lay down any exclusive theory of the production of emphysema, I may remark that my own observations of a large number of cases have led me to conclude that by far the most frequent cause of the partial form of the disease is to be found in the cough attendant on bronchitis, or some other affection of the bronchial tubes, such as pertussis. The fits of coughing caused by repeated attacks of bronchial inflammation must, it appears to me, so react on the pulmonary vesicles, which are most liable to distension, as to produce after a time their dilatation and rupture; and I the more incline to this view of the production of the disease, from knowing how difficult it is to produce emphysema artificially by inflation of the lungs after death. It may be objected to this view, that emphysema should be more frequently found as a sequence of pleurisy or pneumonia. We know that in some cases of inflammation of the lungs partial emphysema is produced. I have noted the fact myself at post-mortem examination. Such a result, however, only occurs rarely, and I think we have an explanation of its infrequency in the character and short duration of the cough attendant on pneumonia as well as on pleurisy.

Again, the frequency with which we meet with emphysema in tubercular lungs appears to me to favour the view I am taking. The deposition of tubercle in the pulmonary tissue, filling up the air-sacs in the same way as a pneumonic exudation, with the subsequent gradual contraction of the walls of the chest, presents no condition favourable to the formation of emphysema, except the cough, which is usually so important a feature of phthisis.

But although I consider that, in the majority of cases of emphysema where the disease is of the *partial lobular* or *lobular* form, the most frequent cause is the cough, which may have existed for a shorter or longer time, yet this view of the determining cause and mechanical production is by no means sufficient to satisfy my mind with reference to that more important and extensive form of the disease denominated *lobar*. Cases of this kind are not infrequently met with where the disease has gradually crept on without the existence of any severe or long-continued cough, and where there has been little or no bronchitis. It cannot be said that in such cases there has been any mechanical force, except that of ordinary respiration, acting on the pulmonary tissue so as to produce a distension and rupture of the air-sacs. It cannot be supposed that the pressure produced by inspiration is capable of bringing about such results, provided the lung-tissue be healthy. We know that the lungs may be distended far beyond the point to which they ordinarily reach without any of their fibres giving way, and the point to which they reach, under the condition of extreme expansion of the thorax, falls far short of that to which they may be distended, without injury, when removed from the body after death. In fact, there can be no doubt that very considerable force is required to rupture the healthy lung.

To what mechanical cause, then, are we to attribute the distension of the lungs under the circumstances just mentioned? From the non-existence of cough and bronchitis, and the prevalence of emphysema throughout the entire lung, we cannot attribute any effect to expiratory efforts: and I am disposed to think that the distension is brought about by inspiration; that the lung-tissue, being in an unhealthy condition, and thus abnormally weak, gives way before a pressure which it would in a state of health resist; that, having once yielded, it is unable to recover itself, from having lost its elasticity; consequently, it undergoes further distension as increased efforts are made to dilate the chest in order to meet the requirements of respiration; until at length the thorax, having reached its extreme point of dilatation, no further enlargement of the lungs can ensue.

It will be seen that in advocating this view I am all the while supposing that the primary step in this latter—the *lobar*—form of the disease is a *degeneration* of the lung-tissue, and that the mechanical distension is a secondary consequence.

If the views I have enunciated be correct, it follows that not only must we place different kinds of emphysema under different heads as to their pathology, but also as to their determining cause and mechanism.

Liverpool, Dec. 1864.

CLINICAL REMARKS

ON

LITHOTOMY AND LITHOTRITY.

By HOLMES COOTE, Esq., F.R.C.S.,

SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

ALTHOUGH, gentlemen, you cannot attach more than a guarded amount of importance to surgical statistics, yet it may interest you to know that during the past two years the lateral operation of lithotomy has been performed thirteen times in St. Bartholomew's Hospital, with a mortality of two, amounting to a death-rate of 13.33 per cent. But this does not include the case of a man, aged twenty-five, in whom a calculus deposit formed around a canula introduced into the bladder after puncture above the pubes for retention of urine. Mr. Callender, who had charge of the case, very properly dilated the fistulous passage, extracted the "stone" without cutting, and the patient recovered. On the other hand, four patients have been subjected to the operation of lithotripsy, and of these two have died, making a death-rate of 50 per cent.

Let us next inquire into the causes of death in these two groups of cases. After the operation of lithotomy, of the two fatal cases, one, aged four years, died from diarrhoea; the other, aged sixty-three, from acute inflammation of a thickened bladder.

After the operation of lithotripsy, of the two fatal cases, one, aged fifty-three years, died from bronchitis and abscess of the kidneys; the other, aged forty-seven years, from acute inflammation of the bladder, and granular degeneration of the kidneys.

