trial on future occasions. The following cases have since occurred.—I shall relate them from the notes I took of each.

CASE II.

A woman at Castle-Bytherm, aged forty-four years, was attacked on the thirtieth of September, 1791, with a diarrhœa, unaccompanied with tenesmus; soon after which the menstrual discharge took place (a fortnight only after its last appearance) with pain, returning at intervals, and extending from the upper part of the right groin across the abdomen, and sometimes across the loins. These symptoms continued on the fourth of October, when I first saw her. Her pulse was then small and quick. A solution of *magnesia vitriolata* in water was directed to be taken immediately, and an anodyne astringent draught after sufficient evacuations.

5th. She had several evacuations yesterday, and a good night; but two loose stools this morning.—An astringent mixture, with tincture of opium, was directed to be taken at intervals.

6th.

6th. The purging ceased yesterday ; but the uterus, with the pain of the abdomen, still continued unabated. Sixty drops of tincture of opium in five ounces of water were directed to be injected *per anum*.

7th. The discharge was lessened, but the pain continued in a considerable degree. As she had had no stool since the 5th in the morning, a rhubarb bolus was ordered to be taken immediately. This produced an evacuation, and the clyster with opium was then repeated. A piece of folded linen, wetted with tincture of opium, was applied to the right groin* after the administration of the clyster.

11th. The pain ceased, and the discharge disappeared after the last clyster ; but the purging having returned, recourse was again had to the astringent mixture. I did not see her again till the first of November following, when she informed me that the purging stopped after the repetition of the mixture, and that she had continued well ever since.

* Upon examination no appearance of rupture could be discovered.

CASE III.

In my way through Creeton, on the nineteenth of October, 1791, I was desired to see a woman aged forty-two years, the mother of several children, who had miscarried after having gone above half her time, on the eleventh instant. From that day she had had a coloured discharge, in more or less degree, from the uterus, till a few hours before I saw her, when she had been seized with a shivering, followed by periodic pains in the loins and abdomen, and an alarming increase of the discharge, with frequent faintings.

I found her on the bed with her cloaths on, and her face beset with cold sweat. Upon taking hold of her arm, with the intention of examining the state of her pulse, it felt cold and moistened my fingers with its sweat, which she said extended to every part of her; and she repeatedly complained that her feet were very cold. Her pulse was small and irregular, beating one hundred and thirty times in a minute, and disappearing upon the least pressure from my fingers. A clyster, composed of seventy drops of tinc-

tincture of opium, and a large tea cupful of water, was immediately injected. She was desired not to undergo the fatigue of undressing but to remain upon the bed, to take strong broth cool frequently, and occasionally small quantities of red wine mixed with water, if the discharge would permit. The room was directed to be kept well aired and cool, and cloths were introduced within the os externum, with a view to impede the discharge.

20th. The pains had diminished after the introduction of the clyster: she had got some sleep during the night, and the discharge had been inconsiderable. The universal cold sweat was still present, and vomiting took place this morning. Her pulse was nearly the same as yesterday. The clyster with opium was directed to be repeated in the evening, or at any time in the day, should the pain or discharge require it. Four table spoonfuls of a mixture composed of a pint of decoction of Peruvian bark, and two drachms of acid elixir of vitriol, were ordered to be taken every three hours.

21st. The clyster had been administered yesterday evening; she had had a good night, and the sweating and discharge had disappeared. She retched once this morning. The exertion this
occasioned

occasioned forced out a large coagulum of blood with the cloths from the vagina. Her pulse was 110, regular, and less feeble. No motion having taken place since the 19th, a laxative clyster was directed to be now employed; the use of the mixture was continued; and the clyster with opium was repeated in the evening.

The laxative clyster yesterday produced a slight evacuation of fæces. She had now no pain or discharge, and her pulse was at 100. The clyster with opium was not repeated after this; but she occasionally had recourse to the laxative clyster, and persevered in the use of the mixture till the tenth of November, at which time she had regained her usual health.

The preceding cases to me afford a strong proof of the justness of Dr. Whytt's observation; and, as I apprehend that it has not been sufficiently attended to, I am desirous of offering them to the medical reader, with the view of rendering the practice as general as its importance seems to deserve.

Swayfield,
October 16, 1792.

X. *An Account of the good Effects of a Mercurial Snuff in a Case of Gutta Serena.* By Mr. R. B. Blagden, Surgeon at Petworth, in Sussex.

MR. ———, aged thirty-one years, of a spare habit, and subject to scrophulous affections of the sub-maxillary glands, between four and five years ago, on a sudden, and without the smallest injury or previous indisposition, became sensible of such a defect in the sight of his right eye, that he was unable to take his favourite diversion of shooting, in the usual way : however, as the sight of the left eye enabled him to read, and to use a left-handed gun pretty successfully, he was contented ; and probably would have remained so, had not that likewise began to fail :—a circumstance of which he first took notice about six weeks before he applied to me.

On the 7th of October, when I first saw him, the pupils of both eyes were contracted to as great a degree as the pupil of a sound eye is by a sudden and strong light.

The

The pupil of the left eye, on the approach of a very vivid light, shewed so small an alteration as to be scarcely perceivable ; and that of the right none at all. With the left the patient could barely see the capital letters which the printers call the Four Lines Pica ; with the right he could only distinguish light from darkness.

The case seemed to me a fair one for a trial of the mercurial snuff recommended, and so successfully used, by Mr. Ware, in the third volume of the Memoirs of the London Medical Society ; and I, accordingly, directed the patient to take a pinch of it (prepared by mixing five grains of the *hydrargyrus vitriolatus* with thirty-five of the *pulvis asari compositus*) every night. As he smiled at the idea of being cured by a pinch of snuff, I gave him two tea-spoonfuls of a mixture, composed of equal parts of tincture of valerian and compound tincture of lavender, twice a day in a cup of rosemary tea : the dose was, afterwards, increased to three tea-spoonfuls.

On the 21st of October the patient could see the capital letters with the right eye, and could read the Four Lines Pica print with the left.—The pupils were, in their general appearance,
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less contracted; and they were affected more sensibly by the impression of light. The first five or six times of using the snuff it made his nose bleed freely, and so long as it produced this effect, he thought he perceived the advances more strikingly; an additional two grains and an half of the mercurial were therefore put to the next quantity of the pulv. asari c. and the hæmorrhage from the nose was reproduced as often as it was made use of.

On the 28th of October, the appearance and contraction of the pupils were natural;—the patient could read a newspaper, and was able to shoot correctly with his right-handed gun.

On the 18th of November, the sight of both eyes was in every respect perfect.

Petworth.

December 5, 1792.

XI. *A Case of Pulmonary Hæmorrhage, with Remarks. By Mr. William Davidson, Apothecary in London.*

HAVING, in the third volume of Medical Facts and Observations, related two cases of pulmonary hæmorrhage, and from them endeavoured to demonstrate that the proximate cause of active hæmorrhage often consists in distention and consequent increased action of the blood vessels, and to point out that abstinence from liquids is a principal mean of removing this distention; I shall now beg leave to add another, which lately occurred, in further confirmation of that doctrine, and of the advantages resulting from such a method of treatment. The patient was a robust man, of a sanguineous temperament, and about sixty-four years of age. He had been affected with a severe cough for near four months before the present attack; and during the last seven or eight weeks had been spitting blood, mixed with a yellow expectoration; but without any pain in or about the chest.

VOL. IV.

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Being

Being sent for on the fourth day of October, 1792, I found him in an insensible state, as if from oppression of the brain, with occasional strong contractions or convulsions of the right arm. His pulse was strong, frequent and full; his tongue was furred, and his breathing laborious. He had been just brought into the house from a Stone-mason's yard, where he was employed in sawing.

The persons about him informed me, that, while at work, he was seized with a fit of coughing, and brought up about three or four pints of blood; that he soon after became insensible, and was immediately brought home. Considering the great hæmorrhage which had taken place, and the apoplectic symptoms now present, I conceived my patient to be in considerable danger, and that the most active method of relieving him should be adopted: accordingly sixteen ounces of blood were instantly taken from a large orifice in the arm. The blood, when coagulated, was covered with the buff coat, as it is called. A few minutes after the operation he became sensible, and complained of great pain in the anterior part of the chest; which, he said, he had first perceived that morning.

About

About half an hour after the bleeding, he took a purging draught, chiefly composed of *magnesia vitriolata*. A large blister was also applied to the breast. He was particularly directed to refrain from drink during the operation of the purgative medicine; and, if thirsty, only to moisten his mouth and throat with a little barley water.

In the evening I found him sensible, with less fever, his cough quiet, his breast easier, and he had not brought up much blood. His medicine had purged him several times.

A saline draught containing twenty drops of antimonial wine was now directed to be taken every six hours; he was strictly enjoined to drink about half a pint only of liquid during the first twenty-four hours; and in every other respect to adhere rigidly to the antiphlogistic regimen.

October 5th, he had rested pretty well, and expectorated about an ounce or two only of blood, which was chiefly in coagula: his breast was easier, but still a little tight; his pulse was much improved, and his skin was cool and moist. He had little thirst, and his tongue was less furred. The use of the saline draught

was continued, and the opening draught was directed to be repeated in the morning. Being so much better he was now allowed a pint of liquid (including tea, &c.) in the twenty-four hours, and the same quantity only was permitted every day during the whole of his illness.

October 6th, he was still much better: he had rested well, had less cough, less fever, little bloody expectoration, and his pulse was nearly natural: his chest was much easier.

From this time to the 12th he continued gradually to recover. He had no expectoration of blood after the 8th, but the saline draught, and likewise the purgative medicine, were occasionally repeated, and he persevered in the limited use of liquids till the 12th, when I thought it unnecessary to visit him any longer. His pulse was then sixty-eight in a minute, and he was apparently in good health, only a little weak.

I afterwards learned that, contrary to my directions, he went upon duty, as patrol, on the Monday following, the 15th day of October.

Considering, therefore, the nature of this office, the season of the year, the age of the patient, and the short time since his recovery,

it cannot seem surprising that the disease was reproduced; accordingly, on the 25th, he was again seized with fever, difficult breathing, cough, and hæmorrhage. He continued, notwithstanding this return of the complaint, to attend his duty regularly until Sunday the 28th, when he was again taken with considerable bleeding, while on the patrol, and instantly expired.

On Tuesday the 30th, having an opportunity of inspecting the body, the following appearances presented themselves:—the thorax and abdomen being laid open, we observed on the anterior surface of the right lung an incipient inflammation, which, however, could not account for the patient's death, for, on further examination, it seemed evidently to be occasioned by the hæmorrhage. There were also some adhesions, apparently rather vestiges of former than of any recent inflammation. There were no tubercles. A portion of the aorta was ossified. All the abdominal viscera were found. In the stomach there was some coagulated blood, which had been swallowed; but there was not the smallest erosion of its coats.

In the two former cases of hæmoptysis, I have noticed the great difficulty of curing a ruptured vessel in the lungs, on account of their constant motion, and the great quantity of blood circulated through them; but that this difficulty might be, in general, overcome by a steady adherence to the plan of cure there recommended, viz. moderate bleeding and purging, but particularly abstinence from liquids. The success attending the treatment of the present case must evidently establish the superiority of that method of cure over every other hitherto recommended. Here a blood vessel, of considerable magnitude, was ruptured in a part of the body which, from its natural office, must be in perpetual action, and where no local application could be made; yet this rupture was healed in almost as short a time as the most experienced Surgeon can heal an external accident of the same nature, even with the assistance of compresses and bandages. For example, I have seen a rupture of some superficial vessels require these applications for many days. It may be said that the bleeding, which has been more or less plentifully used (I mean as to quantity, for it was never used more than once in each case) according to the urgency of
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the symptoms, was the chief mean of cure. But a practitioner, who has seen a patient blooded twelve or thirteen times for an hæmorrhage from the lungs and still sink under the disease, will not readily subscribe to this opinion.

It may be necessary to observe that the patient to whom I allude was allowed to take, and actually did drink, several quarts of diluents in the twenty-four hours. But supposing he had recovered; after such loss of blood he must have remained infirm for many months: whereas this patient, who was so soon relieved by abstinence from liquids, had he been in easy circumstances, and could he have kept from labour and improper exposure to the night air, for another week or two, might have obtained a perfect and permanent cure, without any particular diminution of bodily strength.

