growth in 48 hours at 37° C. In Analysis 1 the broth used had been inoculated with one cubic centimetre of Flask VII., equivalent to 0.000,000,02 gramme of fæces, and in Analysis 3 with one cubic centimetre of Flask VI., equivalent to 0.000,000,2 gramme of fæces. In both instances the guinea-pig died in a few days from septicæmia and a bacillus corresponding in morphological and cultural respects with the bacillus coli communis was recovered from its heart's blood. The fact that the virulent bacillus coli was the most abundant organism that developed in broth in both instances, and also the fact that after taking 42 minims of izal oil by the mouth the abundance of this pathogenic microbe was diminished by presumably 90 per cent., are points that go far to explain the clinical success of izal in the treatment of diarrhœa and dysentery.

Experiment II.

Conditions.	Analysis 4. —Normal.	Analysis 5. —After 50 minims of izal oil.	Analysis 6. —After 78 minims of izal oil.	Analysis 7. —32 hours after stop- ping izal oil.
Since ex- periment began { Time... Motion	— —	48 hours. Second.	Sixth day. Sixth.	Eighth day. Ninth.
Total number of micro-organisms in agar at 37° C. }	200,000,000	260,000,000	20,000,000	60,000,000
Total number of micro-organisms in gelatin at 22° C. }	220,000,000	Approx- imately 200,000,000	20,000,000	40,000,000

The reduction after taking 78 minims of izal oil was therefore in the case of the organisms developing at blood-heat 90 per cent., and in the case of those growing at 22° C. 91 per cent. On the other hand, 32 hours after stopping the drug, the increase was in the case of the former 300 per cent. and in that of the latter 200 per cent.

Experiment III.

Conditions.	Analysis 1.— Normal.	Analysis 2.—After 36 minims of izal oil.
Since experiment { Time ... began. Motion...	— —	Fourth day. Fourth.
Total number of micro- organisms in agar at 37° C. }	20,000,000	8,000,000
Total number of micro- organisms in gelatin at 22° C. }	10,000,000	6,000,000
Total growth in broth at 37° C. }	200,000,000 under 2,000,000,000	20,000 000 under 200,000,000
Total indol in broth at 37° C. }	2,000,000, under 20,000,000	200,000 under 2,000,000

The reduction after taking 36 minims of izal oil was therefore in the case of the organisms developing at blood-heat 60 per cent. and in the case of those growing at 22° C. 40 per cent. The total growth in broth, as also the production of indol, were both reduced by 90 per cent.

The total numbers in agar and in gelatin were in both analyses in Experiment III. estimated from plates inoculated with one cubic centimetre of the fourth dilution—that is to say with an amount representing 0.000,02 gramme of fæces. In the two preceding experiments, on the other hand, the dilution used for this purpose was a much higher one—e.g., one cubic centimetre of the sixth or seventh dilutions representing 0.000,000.2 or 0.000,000,02 gramme of fæces respectively. The latter is far more accurate as a gauge of the actual total of the organisms present in the material itself, for, in plates made from the lower dilutions, owing to a larger number of organisms being present, overcrowding occurs and a proportion of them are unable to grow into colonies and so escape being counted. The two analyses, however, in Experiment III. are strictly parallel, the same amount of fæces having been cultivated in each case, so that the numbers are strictly comparable though not necessarily, or, indeed, probably, a gauge of the actual total present in the material itself. The growth in broth is a better index in this sense as a matter of fact.

SUMMARY AND CONCLUSIONS.

The total number of micro-organisms present in a gramme of fæces and developing in agar-plates at blood-heat was reduced in Experiment I. by 86 per cent., in Experiment II. by 90 per cent., and in Experiment III. by 60 per cent. Moreover, the pathogenicity of the fæces was reduced in Experiment I. by presumably 90 per cent. The only condition introduced that accounts for this effect was that izal oil was being taken by the mouth and the diminution of the micro-organisms in the fæces was broadly proportionate to the dose of the drug. Thus in Experiment I. after 20 minims of izal oil the reduction of the blood-heat organisms was 68 per cent., and only after 42 minims did the reduction reach 86 per cent. Again, in Experiment II. after 50 minims of the oil no reduction, but an actual increase, of the blood-heat organisms was noted. But this was only the second motion since the experiment began, and later, after 78 minims of the oil had been taken, their reduction was as much as 90 per cent. On the other hand, in the same experiment 32 hours after izal had been stopped the organisms developing in agar plates at blood-heat were increased by 300 per cent.

