It is now two years since that small operation was performed, and since then his bladder has been in a state of chronic inflammation, and his urine, as it passes from the bladder, is found, under the microscope, to be loaded with organisms, and these can be seen in the pus and epithelial scales which come from the bladder. He has suffered frequently from swollen testicles, without fresh gonorrhœal infection, and has constant rheumatic pains in his lumbar region. Although the bladder is frequently washed out with antiseptic lotions, it seems to be almost impossible to get rid of the organisms from his urine. They disappear for a few hours after a thorough washing out, but reappear in the course of twenty-four hours.

After sepsis has been once fairly set up in the bladder, in my experience it is extremely difficult to cure it. We cannot pour into the bladder such a strong germicide solution as will at once permanently destroy the organisms, without at the same time injuring the bladder; besides, the organisms travel along the various ducts which communicate with the bladder, and are out of the reach of antiseptic solutions, and they keep up the sepsis in the urine by freshly infecting it after the bladder has been over and over again washed out.

The use of a very strong antiseptic solution, as that of bichloride of mercury, is apt to be followed by intense pain in the bladder and urethra; and I have observed that the organisms rapidly increase in the urine, after there have been symptoms of inflammatory action following the use of a too strong antiseptic solution in washing out the bladder.

It is best to use a weak solution frequently, rather than a strong one occasionally, in washing out the bladder. Inflammation of the mucous membrane of the bladder undoubtedly lowers the vitality of the protecting epithelial cells; and their wonderful resisting power is so reduced, that the parasitic organisms of sepsis have it all their own way in the struggle for existence.

With the object of preventing septic infection of the bladder, rather than curing it, about fifteen months ago I constructed an instrument which I call an aseptic catheter. This has answered extremely well, both in drawing off urine from the bladder, and in washing out the organ when sepsis has been established. An ordinary silver catheter, or any soft elastic instrument, can be made aseptic before it is used by the method I shall now describe.

The whole apparatus consists of two parts. The first is a tin can, holding about a quart, with a stop-cock (Fig. 2), to which is attached an India-rubber tube (Fig. 3), about three feet in length. This tin can is filled with an antiseptic solution, and is placed on a mantel-piece, or is hung up by means of the loop (Fig. 10) on a wall, or at the bedside, three feet or so above the patient lying on his bed. When the tap is turned on, a perfectly steady and constant stream of antiseptic lotion is given through the tube.

The second part of the apparatus consists of a modified catheter. If a soft gum elastic catheter, such as a No. 9 instrument, be used, there is screwed on to the end of the instrument a piece of light metallic tube, about an inch and a half in length. Projecting at right angles from this tube, and equidistant from its ends, there is another metallic tube, about half an inch in length, to which the India-rubber tube from the tin can is to be attached (Fig. 1). The India-rubber tube should be tightly screwed on to this projecting metallic tube in a perfectly air-tight manner. A piece of India-rubber tube, about an inch and a half in length, and tied very tightly in the middle, is used as a cap to fit on to the end of the instrument (Fig. 4). The catheter is now ready for use. Supposing it is perfectly clean outside, the catheter is seized near its eye-end, and held upside down over the basin which is to catch the urine. The tap (Fig. 2) is now turned on. A stream of antiseptic lotion at once pours through the eye of the catheter, having first driven out all the air in the instrument. No air can again enter the tube of the catheter as long as the liquid flows through it. The tap of the can is now turned off until the liquid escapes drop by drop through the eye of the catheter, which is then dipped into carbolic oil or other antiseptic unguent, and is at once passed into the bladder. The India-rubber cap is then twisted off the end of the instrument, and the urine will at once begin to flow. Immediately the urine ceases to flow, the tap (Fig. 2) is turned full on; and, the forefinger of either hand being pressed against the orifice of the catheter, the antiseptic lotion will then pour into the bladder (Fig. 7). As soon as the bladder is full of the antiseptic lotion, the forefinger is withdrawn, and the India-rubber tube is squeezed, or bent on itself, and then the bladder will pour out the antiseptic lotion (Fig. 8). Thus the bladder may be first emptied of its urine, and then washed out, over and over again, in the simple manner now described. On withdrawing the instrument from the bladder, the forefinger should be pressed against the orifice of the catheter so as to prevent the escape of fluid in the catheter. The

patient can wash his own bladder out just as easily as the surgeon can do it for him; and after the catheter is withdrawn from the bladder, it should be thoroughly cleansed by allowing the antiseptic lotion to run through it for a time. It is just as easy to use this catheter in the recumbent as in the vertical position of the patient.