These facts have been furnished me by the surgical registrar, Mr. Willett, whose accuracy and intelligence we all respect.

I grant that the data here given are not sufficiently large for permanent deductions; and yet they correspond with the general impression formed respecting the relative merit of the two operations—namely, that the dangers attending lithotripsy are greater than are commonly supposed, and that the very favourable returns quoted by some surgeons proceed from their considering each "sitting" as a completed case; whereas the result should be regarded only after the patient has been freed of his complaint. The late Mr. Stanley was well aware of the dangers attending lithotripsy; indeed he delivered a clinical lecture in this theatre in illustration of the fact. I believe that I express his opinion in saying that the operation of lithotripsy is suited almost exclusively to cases of men in middle or advanced life, of gouty habit, and with a deep perineum, in whom, after intervals of a few months, a small uric acid calculus drops from the kidney into the bladder, the kidneys being in their general structure healthy. In such cases you may give the patient much relief and greatly prolong his life by crushing each uric acid calculus soon after it has dropped into the bladder, and while it is yet small.

The lithotrite also is useful in breaking up concretions formed around foreign bodies introduced into the bladder. From Ser. 36 (No. 196) I have selected this specimen. It consists of parts of a gutta percha bougie, about five inches in length, incrustated with deposits of lithate of ammonia, ejected from a man's bladder after being broken into several pieces by lithotripsy. The bougie was being passed by the patient twenty-seven days prior to its removal, when it broke between four and five inches from its distal extremity, the fragment being left in the bladder. A surgeon immediately attempted its removal by cutting into the urethra through the perineum, but a spasmodic action of the membranous portion ensued, and the whole fragment was drawn into the bladder. It there lay across the neck, was readily reached with the lithotrite, turned, and an effort made to withdraw it; subsequently I broke it into several pieces, each, as you see, about an inch in length. They were expelled at one act of micturition violently from the bladder the day following the last operation.

In this specimen (Ser. 36, No. 194) you see a portion of sealing-wax, which had been introduced into the bladder three years prior to its extraction. It is almost entirely incrustated with calculous matter.

The lithotrite should under no circumstances be used for the

INFANT MURDER.—The Liverpool coroner, Mr. P. F. Curry, has received a letter from the Secretary of State for the Home Department requesting him to add to the usual statistics of inquests the number of cases of infant death in which verdicts of wilful murder have been returned, distinguishing between children under and over one year.

purpose of crushing an oxalate of lime calculus, the character of which is generally recognised by its sharp ringing sound. The fragments are always sharp and irritating to the bladder, and it not uncommonly happens that the lithotrite fails to act on the great mass of the stone.

Most calculi are composed of uric acid. We have a collection of above 200, and of these there are of uric acid alone, 30; of urate of ammonia, 13; of calculi composed of two layers, uric acid nucleus, 16; urate of ammonia nucleus, 25; of calculi composed of three layers, uric acid nucleus, 7; urate of ammonia, 18: total, 111. But this number would be much higher were it not that very many uric acid and urate of ammonia calculi have been thrown away as too small and too common for preservation. Next in frequency comes the oxalate of lime calculus, amounting to 40; of the fusible calculus, 19; phosphate of lime, 11; cystic oxide, 2. The other specimens are composed of carbonate of lime, or are concretions formed upon foreign bodies.

ON THE

ACTION OF TINCTURE OF PERCHLORIDE OF IRON IN THE CURE OF RENAL AND URINARY AFFECTIONS.

By ARTHUR HILL HASSALL, M.D. LOND.,
SENIOR PHYSICIAN TO THE ROYAL FREE HOSPITAL.

THERE are few remedies more frequently prescribed in the treatment of renal and urinary affections than is the tincture of perchloride of iron, formerly called muriated tincture of iron. The value of that remedy in a variety of such cases is undoubted, as in the albuminuria of Bright's disease, in hæmorrhage from the kidney, bladder, or urethra, in spasmodic stricture, &c.

The tincture of the perchloride of iron consists of two atoms of iron in combination with three of chlorine, dissolved in water to which rectified spirit has been added; and it possesses the properties of an astringent, tonic, and styptic, coagulating blood or albumen with which it is brought into contact, and constringing the vessels and tissues to which it is applied.

Now, this astringent property is just that which a remedy ought to possess to be useful in the cases above referred to, and by it, it is usually supposed, it exerts its beneficial action; and certainly nothing would appear to be more plausible and more natural than this explanation.

Having, after the administration of this remedy, repeatedly tested the urine for the purpose of detecting in it the presence of iron, and having failed to discover the faintest trace of the metal, I was led to doubt the correctness of this view, and was induced to institute some experiments, in order to put the matter to the proof.