I believe that these results justify the inference that not only does the ingestion of izal oil in doses that give rise to no untoward symptoms diminish the number of micro-organisms in the fæces, but that it does so to a very striking extent.

The fact that in spite of the great reduction effected the number of micro-organisms remaining in the fæces was still large is at first sight disappointing. It is, however, no reason for withholding the drug in cases where it is indicated. In the first place the diminution effected may make a great deal of difference to the progress of a given case. Again, for aught we at present know to the contrary, the health of the intestine may be dependent on a state of equilibrium of its bacteriological contents, and a slight disturbance of this equilibrium may be a condition resulting in serious illness. The indication in such a condition would be to restore the disturbed equilibrium, and a drug that can be depended on to achieve this result with certainty and without injury, pain, or even inconvenience, is not to be lightly valued. Thirdly, it is probable that by pushing the dose of izal, but still keeping outside the limit of its toxicity, the number of fæcal organisms may be still further reduced. Again, by combination of izal with other drugs and by careful dietetic treatment it may be possible to reduce still further the pathogenicity and foulness of the intestinal contents.

As in the case of other remedies, however, the scope of izal as an intestinal antiseptic is a matter that can only be eventually established at the bar of clinical experience. Possibly other drugs may be still more efficacious for the purpose stated. But my observations so far with salol and with β naphthol *in vitro* have not led me to form the opinion that they are likely to be among them. This opinion, however, is advanced with all reserve, as I have not yet tested these drugs *in vivo* in the same way as izal.

The success of izal as a remedy for diarrhœa and for dysentery is, according to the authorities cited, a clinical fact. Whether by means of this or another intestinal germicide it will ever be possible to control typhoid fever, appendicitis, &c., at the site of infection is a matter for the future to determine.

In conclusion, I wish to record my thanks to Dr. Houston for much valuable advice.

TWO CASES OF LUPUS VULGARIS.
SUCCESSFULLY TREATED WITH
UREA PURA AND THE
X RAYS.

BY EDWARD SWALES, M.R.C.S. ENG., L.R.C.P. LOND.,
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MAIDSTONE.

A GREAT deal of interest has been centred on lupus vulgaris of late, owing to the introduction of new methods of treatment. Much has been written of the value of the Roentgen rays in this disease, and many successful cases have been recorded. The Finsen light treatment is being extensively employed and great things are expected from it.

The idea of using urea pura for lupus suggested itself to my mind after reading a most interesting paper by Dr. H. Harper¹ of Nottingham on the value of pure urea in phthisis. I had in my wards at the asylum two very bad cases of lupus vulgaris, and I decided to put them both on urea and to give them daily exposures to the x rays. Photographs were taken before and after the treatment.

The general outline of the treatment employed was as follows:—On May 21st, 1901, in the one patient, and on June 7th, 1901, in the other, I ordered urea in 20-grain doses three times a day and commenced the exposures on these dates respectively. The x-ray apparatus used was a 10-inch coil, with a platinum interrupter, and a Crookes's focussing tube with a spark length of six inches. The exposures were made daily and were of seven minutes' duration, at a distance of from two to three inches from the face. The voltmeter registered 12 volts and the indicator of the galvanometer oscillated between four and six amperes. It was never found necessary to protect the healthy skin from the rays, as the only effect produced was a slight red areola round each scab.

In the July number of the *Practitioner* Mr. A. H. Buck, of the Sussex County Hospital, published a paper entitled "A Case of Lupus of 12 years' standing Treated with Urea Pura and Cured." I read this monograph with great interest and found that his treatment differed from mine in that he combined cod-liver oil and malt extract with the urea and applied some ointment as a local dressing, the Roentgen rays not being used at all.