This is the cheapest and simplest form of the apparatus, and only costs a few shillings. Should the catheter wear out, the metallic portion can be easily screwed on to a new soft elastic catheter.

A more perfect instrument is that represented in Fig. 9. It has an air-tight stop-cock just external to the projecting tube. In using this instrument, it is not necessary to have the small India-rubber cap to fit over the orifice of the catheter, and it is not necessary to press the forefinger against the orifice of the catheter, when the bladder is filling with the antiseptic lotion, as in the case of the other instrument. The stop-cock is tight when the instrument is first passed into the bladder, and it is simply turned one way when the urine is escaping from the bladder, and the other way when the antiseptic lotion is pouring into the bladder.

In the case of the ordinary metallic catheter, all that is necessary to do is to fasten on to the instrument a small metallic tube about half an inch in length, and of the same diameter as the catheter itself. This small tube, of course, communicates with the tube of the catheter, and is soldered on about one inch from the end of the catheter, on the upper or curved side of the instrument (Fig. 5). This modified instrument is used in exactly the same way as the one already described.

Mr. Gardner, surgical instrument-maker, South Bridge, Edinburgh, now makes up a box of several catheters with an adapter arrangement, by means of which a single washing-out instrument, as seen in Fig. 9, can be made to fit each and all of the catheters, though of different sizes.

With regard to the antiseptic lotion to be used, it is best to pour into the tin can a certain quantity of a cold and strong solution of a germicide. By the addition of boiling water to this solution, it can be diluted and warmed up to the proper degree for use, and it should be used at once.

The stomach, in disease, and in cases of poisoning, may be washed out in the most effectual manner, by attaching the tube of an ordinary aspirator to the free, or open end, of a large catheter, as in Fig. 9. The stomach being filled from the tin-can with an antiseptic lotion, or solution of an antidote for a poison, may be immediately washed out by the aspirator. In the same way, the pleural, or other cavity, may be rapidly and effectually washed out.

SOME REMARKS UPON ERGOT.

By CHARLES B. PLOWRIGHT, F.L.S., M.R.C.S.,
Surgeon to the West Norfolk and Lynn Hospital.

THE recent investigations of Dr. R. Kobert upon the active principles of this drug, referred to last spring in the *BRITISH MEDICAL JOURNAL*, March 21st, 1885, p. 608, are in themselves of great importance to the medical profession. They show, for one thing, how incomplete our knowledge of the subject even now really is, and, for another, how absolutely essential it is to study the action of such bodies, separately, upon living animals.

Some time ago, there was a tendency, amongst certain members of the profession, rather to doubt whether the continued administration of ergot was capable of inducing those terrible epidemics of gangrene which history has handed down to us. While it is quite true that patients may take for some considerable time small doses of the various preparations of ergot without manifesting any dangerous or even unpleasant symptoms, yet most practitioners feel a certain amount of anxiety about these cases, unless they can be seen at pretty short intervals. There is really, however, no doubt that eating bread contaminated by ergot does produce gangrene (Taylor *On Poisons*, 1848, p. 538), as has been known since the sixteenth century (Pereira, *Elements of Materia Medica*, 1840, vol. ii, p. 604); and, quite recently, Dr. Meadows (*Medical Times and Gazette*, October 2nd, 1879, p. 397) met with a case in which unpleasant symptoms, such as flushing of the face, swelling of the eyelids, hand, and arm, were produced by so small a dose as half a drachm of the powder upon two separate occasions. Kobert (*Ueber die Bestandtheile und Wirkungen des Mutterkorns*, Strassburg, 1884, p. 14) has likewise obtained direct evidence that sphacelinic acid, when administered to fowls, caused dry gangrene of the comb and wattles, as well as of other parts of the body.