Respecting the other medicines, they were doubtless of service, and conspired to effect a cure, which, had the usual quantity of diluents been used, I am convinced, would, notwithstanding, have been much more tedious. For in vain do practitioners attempt to lessen distention by emptying the vessels, either by purging or bleeding, if they are immediately filled again by plentiful drinking. The spare

use of liquids, therefore, may justly be considered as one of the greatest improvements in the modern treatment of hæmorrhage: and particularly in hæmorrhages from the lungs. And why should not the idea be carried farther? Indeed, from some cases I have lately attended, I think I may venture to assert, that, in all diseases of the lungs, moderate drinking will be of service. For seeing they are a congeries of vessels, if these vessels are overfilled, or kept in a continued state of distention, they may so press upon one another that their healthy actions shall be either prevented or greatly impeded, particularly the actions of the absorbent system: whereas, if they are but moderately filled, the different systems of vessels are left more at liberty to exercise their respective functions, either in the business of health, or in the removal of disease. When tubercles are formed in the lungs, why should they not be absorbed? We know that the most solid tumors in other parts of the body frequently disappear; and that even bone itself is capable of being absorbed, as is clearly demonstrated by the different changes which take place in it as well in health as in disease. And in the lungs there are many absorbent vessels, which, if their ac-

tions

tions were not lessened or prevented, might soon remove the most confirmed induration of their substance. As emetics are powerful promoters of absorption, is it not on this principle that many patients, seemingly labouring under tubercles of the lungs, have been cured by vomits, particularly of the stronger kind? I hope the time is not far distant when practitioners, being better acquainted with the laws and functions of this important system, shall be enabled to direct its actions with more certainty, either in removing a tubercle or the most schirrhous tumor. But when this happy period arrives it can only be carried into effect by a proper regulation of the quantity of liquids; and, in general, a diminution of the usual prescribed quantities. Perhaps the advantages arising to consumptive patients from a warm climate and the use of flannel, are principally from their doing the same thing as abstinence from liquids, viz. determining the tide of circulation to the surface of the body, and thus leaving the vessels of the lungs more empty, and, therefore, more ready to recover themselves when under the influence of disease.

*Queen Anne Street East,
January 14th, 1793.*

XII. *A Case of Psoas Abscess successfully treated.*
By Mr. William Smith, Surgeon at Bideford,
and Member of the Corporation of Surgeons of
London. Communicated in a Letter to Edward
Whitaker Gray, M. D. F. R. S.; and by him
to Dr. Simmons.

A YOUNG lady of this town, aged eighteen years, of a fair, ruddy complexion, and rather inclined to plumpness, was attacked whilst she was riding (thinly cloathed) over a bleak common, about the middle of December, 1787, with pain in her back, but was not prevented by it from pursuing her journey, and spending several days with her friends.

She returned to Bideford on the 30th of the same month, when I was first requested to visit her. She complained of a violent and continued pain across her back and loins, which had gradually increased from the time above mentioned, attended with shooting pains through the right groin, in the direction of the psoas muscle, and extending down the thigh; the erect posture always produced increase of pain, and every attempt to roll the thigh bone in the acetabulum
 (when

(when I was endeavoring to detect the immediate seat of the disease) occasioned the most excruciating torture. Her cheeks were flushed, her tongue white and dry, with an insatiable thirst, her pulse hard and full, in number 120, no stools had been procured for several days, and the urine was voided in small quantities, and very high coloured.

Judging from these symptoms that inflammation had taken place in that portion of the cellular membrane which is immediately connected with the psoas and iliacus internus muscles, and, being in hopes that the suppurative stage had not yet begun, I deemed it warrantable to endeavour to effect the cure by resolution.

I ordered her to be put to bed, with a firm injunction to preserve the position recommended, which was laying on her side, with the thigh in a right angle with the trunk, in order to shorten, as much as possible, the space between the origin and insertion of the psoas muscle. Blood was taken from a large orifice in the arm, *ad deliquium*, copious stools were procured by means of purgative medicines and enemata, and a large blister was applied over the lumbar vertebræ; she took an antimonial every six hours, with small doses of tincture of opium; and a diluent
farinaceous

rinaceous diet was strictly enjoined, with a total prohibition of all fermented liquors and animal food.

Notwithstanding this mode of treatment, which she submitted to with great perseverance, the symptomatic fever rather increased than diminished; every attempt to move her in bed produced agony; and a perpetual anxiety and watchfulness rendered her situation truly deplorable.

On the 7th of January, 1788, a severe rigor took place, which was followed by several others during the three succeeding days.

The violence of her pains began now sensibly to diminish; her pulse became softer; partial remissions of fever ensued; sleep was procured by means of opium, and she experienced temporary suspension of her misery.

Revolving in my mind the foregoing symptoms, I had no doubt remaining (although no external tumor yet appeared) of the existence of suppuration, and I became every day more and more solicitous to examine the lumbar region and inguina, being determined to give vent to the matter as soon as it came within reach of the knife; this, however, from too great delicacy, was constantly denied me.

From

From the 7th to the 20th it was obvious that my patient lost strength daily; although the acuteness of the pain had subsided, the symptomatic fever continued with fewer remissions, profuse perspirations came on, with considerable emaciation, and the legs and thighs became anasarcaous. Her pulse was now extremely frequent, small, and tremulous, varying in number, from 120 to 140, upon the slightest agitation or exertion of body.

Wine, Broths, and Jellies, were now added to her diet, with the free use of cow's milk; and the maturation of the abscess was forwarded by warm fomentations: still, however, the nurse assured me (for I had ordered her to make frequent examination,) that no particular hardness or swelling appeared.

On the 29th of January, she was visited by Dr. Wavell, of Barnstaple, at my request. He confirmed me in my opinion of the existence of internal suppuration, encouraged me in the determination of opening it, as soon as the smallest tumor should indicate the direction it would take, and consented to be present at the operation; in the mean time prescribing for her the bark, with the occasional use of opium.

On

On the 4th day of February, I was called to her in the evening; the nurse informed me that she complained of a swelling in the right groin, which occasioned great pain in turning, and that she no longer opposed an examination.

I found the tumor occupying the whole of the right groin, with evident fluctuation; the tenderness of it increased upon raising her to the erect posture, but it became flaccid upon laying her supine, and the whole contents might with ease be pressed into the cavity of the abdomen: the shape of the tumor was a flattened pyriform; its greatest length was from the spine of the ilium to the pubis; and there was little or no discoloration.

On the 5th of February, in the morning, in the presence of Dr. Wavell, I opened the tumor, by making a puncture with a double-edged bistoury below and in the direction of Poupart's ligament, and gave vent to a large quantity of brown, ichorous matter, the stench of which was so intolerably offensive, that with difficulty we could remain in the room whilst the assistants were collecting it in basons, napkins, &c; and, incredible as it may appear, between thirty and forty of the latter were completely soaked in the first few hours after the operation. The
deliquium

deliquium induced by this sudden and great depletion was such, that I was under the necessity of ordering an assistant to press, at intervals, upon the opening, until the patient's strength was sufficiently recruited by wine and volatiles to bear a fresh discharge. Large portions of black, putrid, cellular substance floated through the aperture, and the first day elapsed before any kind of dressing could be retained, as the slightest motions of the body threw off considerable quantities of the same membranous sloughs and fetid sanies.

Dr. Wavell prescribed for her half a drachm of peruvian bark in a strong decoction of the same every five hours, with one grain of opium; and ordered stools to be procured by occasional enemas.

The room was well ventilated, and the putrid effluvia counteracted, as much as possible, by antiseptic fumigations of camphor, vinegar, &c.

In a few days after the operation, her appetite for food returned, and conceiving our first step was to adopt a nourishment proportionate to the daily waste, I determined to arrange the order of her diet, and carefully observe the quantum of food she could take in a day.

Her

Her diet consisted of boiled chickens, hartshorn and calves-feet jellies, milk, soups, and blanc-mange, with the free use of port wine.

During the violence of the discharge, I found her stomach would bear very well two quarts of milk and a bottle of port wine every day, besides her dining on chickens, and taking every two or three hours a cup of jelly, &c.

For the first three weeks the discharge continued profuse, thin, and putrid, excoriating the lips of the aperture, and bringing along with it considerable portions of sloughy cellular membrane, which sometimes choaked up the opening and obstructed the drain: her pulse was seldom under 120 in number, small, and hard; a constant anxiety prevented sleep, and the emaciation of the arms and trunk became every day more visible, whilst the lower limbs were bloated with anasarca to the rim of the belly. Observing that every elevation of body poured out a torrent of sanies, I ordered her to be gently raised on pillows, inclining to the diseased side, in order to obtain a depending orifice from the sac, and thereby effect a more regular discharge.

By the first week in March the discharge was somewhat abated, and the matter become of a thicker consistence, of a paler brown colour, and

and the smell was less offensive; the symptomatic fever also was diminished; her pulse (in number 100) was more soft and open, sleep was obtained by small doses of opium, and I began to conceive hopes that the case might terminate favourably.

Notwithstanding these encouraging appearances, the dropsy of the lower limbs remained, the cuticle burst in several places, and a quantity of lymph oozed out. Suspecting the continuance of this troublesome symptom to be the effect of mere local debility, (the skin having, from long preternatural distention, lost its contractile power,) I made a gradual pressure with flannel rollers, beginning at the feet, and finding I gained ground on the complaint thereby, I increased the pressure every day, and by that mean gradually removed the whole œdema.

By the 25th of March the quality of the discharge was much improved; the factor was gone, and it had a true purulent consistence, lessening in quantity every day: her pulse became natural, and her tongue clean; her sleep was undisturbed and refreshing, without the aid of opiates; the alvine discharges required little assistance from laxatives, and the cata-

menia, which had been obstructed from the first attack, again began to flow.

On the 26th she complained of great pain in her thigh, on the external part, a little below the great trochanter. Upon examination, a fluctuation (though deep seated) beneath the fascia was manifest; and suspecting (as the wound in the groin had discharged very little for several days) that the matter had made its way through the interstices of the muscles, I made a small incision, which gave vent to about six ounces of pure pus, and having obtained thereby an orifice still more dependent, the one in the groin soon closed.

She gained strength now very rapidly; the anasarca was gone; the fever, and its concomitant symptoms, had also left her; the wound of the groin was closed; and a small aperture in the thigh discharged about an ounce of purulent matter at every dressing.

Being apprehensive, however, that a long sinus might yet remain, and that the delicate union of the closed parts might again be separated by any sudden turning or motion of the body, I still enjoined the most absolute rest.

On the 10th of April, I perceived a crimson suffusion on the skin round the last opening,
extending

extending to the rim of the belly, and conceiving that an adhesive inflammation had taken place, which (if unmolested) would unite the sides of the remaining sinus, I withdrew a small doffel, and covered the wound superficially with lint.

My conjecture proved true, for in two or three days the discharge totally ceased, she gradually recovered her strength and blooming complexion, has enjoyed an uninterrupted state of health ever since, and is totally free from lameness.

The exciting cause in this instance seems evidently to have been exposure to cold; and the happy termination of the disease proves that success may be expected sometimes to attend these deplorable cases, which are too often (particularly in hospitals) given up as absolutely incurable.

During the progress of this case I always kept the following considerations in view :

1. To prevent, as much as possible, the admission of external air into the cavities, by operating by puncture only.

2. To appease pain and irritation, by a libe-

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ral use of opium, and the most simple superficial dressings.

3. To endeavour to proportionate the quantum of nourishing diet and tonic medicines to the daily waste by suppuration.

And, 4. To ventilate the room frequently, by passing currents of pure air through it; for which the situation of the house was peculiarly favourable, being by the river side.

Bideford,

Feb. 4, 1793.

XIII. *Case of Phlegmonic Inflammation, with Reflections on certain Effects of Heat and Cold on the living System.* By Thomas Beddoes, M. D.

