hospital, or licensed house." Inquiry should be made as to whether it has been necessary to forcibly hold the patient down or to struggle with him or restrain him by mechanical means. Also as to whether he has lately had falls or other accidents. If any of these events have happened, a physical examination should be made. It is a most unpleasant thing for all concerned, when a patient is discovered on his arrival at the asylum to have broken ribs or severe, perhaps fatal, internal injuries, or to be suffering from small-pox or other infectious fever. This section throws on the certifier direct responsibility for the detection of such conditions and for proper precautions being taken.

5.

The fifth head certifies that the medical man has at first read the section of the Act (printed at the foot of the page), in terms of which it is a misdemeanour to make any wilful misstatement in this or any other report or certificate under the Act. Then sign, as required, with full postal address, and finally insert the date—that is, the date on which the certificate is written. This is usually the same as the date on which the examination of the patient was made, but it need not be so. The petition to the Judicial Authority, which must be accompanied by the certificates, must be made within seven clear days of the date of the examination of the patient, and the certificate may be written any time within that period; but the usual course, and by far the best, is to write the certificate immediately after the examination is made. If that is not done, the memory alone should never be trusted to, but the facts indicating insanity should at once be written down, dated, and kept till the certificate is drawn out.

Lastly, read the whole document carefully over, and see if it hangs together from first to last as a logically consecutive whole. Note particularly if all the marginal directions have been complied with. A very careful man will make a copy of his certificate and preserve it. It is but too well known that a medical man who signs a certificate of insanity does so at his peril. Some twenty years ago prosecutions of doctors by patients whom they had certified were so numerous, that the entire medical profession in England was within measurable distance of striking against this duty, and refusing to touch lunacy certificates under any circumstances. Letters seriously suggesting this course appeared in the medical journals.

In the Act of 1890, still in force, two sections were inserted, designed to afford protection to medical certifiers and others. Owing to this the danger is now distinctly less, but it cannot be said to have disappeared altogether. Section 330 provides that an action may be stayed upon summary application to the High Court or a judge thereof, if the court or judge shall be satisfied that there is no reasonable ground for alleged want of good faith or reasonable care, and upon such terms as to costs as the court or judge may think fit. Section 331 provides that, unless an action is brought within twelve months after the release of the party bringing the action and in the county or borough where the cause of action arose, judgement shall be given for the defendant. By the first of these sections the duty of proving good faith and reasonable care falls on the defendant, and a judge may refuse to give effect to the protective sections and allow the action to proceed. This was actually done in the case of *Carpenter v. Dukes* in 1891. Even if the action is stayed the doctor may have to pay his own costs, besides suffering cruel anxiety and worry. There has been, however, for a number of years no prosecution by a patient of the doctor who had certified him.

It is to be feared that we medical men do not always realize the importance of a strict adherence to business forms, while lawyers, on the other hand, may seem to us to exaggerate it. Now, if a judge on inspection of a certificate that had formed the ground of an action found violations of the clear marginal directions, or facts that do not necessarily indicate insanity set down without remark, or the handwriting careless and almost illegible, or the grammar loose and punctuation nowhere, would he not be apt to infer a want of "reasonable care," and hesitate, perhaps refuse, to stay the action? Kindly people of the old-fashioned sort are wont to say of their family doctor that he is "a careful man," meaning thereby to give him a high degree of praise. In few of his professional actions has he greater need of the excellent quality of carefulness than in writing a certificate of insanity.

CATS AS PLAGUE PREVENTERS.

By LIEUT.-COL. A. BUCHANAN, I.M.S., M.A., M.D.,
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IN the article which appeared in the BRITISH MEDICAL JOURNAL on May 30th I gave reasons for thinking that the best way to prevent plague in India is by keeping cats. That paper was based mainly on observations which had been made in previous years. During the past cold season we have had another epidemic, which, although comparatively mild, has afforded very good opportunities of observing whether and how far cats are likely to prevent plague. I mentioned in the former paper that there are some castes who are very willing to keep cats, as the Mohammedans, and that there are others who are not willing to keep cats, for example, Bhowani Dhers and Jains. Now if we wanted to make an experiment with a view to finding out how far cats would prevent plague, the conditions would be very much the same as those that we actually found in existence here. We had groups of people who keep cats, others who do not keep cats, and the epidemic of plague spread in five out of six of the Taluqs into which the district is divided. Plague occurred in 54 towns and villages, and there were altogether 1,704 deaths, which would give a ratio of slightly more than 2 per 1,000 of the population. Investigations were made in most of the towns and villages where cases occurred, by assistant surgeons and hospital assistants, patwaris (native surveyors), police, vaccinators, and others, and I was able myself to verify a good many of these investigations in a general way.