The toxic effect of ergot upon the animal system is not, however, confined to the production of gangrene. Pereira (*loc. cit.*

p. 600) quotes Diez as having found, among other symptoms, that ergot given to dogs caused "semiparalysis of the extremities, especially of the hinder ones;" and Gaspard as having found that an intravenous injection of aqueous extract produces in the same animal "paralysis of the posterior extremities." In a recent communication, Dr. Althaus (BRITISH MEDICAL JOURNAL, May 10th, 1884, p. 893) says, "Bread contaminated with ergot of rye will, when habitually taken for some time, cause well marked decrease of the posterior columns." Kobert (*loc. cit.*, p. 21) found that eighty grammes of ergot, given to a pig with oil and milk, caused it to become, in three days, markedly ataxic, with loss of the patellar reflex.

With these facts before us, pointing as they do to the possibility of ergot inducing such a formidable disease as locomotor ataxy, or, at any rate, ataxic symptoms, the importance of being cautious in prescribing this drug for any length of time is obvious. Without venturing any pronounced opinion, either upon the pathology or upon the etiology of this disease, there are many cases of it which occur to us in actual practice in which none of the usually accredited causes, such as syphilis, sexual excess, alcoholic abuse, exposure to cold, etc., can be blamed. Although rye-bread is not consumed in this country as an article of diet to any extent, yet one class of the community, at any rate, is liable to ergotisation from a source which is not generally recognised.

In many parts of England, especially in the eastern counties, wheat is often ergoted to an extent, in some seasons, that would hardly be credited by anyone who has not specially looked into the matter. This being the case, a few remarks upon the subject may not be out of place.

Of all our cereal crops, rye is most subject to ergot, next to it wheat, very rarely barley, and never, as far as my knowledge goes, oats. Many species of grasses are, however, ergoted to an extent that is of very serious import to the graziers. In all these cases, the same fungus is the cause (*Claviceps purpurea*).

An ergot is an ovule of one of these grasses into which, either at the time of its fecundation by the pollen, or immediately afterwards, a spore of the *Claviceps* has gained admission. The spore once inside, gives rise to mass of mycelium, which so alters the grain that, instead of developing into starch, it becomes a sclerotium, or, in other words, a consolidated mass of mycelium, which remains in a state of quiescence for a long time (one or two years if necessary), but retaining its vitality until favourable conditions enable it to produce the perfect fungus, *Claviceps*. This, under ordinary circumstances, takes place in May and June, just about the time that the grasses and cereals are in flower. The spores of the *Claviceps* come into contact with the stigma of the grass by being carried in the air to it, and then give rise in the ovule, not directly to an ergot, but to an enormous number of very minute spores (conidia), which are held together, by a viscid material, into a mass to which the name sphacelia has been applied. It is obvious that these conidia (which used to be called *Ergotetia abortifaciens*), held together as they are by the sticky material, cannot be blown from one plant to another by any wind-currents.

Flückiger (*Lehrbuch der Pharmakognosie des Pflanzenreiches*; Berlin, 1867) has shown that the viscid substance in the sphacelia is saccharine, and produces a copious precipitate of the suboxide of copper with Fehling's solution; and Ráthay (*Untersuchungen über die Spermogonien der Rostpilze*, Wien, 1882, p. 35) says that eighteen species of Diptera, as well as other insects, visit the sphacelia in search of their sugary pabulum, and thus convey the conidia to healthy stigmata, in the same way as other insects in their search for the honey of flowering plants carry the pollen from flower to flower. Subsequently, the production of conidia ceases, and the true ergot is developed by the infected ovule, and so the life-cycle of the fungus is maintained throughout the year.

Mr. A. Stephen Wilson informs me, however, that, while he has confirmed Ráthay's observation as to the avidity with which insects, especially flies, feed upon the sphacelia, yet they die in great numbers, apparently poisoned by it.

The reproduction of the fungus by means of the conidia continues on some species of grass throughout the summer and autumn. Notably is this the case with the common rye-grass (*Lolium perenne*), which, late in the year, is almost invariably ergoted, although many of the ergots are so small as to remain concealed within the florets. The reason that wheat is less frequently affected than rye is because, in the former plant, as soon as its stigma is fertilised by the pollen, it is retracted within the pales, while, in the latter, it remains hanging outside them. Hence we see a sunless year is more apt to be one in which wheat is ergoted than any other, even a rainy one. It is a curious fact that some grasses which do not in this country usually

perfect their fruit, are, nevertheless, very prone to be ergoted. The common reed (*Phragmites communis*) is a case in point, and is the probable source from which the wheats in the fens become infected. Twitch-grass (*Triticum repens*) is another instance.