A PATIENT lately mentioned to me, among the particulars of her complaint, a circumstance which seems, both on account of its singularity and of the illustration it affords of an important principle in animal nature, to be worth recording. The case was one of those very common cases where a small irregularity
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in diet, exposure to cold, &c. produced pain and disorder in the bowels, sometimes arising to a severe fit of the colic. The patient having one day occasion to wash some butter, conceived that by removing her hands occasionally out of the cold spring water into warm water, she should have a better chance of escaping the accustomed complaint in her bowels. She accordingly heated some water as hot as she could well bear it, and, from time to time, transferred her arms out of the cold into the hot water, immersing them pretty deep in the latter. It was on a Saturday in spring: the next morning she was awakened by violent pain under each axilla, and was likewise sensible of a considerable swelling under each. The inflammation continued, and by Tuesday morning the tumors had increased, as she says, to the size of a twopenny loaf each. They soon afterwards broke, and discharged a large quantity of pus. In about a fortnight both wounds were healed. These circumstances indicate a true phlegmonic inflammation, which, I suppose, may be safely ascribed to the alternate action of heat and cold.

I know not whether it has been observed that the inflammations, particularly those of the eyes, which are so frequent in those hot climates

where it is the custom to sleep during the summer in the open air, are to be referred to the succession of heat to cold. Travellers, especially those into Egypt, have variously attempted to account for this phenomenon. Hasselquist imputes it to certain miasmata arising from the almost empty reservoirs in which the water of the Nile is preserved from inundation to inundation. This is, however, a mere hypothesis, unconfirmed by any strict analogy; nor is the supposed cause in any way brought home to the effect. As little, in my opinion, can the inflammation of the eyes be ascribed to the influence of the nocturnal light of the heavens upon the eye, the eyelids being more or less closed during sleep. The cause seems inadequate. It is common in this country to sleep in chambers not less strongly illuminated (if not more so) than in Egypt during the night, without any inconvenience to our sight. Besides, I think, if we could suppose the eye to be so dazzled by the light of the night as to be injured, the injury ought to fall upon the nerve and not upon the eyelids and external parts. The nitrous particles with which Alpinus imagines the atmosphere of Egypt to be impregnated will not, I suppose, be considered

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as a cause more probable than any of the preceding : but the following passage may serve to give an idea of the nature of the complaint in question, and its frequency at Cairo. “ Plurimasque (oculorum lippitudines) Cayri eademque per omnia anni tempora homines invadere ob nitrosum pulverem, qui continuè oculos habitantium mordicat, et calefacit, observatur, longè maximèque in æstatis primâ parte, quo tempore calor ambientis summè calidi oculos inflammat, taliumque morborum numerum auget. *Sparfim* vero per urbem toto anno hæ oculorum inflammations vagantur; atque *epidemicæ plurimæ* in primâ æstatis parte calidissimâ inæqualissimâque ob vehementissimum * meridionalium ventorum calorem, atque inflammatarum arenarum copiam, quæ ab iisdem ventis asportantur. Eo enim anni tempore è centum hominibus quinquaginta saltem lippientes observantur.” (De Medicin. Ægypt p. 24.). The flying sand must be troublesome, and probably, in many cases, supports and increases the inflammation, and in some may give rise to it : but the following

* See Niebuhr's Thermometrical Tables in the first volume of his Travels.

fact, which seems to me to render the induction complete, shows that the true and general cause is the great inequality between the temperature of the night and day; to which cause signal effect is given by the practice of sleeping *sub dio*.

Mr. Clarkson (in his Essay on the impolicy of the African slave trade) informs us, (p. 71) that “when the slaves are brought on board, the seamen, to make room for them, are turned out of their apartments between decks, and sleep, for the most part, either on the deck or in the tops of the vessel during the whole of the middle passage; or from the time of their leaving the coast of Africa, (where the days are excessively hot, and the dews excessively cold and heavy, *ibid.* p. 68) to that of their arrival at the West-India islands.” “From this bad lodging—he proceeds—and this continual exposure to colds and damps, and suddenly afterwards to a burning sun, fevers originate, which carry many of them off! Nor is this the only effect which this continual vicissitude from heat to extreme dampness and cold has upon the surviving crew: inflammatory fevers necessarily attack them. This fever attacks the whole frame: the eye feels the inflammation most. This inflammation terminates either in dispersion or suppuration: in the first instance

instance the eyes are saved ; in the latter, they are lost."

The inflammation of the eye is not the only disease produced in Egypt by the succession of hot days to cool nights any more than on board our slave ships ; in both situations causes and effects run parallel, as the reader will find upon recurring to Alpinus and the later travellers. The well-known danger of exposure to dews in hot climates, and indeed in all climates, in certain cases, seems to depend on the same principle. It is also probable that the heat of the preceding day enables the dews of the night to prepare the system for the stimulating effects of the heat of the succeeding day ; so that of two persons who should expose themselves without precaution to the cold of night and the heat of the following day, he who should have been most exhausted the day before by the heat, would, if other circumstances could be rendered alike equal, be most injured by the next alternation.

Several circumstances, such as the redness and swelling of parts exposed to cold, together with the frequent occurrence of inflammatory disorders not long after exposure to cold, were calculated to mislead observers into a belief that
these

these disorders were the direct effect of cold. Yet the great difference in the state of a part during inflammation, and under the influence of cold, might have induced them to suspect that so slight an analogy might be illusive: and after taking into the account other well-ascertained facts, they ought to have concluded that the theory was false. Linnæus, in a paper in the *Amœnitates Academicæ*,¹ expresses his astonishment at the impunity with which the heated Laplander rubs himself with snow, or even rolls in the snow, and drinks the cold snow-water. We every day see horses in a state of the most profuse perspiration freely washed with cold water, and always without injury. I have several times within these two years caused horses, accustomed to be stabled, to be turned out for a single night in winter: and no cough, catarrh, or other disorder, has ever been the consequence. It appears therefore to me that, within certain limits, and those not very narrow, the transition from a higher to a lower temperature is attended with no danger to animals in a state of tolerable health; and a person, I conceive, might suddenly pass from an higher to a lower temperature without inconvenience, even where the difference is so great as
to

to be capable of producing considerable inflammation, if the change should be made with equal celerity in a contrary direction. On this, though an interesting subject for observations on man, and experiments on animals, we want precise facts; and I state the principle in order to induce observers to compare with it the facts that fall in their way.

Besides the succession of heat to cold, and *vice versa*, there is a third case well worthy of consideration; and this where part of the body is exposed to one of these powers, and the remaining part to the other; as, for instance, where a stream of comparatively cold air flows upon part of the body of a person sitting in a warm room, and perhaps also drinking stimulating liquors. In making chemical experiments it often happens that a cold (catarrh) is taken, if the hands be much immersed in cold water, when the laboratory is much heated; by adding warm water to raise the temperature of that in the trough this danger is easily avoided. In these cases the effect seems to be the same as that of the succession of heat to cold. In persons whose bowels are extremely liable to be affected, it sometimes happens, as I have myself known it to happen, that the removal of a

foot into a cold part of the bed, after the body has become warm in bed, shall bring on acute pain in the bowels; and yet no pain is produced in getting into bed, though the temperature be the same, and perhaps lower, than that of the part into which the foot is removed; and probably total immersion in cold water would not produce any pain in the bowels. The laws of such phenomena, however deserving of investigation, have as yet scarcely been an object of attention with pathologists. It is probable that the phenomena, in any given case, are regulated by two circumstances: first, by the excess of the heat (or the strength of the stimulus, whatever it be) to which the greater part of the body is exposed, above that to which the smaller is exposed. 2. The second circumstance is the difference between the extent of the heated and cooled surfaces. When the latter is not extremely minute, and yet confined within moderate limits, the inflammatory effect seems to be considerable.

Should the circumstances be reversed, and a stream of air so warm as to convey heat to the body, instead of carrying it away, play upon a small part of its surface, the rest being exposed to a moderate, or a low temperature, it is probable

bable

bable the result would be the same as when moderate cold succeeds to warmth ; *i. e.* no bad effect would follow.

But I have added these latter speculations with a view to show how little has yet been ascertained concerning the operation of powers to whose influence we are every moment exposed ; and undoubtedly we cannot expect the desideratum to be supplied, till observers are rendered fully sensible of its existence.

XIV. *Observations on the good Effects of Caustics in Cases of White Swellings of the Joints. By Mr. Bryan Crowther, Surgeon to Bridewell and Bethlem Hospitals.*

THE great success generally attending the use of caustics in curvatures of the spine, arising from a diseased state of the vertebræ, or of their ligaments, has induced me to extend the remedy to white swellings of the joints of the limbs. I am aware that Mr. Pott applied Caustics a little above and a little below scrophulous joints of the

the limbs *, but his practice was not so successful as in cases of curved spine. The failure has been supposed to be owing to the greater distance of the limb from the heart ; it may be rather apprehended, that in the extremities the application was not near enough to the disease.

This opinion has something more than probable conjecture to recommend itself ; as in the last of the cases I shall relate, I made one issue on the integuments covering the external condyle of the thigh-bone, and another in the hollow above the knee ; and repeated attentive observations and enquiries satisfied me that the external issue afforded greater relief than the one made above the joint, which induced me to bring the issue from above the knee, by the plastered sponge, down upon the inner condyle of the thigh-bone ; and the advantage arising from merely changing the situation of the sore has fully answered my expectations.

These ideas of the malady and the remedy led me to embrace the first opportunity of applying the caustic on each side of the diseased joint. In doing this I was induced to apply it

* Vid. Vol. iii. of Mr. Earle's Edition of Mr. Pott's works, pages 497 and 498.

where the soft parts were thickest. When the eschars were separated I kept the sores open, by an occasional dressing of the *Ung. Cantharid.* or by escharotic applications; but before it could be known what effect the caustic would produce, I found that the issue ointment, as well as the escharotic applications, gave more pain than the patient could well bear. To promote a discharge from the sores in an easier way, therefore, I made use of a piece of sponge dipped in melted wax, and pressed flat, which was cut nearly to the size of the sore, to which it was confined by cross slips of adhesive plaster. The same intentions may be answered by pouring melted wax on two or three layers of lint laid on each other; but whether the lint or the sponge be used, the waxed application should be less than the sores, so as to allow room sufficient for the granulations at their edges to rise above its surface; thus will the waxed lint or sponge be confined in its situation, the use of the blister ointment be rendered unnecessary, and the bandage required to keep on the dressings will prevent any fungus that can be distressing to the patient, or troublesome to the surgeon. Should the sores contract, they may be enlarged to the extent wished for, by applying sponge that has
been

been dipped in the melted empl. attrahens. Sponge thus prepared will swell out, which is not the case when it is filled merely with wax.

The patients, in fine weather, should be in the open air as much as possible, assisted by a crutch to take off the weight of the body from the diseased limb; they should be allowed a nourishing diet, with the use of bark, and, in some cases, opium.

That the proposed means of relief do not confine those who labour under this disease to the house, is a very happy circumstance to all, but more especially to hospital patients.

Of the usual remedies in this complaint, blisters seem to be the most promising. They afford indeed, in general, only a temporary relief; but they should be applied to the joint when the pain is excruciating, as they prepare the skin for the action of the caustic; it being certain that the latter does the most execution in cases where the skin has been recently blistered.

This happened in the case of Stephen Rashfield*; in that instance we were obliged, on

* See Case I.

account of the pain the patient felt, to examine the dressings; and, on removing them, found that the caustic immediately covering the new-form'd skin, had there made a deeper eschar than on the original skin. In scrophulous joints, not attended with much pain, as generally is the case when the disease is confined to bone, recourse should be immediately had to the caustic.

When blistering distresses the patient by strangury, perhaps sinapisms might be substituted with equal effect. I have observed that they will procure more discharge; and this from a surface less superficial than a blister. In a manuscript, in my possession, without a date, entitled 'Commentaries on Monro's Osteology' I find sinapisms recommended in dropsies of the joints, in preference to blisters, as being more manageable, and their effect more lasting.

The following case related by Fabricius ab Aquapendente *, from its analogy to our present subject, will probably not be thought unworthy of perusal. "Nobilis vir in consistenti
" ætate constitutus, cum ex fluxione pituitosa
" & frigida genu haberet valde tumidum, et ita
" obduratum, ut penitus immobile factum esset,

* De chirurg. operat. cap. 106.

