A Bill has recently been passed by the Bombay Legislature requiring that maternity benefits should be paid to all women mill-workers at confinement, the benefit to consist of two months' wages, that is leave on full pay for a month before and a month after confinement. While welcoming the action, one cannot help regretting the form in which the benefit is given for the reasons already declared. The woman is handed a cash benefit and no effort is made to tell her why, or to ensure that her own health or the child's will be safeguarded. It is not impossible, even yet, to amend the proposals of the bill.

The benefit now provided by legislation is Rs. 21 per head. There are about 30,000 women mill-workers in Bombay, of whom it is estimated about 10 per cent. bear children annually. Thus the amount to be given by the mill industry towards the benefit (if all women eligible came forward, which is unlikely) would be about Rs. 60,000 annually. A proportion of this sum would be sufficient to finance a large enquiry on the lines given above and to obtain ample evidence as to the best method of giving maternity benefits in India. Surely such an enquiry would be a wise preliminary of any widespread scheme for maternity benefits.

In the course of our investigation we were impressed by the fact that improvement in the conditions of the male workers would in itself assist the maternity troubles of the women. The lack of proper nourishment in pregnancy and the need for continuing work when physically unable is often due to the habits of the men who spend their own wages on drink or gambling, so that the wife practically supports the household. The provision of cinemas or other amusements for Sundays and holidays, the starting of welfare organizations, propaganda to inculcate a sense of responsibility towards the wives and children would all be means to this end. Work of this kind is already being carried out by the Y. M. C. A. in Bombay, but our point is that it should be done by the employer for the benefit of the worker. Grain shops in the mills would ensure the workers getting a good return for their money, and schools for the workers' children would be specially useful as inculcating on impressionable minds a sense of greater responsibility both in regard to work and social relations.

In concluding, we wish to express our thanks to Dr. Lucy Wills for much help and advice, especially with regard to tables and to the facts about diet obtained in the course of a larger enquiry which she is carrying out.

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A CLINICAL STUDY OF POST-KALA-AZAR DERMAL LEISHMANIASIS.

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EIGHT years ago Brahmachari (1922) reported a case, a man with nodular skin lesions all over the body in which leishmania had been demonstrated. This patient gave a history of having had kala-azar and of having been cured by a course of injections of sodium antimony tartrate. During the next year or two a few more single cases of a similar type were encountered and reported, one by the senior writer (Knowles, Napier and Das Gupta, 1923). From the latter half of the year 1925 onwards an increasing number of patients suffering from this condition have attended at the School of Tropical Medicine and Hygiene for diagnosis and treatment. Colonel Acton and the senior writer (Acton and Napier, 1927) published a paper describing three distinct clinical types and discussing the pathology of this condition; in this report they analysed 44 cases. Since the publication of this paper Brahmachari (1928) has described yet another clinical type.

Our reason for writing this paper is threefold. During the last two and a half years we have seen, and have made and collected notes on, some 150 more patients suffering from this condition; these 150 cases include some previously undescribed clinical types; and, finally, we have realized the necessity of publishing further notes on this comparatively common condition with which the general practitioner in Bengal does not appear to be very familiar, if the diagnoses made before patients attend this institution are fair samples. Our previous paper was published in the *Indian Journal of Medical Research* and was probably not seen by a very large percentage of the readers of this *Gazette*. We propose to make this a purely clinical study.

Ætiology of post-kala-azar dermal leishmaniasis.

The condition has so far only been observed in kala-azar endemic areas. In this School we have seen well over two hundred cases whereas only 3 or 4 other cases have been reported in the literature. One case has been reported from Assam and so far none from Madras, to mention the other two endemic areas in India. We believe that a few other cases have been diagnosed in Assam and in the series now being reported two of the patients came from that province.

Persons of all ages, both sexes and all classes of the community appear to be equally susceptible. Indians, Anglo-Indians, Armenians, and Europeans have suffered from the condition; no community seems to be immune.

The condition is a sequela of a generalized leishmania infection. The majority of the patients give a history of having suffered from —and of having received treatment for—kala-azar, others give a history of having suffered from a definite attack of fever and splenic enlargement, whilst a very small number give no history of any such attack. As there appears to be no clinical difference between the cases in which there was and those in which there was not a definite history of kala-azar, the conclusion that all of them have at some time or another suffered from a generalized leishmania infection which in some instances cleared up without treatment, and which in others gave rise to symptoms so mild that they were forgotten or even not noticed by the patient, appears to be justified.