CASE 1.—The patient, a woman, aged 30 years, was admitted into the Kent County Asylum on Feb. 1st, 1901. The following note, taken from the case-book, shows her condition on admission: "She is demented and quite lost to her surroundings. She is weak, badly developed, and poorly nourished. She has chronic lupus of the face. There is a suspicion of tubercle at the right apex. The heart's action is weak." The lupus extended from ear to ear, spreading out like the wings of a butterfly. These two areas were connected by extension of the disease over the bridge of the nose and the upper lip. The whole of the cartilages forming the tip had ulcerated and the lower ends of the nasal bones were visible through the weak and indolent tissue. The glands of the face and of the submaxillary and cervical regions were enlarged on both sides, but especially on the left. There was distinct softening in some and fluctuation could easily be felt. The softening had proceeded so far in the one immediately in front of the left ear that just as I was exposing the photographic plate the pus burst through the skin and ran down the face. The patient was unable to breathe through the nose, owing to blocking of the nasal passages by dried mucus and pus. Her breath was extremely foul, and she was very weak and anæmic. Her pulse was soft, weak, and rapid. The action of her heart was very feeble. There was slight impairment of the percussion note over the right apex. The breath sounds were somewhat harsh. The patient's weight was six stones five pounds. The dose of urea at first was 20 grains three times a day. It was gradually increased up to November, when the patient was taking as much as 120 grains three times a day. Since July I have followed Mr. Buck's example and added cod-liver oil and malt extract to the mixture. On Sept. 30th, 1901, as all active signs of the disease had disappeared, the exposures to the x-rays were discontinued, and since that time the redness has gradually subsided, and a thin, smooth, white scar now occupies the place of the apple-jelly nodules and ulceration. On examination of the chest on March 2nd the difference in the percussion note was so slight that had I not the knowledge that the right lung had been affected I should have said that there was no difference. The breath sounds were not quite pure on the right, but they were not so harsh as when the patient was admitted. The heart sounds were regular and of normal volume. The pulse was 78, regular, full, and well maintained. She has recovered from her anæmia. She sleeps well and eats well, and is altogether in very much better general health. She takes some interest in things going on around her, talks a little, and is, as a matter of fact, much more trouble to manage than on admission. There was no increase in the percentage of urea in the urine, for out of several estimations the highest percentage found was 2 (the normal). Her weight is six stones six pounds.

CASE 2.—The patient, a woman, aged 30 years, was

admitted into the Kent County Asylum on March 1st, 1901. The following are notes from the case-book taken on admission: "She is demented. No evidence of mind. She never speaks. Cannot make her wants known in any way, and is most filthy and degraded in her habits. She is very weak, badly developed, badly nourished, and very anæmic. Has lupus on face. Heart's action rapid and weak. Lungs very weak. Weight five stones 13 pounds." When the treatment was commenced on June 7th she was in a very low condition. Her face was one mass of ulceration and dried scabs. Her eyelashes were turned inwards and swept the cornea. Pus welled out of both eyes from the conjunctivæ, which were red and inflamed. Her eyes were directed downwards and inwards. It was very doubtful whether she could see or not. On the left side of the nose, over the situation of the nasal duct, was a small sinus from which thick creamy pus exuded. Her upper lip was enormously swollen and protruded one and a half inches beyond the lower. The mucous membrane of the nose was red, swollen, and ulcerated. Her breath was very foul-smelling. The submaxillary, cervical, and supraclavicular lymphatic glands were greatly enlarged, many being in a condition of softening. Almost the whole of both cheeks were involved in the disease. For the first fortnight I had the face dressed with olive oil night and morning to soften the scabs, which I then removed with a pair of forceps and a warm solution of chinisol. This was the only local application, and was discontinued as soon as all the scabs had been removed. She never spoke but made unintelligible sounds, and this I believed was due to the enormous size of the upper lip and the blocking up of the nose with dried mucus and pus. The dose of urea was gradually increased from 20 grains three times a day to 120 grains three times a day, and, just as in the last case, since July cod-liver oil and malt extract have been added. She had exactly the same Roentgen-ray treatment as the first case, but she improved much more rapidly, and as a result the exposures were discontinued on Sept. 3rd. I think that this is accounted for by her not having had the disease for such a long time as the other patient had. Since that time the redness due to the exposures has gradually subsided, and at the time of writing (March 2nd) a smooth white scar occupies the place of the ulcerated surface. There is no discharge from the eyes, and the sinus over the nasal duct has quite healed. Her lip has returned to its normal size and she speaks quite distinctly at times. She can see very well and appears to take much more interest in her surroundings. It was impossible to get a 24 hours' specimen of this patient's urine, so I have been compelled to make my estimations from the specimens which I could secure, no matter how small the quantity. But in no case did I discover more than the normal percentage of urea, the average being about 1·7. There are no signs of phthisis in the lungs. The heart sounds are normal. She has gained flesh, sleeps well, eats well, talks, chatters, and sings, and at times she is very violent and troublesome. Her weight is five stones 13 pounds.

