keeping cats, but there is not, as far as I can find out, any religious objection. As soon as they realize the advantage of keeping cats they willingly agree. The Bhowani Dher, who are not a numerous people, object to keeping cats because the death of a cat in their house puts them out of caste, and they have to break all their earthen vessels and perhaps entertain their caste fellows. The birth of kittens in their house is also a serious matter, but to avoid this latter misfortune, those who have recognized the value of keeping cats now keep male cats. These people sometimes suffer severely from plague, for example, in Dhaba village the Bhowani group of houses suffered from plague while the group of houses occupied by the Tels, where the percentage of cats was over fifty, escaped.

RAT-PROOF HOUSES.

Dr. Ashburton Thompson is a strong advocate of the rat-proof house, and theoretically this idea is excellent. But most houses in an Indian village are built of mud, and in all probability will be built of mud for centuries to come. The mud wall might be called the black rat's home, for it is in the mud wall that it likes to make its burrow and nest. The Bhowani Dher in this district often lives in a wattle hut, and those who live in such huts are remarkably free from plague, because there is little attraction for the rat.

INOCULATION *versus* CATS.

While we did not know how plague was spread, there was a great deal to be said in favour of inoculation; but now that we know that plague is spread by rats and that without rats there will be no epidemic, surely it is much better to try and remove rats; and when we know that rats can be kept away by cats there can be little question that the best way to prevent plague is to keep cats. In this district, where vaccination is an exceedingly popular measure and where the elder men could soon convince the doubter who has perhaps never seen a case of small-pox of the value of vaccination, the people have not readily taken to inoculation, and their reasons might be stated somewhat like this:

<i>Inoculation.</i>	<i>Keeping Cats.</i>
Efficient for a few months.	Permanent efficiency.
Does not strike at the root.	Destroys the root.
Very expensive.	Cost to the public <i>nil</i> .
Large establishment required.	No establishment required.
Necessary to inoculate every member of household.	One cat protects a household.
Not an absolute preventive.	When the number is sufficient all risk of plague is abolished.
Sore arms, fever, and absence from work.	No inconvenience.
Many objections on the part of the people.	Extraordinary willingness.
Not favoured by tradition or religion.	Strong tradition in favour of keeping cats (Parsis and Bhowani Dher excepted).

CONCLUSION.

In the early days of plague epidemics many mistakes were made. Cordons were drawn round villages and towns so that infected people could not get in, but infected rats might steal in unobserved. Disinfection was practised with great vigour, but while this operation was in progress the rat was sitting comfortably in its burrow, ready to come out as soon as the disinfection operations were over. The plague patient was hastily segregated to a plague camp, but we now know that plague (bubonic) is practically never conveyed direct from man to man, so that it has come to be a common saying that "the safest place in a plague epidemic is a plague camp," and those of us who have had charge of plague camps know that those servants who lived in the camp practically never took plague, although they were handling plague patients all day. A few cases of plague have been occurring daily in this district for some time, and from daily inquiries which are being made I think 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. At any rate, I hope I have shown that there are reasonable grounds for making further inquiries on the lines suggested here.

REFERENCE.

¹ Indian Medical Gazette, October, 1907

SPORADIC KALA-AZAR IN CALCUTTA, WITH NOTES OF A CASE TREATED WITH ATOXYL.

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KALA-AZAR, as used in this article, may be defined as the disease caused by the Leishman-Donovan bodies. Its epidemic manifestation, which is seen in Assam, more frequently goes by this name. It is endemic round about Calcutta and probably occurs in the city itself.

Last year I examined the spleen blood of nearly 150 cases of enlarged spleen admitted into my wards in the Campbell Hospital, and found the parasite of kala-azar in 60 cases. From this it is seen that cases of this disease are frequently admitted into the Calcutta hospitals.