“ et inflexibile, vocati ad hujusmodi curam
 “ Capivaccius, et ego, existimavimus casum esse
 “ insanabilem; tamen ut aliquid tentaremus, so-
 “ latii potius egrotantis gratia, cœpimus ipsum
 “ purgare, ut tuta administraremus, interea a
 “ quodam empirico emplastrum ex quadam
 “ herba confectum, quam ego puto flammu-
 “ lam fuisse, impositum fuit, quod statim in-
 “ flammationem insignem in genu excitavit,
 “ cum rubore, calore & dolore; et ab ea hora
 “ cepit æger aliquantulum genu movere; sen-
 “ simque ita processit, ut tandem sanus factus
 “ fit.”

This disease is now and then cured, though
 more frequently only relieved, by an abscess
 forming in the vicinity of a diseased joint. In
 these cases the suppurative process seems ne-
 cessary to a cure; but when symptoms of
 recovery do not speedily follow, the patient
 becomes hectic, and at length dies, after endu-
 ring great pain and misery, unless this fatal
 termination is prevented by a timely amputation
 of the limb.

The caustic I have made use of in this disease
 has been the caustic powder prepared at Apo-
 thecaries Hall, and made into a paste by the
 addition of a little *Lixiv. Saponac.* and soft soap;
 but

but whatever escharotic may be preferred it should remain as long a time on the part as from the thickness of the integuments can be done with safety; or, rather, till a sufficient depth of eschar is made, that can secure to the surgeon a granulating surface. The pain the patient feels, and the introduction of the point of a lancet into the eschar, will best enable us to ascertain the execution done by the caustic.

The size of the sores must be determined by the patient's health, and the progress the disease has made.

As the bones at the articulations are more thinly covered than other parts of the body, I would propose that the sores in general should be made as large as a crown piece. How long they should be kept discharging can be determined only by their effect; but I would recommend their remaining open (though a little contracted) for some time after the cure.

It is worthy of remark, that in the cases where the caustic, with the subsequent treatment as above recommended, has been tried, collections of diseased fluids in and about the scrophulous joint have been dispersed, and thereby the morbid enlargement of the joint reduced.

M 2

CASE

CASE I.

The first case in which the caustics were applied was that of Stephen Rashfield. He had been afflicted, according to his own account, with a white swelling of his knee eight years. During the first four of these the disease, he observed, had made a considerable progress, till an abscess formed on the outside of the joint, which was opened by Mr. Pitts, late surgeon of St. Bartholomew's Hospital, and discharged half a pint of matter. This abscess remained open ten months, during which time he experienced great relief. Soon after this period he relapsed, and from that time became worse.

He applied to me in April 1792; and, besides this scrophulous knee, which was greatly enlarged and much contracted, he had nodes of the tibia on the other leg, attended with nocturnal pains, which he said could not be venereal, as he had never been in the way of contracting such a complaint. They yielded, however, to a mercurial course, which afforded no relief to the diseased joint. His pains being excruciating, a blister was applied over the whole knee; this

this procured a temporary ease, but did not tend to alter the state of the joint. Caustics were therefore tried in the manner I have recommended, and though this case did not succeed, yet the patient for many weeks found himself relieved by them, and the size of the knee was reduced.

In the month of December he was admitted into St. Thomas's Hospital, where he underwent amputation.

CASE II.

Charles Sellers applied to me in June 1792, on account of a scrophulous knee which had been diseased eighteen years. It was nearly twice as large as the sound knee, and was attended with violent pain. A blister was applied to it, which afforded him no relief; caustics therefore were had recourse to, and when the eschars were digested off he became easier; and in a few weeks the knee was free from pain, and much diminished in size. His health at the same time was greatly improved.

Some of my medical friends, who had seen him previously to the application of the caustics,

tics, noticed their effects with pleasure. He continued to go on well, and we had every reason to hope for a gradual cure till the middle of November, when a large abscess formed in the ham. After this his health suffered so much from the quantity of matter discharged, that he requested me to take off his limb, which I did on the 25th of December. The diseased knee was then reduced very nearly to the size of the other. His stump is now perfectly healed, and his health re-established.

CASE III.

Elizabeth Platt, of Hoxton, about seven years of age, a little before Christmas 1791, was observed by her mother to walk lame, which was attributed to chilblains; but, on undressing her, her mother discovered that one knee was larger than the other. On the 6th of April following I visited the patient, and found her labouring under symptoms of hectic fever. Her knee joint was then much contracted, incapable of flexion or extension, and much enlarged, particularly the inner condyle of the thigh bone. As her pain was not violent, except
when

when the limb was moved, recourse was immediately had to the caustic, which has effected a re-establishment of her health, a diminution in a great degree of the enlargement of the joint, with a perfect recovery of its motion, and a considerable relaxation of the tendons of the flexor muscles, the remaining contraction of which seems the only impediment to the full exertion of the limb ; as she can bend the joint with ease, and can extend the leg as far as the contraction of the tendons will admit of.

Large discharges suddenly produced from the surface of the issues seem to relieve the disease, and amend the constitution, much more than a regular and gradual drain. This remark was made in Platt's case since Christmas last ; as before that time the means of dilating the fores by a plastered sponge, and consequently increasing the discharge, had not occurred to me.

It may be thought, and with good reason, that my experience of the efficacy of caustics in these cases is too inconsiderable to prove what degree of confidence they may merit as a remedy in such complaints. The good effects that were produced by them in the instances I have related seem indeed sufficient to recommend them

to the notice of surgeons in similar cases ; but the utility of this, or of any other mode of treatment can be satisfactorily ascertained only by an extensive trial ; and I submit the above observations to candid practitioners that they may augment or correct them.

Boswell Court,
April 27th, 1793.

XV. *On the Cure of the Elephantiasis.* By At'har Ali' Khán, of Dehli. Vide *Asiatick Researches : or, Transactions of the Society instituted in Bengal, for inquiring into the History and Antiquities, the Arts, Sciences, and Literature of Asia.* Volume II. 4to. Calcutta, 1790.

IN an introductory note to this paper, Sir William Jones, the learned president of the society, observes, that the disease which is the subject of it has been long known in Hindustan, and that the writer of it, whose father was physician

fician to Nádir Sháh, and accompanied him from Persia to Dehli, has assured him that it rages with virulence among the native inhabitants of Calcutta.

This disease, Sir William remarks, is the *judhám* of the Arabs, or *khórah* of the Indians. It is also, he adds, called in Arabia *dáül'ásad*, a name corresponding with the *leontiasis* of the Greeks, and supposed to have been given in allusion to the grim, distracted, and *lion-like* countenances of the miserable persons who are affected with it. The more common name of the distemper is *elephantiasis*, or, as Lucretius calls it, *elephas*, because it renders the skin, like that of an elephant, uneven and wrinkled, with many tubercles and furrows; but this complaint the learned president observes, must not be confounded with the *dáül'fil*, or swelled legs, described by the Arabian physicians, and very common in India. It has no fixed name in English, though Hillary, in his observations on the diseases of Barbadoes, calls it the *leprosy of the joints*, because it principally affects the extremities, which, in the last stage of the malady are distorted, and at length drop off: but since it is in truth a distemper corrupting the whole mass of blood, and therefore considered by

Paulus

Paulus Ægineta as an universal ulcer, it requires, Sir William thinks, a more general appellation, and may properly be named the *black leprosy*; which term is in fact adopted by Sauvages and Gorraeus, in contradistinction to the white leprosy, or the *beres* of the Arabs, and *leuce* of the Greeks.

This disease, by whatever name we distinguish it, is peculiar to hot climates, and has rarely appeared in Europe. Lucretius supposes it confined to the banks of the Nile; and it has certainly been imported from Africa into the West India islands by the black slaves.

With respect to the remedy recommended for the cure of this disease in Hindustan, the learned president observes, that whatever apprehensions may be formed of future danger from the distant effect of arsenick, even though it should eradicate a present malady, yet as no such inconvenience has arisen from the use of it in India, and as experience must ever prevail over theory, he cannot help wishing, that this ancient Hindu medicine may be fully tried under the inspection of the European surgeons in that country. Should it, he adds, be thought that a mixture of sulphur must render the poison less active, it may be advisable, at first, to administer

nister orpiment, instead of the crystalline arsenick.

We come now to the paper itself, which we shall here give entire.

‘ God is the all-powerful healer.

‘ In the year of the Messiah 1783, when the
 ‘ worthy and respectable *Maulavi* M^r M^u-
 ‘ HAMMED HUSAI’N, who excels in every
 ‘ branch of useful knowledge, accompanied Mr.
 ‘ Richard Johnson from Lac’knau to Calcutta,
 ‘ he visited the humble writer of this tract,
 ‘ who had long been attached to him with sincere affection, and in the course of their conversation, “ One of the fruits of my late excursion, said he, is a present for you, which
 ‘ suits your profession, and will be generally
 ‘ useful to our species : conceiving you to be
 ‘ worthy of it by reason of your assiduity in
 ‘ medical inquiries, I have brought you a prescription, the ingredients of which are easily
 ‘ found, but not easily equalled, as a powerful
 ‘ remedy against all corruptions of the blood,
 ‘ the *judham*, and the *Persian* fire, the remains
 ‘ of which are a source of infinite maladies.
 ‘ It is an old secret of the Hindu physicians ;
 ‘ who applied it also to the cure of cold and
 ‘ moist

“ moist distempers, as the palsy, distortions of
 “ the face, relaxation of the nerves, and similar
 “ diseases : its efficacy too has been proved by
 “ long experience, and this is the method of
 “ preparing it.

“ Take of white arsenic,* fine and fresh, one
 “ *tóla* ; of picked black pepper six times as
 “ much : let both be well beaten at intervals
 “ for four days successively in an iron mortar,
 “ and then reduced to an impalpable powder in
 “ one of stone, with a stone pestle, and thus
 “ completely levigated, a little water being
 “ mixed with them. Make pills of them as
 “ large as tares, or small pulse, and keep them
 “ dry in a shady place*.

“ One

* The following note to the above passage is by Sir William Jones : ‘ The lowest weight in general use among the
 ‘ Hindus is the *reti*, called in Sanscrit either *rettica* or *rac-*
 ‘ *tica*, indicating *redness*, and *crishnalà* from *crishna*, *black* ;
 ‘ it is the *red* and *black* seed of the *gunjà*-plant, which is a
 ‘ creeper of the same class and order at least with the *glycy-*
 ‘ *rhiza* ; but I take this from report, having never examined
 ‘ its blossoms. One *ratticà* is said to be of equal weight
 ‘ with three barley corns, or four grains of rice in the husk ;
 ‘ and eight *reti* weights, used by jewellers, are equal to
 ‘ seven carats. I have weighed a number of the seeds in
 ‘ diamond scales, and find the average apothecary’s weight
 ‘ of

“ One of those pills must be swallowed morn-
 “ ing and evening with some *betel*-leaf, or, in
 “ countries where *betel* is not at hand, with
 “ cold water: if the body be cleansed from
 “ foulness and obstructions by gentle cathar-
 “ tics and bleeding, before the medicine is
 “ administered, the remedy will be speedier.”

‘ The principal ingredient of this medicine
 ‘ is the arsenic, which the Arabs call *shucc*, the
 ‘ Persians *mergi mûsh*, or *mouffe-bane*, and the
 ‘ Indians *sanc’hyâ*; a mineral substance ponde-
 ‘ rous and *crystalline*; the orpiment, or yellow
 ‘ arsenic, is the weaker sort. It is a deadly
 ‘ poison, and so subtil, that when mice are kil-
 ‘ led by it, the very smell of the dead will de-
 ‘ stroy the living of that species; after it has

‘ of one seed to be a grain and five sixteenths. Now in the
 ‘ Hindu medical books ten of the *ratticâ* seeds are one
 ‘ *mâshaca*, and eight *mâshacâs* make a *tôlaca* or *tôlà*; but in
 ‘ the law books of Bengal a *mâshaca* consists of *sixteen ratticâs*,
 ‘ and a *tôlaca* of five *mâshâ’s*; and, according to some authori-
 ‘ ties, *five reti’s* only go to one *mâshâ*, *sixteen* of which make
 ‘ a *tôlaca*. We may observe, that the silver *reti* weights, used
 ‘ by the Goldsmiths at Banâres, are *twice* as heavy as the
 ‘ *seeds*; and thence it is that *eight reti’s* are commonly said
 ‘ to constitute one *mâshâ*; that is, *eight* silver weights, or
 ‘ *sixteen* seeds; eighty of which seeds, or 105 grains, con-
 ‘ stitute the quantity of arsenic in the Hindu prescription.’