ARGUMENT ON GENERAL GROUNDS.

Let us suppose that any reader of this paper heard of plague for the first time, that he was told on good authority that the epidemic is entirely due to rats, and that a suggestion had been made that the best way to keep away rats is by keeping cats—he would probably say that this seems to be a common-sense way of dealing with the problem. If you then tell him that in India the majority of Hindus object on religious grounds to killing rats with traps or poison, but that all Mohammedans and well over 90 per cent. of the Hindus are willing to keep cats, that with a large number it is almost a religious duty to keep a cat, that it is our policy in India to give strict consideration to the wishes, traditions, and religious ideas of the people, he would, I think, be fully convinced that it is a very sound policy to recommend the people to keep cats for preventing plague; and he would probably go further, and say that it seems very curious that there should be any hesitation in regard to adopting this method. But the actual case is not so simple as this. We have had plague epidemics going on for twelve years, and we have many recommendations made and carried out for a year or two until they were proved to be ineffectual; so that now, when any new suggestion is made, however simple it may be, people are inclined to think that it will meet the same fate as other methods which have preceded it. A large amount of evidence has been collected, and I propose to review it by contrasting villages, then groups of houses (mohullas), and then give some illustrations to show that houses with cats are less liable to be infected with plague.

EVIDENCE FROM VILLAGES.

Hospital Assistant Shian Behari Lal of Daryapur Taluq gives several instances like the following: A, B, and C are three villages. Plague has occurred in A and C, but not in B, which lies between the other two; and on inquiry he finds that the cat percentage is high in B, but not in the other two. (The cat percentage is the number of cats to a hundred houses.)

Hospital Assistant Azimuddin of Badnera states that plague occurred in Dhaba village, but not in any of six adjacent villages. In Dhaba the cat percentage was low, but varied from 32 to 75 in the other villages. Many of the people in Dhaba are Bhowani Dhers (who do not keep cats), and they suffered most from plague; but in this same village there is a mohulla which is occupied by Telis, who had 9 cats to 19 houses, and they were quite free from plague, although they did not leave the village.

Hospital Assistant Paranjpe at Chandur Bazar mentions four villages in which plague occurred, and in the

centre of the area occupied by these villages there is one village which was free from plague. The cat percentage was high in the central village, but low in the others.

The Patwari of Asagaon has four villages in his charge. Plague occurred in only one of them, and in that village the cat percentage was low, while it was over .50 in the other three.

Plague has occurred twice in Walgaon, but never in Khar Talegaon, which is within five miles. There are many Bhowani Dheres in Walgaon, but none in the other village. In Walgaon there were very few cats, but in the other village there were many. In Walgaon the number of cats is now considerably increased, and even the Bhowanis are keeping cats, for the villagers now all fully recognize the value of the cat. I have noticed that a village where many buffaloes are kept will usually escape plague, because buffaloes are kept chiefly for milk, and where there is milk, cats are likely to be found. The villagers have of their own accord frequently mentioned this point.

MOHULLA ARGUMENT.

A group of houses in a village is called a "mohulla" and we very often find that people of particular castes congregate together in one part of the village. If, then, we have in a village Mohammedans and Bhowani Dheres there is a good opportunity of noticing whether the people who keep cats are less liable to plague than the others. In Ellichpur there is a mohulla (Kasatpura) which is occupied almost entirely by Mohammedans, and Dr. Holmes and the municipal secretary found that while plague was prevalent in most parts of the city this mohulla was almost free from plague. I had visited this mohulla when plague broke out and had noticed that there were many cats—nearly 50 per cent. It might be said that the freedom from plague was possibly due to evacuation, which we know to be a very safe preventive, but the Mohammedans, owing to the difficulty of maintaining their "purdah" system, are very reluctant to go out, and, as a matter of fact, very few of them left the Kasatpura mohulla. In Saur, a village of about 2,000 population, I found that plague was severe in the Bhowani Dher area, while the Mallies, who keep buffaloes and consequently had plenty of cats, neither left the village nor suffered from plague. At Malkapur I visited a house in the Bhowani Dher area in which eight people had recently died from plague, but the Mohammedan area, which is within a hundred yards, was quite free from plague. Hospital Assistant Azimuddin reports that in Anjangaon Bari, while plague was raging furiously in Baripura, the Mussulman area (50 houses with 20 cats) was quite free.