The dermal lesions usually make their appearance from one to two years after all the signs and symptoms of the visceral infection have disappeared. We have heard of no case in which the dermal lesions developed during the primary visceral attack, but in three instances which have come to our notice the visceral disease appeared to relapse at a time when the patient was suffering from dermal lesions.*

In every instance in which a thorough search is made *Leishmania donovani* can be demonstrated in the nodular lesions; in the depigmented patches the parasite cannot usually be found by means of a smear, but in a number of instances leishmania have been obtained from a culture of a skin snip from a purely depigmented lesion. There is little doubt that the parasite is *Leishmania donovani* and not one of the other species of the genus Leishmania; Das Gupta (1927) and others have demonstrated that when inoculated into mice the culture from a dermal lesion produces symptoms similar to those produced by the culture from a case of kala-azar.

Certain other points in the ætiology of the condition will be discussed later in this paper when the details of the present series of cases have been analysed.

Description of the different lesions encountered in post-kala-azar dermal leishmaniasis.

(1) *The depigmented area.*—A small partially depigmented area, varying in size from a pin-point (Plate I, fig. 1) to an extensive area occupying the whole of one aspect of a limb (Plate I, fig. 2), but usually about 1 centimetre in diameter. They commence as small pin-point areas and increase in size, not often to a greater size than 1 centimetre, so that they are usually discrete but occasionally they increase beyond this, coalesce, and produce the map-like appearance of Plate I, fig. 2. The depigmentation is not progressive so that complete depigmentation is not seen. At first the lesions are macular in type, but later become very slightly raised, the pre-nodular type of lesion. The anatomical distribution of these lesions is shown in the analysis of our cases, below.

The erythema or butterfly rash. (Plate I).—There is an erythema which varies in intensity in different individuals; in some it is very striking, in others noticeable only when attention is drawn to it. Though it is constantly present the patient will sometimes give a history that it is far more prominent after the face has been exposed to the sun. The distribution of this erythema is very constant, namely on the cheeks, the skin surfaces of the upper and lower lips, and the outer surfaces of the alæ nasi; occasionally it extends on to the tip and sides of the nose and the chin.

The nodules (Plate II, figs. 3 and 4).—These are soft granulomatous growths, yellowish-pink in colour, varying in size, but usually about the size of a split pea. The nodules may join and form plaques (Plate II, fig. 3). The skin over the nodule is thin and glossy, but shows no special susceptibility to break down and heals rapidly after a portion of it has been removed for diagnostic purposes. The nodules are painless, but there is no anæsthesia. They appear on all parts of the body but mostly on the face. The best idea of the frequency with which the nodules appear at different sites can be obtained from the analysis of the present series which is given below.

These three are the most common types of lesion; the rarer types are described below:—

The verrucose type (Plate II, fig. 5).—Warty growths occur at the root of the nails on the fingers and toes, and there is considerable thickening of the distal phalanges of the digits;

*Recently Brahmachari and Banerjee (1929) have reported one such case. The patient was originally treated for kala-azar with sodium antimony tartrate by the senior writer, remained free from all symptoms of dermal leishmaniasis for 2 years, he then developed dermal lesions, and was given 3 courses of treatment, including one of urea-stibamine, without showing any improvement. He drifted away from our institution, he developed signs of visceral infection again and was then treated by Dr. Brahmachari. Again the signs of visceral disease disappeared, but the dermal lesions remained. He eventually responded to a very prolonged course of antimony injections; the photographs show him to be entirely free from nodular lesions on the face.

PLATE I.

Fig. 1.