Remarks.—The points to which I particularly wish to draw attention are: the low-pressure tube used (viz., six inches) and consequently the absence of any severe dermatitis in the neighbouring healthy skin; secondly, the comparatively short duration of the treatment and the small amount of trouble entailed in carrying it out; thirdly, the great improvement in the general health—lungs, heart, mental condition, and anæmia; and, lastly, the absence of all puckering of the skin and unsightly contractions, so commonly seen in cases treated by the older method of scarification. The great objection undoubtedly is the expense of the urea.

Maidstone.

REVACCINATION OF TRAMPS.—At the meeting of the Stonehouse Board of Guardians held on Feb. 27th the medical officer (Mr. T. Leah) stated, in reference to the revaccination of tramps, that unless he inspected the cases afterwards the Local Government Board auditor might perhaps not allow the fees, and he did not wish to keep tramps in the workhouse for a week in order to inspect them. Eventually the matter was referred to the house committee. —The Torrington (Devon) Board of Guardians at its meeting on Feb. 22nd decided that all vagrants should be vaccinated on their admission to the workhouse—a procedure which has also been enforced by the Bideford Guardians.

¹ THE LANCET, March 9th, 1901, p. 694.

ABDOMINAL HYSTERECTOMY FOR CANCER OF THE UTERUS;

WITH NOTES OF TWO CASES.

BY ROBERT O'CALLAGHAN, F.R.C.S. IREL.,
SURGEON TO THE FRENCH HOSPITAL;

AND

HENRI DARDENNE, M.D. EDIN, M.R.C.P. LOND.,
PHYSICIAN TO OUT-PATIENTS AT THE FRENCH HOSPITAL.

CASE 1. *Cancer of the cervix treated by amputation, followed by pregnancy, necessitating Cæsarean section with complete hysterectomy*—On March 11th, 1901, Dr. Dardenne was called to see a woman who had been married for 17 years and had never been pregnant. She was 36 years of age. When Dr. Dardenne saw her she complained of pain in the hypogastric region and also of a muco-sanguinolent discharge of a foetid odour. She was uncertain as to the exact date of the commencement of her present illness, except that four months previously she had a smart attack of hæmorrhage which had compelled her to keep her bed for three days. Ever since she had been troubled more or less with the discharge of which she now complained. Previously to this she had been in good health except for obstinate constipation. Her general surroundings were extremely good and had always been so. Her family history was good. Her facial expression was somewhat anxious and her complexion was pasty. She was stout in body and had no idea that she was seriously ill. There was no œdema; in fact, no morbid appearances could be detected. The temperature was normal; the pulse was 80. On making a vaginal examination, Dr. Dardenne noted at the time that the cervix was invaded by a hard cauliflower growth, and at the back of this there was a crater-like fissure on the right and a similar fissure was present on the anterior and posterior surface of the cervix. On bimanual examination a hard mass of indurated glands was felt in the right iliac region. The bladder gave no trouble to the patient. Dr. Dardenne diagnosed cancer of the cervix and advised her to become an inmate of the French Hospital. This she did and when seen the next day by Mr. R. O'Callaghan he confirmed the diagnosis and operated on the following day. With the knife and cautery he removed all that was possible of the affected tissues. The disease being so far advanced he did not think that a hysterectomy would be of much benefit to the patient. She left the hospital on March 30th. On Nov. 2nd Dr. Dardenne saw the patient again and on examination found that she was five months pregnant. She had quickened a fortnight before. Since the operation she had some slight bleeding which she attributed to her periods. On Dec. 24th labour pains came on and she entered the French Hospital on Christmas Day. The whole of the lower segment was one mass of cancer and after 18 hours of labour pains the little finger could not be introduced through the hard mass. At 8 P.M. Mr. O'Callaghan performed a Cæsarean section. An incision four inches long was made in the middle line and the uterus was brought well forward and incised; the child and the placenta were rapidly extracted without any difficulty; there was some sharp hæmorrhage which was easily controlled by the house surgeon. The greatest difficulty experienced was now to be met with in the complete removal of the uterus. The new growth having destroyed all landmarks made it difficult to get into the vagina safely without injuring the bowel, the bladder, or the ureters; this, however, was done successfully, after very tedious manipulation owing to the very fat parietes. The ligatures were brought into the vagina and the peritoneal vault was sutured, the abdominal wound was then closed, and the patient was quickly removed to bed, having borne the operation very well. She, however, never seemed to rally from the shock and died in 48 hours.