Hospital Assistant Pranjpe, of Chandur Bazar, has sent detailed reports in regard to several villages. In Shirasgaon plague occurred in Kumbharpura mohulla, but in the adjacent mohulla, Deshmukhpura (with 36 cats to 40 houses), there was not a single case. Quite close to Kumbharpura is Jamalpura (40 houses with 33 tame cats), but no cases occurred here. The hospital assistant adds that "most of the people have a firm belief that cats prevent plague." In Jasapur (population 846) there were 38 cases with 21 deaths. The cases occurred in 21 houses, and in only one of these houses was a cat present, but that cat was a young one. There was one group of 18 houses with 23 cats in this village, and no case of plague occurred there. The first case occurred in a Bhowani's house. The hospital assistant adds that "the people have come to know the advantage of keeping cats; they are fully convinced that cats destroy rats and thus prevent plague."

In Kharwadi (population 550) 8 cases occurred in 8 houses; there was no cat in any of these houses. There are 25 Bhowanis' houses in this village; the first case occurred in a Bhowani's house.

In Brahmanwada (population 4,615: 129 cases and 68 deaths) there is one group of houses—Dhedpura—with 10 cats to 22 houses. No case occurred there, and the people did not leave their houses. In another group (18 houses with 8 cats) there were no cases, and the people did not evacuate their houses. In this village there are 5 Bhowanis' houses, but no plague occurred in any of these houses. They are, however, situated close to Dhorepura, where there were many cats.

THE HOUSE ARGUMENT.

While plague was prevalent in Amraoti city I saw very frequently one man who did not leave the city, and he told me that neither in the previous epidemic nor in that epidemic were there any rats in his house, because he kept cats, and he did not leave the city during the prevalence of either epidemic. Many others have told me the same story, but I fully recognize that one or two cats in an area in which the majority of people do not keep cats will not prevent plague. For example, a Mohammedan who lives in the Jain area, although he has kept two cats, has had cases of plague in his house on two occasions, because the majority of Jains do not keep cats. I have told him that if he wants to continue living in that area he would need to keep a dozen cats. The Jains object to taking life of any kind, and I have been told that there is a place in Bombay to which Jains send bugs and pay men liberally to sleep there so as to provide a meal for these bugs. It can easily be imagined that the Jains will present a difficulty in regard to plague prevention, but they are not a numerous body, and in most towns, in this district at least, there are only a few of them, and their neighbours' cats can after a year or two be relied on to keep the rats away. Last year I visited D——, a town in which plague was then prevalent; most of the people had gone out, but an American missionary who believes in faith cures remained with his family in his house, which is situated in the middle of the town, no doubt relying on his faith to keep plague away from himself and his family. In the course of conversation he casually mentioned that since the people went out he was greatly troubled by about a dozen cats which came to his house, and which his wife fed daily. I am afraid I spoiled what he, no doubt, would have brought forward as a good illustration of the value of faith, when I asked him if it had never occurred to him that he and his family owed their lives to these same troublesome cats. He replied that the idea had never occurred to him before.

DIFFICULTIES.