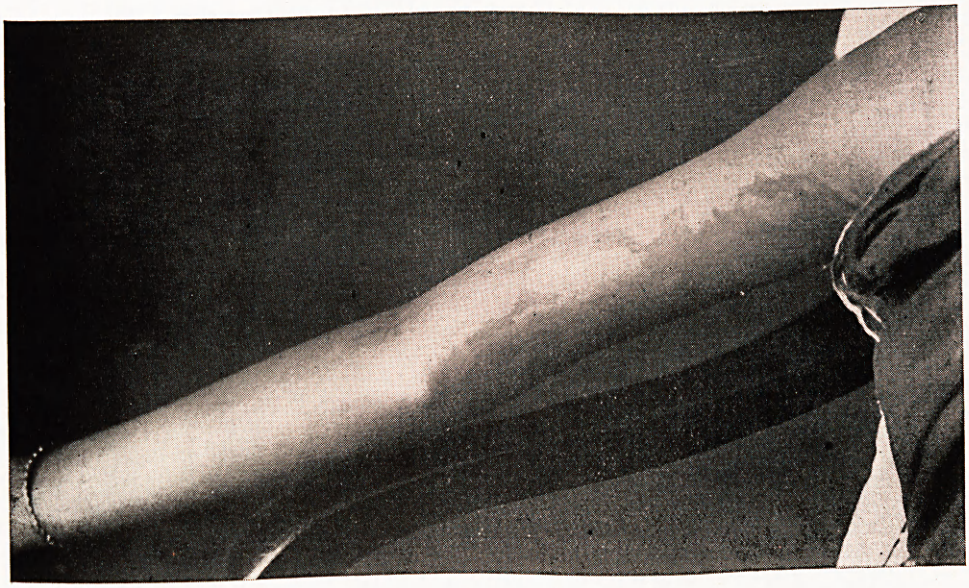


Fig. 2.

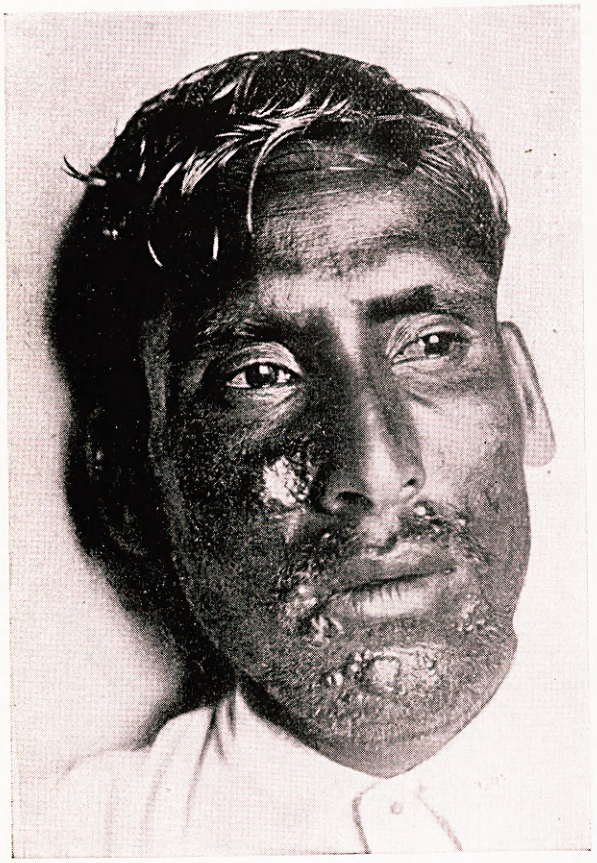


Fig. 3.