‘ been

' been kept about seven years it loses much of
 ' its force : its colour becomes turbid, and its
 ' weight is diminished. This mineral is hot and
 ' dry in the fourth degree ; it causes suppura-
 ' tion, dissolves or unites according to the
 ' quantity given ; and is very useful in closing
 ' the lips of wounds, when the pain is too in-
 ' tense to be borne. An unguent made of it,
 ' with oils of any sort, is an effectual remedy
 ' for some cutaneous disorders ; and, mixed
 ' with rose water, it is good for cold tumours
 ' and for the dropsy : but it must never be
 ' administered without the greatest caution ; for
 ' such is its power, that the smallest quantity
 ' of it in powder, drawn, like alcohol, between
 ' the eyelashes, would, in a single day, entirely
 ' corrode the coats and humours of the eye ;
 ' and fourteen *retis* of it would in the same
 ' time destroy life. The best antidote against
 ' its effects are the scrapings of leather reduced
 ' to ashes. If the quantity of arsenic taken be
 ' accurately known, four times as much of
 ' these ashes, mixed with water and drank by
 ' the patient, will sheath and counteract the
 ' poison.

' The writer, conformably to the directions
 ' of his learned friend, prepared the medicine ;
 ' and,

‘ and, in the same year, gave it to numbers
 ‘ who were reduced by the diseases above-men-
 ‘ tioned to the point of death. God is his wit-
 ‘ ness, that they grew better from day to day,
 ‘ were at last completely cured, and are now
 ‘ living (except one or two, who died of other
 ‘ disorders) to attest the truth of this assertion.
 ‘ One of his first patients was a *Pârsi*, named
 ‘ *Menúchehr*, who had come from Surat to this
 ‘ city, and had fixed his abode near the writer’s
 ‘ house : he was so cruelly afflicted with a
 ‘ confirmed lues, here called *the Persian fire*,
 ‘ that his hands and feet were entirely ulcerated
 ‘ and almost corroded, so that he became an
 ‘ object of disgust and abhorrence. This man
 ‘ consulted the writer on his case, the state of
 ‘ which he disclosed without reserve. Some
 ‘ blood was taken from him the same day, and
 ‘ a cathartic administered on the next. On
 ‘ the third day he began to take the arsenic
 ‘ pills, and, by the blessing of God, the viru-
 ‘ lence of his disorder abated by degrees, until
 ‘ signs of returning health appeared ; in a fort-
 ‘ night his recovery was complete, and he was
 ‘ bathed, according to the practice of our phy-
 ‘ sicians ; he seemed to have no virus left in his
 ‘ blood,

‘ blood, and none has been since perceived by
 ‘ him.

‘ But the power of this medicine has chiefly
 ‘ been tried in the cure of the *juzám*, as the
 ‘ word is pronounced in India; a disorder in-
 ‘ fecting the whole mass of blood, and thence
 ‘ called by some *fisádi khún*. The former name
 ‘ is derived from an Arabic root signifying, in
 ‘ general, *amputation, maiming, excision*, and par-
 ‘ ticularly the *truncation or erosion of the fingers*,
 ‘ which happens in the last stage of the disease.
 ‘ It is extremely contagious, and for that rea-
 ‘ son, the prophet said: *Ferrú miná’lmejdhúmi*
 ‘ *camá teferrú miná’l ásad*, or, “Flee from a
 ‘ person afflicted with the judhám, as you would
 ‘ flee from a lion.” The author of the *babbru’l-*
 ‘ *jawahir*, or *sea of pearls*, ranks it as an infec-
 ‘ tious malady with the measles, the small pox,
 ‘ and the plague. It is also hereditary, and, in
 ‘ that respect, classed by medical writers, with
 ‘ the gout, the consumption, and the white
 ‘ leprosy.

‘ A common cause of this distemper is the
 ‘ unwholesome diet of the natives, many of
 ‘ whom are accustomed, after eating a quantity
 ‘ of fish, to swallow copious draughts of milk,
 ‘ which

' which fail not to cause an accumulation of yel-
 ' low and black bile, which mingles itself with
 ' the blood, and corrupts it : but it has other
 ' causes ; for a *bráhmén*, who had never tasted
 ' *fish* in his life, applied lately to the composer
 ' of this essay, and appeared in the highest de-
 ' gree affected by a corruption of blood, which
 ' he might have inherited, or acquired by other
 ' means. Those, whose religion permits them
 ' to eat *beef*, are often exposed to the danger of
 ' heating their blood intensely, through the
 ' knavery of the butchers in the *bázár*, who
 ' fatten their calves with *baláwer* ; and those,
 ' who are so ill-advised as to take provocatives,
 ' a folly extremely common in India, at first
 ' are insensible of the mischief, but, as soon as
 ' the increased moisture is dispersed, find their
 ' whole mass of blood inflamed, and, as it were,
 ' adust ; whence arises the disorder of which
 ' we are now treating. The *Persian* (or vene-
 ' real) fire generally ends in this malady ; as
 ' one *Dévi Prasád*, lately in the service of Mr.
 ' Vansittart, and some others, have convinced
 ' me by an unreserved account of their several
 ' cases.

' It may here be worth while to report a re-
 ' markable case, which was related to me by a
 VOL. IV. N man,

‘ man, who had been afflicted with the *juzám*
 ‘ near four years ; before which time he had
 ‘ been disordered with the *Persian* fire, and,
 ‘ having closed an ulcer by means of a strong
 ‘ healing plaister, was attacked by a violent
 ‘ pain in his joints. On this he applied to a
 ‘ *cabirája*, or Hindu physician, who gave him
 ‘ some pills, with a positive assurance, that the
 ‘ use of them would remove his pain in a few
 ‘ days ; and in a few days it was, in fact, whol-
 ‘ ly removed : but, a very short time after, the
 ‘ symptoms of the *juzám* appeared, which con-
 ‘ tinually increased to such a degree, that his
 ‘ fingers and toes were on the point of drop-
 ‘ ping off. It was afterwards discovered, that
 ‘ the pills which he had taken, were made of
 ‘ cinnabar, a common preparation of the Hin-
 ‘ dus ; the heat of which had first stirred the
 ‘ humours, which, on stopping the external
 ‘ discharge, had fallen on the joints, and there
 ‘ had occasioned a quantity of adu st bile to mix
 ‘ itself with the blood, and infect the whole
 ‘ mass.

‘ Of this dreadful complaint, however cau-
 ‘ sed, the first symptoms are a numbness and
 ‘ redness of the whole body, and principally
 ‘ of the face ; an impeded hoarse voice, thin
 hair,

‘ hair, and even baldness; offensive perspira-
 ‘ tion and breath, and whitlows on the nails.
 ‘ The cure is best begun with copious bleed-
 ‘ ing, and cooling drink, -such as a decoction
 ‘ of the *nílúfer*, or *nymphæa*, and of violets,
 ‘ with some doses of manna: after which
 ‘ stronger catharticks must be administered. But
 ‘ no remedy has proved so efficacious as the
 ‘ pills composed of arsenic and pepper: one
 ‘ instance of their effects may here be mention-
 ‘ ed, and many more may be added, if re-
 ‘ quired.

‘ In the month of February, in the year just
 ‘ mentioned, one *Shaikh Ramazáni*, who was
 ‘ then an upper servant to the board of revenue,
 ‘ had so corrupt a mass of blood, that a black
 ‘ leprosy of his joints was approaching, and
 ‘ most of his limbs began to be ulcerated: in
 ‘ this condition he applied to the writer, and
 ‘ requested immediate assistance. Though the
 ‘ disordered state of his blood was evident on
 ‘ inspection, and required no particular decla-
 ‘ ration of it, yet many questions were put to
 ‘ him, and it was clear from his answers, that
 ‘ he had a confirmed *juzám*: he then lost a
 ‘ great deal of blood, and, after due prepara-
 ‘ tion, took the arsenic pills. After the first

‘ week his malady seemed alleviated ; in the
 ‘ second it was considerably diminished ; and,
 ‘ in the third, so entirely removed, that the pa-
 ‘ tient went into the bath of health, as a token
 ‘ that he no longer needed a physician.’



XVI. *On the Spikenard of the Ancients.* By Sir William Jones, Knt. Vide *Asiatic Researches : or, Transactions of the Society instituted in Bengal, for inquiring into the History and Antiquities, the Arts, Sciences, and Literature of Asia.* Volume II. 4to. Calcutta, 1790.

THE Indian Spikenard has long been a subject of uncertainty. All agree that it is an odöriferous plant, the best sort of which, according to Ptolemy, grew about Ranganritica, and on the borders of the country now called Butan. It is mentioned by Dioscorides ; but his description of it is very imperfect, and even Linnæus was not enabled to class it with certainty, though he supposed it to be a species of Andropogon. A similar opinion, as we have seen, has lately been adopted by Dr. Blane, in an ingenious essay on this subject* ;

* See vol. i, p. 153.

but

but Kœnig, a disciple of Linnæus, who died in India, assured the learned author of the paper now before us, that he knew not what the Greek writers meant by the Spikenard of India. Since the death of Kœnig he has consulted, he tells us, every botanist and physician, with whom he has been acquainted, on this subject; but all have confessed, without reserve, though not without some regret, that they were ignorant what was meant by the Indian Spikenard.

In order to procure information from the learned natives, it was necessary to know the name of the plant in some Asiatic language. The very word *Nard*, the author observes, occurs in the Song of Solomon, but the name and the thing were both exotic. The Hebrew lexicographers imagine both to be Indian, but the word, he tells us, is in truth Persian, and he has found it in a distich of an old poet, where it is not easy to determine whether *Nard* means the *stem* or the *pith*; but it is manifestly a part of a vegetable, and neither the *root*, the *fruit*, nor the *branch*, which are all separately named. Whatever it signified in old Persian, the Arabic *Sumbul*, which means an *ear* or *spike*, has long been substituted for it; and there can be no

N 3

doubt,

doubt, he thinks, that by the *Sumbul* of *India*, the Muselmáns understand the same plant with the *Nard* of Ptolemy, and the *Nardostachys*, or Spikenard, of Galen, who was deceived by the dry specimens he had seen, and mistook them for roots.

A singular description of the *Sumbul*, by Abu'lfazl, who frequently mentions it as an ingredient in Indian perfumes, had for some time almost convinced our author that the true Spikenard was the *Cétaca*, or *Pandanus*. His words are, *Sumbul panj berg dáred, cel dirázii ín dab angoshtestu pahnái sek*, or, “ The Sumbul has five leaves, ten fingers long, and “ three broad.” Our author was aware that the writer in question, not being a botanist, might easily have mistaken a thyrsus for a single flower. He had seen no blossom, or assemblage of blossoms, of such dimensions, except the male *Cétaca*; but what most confirmed his opinion, was the exquisite fragrance of the *Cétaca*-flower, which to his sense far surpassed the richest perfumes of Europe or Asia. Scarce a doubt remained, when he met with a description of the *Cétaca* by Forskohl, whose words are so perfectly applicable to the general
idea,

idea, which we are apt to form of Spikenard, that he has thought it right to give us a literal translation of them: “ The *Pandanus* is an incomparable plant, and cultivated for its odour, which it breathes so richly, that one or two *spikes*, in a situation rather humid, would be sufficient to diffuse an odoriferous air for a long time through a spacious apartment; so that the natives in general are not solicitous about the living plants, but *purchase the spikes at a great price.*” Our author learned also that a fragrant essential oil was extracted from the flowers; and he procured from Banâres a large phial of it, which was adulterated with sandal; but the very adulteration convinced him, that the genuine essence must be valuable, from the great number of thyrsi that must be required in preparing a small quantity of it. Thus had he nearly persuaded himself that the true Nard was to be found on the banks of the Ganges, where the Hindoo women roll up its flowers in their hair after bathing; and he imagined, that the precious alabaster box mentioned in the scripture, and the small onyx, in exchange for which the poet offers to entertain his friend with a cask of old wine, contained an essence of the same kind

with the Nard he had procured ; but an Arab of Mecca, who saw in his study some flowers of the *Cétaca*, informed him that the plant was extremely common in Arabia, where it was named *Cádhi* ; and several Mahomedans of rank and learning have since assured him, that the true name of the India *Sumbul*, was not *Cétaca*, but *Jatámánsi*.