CASE 2. *Cancer of the cervix complicated by cystic ovary and adhesions treated by complete abdominal hysterectomy*.—A woman, aged 34 years, came to Dr. Dardenne in the out-patient department of the French Hospital on Dec. 9th, 1901, complaining of a bloody discharge from the vagina which had been preceded for about three years by a muco-purulent one. She had been married for 18 years; she had had two children, the younger being 16 years of age, and one miscarriage. Menstruation began when she was 15 years of age, and up to three years previously she was quite regular when

she had a period lasting for 18 days, and ever since then she had been irregular. Her family history was good. She was admitted into hospital under Mr. O'Callaghan and on the following day she was examined under ether. The uterus was fixed and the cervix was enlarged and of a dark-red colour; bimanually the uterus was found to be enlarged and an enlarged ovary was felt on the left side. The uterus was fixed and could not be brought down to the vulva. A portion of the posterior lip was removed with the knife and sent to the Clinical Research Association. Mr. J. H. Targett reported that it was an epithelioma. The patient having given her consent for the removal of her uterus she was operated upon on Jan. 10th, 1902. The abdomen was opened by a three-inch incision. The right ovary, which was cystic, was removed as well as the left, when it was freed from adhesions. The uterus was with difficulty freed from old adhesions, then well drawn out and removed in the usual method. The ligatures were drawn into the vagina, and as there was considerable oozing a strip of cyanide gauze was passed into the vagina for a drain. The peritoneal vault was closed over all and the abdominal wound was sutured in two layers. The patient made an easy recovery.

Remarks by Mr. O'CALLAGHAN.—In Case 1 it is interesting to note that after 17 years of barrenness this poor woman became pregnant after amputation of her cervix for malignant disease followed by a thorough efficient use of the cautery. It was a matter of regret that she did not come into hospital, as we had arranged she should do, before labour, which came on at seven months, and she was, unfortunately, in labour for 18 hours and the membranes had ruptured (an important factor as regards the result). She was very tired as a consequence and for an hour before operation, while finding me and an anaesthetist, the house surgeon gave her frequent inhalations of chloroform. It was an emergency in which the difficulties were, I am glad to say, rare. The patient never seemed to rally from the shock of the operation, although she was given hypodermic injections of strychnine sulphate by Dr. H. Leclezio, and despite his unremitting care she died in 48 hours. A post-mortem examination could not be obtained, but the right breast was found to contain a new growth which had affected the axillary glands. Such cases are, fortunately, rarely met with, and demand prompt action if only to prolong life for a little while. A simple Porro's operation, and fixing the stump of the uterus in the abdominal wound might have saved shock and prolonged life in this case for a short time, but it would not have been a good precedent.

In Case 2, although the uterus was fixed and could not be drawn down into the vagina the history of the case and the appearance of the growth suggested chronic endometritis with erosion more than epithelioma. As it would have been very difficult, if not impossible, to remove the uterus by the vaginal route I decided to do a complete abdominal hysterectomy. The appendages on both sides were adherent and one ovary was cystic. This caused a good deal of venous oozing which was treated by packing with a strip of gauze, leaving the end in the vagina; this drain was removed in 48 hours, the patient making an uninterrupted convalescence. I have no hesitation in saying that when the uterus is at all fixed the abdominal route is the method of selection in these cases, as the operation is more satisfactory from a surgical point of view, and the ovaries and tubes can be removed, no matter how large or adherent they may be, which I hold should be done in all cases of hysterectomy, as they are absolutely useless after the removal of the uterus and can only become nuclei for further pelvic mischief.

I have to thank the house surgeon for his efficient assistance in these cases and for his intelligent preparation and after-care of them.

ELECTRIC SHOCKS.¹

BY F. B. ASPINALL.

I BRING this question before the institution principally with a view of obtaining particulars of severe electric shocks which have not proved fatal, and therefore I trust that any one who from his own experience can give particulars of cases will kindly do so. My reason for trying to obtain this

¹ A paper read before the Institution of Electrical Engineers on Feb. 27th, 1902.