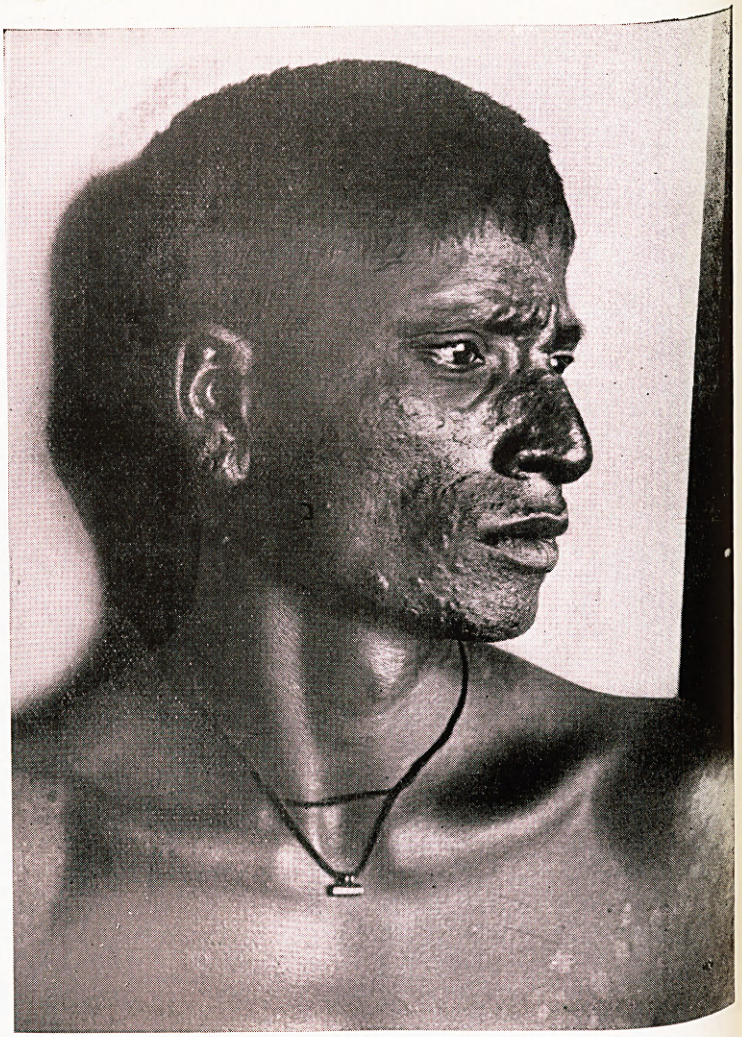


Fig. 4.

Fig. 5.

the condition is usually diagnosed as a tuberculide.

The papillomatous type (Plate III, fig. 6).—Instead of the ordinary nodular growth there is hypertrophy of the individual papillæ of the skin with the production of a rough, dry area consisting of minute papillomatous growths. This is usually seen on the nose or chin.

The hypertrophic type.—In this the lips, eyelids, or alæ nasi become hypertrophied as if there were lymphatic obstruction of the part. They form soft lipoma-like swellings which do not pit on pressure (Plate III, figs. 7 and 8). In one variety of this type the nose is involved; there is a general hypertrophy of the tip of the nose, the skin is stretched and the tumour presents a mottled appearance like a gooseberry (Plate IV, figs. 9 and 10). In the sites where this particular type of lesion occurs the mucous membrane is continuous with the skin and the former appears to be involved in the infection. In the case shown in Plate III, fig. 7, the parasites were obtained for a scraping from the mucous surface of the lip and in the case shown in Plate IV, fig. 9, in a smear from inside the nose.

The xanthoma type.—The lesions present the textbook description of those of xanthoma tuberosum multiplex. There are raised orange-coloured plaques on different parts of the body, most noticeably at the bend of the elbow, on the axillary folds, on the inner side of the thigh, at the outer canthus of the eye, on the chin and at the angles of the mouth. They are painless and do not ulcerate. In a type of the disease which might be classed under this heading there are large raised plaques on different parts of the body which do not undergo the same colour change, but which become completely depigmented.

The relationship of the different types of lesion.

As far as the trunk and limbs are concerned the depigmented patches are the first to make their appearance. These patches tend to increase in size and in some situations they are replaced by nodules. Although depigmented lesions are very common on certain parts of the body below the neck—the back, arms, forearms and thighs—nodules are extremely rare; it seems obvious, therefore, that in these situations the depigmented areas seldom go on to nodular formation, but remain without undergoing any change for a considerable time. These lesions appear usually about one year after the kala-azar attack, but in some cases the interval appears to have been longer; this can be explained partly by lack of observation on the part of the patient.

On the face depigmented patches are frequently the first manifestation but occasionally these are preceded or accompanied by the butterfly erythema referred to above. When this erythema disappears it may leave scattered nodules or depigmented patches, usually both. The erythema and the depigmented patches may be considered as the first stage of the disease, the nodular the second stage.

The nodular lesions appear on an average about two years after the kala-azar attack—they are usually preceded by depigmented patches or the erythematous rash, but are sometimes the primary lesions. A few patients have returned within a year of treatment for kala-azar with an extensive nodular eruption.

The xanthoma stage would appear to be the final outcome of this condition, but the comparative rarity of this type suggests that only a small percentage of cases go on to this stage. The history in these cases is usually from 10 to 30 years.

The other types described are probably not stages in the disease so much as special manifestations due to the particular anatomical distribution of the foci of infection; the verrucose type occurs in the terminal phalanges of the digits, the hypertrophic in the eyelids, lips, etc.

Diagnosis.

The depigmented lesion and the nodule are so typical that after a very little experience they are easily recognized clinically. It is not easy to find the parasite in the depigmented lesions, in fact we have never yet seen the parasite in a smear made from one of these lesions, but by snipping out a piece of skin and dropping it into an N.N.N. tube, under strict aseptic precautions, a culture can usually be obtained. The confirmation of the diagnosis of a nodular lesion is much simpler; a portion of a nodule is cut off with a pair of scissors and a smear made from the cut surface, the smear is stained by Leishman's or Giemsa's stain and leishmania parasites are usually found without difficulty. In some nodules the parasites are scanty and a prolonged search may be necessary. The atypical lesions can only be diagnosed by finding the parasite.