Our author now abandoned his first opinion, and began to enquire eagerly for the *Jatámánsi*. A fresh plant was soon brought to him, and appeared, on inspection, to be a *cyperus*, the root of which had a pungent taste, with a faint aromatic odour ; but no part of it bore the least resemblance to the drug known in Europe by the name of Spikenard ; and a Muselmán physician from Dehli assured him the plant was not *Jatámánsi*, but *Súd*, as it is named in Arabic, which the author of the *Tokfatu'l Múmenín* particularly distinguishes from the Indian *Sumbul* :
 “ *Súd*, says that writer, has a roundish olive-
 “ shaped root, externally black, but white in-
 “ ternally, and so fragrant as to have obtained
 “ in Persia the name of *subterranean musk* : its
 “ leaf has some resemblance to that of a leek,
 “ but is longer and narrower, strong, some-
 what

“ what rough at the edges, and tapering to a
 “ point. 2. *Sumbul* means a *spike* or *ear*, and
 “ was called *Nard* by the Greeks. There are
 “ three sorts of *Sumbul*, or *Nardin*; but when
 “ the word stands alone it means the *Sumbul* of
 “ India, which is an herb *without flower* or
 “ *fruit*, (he speaks of the drug only) like the
 “ tail of an ermine, or of a small weasel, but
 “ not quite so thick, and about the length of a
 “ finger. It is darkish, inclining to yellow, and
 “ very fragrant. It is brought from *Hindustan*,
 “ and its medicinal virtue lasts three years.”

A specimen of the dry *jatámánsi* was pro-
 cured, and found to correspond exactly with the
 above description of the *Sumbul*; and our au-
 thor farther learned, that the merchants brought
 this drug from the mountainous country to the
 North East of Bengal; that it was the entire
 plant, not a part of it, and received its Sanscrit
 names from its resemblance to *locks of hair*; as
 it is called *Spikenard*, he supposes, from its
 resemblance to a spike, when it is dried, and
 not from the configuration of its flowers. The
 Persian author describes the whole plant as re-
 sembling the tail of an ermine; and the *Jatá-
 mánsi*, which is manifestly the *Spikenard* of our
 druggists, has, it seems, precisely that form,
 con-

consisting of withered stalks and ribs of leaves, adhering in a bundle of yellowish brown capillary fibres, and constituting a spike about the size of a small finger. We may, on the whole, we are told, be assured, that the *Nardus* of Ptolemy, the *Indian Sumbul* of the Persians and Arabs, the *Jatámánsi* of the Hindus, and the Spike-nard of our shops, are one and the same plant.

Hitherto the *Jatámánsi* has not been found growing in any part of the British territories in India. Mr. Saunders, who met with it in Buthan, where, as he was informed, it is very common, and whence it is brought in a dry state to Rangpur, supposed it to be a species of the *Baccharis* ; but our author has reason to think that the plant which Mr. Saunders saw was not the *Jatámánsi*, and having traced the Indian Spikenard, by this name, to the mountains of Népal, he requested his friend Mr. Law, who then resided at Gayá, to procure some of the recent plants by the means of the Nepalese pilgrims. Many young plants were accordingly sent to Gayá, where they have blossomed. From one of these plants a drawing (for an engraving of which we must refer our readers to the work itself,) was made by Mr. Burt, a gentleman in whose accuracy our author expresses the
most

most perfect confidence, and by whose account he has been enabled to give a botanical description of the plant. But before he proceeds to this description, he endeavours to remove a prejudice, in regard to the *natural order* of the Spikenard; which they, he observes, who are addicted to swear by every word of their master Linnæus, will hardly abandon, and which he himself, he confesses, has abandoned with some difficulty. *Nard* has been generally supposed to be a *grass*; and the word *stachys*, or *spike*, which agrees with the habit of that natural order, gave rise, perhaps, to the supposition. There is a plant in Java, it seems, which most travellers and some physicians call *Spikenard*; and our author has been informed by the governor of Chinsura, that a Dutch author pronounces it a *grass like the cyperus*, but insists that what is called the *spike* is the fibrous part above the root, as long as a man's little finger, of a brownish hue inclining to red or yellow, rather fragrant, and with a pungent, but aromatic, scent. From this account of it our author would have supposed, he tells us, the plant in question to be the *Jatámánsi*, if a well-informed man, who had seen it in the island, had not assured him that it is a sort of pimento, and consequently a
species

species of myrtle. The resemblance already mentioned between the Indian *Sumbul*, and the Arabian *Súd* or *Cyperus*, has led him to suspect that the true Nard was a *grass* or a *reed*; and, as Bengal abounds in odoriferous grasses, he began to collect them from different quarters. From Colonel Kyd he received two plants with sweet smelling roots; and, as they were known to the Pandits, he soon found their names in a Sanscrit dictionary: one of them is called *gandbhāṣat'hi*, and is used by the Hindus to scent the red powder of *Sapan* or *Bakkam* wood, which they scatter in the festival of the vernal season. The other has many names, and among them *Nagaramastac* and *gónarda*, the second of which means *rustling in the water*; for all the Pandits, it seems, insist, that *Nard* is never used as a noun in Sanscrit, and signifies, as the root of a verb, *to sound*, or *to rustle*. Soon after, Mr. Burrow brought him, from the banks of the Ganges, near Heridwâr, a very fragrant grass, which in some places covers whole acres, and diffuses, when crushed, so strong an odour, that a person, he says, might easily have smelt it, as Alexander is reported to have smelt the Nard of Gedrosia, from the back of an elephant. From Mr. Blane, of *Lucnow*,
 he

he received a fresh specimen of the same plant. This is the species of *Andropogon* which Dr. Blane, as we have seen *, supposed to be the true *Nardus Indica* of the ancients. Lastly, Dr. Anderson, of Madras, favoured our author with a complete specimen of the *Andropogon Nardus*, one of the most common grasses on the coast, and flourishing most luxuriantly on the mountains, never eaten by cattle, but extremely grateful to bees, and containing an essential oil, which is extracted from it in many parts of Hindustan, and used as an *átar*, or perfume. He added, we are told, a very curious philological remark, that, in the *Tamul* dictionary, most words beginning with *nár* have some relation to fragrance, so that not only the *Nard* of the Hebrews and Greeks, but even the *copia narium* of Horace, may be derived from an Indian root. On this point, however, the learned author has thought it right to observe that he has not met with any such root in Sanscrit, the oldest polished language of India, and that in Persian, which has a manifest affinity with it, *nár* means a pomegranate, and *nárgil* a cocoa-nut, neither of which has any remarkable fragrance.

* Vol. i, p. 158.

None of these grasses bear any resemblance to the *Jatamansi*, which, our author conceives, to be the true *Nardus* of the ancients. He is not, indeed, of opinion that the *Nardum* of the Romans was merely the essential oil of the plant, from which it was denominated; but he is strongly inclined, he tells us, to believe, that it was a generick word, meaning what we now call *átar*, and either the *átar* of roses from Cashmir and Persia, that of Cétaca or Pandanus, from the western coast of India, or that of Aguru, or aloe-wood, from Asam, or Cochinchina, the process of obtaining which is described by Abu'lfazl, or the mixed perfume, called *ábir*, of which the principal ingredients were yellow sandal, violets, orange flowers, wood of aloes, rose water, musk, and true spikenard: all those essences and compositions, he observes, were costly; and most of them being sold by the Indians to the Persians and Arabs, from whom, in the time of Octavius, they were received by the Syrians and Romans, they must have been extremely dear at Jerusalem, and at Rome. There might also have been a pure *nardine oil*, as Athenæus calls it, but *Nardum*, our author thinks, probably meant (and Kœnig, he adds, was of the same opinion)

opinion) an Indian essence in general, taking its name from that ingredient, which had, or was commonly thought to have, the most exquisite scent.

After these preliminary observations the author gives the following natural characters of the Jatamansi.

AGGREGATE.

Cal. Scarce any : *margin*, hardly discernible.

Cor. One petal. *Tube* somewhat gibbous. *Border* five cleft.

Stem. Three *anthers*.

Pist. *Germ* beneath. One *style* erect.

Seed solitary, crowned with a pappus.

Root fibrous.

Leaves hearted, fourfold ; *radical* leaves petioled.

It appears therefore, our author observes, to be a species of valerian, which, in the language of Linnæus he would describe, “*VALERIANA JATA'MA'NSI floribus triandris, foliis cordatis quaternis radicalibus petiolatis.*”

The radical leaves, rising from the ground, and infolding the young stem, are plucked up,
we

we are told, with a part of the root, and being dried in the sun, or by an artificial heat, are sold as a drug, which from its appearance has been called *spikenard*; though, as the Persian writer, already quoted, observes, it might be compared more properly to the *tail of an ermine*; when nothing remains but the dry fibres of the leaves, which retain their original form, they are said to have some resemblance to a *lock of hair*, from which the Sanscrit name, as we have seen, is derived.

Two mercantile agents from Butan, on the part of the D  v  raj  , or Sovereign, were examined at our author's request by Mr. Harington, and informed him that the drug which the Bengalese call jatamanfi, " grows erect above
 " the surface of the ground, resembling in colour an ear of green wheat; that, when recent, it has a faint odour, which is greatly
 " increased by the simple process of drying it;
 " that it abounds on the hills, and even on
 " the plains, of Butan, where it is collected and
 " prepared for medicinal purposes." From Mr. Purling, who made inquiries for it among the merchants of Butan, our author had before learned that the living plant could not be obtained without an order from the D  v  raj  .

XVII. *An Account of some chemical Experiments on Tabasheer.* By James Louis Macie, Esq. F. R. S.—Vide *Philosophical Transactions of the Royal Society of London*, Vol. LXXXI. for the Year 1791. Part II. 4to. London, 1791.

THE Tabasheer employed in these experiments consisted of seven different specimens, one of which was Tabasheer from Hydrabad*, the finest kind of this substance that can be purchased. This being in the greatest quantity, and appearing to be the most homogeneous and pure, the experiments, we are told, were begun, and principally made, with it.

This Hydrabad Tabasheer, in its general appearance, Mr. Macie observes, very much resembled fragments of that variety of calcedony which is known to mineralogists by the name of *Cacholong*. Some pieces, he tells us, were quite opaque, and absolutely white; while others possessed a small degree of transparency, and had a bluish cast. The latter, held before a lighted candle, appeared, it seems, very pellucid, and of a flame colour.

* See Vol. I. page 148.

The pieces, he observes, were of various sizes; the largest of them not exceeding two or three tenths of an inch cubic. Their shape was quite irregular; some of them bore impressions of the inner part of the bamboo against which they were formed.

This Tabasheer, we are told, could not be broken by pressure between the fingers; but by the teeth it was easily reduced to powder. On first chewing it felt gritty, but soon ground to impalpable particles.

Applied to the tongue, it adhered to it by capillary attraction.

It had a disagreeable earthy taste, something like that of magnesia.

No light was produced either by cutting it with a knife, or by rubbing two pieces of it together, in the dark; but a bit of this substance, being laid on a hot iron, soon appeared surrounded with a feeble luminous *auréole*. By being made red hot, it was deprived of this property of shining when gently heated; but recovered it again, on being kept for two months.

Examined with the microscope, it did not appear different from what it does to the naked eye.

Mr.

Mr. Macie found that a quantity of this Tabasheer which weighed 75.7 gr. in air, weighed only 41.1 gr. in distilled water whose temperature was 52.5 F. which makes its specific gravity to be very nearly $= 2.188$.