No two cases came from the same house, and I have not succeeded in corroborating the fact that the disease is limited to individual houses or families; 91.7 per cent. of my cases were Hindus, while 8.3 were Mohammedans, giving a proportion of nearly 11 to 1. Out of the total number of patients admitted into my wards in 1907, about 75 per cent. were Hindus and 17.5 per cent. Mohammedans, giving a proportion of nearly 4 to 1. It will thus be seen that Hindus are more frequently affected by the disease than the Mohammedans, and if this fact is corroborated by more extended observations it may probably throw some light on the etiology of the disease; 33 per cent. of my cases were below the age of 20. I have not met with any case above the age of 55. The cases came to my wards during all the parts of the year, the largest number of admissions being during the period of April to August, but especially in the month of May.

It was difficult to trace from the history of the cases where the disease was contracted. Most of them pointed, however, to the disease having been contracted in the neighbourhood of Calcutta, and a few seemed to have contracted the disease in the city itself, as they never went out of it. None of my cases came from the epidemic area of Assam. Some came from Orissa, Eastern Bengal, district of Murshidabad and Behar.

Most of my cases were chronic, with history of illness for several months, and with the spleen extending 3 in. or more below the costal arch. In a large majority the liver was also moderately enlarged, while in a very few cases the liver was very much more enlarged than the spleen, which extended just an inch or so below the ribs. I have not met with a case in which the spleen was not at all enlarged.

SYMPTOMS.

As regards the early symptoms of the disease, knowledge is still very limited. The patients met with in the hospital wards have suffered for a long time. I give here a summary of the early symptoms of the disease as gathered from the patients.

In one class of cases we get a history of intermittent attacks of fever, quotidian for some time, and later on becoming irregular with or without rigors, lasting for several months and not benefited or only temporarily benefited by quinine. In a second class there is a history of a few previous attacks of fever, continuing for some time on each occasion, the spleen becoming slowly and steadily enlarged. In a third class there is a history of attacks of low fever, continued for several months, with a progressive enlargement of the spleen not benefited by any treatment. In a fourth class there is a history of one or two attacks of remittent fever more or less resembling typhoid. In a fifth class the patient gives a history of gastro-intestinal troubles, with dysenteric or diarrhoeic attacks followed by oedema of the lower extremities, and attended from time to time with ague-like attacks of fever. In all these cases the patient invariably says that there was very slight or no benefit from quinine. Possibly a large majority of cases begin with attacks of remittent fever.

Among the other symptoms I have observed may be mentioned progressive emaciation, with anaemia, cachexia, oedema of the extremities, diarrhoea, dysentery, which may sometimes be very obstinate, and haemorrhages from various parts of the body, such as the skin and mucous membranes.

Oedema of the extremities is sometimes an early symptom; on the other hand, it may be absent even up

to the last. It is not easy to explain the cause of this oedema. It appears that we can distinguish two classes of cases—one in which oedema is a marked symptom and the other in which it is not. These two types are well shown in the two accompanying photographs.

I have elsewhere described in detail the various types of pyrexia that I have observed in this disease.¹ Besides

Fig. 1.—Advanced case of kala-azar with no oedema.

these, there may sometimes be pyrexia of the pyaemic type, there being more than two remissions or intermissions in twenty-four hours. Rarely the disease takes on an apyretic course for an indefinite length of time.

BLOOD COUNT.

In the main my observations corroborate those of Major Rogers.² Leukopenia is extreme, and in many cases the proportion of white to red is less than $\frac{1}{1000}$ (Table I).

TABLE I.

	Red Corpuscles.	White Corpuscles.	Proportion.
1	2,390,000	1,720	$\frac{1}{1389}$
2	2,530,000	2,530	$\frac{1}{1000}$
3	2,740,000	1,792	$\frac{1}{1529}$
4	3,440,000	2,386	$\frac{1}{1441}$
5	3,170,000	2,380	$\frac{1}{1352}$
6	2,660,000	1,160	$\frac{1}{2293}$
7	2,762,000	1,527	$\frac{1}{1807}$
8	2,920,000	1,320	$\frac{1}{2212}$
9	2,120,000	1,736	$\frac{1}{1221}$
10	2,320,000	1,600	$\frac{1}{1456}$

In a number of cases, though there was a marked leukopenia, yet the proportion of white to red was higher

Fig. 2.—Advanced case of kala-azar with marked oedema.

than $\frac{1}{1000}$. These are probably very advanced cases with extreme anaemia (Table II).