The present series.

This series consists of 150 cases. The patients attended for treatment at the Calcutta School of Tropical Medicine between October 1927 and February 1930, a period of about 28 months. The previous paper on this subject, referred to above, was submitted for publication in March 1927; it was a report on 44 cases. Between March and October a number of patients attended, but as the senior writer was on leave no special notes were kept.

The presence of parasites.

In most of the nodular cases an attempt was made to confirm the diagnosis microscopically; in some, however, in which nodules were scanty, even though the first smear did not show parasites, if the condition was clinically typical, the clinical diagnosis was accepted. In a few of the cases in which depigmented patches only

were present, the diagnosis was confirmed by cultural methods, but this was not done as a general rule. There is little likelihood of mistakes having been made on this account as the condition is so characteristic and the few cases in which there was any doubt were excluded.

Leishmania was demonstrated in 81 cases and in 69 the diagnosis was clinical only. We have divided the cases into two groups. A, being those diagnosed misroscopically and B, those diagnosed clinically. It will be seen that these two groups are in every way similar and it is, therefore, almost certain that the ætiology in the clinically diagnosed group is the same as in the other.

Nature of the lesions.

The cases can be classified as follows:—

TABLE I.

	A. (Leishmania present).	B. (Leishmania not demonstrated).	Total.
Mixed lesions, nodules *plus* other lesions	75	31	106
Nodules only	4	..	4
Depigmentation and erythema	1	12	13
Depigmentation only	1	26	27
TOTAL ..	81	69	150

The other types of lesion were always associated with nodules; the verrucose was observed in 2 cases, the papillomatous in 2, the hypertrophic in 3, and a modified xanthoma type in 2. The butterfly erythema was observed altogether in 26 cases.

The distribution of the lesions.

A. In 15 cases there were nodules on the trunk or limb, in 63 nodules on the face and depigmented patches on the body, and in 1 nodules on the face only.

B. In 3 cases there were nodules on the trunk or limbs, and in 28 on the face only.

The distribution of the lesions on the various parts of the body is shown in the following table (Table II):—

It is thus apparent that nodules are the more common lesions above the shoulders, and the depigmented spots below. The nose, chin and cheek are the usual sites for the nodules, whereas the depigmented patches are found on the back, arms, forearms and thighs, a little less frequently on the chest, legs, shoulders and axillary folds, and rarely on the nose, ears and feet.

History of prior attack of kala-azar.—About 80 per cent. of the patients gave a history of a definite attack of kala-azar for which treatment had been given, others gave a history of a

TABLE II.

	LEISHMANIA PRESENT.		LEISHMANIA NOT DEMONSTRATED.		TOTAL.	
	Nodules.	Depigmented areas.	Nodules.	Depigmented areas.	Nodules.	Depigmented areas.
Forehead ..	31	12	8	18	39	30
Nose ..	62	2	17	8	79	10
Lips ..	33	5	4	14	37	19
Ears ..	15	..	4	1	19	1
Cheek ..	49	16	13	33	62	49
Chin ..	70	8	19	34	89	42
Shoulder ..	5	32	..	34	5	66
Chest ..	5	43	2	37	7	80
Back ..	7	52	1	51	8	103
Axillary folds ..	6	29	..	31	6	60
Arm ..	8	51	..	51	9	102
Forearm ..	10	48	1	51	11	99
Hand ..	5	12	0	10	5	22
Abdomen ..	4	24	0	32	4	56
Thigh ..	6	50	1	49	7	99
Leg ..	5	35	1	37	6	72
Foot ..	5	7	..	5	5	12

febrile attack with splenic enlargement, but a very few gave no history of fever at all. The table below gives further details of the histories:—

TABLE III.

	Cases in which leishmania was found.	Cases in which leishmania was not demonstrated.
History of kala-azar and treatment thereof.	63	56
History of a febrile attack and splenic enlargement.	11	11
No history of any febrile attack.	7	2
TOTAL ..	81	69
Percentage giving no history of kala-azar.	22.2	18.8

Excluding one case in which the history was 36 years, the average lapse of time between the attack of kala-azar and the first attendance for the dermal condition was 3.45 years in the cases showing nodules and 3.28 in those with only depigmented patches. There is very little difference between these two figures; this suggests that the depigmented patches do not by any means always develop into nodules.