From the above considerations it would seem at first sight that there ought to be no difficulty in inducing people to keep enough cats to wipe out plague within a few years. In this district the great majority are so fully convinced of the value of the cat, and are so keen on becoming the owners of a cat, that I think I am justified in concluding that there will not be a recurrence of plague on a large scale, except in the areas occupied by those who are not willing to keep cats; but the value of the cat is not yet recognized in most parts of India. The Plague Commission which sat recently in Bombay has done excellent work in placing beyond doubt the fact that rats are the cause of plague epidemics, and that fleas are the transmitters from rats to man, but does not appear to have taken into consideration the part played by cats in destroying rats. For example, two members of the Commission have recently published pamphlets in which they tell us that we cannot get rid of rats. One of them gives a whole page of figures to show that after a year's work with traps in a village there were still many rats remaining, and he goes on to argue from this that we must fall back on inoculation, but he has not said a word about the cat. Now, when the Commission were satisfied that rats are the cause of plague epidemics, one would have expected that the first thing they would do would be to inquire whether there is any natural enemy of the rat, and whether the people would be likely to willingly keep this animal. Professor Haffkine also tells us that we cannot get rid of rats, and that therefore we must fall back on inoculation, but he had not, as far as I know, made any inquiries about the cat. I have already referred to the inaugural meeting of the National Society for the Destruction of Vermin, and to the fact that the cat was not included in the long list of rat destroyers that were mentioned at that meeting. It seems to me very extraordinary that the cat should be thus persistently ignored by scientific men. The first sentence that most of us learned at school was that "cats kill rats." It is the last thing that many are willing to put into practice.

In my former paper I said that I thought there is good reason to believe that the duration of plague in India depends on the time it will take before it is generally recognized that the cat is the best plague preventer.

Further inquiries have confirmed me in that opinion. It is as clear as anything can be that the question of plague or no plague in this country is a question of Nature's balance between cats and rats. We may assist the cat by using traps and poison, but we can never hope to compete with the cat, and a great point is the strong religious feeling in favour of keeping cats. The people in this district have seen for themselves that where there are cats it is the rare exception to find plague; and I feel that the weak point in this paper is my failure to convey an idea of the very strong opinion that cats are the best plague preventers, which is held by those who have seen for themselves the freedom from plague of those villages and mohallas where cats are numerous and of those houses in which cats were present. I fully admit that there will be a difficulty in the case of Jains and some Marwaris, and with some of the worshippers of Vishnu.

Of course it would take some time to get a sufficient number of cats, but in the meantime other measures should be pushed with vigour. What I should like to lay special stress on is the importance of recognizing that the ultimate method of preventing plague will be by keeping cats. Cats breed twice a year in India, and have about three kittens each time. Many of the kittens now die from neglect, or are eaten by the males, and it is only when the value of the cat is recognized that sufficient protection will be given to the young cats.

P.S.—Professor Kitasato, Director of the Institute for the Research of Infectious Diseases, writes from Tokyo, July 13th:

Your paper on cats as plague preventers was read with special interest (BRITISH MEDICAL JOURNAL, May 30th, 1908). Professor Koch of Germany, who is now staying with us in Japan, has strongly recommended the keeping of cats as a good method for plague prevention for our epidemic, in consequence of his success in keeping cats on board the ships bound for tropics to make them clear of the rodents. Consequently we have been just going to carry his suggestion into practice. When the things were thus far going on, I have received your paper, and immediately showed it to Professor Koch, who expressed his sincere admiration on your idea as one of the most useful reports on the matter.

A CASE OF IMPLANTATION OF THE URETERS INTO THE RECTUM FOR EXTROVERSION OF THE BLADDER IN A WOMAN, BY A MODIFIED PETERS'S OPERATION.

By R. LAW FORD KNAGGS, M.C.CANTAB.,
SURGEON TO THE LEEDS GENERAL INFIRMARY.

EXTRAPERITONEAL transplantation of the ureters into the rectum, or Peters's operation, for relief of extroversion of the bladder, has now been frequently done, but so far as I am aware no case has yet been recorded in which an operation upon the lines of a Peters has been carried out in a female.

It must be at once obvious that the uterus and broad ligaments, interposed as they are between the back of the bladder and the rectum, form the chief obstacle to the extraperitoneal method, and to enable it to be performed with as little departure as possible from Peters's plan in the male it is necessary for the uterus to be removed.

To be rid of this viscus is very desirable from the patient's point of view, because the menstrual periods add very materially to her distress, both bodily and mental; and by the retention of a pool of decomposing fluid in the misplaced vagina the disgusting urinous odour from which she is never able to escape is rendered peculiarly fetid; indeed, so far as my experience goes, the condition of a woman who suffers from ectopia vesicae is far worse than that of a man.

From the ethical standpoint no one could dream of raising any objection to a proceeding that would render these unfortunate people less loathsome to themselves and to others, and give them a very welcome relief from continuous suffering.