Mr. Cavendish, he adds, who tried this same parcel when become again quite dry, found its specific gravity to be $= 2.169$.

In both the experiments to ascertain the specific gravity of this substance, great care, we are told, was taken that every bit was thoroughly penetrated with the water, and transparent to its very center, before its weight in the water was determined.

Mr. Macie gives an account of his experiments on this substance treated with water; with vegetable colours; at the fire; with acids; with liquid alkalies; with dry alkalies; and with other fluxes : after which follow his observations on the other specimens.

It appears from his experiments that five of the specimens consisted of genuine Tabasheer; but that those kinds, immediately taken from the plant, contained a certain portion of a vegetable matter, which was wanting in the specimens procured from the shops, and which

our author thinks had probably been deprived of this admixture by calcination.

The nature of this substance, Mr. Macie observes, is very different from what might have been expected in the product of a vegetable. Its indestructibility by fire; its total resistance to acids; its uniting by fusion with alkalies in certain proportions into a white opaque mass, in others into a transparent permanent glass; and its being again separable from these compounds, entirely unchanged by acids, &c. (all of which circumstances are proved by his experiments) seem, he thinks, to afford the strongest reasons to consider it as perfectly identical with common *siliceous earth*.

Yet from pure quartz, he observes, it may be thought to differ in some material particulars; such as in its fusing with calcareous earth, in some of its effects with liquid alkalies, in its taste, and its specific gravity.

But its taste, he thinks, may arise merely from its divided state, for chalk and powdery magnesia both have tastes, and tastes which are very similar to that of pure Tabasheer; but when these earths are taken in the denser state of crystals, they are found to be quite insipid; so Tabasheer, he observes, when made more solid by

exposure to a pretty strong heat, was no longer perceived, when chewed, to act upon the palate.

From Mr. Macie's experiments with liquid alkalies we learn that some liquid caustic vegetable alkali being heated in a phial, Tabasheer was added to it, which dissolved very readily and in considerable quantity; and that on exposing this solution in a shallow glass to spontaneous evaporation in a warm room, at the end of a day or two it was converted into a firm, milky jelly, which in a few days more became whiter, and finally became quite dry and separated from the glass. These effects, however, with liquid alkali, he observes, are found on accurate comparison not to be peculiar to this substance; for though it was found, on trial, that the powder of common flints, when boiled in liquid caustic alkali, was scarcely at all acted upon; and that the very little which was dissolved was soon precipitated again, in the form of minute *focculi*, on exposing the solution to the air, and was immediately thrown down on the admixture of an acid; yet the precipitate obtained from *liquor silicum* by marine acid was discovered, it seems, even when dry, to dissolve readily in this alkali, but while still moist to do so very copiously, even without the assistance of

heat; and some of this solution, we are told, thus saturated with filiceous matter by ebullition, being exposed to the air in a shallow glass, became a jelly by the next day, and the day after dried, and cracked, &c. exactly like the solution of Tabasheer.

Mr. Macie observes that the ashes, obtained by burning the bamboo, boiled in marine acid, left a very large quantity of a whitish insoluble powder, which, fused at the blow-pipe with soda, effervesced, and formed a transparent glass. Only the middle part of the joints, we are told, was burned; the knots were sawed off, left, being porous, Tabasheer might be mechanically lodged in them. However, the great quantity of this remaining substance, he thinks, shows it to be an essential, constituent part of the wood.

The ashes of common charcoal, digested in marine acid, left, it seems, in the same manner an insoluble residuum which fused with soda with effervescence, and formed glass; but the proportion of this matter to the ashes, our author observes, was greatly less than in the foregoing case.

Mr. Macie gives the following account of a singular circumstance, which, it seems, presented itself after his experiments on this substance were

were finished.—“ A green bamboo, cut in the
 “ hot-house of Dr. Pitcairn, at Islington, was
 “ judged to contain Tabasheer in one of its
 “ joints, from a rattling noise discoverable on
 “ shaking it; but being split by Sir Joseph
 “ Banks, it was found to contain, not ordinary
 “ Tabasheer, but a solid pebble, about the size
 “ of half a pea.

“ Externally this pebble was of an irregular
 “ rounded form, of a dark-brown or black co-
 “ lour. Internally it was reddish-brown, of
 “ a close dull texture, much like some martial
 “ siliceous stones. In one corner there were
 “ shining particles, which appeared to be crys-
 “ tals, but too minute to be distinguished even
 “ with the microscope.

“ This substance was so hard as to cut glass !

“ A fragment of it exposed to the blow-pipe
 “ on the charcoal did not grow white, contract
 “ in size, melt, or undergo any change. Put
 “ into borax it did not dissolve, but lost its
 “ colour, and tinged the flux green. With
 “ soda it effervesced, and formed a round bead
 “ of opaque black glass.

“ These two beads, digested in some perfectly
 “ pure and white marine acid, only partially
 “ dissolved, and tinged this menstruum of a

“ greenish yellow colour ; and from this solution Prussite of tartar, so pure as not, under many hours, to produce a blue colour with the above pure marine acid, instantly threw down a very copious Prussian blue.”

CATALOGUE OF BOOKS.

i. **A**DVICE to the Female Sex in general, particularly those in a State of Pregnancy and Lying-in : The Complaints incident to their respective Situations are specified, and Treatment recommended, agreeable to modern Practice ; the Result of Observation and Experience : To which is added an Appendix, containing some Directions relative to the Management of Children in the first Part of Life. By *John Grigg*, Practitioner in Midwifery, Surgeon to the Pauper Charity in Bath, and late of his Majesty's Navy. 8vo. Bath, 1789.

2. Medical Advice to the Inhabitants of Warm Climates, in the Domestic Treatment of
all

all the Diseases incidental therein : With a few useful Hints to new Settlers, for the Preservation of Health, and the Prevention of Sicknefs. By *Robert Thomas*, late of the Island of Nevis, Surgeon. To the Work are prefixed some Observations on the proper Management of new Negroes, and the general Condition of Slaves in the Sugar Colonies. Also are annexed a List of the Medicines recommended in the Treatment of the Diseases, and an explanatory Table of the Weights and Measures used by Apothecaries. 8vo. *Johnson*, London, 1790.

3. An Essay on the Changes produced in the Body by Operations of the Mind. By the late *Dr. Corp*, of Bath. 8vo. *Ridgway*, London, 1791.

4. Observations on Scrophulous Affections, with Remarks on Schirrus, Cancer, and Rachitis. By *Robert Hamilton*, M.D. Fellow of the Royal College of Physicians, Edinburgh; F.R.S. Edin. Honorary Member of the R. Ph.S. Edin. and C.M.S. London. 12mo. *Dilly*. London, 1791.

5. A remarkable Case of Madness, with the Diet and Medicines used in the Cure. By *William Perfect*, M.D. of West Malling, in Kent,

Kent, and Member of the London Medical Society. 8vo. *Evans*, London, 1791.

6. A New Medical Dictionary, or general Repository of Physic. By *G. Motherby*, M.D. C.M.S. The Third Edition, revised and corrected, with considerable Additions, by *G. Wallis*, M.D. S.M.S. Lecturer on the Theory and Practice of Physic in London. Folio. *Johnson*, London, 1791.

7. A New Collection of Medical Prescriptions, distributed into twelve Classes, and accompanied with pharmaceutical and practical Remarks, exhibiting a View of the present State of the Materia Medica and Practice of Physic, both at Home and Abroad. By a Member of the London College of Physicians. 12mo. *Baldwin*, London, 1791.

8. On Electricity; with occasional Observations on Magnetism; pointing out the Inconsistency and Fallacy of the Doctrine of positive and negative Electricity; and investigating and explaining the true Principles, Composition, and Properties, of Electric Atmospheres. By *E. Peart*, M.D. 8vo. *Miller*, London, 1791.

9. A concise History of the Human Muscles, carefully compared with the Subject; collated with the *Historia Musculorum* of *Albinus*,
and

and with the Works of several other more modern Anatomists. Interspersed with occasional Instructions, particularly calculated to facilitate the Labours of the Dissector. By *Thomas Wright*, Licentiate of the Royal College of Surgeons, and Superintendant of the Dissecting Pupils to the same. 12mo. Dublin, 1791.

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11. Physical and Chemical Essays: Translated from the original Latin of *Sir Torbern Bergman*, Knight of the Order of Wasa, Professor of Chemistry at Upsal, &c. To which are added, Notes and Illustrations by the Translator. Vol. III. 8vo. Edinburgh, 1791.

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INDEX.

A.

A BERNETHY, John, Surgical Essays, —	215
Abscess, Lumbar, Essay on, —	<i>ibid.</i>
— . See <i>Pfoas.</i>	
Adair, William, Case in which the Brachial Artery was divided	21
—, Effects of Oil of Turpentine in internal Hæmorrhage, —	25
—, Case of imperforated Anus, —	27
Albinus, Bern. de Causis et Signis Morborum —	221
Alpinus, Prosper, his Observations on the Frequency and Causes of Ophthalmia at Cairo, —	151
Amphibiorum Physiologiæ Specimen, —	224
Anatomy, Works relative to, —	218, 223, 224
Aneurism, Varicose, Case of, —	111
Animal Magnetism, Work relative to, —	208
Anus, imperforated, Case of, —	27
Apoplexy, Work relative to, —	207
Army, Work on the Diseases of, —	211
Arsenic, given in India as a Remedy for Elephantiasis	172
—, recommended as an external Application in some cutaneous Disorders, —	174
Artery, Brachial, Case in which it was wounded, —	21
Arthrodynia, Dissertation on, —	217
Ash Tree, Bark of, Treatise on, —	219
At'har Ali Khan, on the Cure of Elephantiasis, —	168

B.

Beddoes, Dr. Thomas, Case of Phlegmonic Inflammation, —	148
Bell, Benjamin, on Gonorrhea and Lues, —	217
—, Dr. on Animal Magnetism —	208
Bengal, Works relative to the Diseases of, —	216
Bergman, Sir T. Physical and Chemical Essays, —	203
Bezoar Stones, described, —	33
—, in what Animals produced, —	34
Billardièrè, J. J. la, Icones Plantarum Syriæ rariorum —	220
Bladder, Dissertation on the Puncture of through the Rectum, —	221
Vol. IV. Q	Blagden.

Blagden, R. B. Case of Gutta Serena,	126
Boag, W. on the Fevers and Dysentery of hot Climates,	1
Botany, Introduction to,	204
Brachial Artery, Case in which it was wounded,	21
Bradly, Edv. de Scarlatina et Cynanche Maligna,	217
Broughton, Dr. A. Hortus Eastensis,	215

C.

Cæfarean Section, Dissertation on,	222
Calculus in general, Obsl. on its Formation,	41
————, urinary, said to occur rarely in warm Climates,	47
————, intestinal, Symptoms of, and Mode of treating,	54
————, Chemical Analysis of,	75
Cancer, Works relative to,	201, 209, 216
Carlfruhe, Catal. of the Botanic Garden at,	219
Castringius, Lud. de Sectione Cæfareæ,	222
Cataract, Extraction of, Work relative to,	208
Catheter, Male, Introduction of, Work relative to,	ibid.
Cautics, good Effects of, in White Swellings of the Joints,	157
Chemistry, Annals of,	203
Children, Works relative to the Management of,	200, 206
Clarke, Dr. T. Hortus Eastensis,	215
Clarkson, Mr. a Fact from his Essay on the Impolicy of the Slave Trade, quoted,	152
Clerke, Josias, de Tetano,	217
Climates, hot, Obsl. and Works relative to the Diseases of,	1, 216
Clothing, modern, Essay on,	204
Concoction of Food, Dissert. on,	217
Consumption, pulmonary, Essays on,	206, 210
Copland, Peter, Cases of Menorrhagia,	118
Corp, Dr. on the Effects of the Mind on the Body,	201
Crowther, B. on the Use of Cautics in White Swellings,	157

D.

Dancer, Dr. Tho. Catalogue of Plants,	215
Davidson, William, on pulmonary Hæmorrhage,	129
Dictionary, Medical,	202
Dorsal Spasm, Treatise on,	205
Dysentery of hot Climates, Observations on,	1
————, Use of Mercury in,	15
————, Opium in,	17
E. East	

E.