TABLE II.

	Red Corpuscles.	White Corpuscles.	Proportion.
1	1,400,000	2,170	$\frac{1}{645}$
2	860,000	2,250	$\frac{1}{382}$
3	1,460,000	3,670	$\frac{1}{248}$
4	1,300,000	3,300	$\frac{1}{393}$

In many cases complications often lead to increase in the leucocyte count (Table III).

TABLE III.

	Red Corpuscles.	White Corpuscles.	Proportion.	Complication.
1	2,580,000	7,662	$\frac{1}{337}$	Pneumonia.
2	895,000	2,768	$\frac{1}{309}$	Cancerum oris.
3	3,070,000	3,500	$\frac{1}{877}$	24 hours after application of a large blister over the splenic region.

Lastly, cases that have been recovering or have recovered from cancerum oris, or have been treated with atoxyl for some time, may give a higher relative leucocyte count than 1000 (Table IV).

TABLE IV.

	Red Corpuscles.	White Corpuscles.	Proportion.
1	2,340,000	4,569	$\frac{1}{12}$ (Recovery from cancerum oris)
2	2,600,000	3,340	$\frac{1}{18}$ (Treatment with atoxyl)
3	3,400,000	0'909	$\frac{1}{25}$ (Treatment with atoxyl)

Comparing the leucocyte count in kala-azar with what we observe in malarial cachexia, exactly the same conclusion as that of Major Rogers is reached—namely, that a ratio of red to white corpuscles below 1000 is almost diagnostic of kala-azar; but, as we have shown above, we may meet with cases without any apparent complication, or some with well-marked complications, or others that have taken a favourable turn, in which the proportion may be higher than 1000.

I append here a table showing the blood count in malarial cachexia, in which the proportion of white to red is much greater than 1000 (Table V).

TABLE V.—Malarial Cachexia.

	Red Corpuscles.	White Corpuscles.	Proportion.
1	3,240,000	2,000	$\frac{1}{62}$
2	2,238,000	3,372	$\frac{1}{28}$
3	2,354,000	4,863	$\frac{1}{48}$

COMPLICATIONS.

(1) Pneumonia; (2) phthisis; (3) dysentery; (4) diarrhoea; (5) cancerum oris and its attendant complications; (6) hæmorrhage from the gums or under the skin in advanced cases; (7) delirium or coma, in some cases, shortly before death; (8) albumen in the urine in a few cases, which might be due to concomitant kidney disease; (9) paraphimosis; (10) hæmorrhoids; (11) hæmatemesis; (12) melaena; (13) epistaxis; (14) oedema of the extremities; (15) splenalgia due to infarcts in the spleen; (16) hæmorrhoids, which may bleed obstinately and profusely; (17) large abscesses. I have not met with a case in which there was perforation of the bowels, which Captain Christophers describes in some of his cases.

PROGNOSIS.

According to my observations, the prognosis is always grave. I have not the record of a single case which I could pronounce cured; 40 per cent. of my cases died in the hospital, the most frequent cause of death being intractable diarrhoea or dysentery.

TREATMENT.

So far as my observations go, no drug can kill the parasites. I have used the following drugs without success: (1) Quinine internally; (2) quinine hypodermically; (3) fluorides; (4) arsenic and some of its new preparations, such as sodii cacodylas, arrhenal, and atoxyl; in some cases arrhenal and sodii cacodylas were given hypodermically; (5) methylene blue internally; (6) methylene blue hypodermically; (7) izal in increasing doses; (8) cyllin in increasing doses up to half a drachm thrice a day.