The developmental and anatomical relations of the genito-urinary system are so intimate, that when a grave congenital defect such as extroversion is present it would not be astonishing if a departure from the normal were

met with in one or other of the associated structures. But when, in this instance, consent for the operation had been obtained, great difficulty was experienced in obtaining any information as to the possible peculiarities of the female genital arrangements in such cases.

Textbook accounts are invariably based upon male cases, and though occasional references to the malformation in the female are to be met with in the literature of the subject,* they are not sufficient to be of definite assistance, but just enough to justify the impression that maldevelopment may not be confined to the bladder and urethra, but may involve the genital passages and organs. The want of knowledge on this point was productive of the one unexpected difficulty met with during the operation.

For the opportunity of operating in this instance I am indebted to the kindness of my colleague, Mr. Ward, who, being aware of my interest in these cases, transferred the patient to me.

History.

Mary G., aged 31, had been operated upon by the late Mr. Jessop for extroversion of the bladder at the age of 4. Evidently the old flap operation of Wood had been performed, and the object aimed at had been achieved, for the bladder mucous membrane was completely concealed, and the urine escaped from a large cavity by a dependent opening at the top of the vulva. As she grew up, however, her unfortunate state became one of great misery, for the vulva was kept in a state of chronic inflammation owing to the irritation of decomposing urine, which deposited phosphates upon the hair, and of an offensive purulent discharge from the interior of the cul-de-sac, which was probably either vaginal or uterine in origin. Her sufferings were aggravated at the menstrual periods, and, owing to the soreness of the skin, she was unable to wear a urinal, so the condition of her clothes can be imagined. The usually foul and offensive odour which permeated her vicinity was alone sufficient to explain the misery depicted in her face and the shrinking timidity of her manner. Her broken spirit could not at first be brought to the point of facing any operation, but, as matters grew worse, she eventually consented, and was admitted on June 10th, 1907.

Operation.

After careful preparatory treatment, to subdue the eczematous condition of the labia and perineum and thighs, the following operation was performed on June 26th:

The patient having been anaesthetized and the field of operation carefully shaved and cleaned, the first step was to remove the anterior wall of the cul-de-sac by cutting through its attachment to the abdominal wall and labia with scissors. A large area covered with smooth skin from which a few short, fine hairs grew, was exposed, and at its lower part was the extroverted bladder with its two ureteral orifices filling in the gap left by the divergence of the lower ends of the recti. The mucous membrane of the bladder and urethra was continuous with the mucous membrane in the vulval cleft, and about 1½ in. below the orifices of the ureters was a small aperture from which some dirty mucus exuded. This was thought to be the os uteri, as it appeared to coincide with the position which a previous examination of the rectum had shown the cervix of a retroverted uterus to occupy.

Next, the exposed bladder, whose area was about two square inches, was incised all round at its junction with the skin and with the urethral mucous membrane and dissected up from the underlying peritoneum. In this way the bladder with both ureters attached was isolated, and a strip of gauze passed between the ureters was used as a retractor to draw it upwards and out of the way for the next stage of the operation, namely, the removal of the uterus.

The intention was to open the exposed peritoneum transversely, but on attempting to do this, instead of entering the peritoneal cavity, a sac containing, perhaps, a couple of ounces of dirty offensive mucus was exposed. This proved to be the vagina, and the aperture which had been mistaken for the os uteri was its external orifice. It was carefully sponged out and cleaned, and then with the help of an assistant's finger in the rectum as a guide, the peritoneum was opened just above it for about 1½ in. Into this opening the uterus was made to present, was seized with a vulsellum and drawn out. First the left and then the right broad ligament was divided and ligatured, the ovaries being left behind; next the posterior vaginal wall was cut across just at the point where it ceased to be applied to the anterior surface of the rectum, and the uterus with the anterior vaginal wall was removed after the uterine arteries had been tied and the few remaining points of attachment divided. This part of the operation was very easy. If this account has been carefully followed it will be seen that the hole left in the peritoneum after the removal of the uterus had for its lower border the edge of the peritoneum where it is reflected from the posterior vaginal wall on to the anterior wall of the rectum and

* The clitoris in the female is split in two portions, corresponding to the nymphæ, the anterior commissure of the vulva being wanting, and the bladder and urethra thus opening between the labia, and directly into, or immediately above, the vagina. The uterus is usually well formed.—Harte, *Annals of Surgery*, vol. xli, p. 466, 1905.