In the fen-district, every year a certain amount of ergot occurs in the wheat; but sometimes, as in 1879, it is very abundant. In the latter year, most of the samples from this district which were offered in the King's Lynn market contained ergots. These, of course, were but a small proportion of the numbers which originally occurred in it; the improved processes of threshing and dressing having eliminated all those ergots which were either larger or smaller than the wheat-kernefs. For this reason, there is not much fear of the general public suffering any ill-effects from this cause. Still such a thing is within the bounds of possibility. There is, however, a pretty numerous class to which this does not apply, namely, to the agricultural labourer, who often subsists for many weeks during the winter upon corn which his family have gleaned after the harvest. The total amount of this gleaned corn in the possession of each family, never being very large, it is threshed and dressed by the labourers themselves in the most primitive manner. It is then sent to the miller to be ground by him, and returned to the family for their winter's consumption. In appearance, a wheat-ergot is very similar to a rye-ergot, but shorter and stouter. They are often mistaken by farmers and millers for the excreta of mice or rats.

With regard to the action of ergot in producing abortion, there is one point which has long struck me; namely, that a pregnant person or animal, by taking a number of small doses extended over a considerable time, is quite as likely to abort as, and perhaps even more so than, after a single pretty large dose. If the uterus be thrown into a chronic state of contraction, however slight this may be in degree, it is obvious that the blood-supply to the placenta will be more or less interfered with. This may be, at the same time, accompanied by trivial localised separations, so small in themselves, that, when the immediate effect of each dose passes off, the placenta itself is not detached, but sufficiently numerous, by their continued repetition, to inflict serious if not fatal injury upon the fœtus. Short of this, however, it is obvious that the contraction of arterioles, characteristic of the action of ergot upon the animal economy, must necessarily imperil the vitality of the embryo in any stage of its existence. This is borne out by what occurs to the flock of pregnant ewes. Here the animals become ergotised, not by a single large dose, but by continually ingesting small ones, principally from rye-grass, which is constantly ergotised in pastures, but especially upon road-sides. The same is even more strikingly shown in the case of cattle, where the animals are much larger. Often, in these cases, the fœtus is not expelled at once, but is so injured that it subsequently dies, and is expelled at a later period.

NOTES ON STROPHANTHUS (HISPIDUS).

By J. LINDSAY PORTEOUS, M.D., F.R.C.S.Ed., Pathhead, Fife.

At the annual meeting of the British Medical Association in Cardiff, Professor Thomas Fraser, of Edinburgh, read a most instructive and interesting paper on "The Actions and Uses of Digitalis and its substitutes, with special reference to *Strophanthus* (*Hispidus*). Dr. Fraser says that the pharmacological action of strophanthine is as a muscle-poison; that it increases the contractile power of all striped muscles, and renders their contractions more complete and prolonged. As to the heart, he says, "the systole is increased, and its contractions are slowed by small doses. It is paralysed in a condition of rigid systolic contraction by large doses." It also increases secretion of urine, and reduces temperature.

Having in my practice a considerable number of cases of cardiac disease, and finding that digitalis did not agree with all my patients, I was anxious to try the effects of this medicine, which had proved so beneficial in the cases of Dr. Fraser. Through his kindness I obtained a small quantity, and I give notes of three cases where I used it; and I am only sorry that the notes are not fuller; but we all know the difficulty there is in taking careful and correct records in private practice.

CASE I.—Mrs. W., aged 38, of florid complexion, rather thin, wife of a factory-worker, stated that she had a severe attack of rheumatic fever three years ago, and had been troubled with shortness of breath and palpitation ever since. During the night, she had frequently to start up with "a feeling of choking for want of breath." She had been treated by several medical men, and received digitalis from all, which gave temporary relief. On November 12th, 1885, she was confined, and although the labour was rapid and easy, it gave me a