East, Hinton, Catalogue of his Exotic Plants,	215
Ebel, J. G. Observ. Neurologicæ,	224
Electricity, Work relative to,	202
Elephantiasis, Observations on,	168
————, how named by the Arabs and Indians,	169
————, not to be confounded with the swelled Legs described by the Arabian Physicians,	<i>ibid.</i>
Epiphora, Work relative to it,	208
Erskine, Jo. Jac. de Concoct. Aliment.	217
Extra-uterine Gestation, Case of,	103

F.

Ferriar, John, Medical Histories,	205
Fevers of hot Climates, Obs. and Works relative to, 1,	216
Fischer, Joh. Leon. de Neurologia,	218
Flora Posonienfis,	222
Foot, Jesse, on the Lues Venerca,	204
Forskæl, Petr. Descript. of the Plants collected by him,	220
Fraxinus Excelsior. See <i>Asp Tree</i> .	

G.

Gaitkell, W. Observations on Calculi,	31
Gardiner, Dr. John, on the Gout,	212
Garnett, Dr. T. on the Mineral Waters of Harrowgate,	205
Giseke, P. D. See <i>Linne</i> .	
Gonorrhœa, Treatise on,	217
Gooch, Benj. Chirurgical Works of,	210
Gout, Treatises on,	206, 211, 212
Graf, Ern. F. Chr. de Sensatione et Irritatione,	221
Gravel, urinary, Work relative to,	214
Griffith, R. on a Reproduction of the Sphincter Ani,	204
Grigg, John, Advice to the Female Sex,	200
Gutta Serena cured by a Mercurial Snuff,	126

H,

Hæmorrhage, internal, Effects of Oil of Turpentine in,	25
———— of the Nose, Semeiological Dissertation on,	222
————, Uterine. See <i>Menorrhagia</i> .	
————, pulmonary, Remarks on,	129
Hamilton, Dr. Alex. on Female Complaints,	206
———— Letters to Dr. W. Osborn,	211

Hamilton, Dr. R. on Scrophula,	201
Harrowgate, Treatise on the Waters of,	205
Hasselquist, his Hypothesis of the Cause of the frequency of Ophthalmia, in Egypt, controverted,	150
Health, the Restorer of, a Work so entitled,	212
Heat, Dissertation on,	218
Heat and Cold, Remarks on certain Effects of on the living System,	148
Henke, H. L. de Hæmorrhagiis Uteri,	222
Hensler, F. de Exploratione Obstetricia,	223
Homer, Work on the Medical Obs. in the Writings of,	222
Houlston, W. on the Venereal Disease,	212
Howard, John, Plan for the Relief of Cancers,	209
Hunter, Dr. A. his Edition of Dr. White's Obs. on Phthisis,	210
Hydrocephalus, Dissertation on,	218
Hydrophobia, Work relative to,	213

I.

Jackson, Dr. S. H. on Diseases of the Skin,	214
——, Robertus Donaldson, de Arthrodynia,	217
Jamaica, Catalogues of Plants in,	215
Jatamanfi, a Species of Valerian growing in India, supposed to be the Spikenard of the Ancients,	184
Jeans, Dr. Tho. on the Gout,	206
Inflammation, adhesive, Dissertation on,	221
——, phlegmonic, Case of,	148
—— of the Eyes, in hot Climates, a frequent Com- plaint,	149
——, how accounted for by Hasselquist and Alpinus,	150, 151
——, supposed to ori- ginate from the great Irregularity between the Temperature of the Night and the Day,	152
Johnson, Thomas, de Syphilide,	217
Jones, Sir William, on Elephantiasis,	168
——, Obs. on the Weights of the Hindus,	172
——, on the Spikenard of the Ancients,	180
Irritation, Dissertation on,	221

K.

Kent and Canterbury Hospital, Rules of,	216
Kirkland, Dr. Tho. on Apoplexies and Palsies,	207
Klohs,	

Klöhfs, J. L. de Paracentesi Veficæ per Inteft. Rectum,	221
Koppen, J. F. de Vulneribus et Ulceribus,	— 218

L.

Leake, Dr. John, on Diseases of the Viscera,	— 207
Lettfom, Dr. J. C. his Edition of a Work on the Rabies	
Canina	— 213
Linné, Carol. a, Genera Plantarum curâ Schreberi,	219
—————, Prælect. in Ord. nat. Plant. curâ Gisekii,	223
Lifter, Gul. de Blenorrhœa,	— 217
Lüdgers, M. S. J. de Medicamento <i>Tebafchir</i> dicto,	221
Ludwig, C. F. Scriptorum Neurolog. Thesaur.	218
Lues Venerea, Works on,	204, 212, 217
Lumnitzerus, Steph. Flora Pofoniensis,	— 222

M.

Macdougall, Gul. de Variolis,	— 218
Macie, J. L. Experiments on Tabasheer,	— 193
Madness, Works relative to,	— 201, 207
Malacarne, Vinc. Nevro-Encefalotomia,	— 223
Mania. See <i>Madness</i> .	
Mariners, Work on the Diseases of,	— 206
Mather, Alex. on the Effects of Opium in Retention of	
Urine,	— 102
—————, Cafe of monftrous Birth,	— 107
Matter, Animal, Effay on the Composition and Analyfis of,	215
May, Dr. W. on Pulmonary Consumptions,	— 206
Meafe, James, on the Rabies Canina,	— 213
Medical Society, in London, Memoirs of,	— 210
————— and Chirurgical Society, in London, Tranfactions	
of,	— 213
Menorrhagia, Cafes of, cured by opiate Clyfters,	— 118
—————, Differtation on,	— 222
Mercury, Observations on its Ufe in Fevers and Dyfenteries	
in hot Climates,	— 1
————— the mode of adminiftring it,	— 15
Mercurial Snuff, Efficacy of, in Gutta Serena	— 126
Midwifery, Works relative to,	200, 206, 211, 213, 223
Mitchill, Dr. S. L. Outlines of Nat. Hift. and Chémiftry,	214

Moldenhawer, J. J. P. Tentam. in Hist. Plant. Theophrast.

Monstrous Birth, Case of,	219
Moscow, Enumeration of the Plants of,	107
Motherby, Dr. G. Medical Dictionary,	223
Munro, Hugh, Compendium of Surgery,	02
Muscles, Human, History of,	210
	202

N.

Nardus Indica. See <i>Spikenard</i> .	
Nevro-Encefalotomia,	223
Neurology, Treatise on,	218, 224
Nicandri Alexipharmaca,	223
Nitre, Dissertation on the freezing power of,	222

O.

Oak Bark, recommended as a Marine Antiscorbutic,	214
Okely, Gul. de Hydrocephalo,	218
Ophthalmy, scrofulous, Work relative to,	208
Opium, Efficacy of, in Retention of Urine,	102
Menorrhagia,	118
Osborn, Dr. W. on the Practice of Midwifery,	211
Letters to,	ibid.
Osterhausen, I. C. Hist. Sectæ Med. Pneumaticorum,	223

P.

Palsies, Work relative to,	207
Pargeter, Dr. W. on Maniacal Disorders,	207
Park, H. Case of Varicose Aneurism,	111
Paulet, J. J. Tabula Plantarum Fungosarum,	220
Pearson, John, on Cancerous Complaints	216
Peart, Dr. E. on Electricity,	202
the Properties of Matter,	209
Perfect, Dr. W. Case of Madness,	202
Persian Fire, a Name given to the Lues Venerea in Hindo-	
stan,	175
Pharmacopœia, of London, Analysis of,	205
Castrensis Borussica,	219
Plants, British, Botanical Arrangement of,	210
of the West Indies, Observations on,	250
Fungous. See <i>Paulet</i> .	
rare, Figures of,	224
of Syria. See <i>Billardiæ</i> .	
Pneumatic Sect of Physicians, History of,	223
Prescriptions,	

Prescriptions, Medical, Collections of,	202, 204
Pryis, Ulricus, de Inflammatione conglutinante,	221
Psoas Abscess, Case of,	138

Q.

Quandt, Chr. Frid. de Nitri Vi gelante,	222
---	-----

R.

Rachitis, Work relative to it,	201
Reide, T. D. on the Diseases of the Army,	211
Renwick, W. on Sickness in Ships of War,	206
Riederer, Geo. And. de Hæmorrhagia Narium,	222
Riemer, J. And. Phærmac. Castrensis Borussia,	219
Rowley, Dr. W. on the Gout	212

S.

Saunders, Samuel, Introduction to Botany,	204
Scarlatina & Cynanche Maligna, Dissert. on the distinction between,	217
Scirrhus, Work relative to it,	201
Schneevoogt, G. V. descript. plant. rariorum,	224
Schneider, J. G. his edition of the Alexipharmaca Nicandri,	223
—————, Amphib. Physiolog. Specimen,	224
Schraud, Franc. de Febribus,	221
Schreber, J. C. D. his edition of the Genera Plantarum Linnæi,	219
Schreger, B. N. G. de Cortice Fraxini excelsioris,	<i>ibid.</i>
Scrophula, Work relative to it,	201
Sensation, dissertation on,	221
Sinapisms, recommended in dropsy of the joints,	161
Skin, Work on the diseases of,	214
Smith, Dr. Hugh, Formulæ Medicamentorum,	204
Spasm dorsal, Treatise on,	206
Small Pox, dissertation on,	218
Sphincter ani, Work relative to the reproduction of,	204
Spikenard of the ancients, obs. on.	180
—————, mentioned by Dioscorides,	<i>ibid.</i>
—————, not known with certainty to Linnaeus,	<i>ibid.</i>
—————, not, as hath been supposed, a species of Andropogon	189, 190
—————, but a species of Valerian,	190
—————, Botanical description of,	191
Snuff, Mercurial, Efficacy of, in a case of Gutta Serena,	126
Q 4	Stephanus,

Stephanus, Fr. Flora Moscuensis,	— —	225
Surgery, compendious System of,	— —	210
Swartz, Olavus, de Plantis Indiæ occidentalis,		220
Syphilis. See <i>Lues Venerea</i> ,		

T.

Tabasheer, Chemical Experiments on,	—	193
———, specific Gravity of,	—	195
———, found to be identical with siliceous earth,		196
———, in a green Bamboo growing in England,		199
———, Dissertation on,	— —	221
Tetanus, Dissertation on,	— —	217
Thomas, R. on the Diseases of warm Climates,		201
Tongue, as a sign in Diseases, Dissertation on,		221
Trye, C. B. on the swelling of the lower Extremities in Lying-in Women,	— —	213
Tunbridge Wells, Analysis of the Waters of		204
Turnbull, William, Case of Extra-Uterine Gestation		203
Turpentine, Oil of, its effects in internal Hæmorrhage,		25

U.

Vahl, Martin. Symbolæ Botanicæ,	—	220
Varicose aneurism, Case of,	—	111
Vaughan, Dr. Walter, Essay on modern Clothing,		204
Viscera, Work on the Diseases of,	—	207
Vision, single, with two Eyes, Essay on,	—	213
Urine, Case of Retention of, cured by Opium,		102

W.

Wade, Dr. J. P. on Emetics, &c. in Diseases of Bengal,		216
———, the Diseases of Seamen and Soldiers in Bengal,	— — —	<i>ibid.</i>
Wallis, Dr. G. Medical Dictionary,	—	202
Ware, James, on the Epiphora,	—	208
Wells, Dr. W. C. on single Vision with two Eyes,		213
White, Dr. R. Analysis of the London Pharmacopœia,		205
———, Dr. W. on Phthisis Pulmonalis,	—	210
——— Swellings of the Joints, good Effects of Caustics in,		157
Whytt, Dr. recommends Opium in Uterine Hæmorrhage,		120
Wilson, Dr. A. P. on Urinary Gravel,	—	214
Withering, Dr. William, Arrangement of British Plants,		210
Wolf, Dav. G. de Rebus ex Homero medicis,		222
Worthington, Rev. Dr. R. on the Dorsal Spasm,		205
Wounds and Ulcers, Work relative to,	—	218
Wright, Thomas, History of the Human Muscles,		202