Encouraged by the results of the use of atoxyl in trypanosomiasis, I gave it an extensive trial in a few cases, one of which has been under my observation for nearly eight months and under atoxyl treatment for nearly six months. As far as I am aware, there are no records of a single case in which atoxyl was used for such a prolonged period in ka'a-azar.

The patient, aged 30, a Hindu, had slight oedema of the lower extremities at the time of admission, the spleen extending 8 in. from the left nipple in the middle line.

The effects of the treatment were as follows:

1. Body Weight.

	St lb.
May 25, 1907	6 0
August 12, 1907	7 4
September 9, 1907	7 $\frac{1}{2}$
November 16, 1907	8 0
December 29, 1907	8 $\frac{1}{2}$

2. Blood-count.

Date.	Red Corpuscles.	White Corpuscles	Proportion.
May 2, 1907	2,760,000	1,527	$\frac{1}{1807}$
August 16, 1907 ..	2,500,000	1,600	$\frac{1}{1562}$
September 7, 1907..	2,280,000	1,950	$\frac{1}{1170}$
November 18, 1907 .	2,600,000	3,240	$\frac{1}{788}$
January 7, 1908 ..	3,400,000	6,600	$\frac{1}{515}$

3. Pyrexia.

4. General Condition.—The patient looks much better in health; the oedema of the extremities has completely disappeared. He is fatter than before, is less anaemic, has no cachexia, and has got better appetite.

5. Toxic Action.—There were never any symptoms of arsenic poisoning.

6. Local Action.—The drug was almost non-irritating. Except on one occasion there was very slight local irritation; on this occasion there was a slough formed, which I think was due to the solution being too hot. In other cases in which I have given injection of atoxyl no untoward local symptoms were met with.

7. Effect on the Parasites.—They are still found in the splenic blood. Some of them present a granular appearance, but they are still to be seen in large numbers.

8. Spleen.—Not much diminished in size.

Before concluding, I would just mention one point, that spleen puncture, though it has been pronounced dangerous by the highest authorities, has never led to any single accident in any of my cases. I have found that a large hypodermic needle is sufficient to enable one to draw one or two drops of blood, which are almost always sufficient to show the parasites if they are present. I would therefore recommend that not more than one or two drops of blood should be drawn from the spleen for ordinary diagnostic purposes. It appears to me that the danger of spleen puncture may be reduced to a minimum if one uses a hypodermic needle, gives the patient calcium chloride before and after puncture, enjoins absolute rest in bed, and puts pressure upon the punctured spot for about fifteen minutes after the operation.

CONCLUSIONS.

1. Sporadic kala-azar is frequently seen in Calcutta hospitals, and is probably endemic in Calcutta itself. Hindus are probably more affected than Mohammedans.

2. The leucocyte count is of great diagnostic help, but not absolutely so in kala-azar.

3. Atoxyl is borne in very large doses (gr. xv, in one injection) by kala-azar patients. It is perfectly harmless and non-irritating. Its effect on the parasites is perhaps very slight. While improving the patient's health, it does not remove the cause, though it has apparently some effect upon the pyrexia. In order that it may do any good it must be given in very large doses (gr. xv) as injection every seven or ten days, continued for several months.

4. Spleen Puncture.—It is practically safe if one uses a hypodermic needle and does not draw more than one or two drops of blood.

REFERENCES.

1 Indian Medical Gazette, January, 1906. 2 Lancet, March 2nd, 1907.

A COMMITTEE on the use of lead in the manufacture of earthenware and china has been appointed by the Home Secretary. The committee is to consider the dangers attendant on the use of lead in pottery, and to report how far these can be obviated by improved appliances and methods in lead processes, by the limitation of the use of lead, by the substitution of harmless compounds for raw lead, or of other materials for lead, and by other means. The committee is also instructed to consider the danger and injury to health arising from dust or other causes in the manufacture of pottery, and the special rules regulating the decoration of earthenware and china. The members are: Mr. E. F. G. Hatch (chairman), Mr. A. Vernon Harcourt, F.R.S., Dr. George Reid, Mr. William Burton, and Mr. Bernard Moore.