To a patient, T. L—, labouring under an habitual urinary discharge, I administered for the period of more than a week a drachm of the tincture thrice daily; but, although I tested the urine on several occasions, in no instance could I detect the smallest trace of iron, notwithstanding that a pint of the urine was evaporated to a small bulk before being examined.

To a patient now in the Royal Free Hospital, Charles S—, who is suffering from an extravasation of blood, three drachms of the tincture were administered on two consecutive days. The whole of the urine passed in the twenty-four hours of each day was collected, a pint of each sample evaporated to a small bulk, and tested as before, but with a similar negative result.

Lastly, I myself took in the course of a day three drachms of the tincture; the urine passed in the twenty-four hours being collected and analyzed, not only on the day on which the medicine was taken, but on the preceding and succeeding days. Still no iron was found.

I could enumerate several other instances in which iron had been taken and the urine analyzed without even traces of the metal being subsequently discovered. The examples, however, I have quoted are sufficient to show that the tincture of perchloride of iron does not produce its beneficial effects, as generally supposed, in restraining the amount of albumen or of blood discharged from the kidney or other portion of the genito-urinary mucous track by coming in contact with the seat of the lesion and by its action as an astringent.

How, then, does this remedy act? That much of the iron

contained in the sesquichloride does not find its way into the circulation at all, but escapes from the system with the undigested portions of the food, is certain; the black discoloration of the fæces under the use of this tincture, and indeed, I believe, under all the preparations of iron, is well known, the colour being due to a combination of the iron with a portion of the sulphur of the food—sulphuret of iron being thus formed. It might therefore be very plausibly presumed that while the greater part of the iron is thus thrown off by the bowels without having been absorbed at all, the hydrochloric acid, being set free, enters the circulation, is eliminated by the kidneys, and so comes in contact with the seat of lesion; and that it is to the acid, and not to the iron, that the benefit is to be attributed. But if this view be correct, it is capable of being substantiated by experiment; and with this object I administered to two persons drachm doses, repeated thrice daily, of the perchloride; the urine of the twenty-four hours being collected and analyzed before, during, and after the administration of the ferruginous preparation. The results will be seen in the following tables:—

C. S—.

	Nov. 26th. Before.	27th. Before.	28th. During.	29th. During.
Quantity ...	62½ oz.	70½ oz.	49 oz.	46 oz.
Acidity...	30·35	30·18	33 gr.	30·14
Chlorine ...	115·0	137·0	90·0	140·0

A. H—.

	Nov. 17th. Before.	18th. During.	19th. After.	20th. After.
Quantity ...	56 oz.	57 oz.	33 oz.	53 oz.
Reaction {	Faintly alkaline.	Faintly alkaline.	Faintly alkaline.	Faintly alkaline.
Chlorine ...	95·0	84·57	76·0	44·98

The above figures show, 1st, that there was no increase in the acidity of the urine consequent upon taking the remedy; 2nd, that there was no increase of chlorine, and that therefore the hydrochloric acid of the perchloride was not eliminated by the kidneys either in the free or combined state: thus proving that the second view mentioned of the action of the remedy is also entirely unfounded.

These results are not a little remarkable; and we have, therefore, still to inquire, in what way does this medicine act in the cure of disease? Its effects are too rapid to allow it to be supposed that its operation is due to its influence in improving the condition of the blood by its action on the red corpuscles. We appear, therefore, driven to the conclusion that the perchloride of iron acts by its stimulating influence on the nervous system.

These observations are interesting, not alone as concerns this one preparation of iron; they also probably apply more or less to most of the other medicinal preparations of that metal, since it is at least certain that by far the greater part of the iron contained in them is not absorbed but escapes from the system by the bowels like that of the perchloride.

The particulars herein recorded are suggestive of further experiments calculated to throw additional light upon the subject, and which hereafter I may have the opportunity of instituting.

Wimpole-street, Dec. 1864.

REMARKABLE CASE OF PISTOL-WOUND OF HAND.

By JAMES SAVAGE, M.R.C.S., Undergrad. Lond.

E. G—, aged twelve years, was brought to my surgery on the morning of the 6th of August, about seven o'clock, by his mother, who told me that he had been frightening birds from the corn, and that with a pistol which he used for that purpose he had blown off part of his hand. The charge consisted of powder and paper. Upon examination I found the index finger and head of the metacarpal bone of the left hand completely smashed, with the muscles and skin a good deal torn, but no further injury to surrounding parts. He had had his breakfast, and soon after entering my house he vomited it up. I inquired if he had good health, and was told "yes," but that occasionally he was troubled with worms. I examined his heart, and finding its action regular and tolerably strong, at once gave him chloroform, and, having pared off the jagged parts, I cut across the metacarpal bone with the forceps about its centre. There was no bleeding, and so no ligature was used.