The incubation period.—In kala-azar the parasites are distributed widely and can be found in practically every tissue and organ in the body, but for some reason even in chronic cases of the disease no development in the skin sufficient to produce local lesions appears to take place. Presumably, therefore, this development commences when the visceral infection disappears. For those cases in which a history was obtained the time that elapsed between the conclusion of treatment for kala-azar and the first observation of the skin lesions is shown in the following table:—

This is also shown graphically in Graph I.

The mean of the lapse of time between the disappearance of the symptoms of visceral leishmaniasis and the appearance of the lesions of dermal leishmaniasis is 1.88 years. It must be remembered that a large number of the patients will not have noticed the early lesions so that the actual time is probably less than these figures indicate. In 88 per cent. of patients the lesions appeared within three years of the kala-azar attack.

The relationship to treatment.

The majority of the patients gave a clear history regarding the treatment they had received, but a few could only state that the injections were "white, like water," or "red," as the case might be. These were entered as sodium antimony tartrate or urea stibamine, respectively. The following table gives details of the treatment which the patients had received (Table V):—

Of the 112 patients who had received treatment 2 had definitely received an insufficient number of injections, and 24 had received less than the usual course, but sufficient to produce a 70 or 80 per cent. cure rate. As a very large percentage of patients fail to complete their course of treatment, there is nothing in these figures which suggests that insufficient treatment is a predisposing factor in the production of skin lesions.

Caste, sex and age.

The following table shows the caste and sex of the patients (Table VI):—

The sex distribution is very much that of the general out-patient attendance. In an analysis of 300 kala-azar out-patients (Napier, 1922) the total number of females was 45; this is almost exactly the proportion of females in this series.

Age distribution.

This is shown in tabular form below (Table VII):—

There is a very marked difference in the age distribution between those showing nodular

TABLE IV.

Period that elapsed between conclusion of treatment for kala-azar and first signs of dermal condition (roughly, to nearest year).	NUMBER OF CASES IN EACH GROUP.			
	Those showing depigmented lesions only at present.	Nodular lesions..	All cases.	
Less than one year	4	13	17	
One year	10	27	37	87.9%
Two years	8	26	34	
Three "	6	8	14	
Four "	2	7	9	
Five "	1	2	3	
Six "	..	2	2	
	31	85	116	

TABLE V.

Nature of treatment.	Cases with only depigmented lesions.	Cases with nodular lesions.	All cases.
Sodium antimony tartrate	17	33	50
Urea-stibamine, or other pentavalent compound ..	13	38	51
Mixed treatment	1	10	11
	31	81	112
	(Treated at the School of Tropical Medicine.)		
Sodium antimony tartrate	5	5	10
Urea-stibamine	1	1	2
Neostibosan	1	2	3
	7	8	15

TABLE VI.

Caste and sex.	Nodular.	Depigmented only.	All cases.
Hindu, male	64 ..	22 ..	86 ..
„ female	.. 4	.. 3	.. 7
Mohamedan, male	31 ..	4 ..	35 ..
„ female	.. 3	.. 1	.. 4
European or Anglo-Indian, male ..	2 ..	1 ..	3 ..
„ „ „ female ..	.. 4	.. 2	.. 6
Indian Christian, male	2 ..	1 ..	3 ..
„ „ female ..	.. 2	.. 4	.. 6
TOTALS ..	male 99, female 13	male 28, female 10	male 127, female 23

TABLE VII.

Age group.	NODULAR.		DEPIGMENTED ONLY.		TOTAL.		GENERAL.
	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Kala-azar attendance.
Less than 10 years ..	1	0.95	3	8.11	4	2.82	21.1%
10, but less than 20 ..	18	17.14	21	56.76	39	27.47	41.1%
20, but less than 30 ..	43	40.95	12	32.43	55	38.73	22.6%
30, but less than 40 ..	30	28.57	1	2.70	31	21.83	10.0%
40, but less than 50 ..	12	11.41	..	..	12	8.45	5.2%
50, or over ..	1	0.95	..	..	1	0.7	

lesions and those showing depigmented lesions only; whereas 40 per cent. of the former are over the age of 30, only 1 patient or 2.7 per cent. of the latter are above this age. This is well shown in Graph II. Comparing the age grouping with that of the kala-azar patients attending the same institution, it will be seen that the dermal lesions are relatively much more common in the later age periods; of the kala-azar patients 21 per cent. are in the first decennial period, whereas only 2.8 per cent. of the dermal cases fall in this period. Graph III shows the difference between the age grouping in the two conditions. The dermal leishmaniasis curve appears to be about 10 years behind the kala-azar curve. This cannot be accounted

Fig. 6.

Fig. 7.

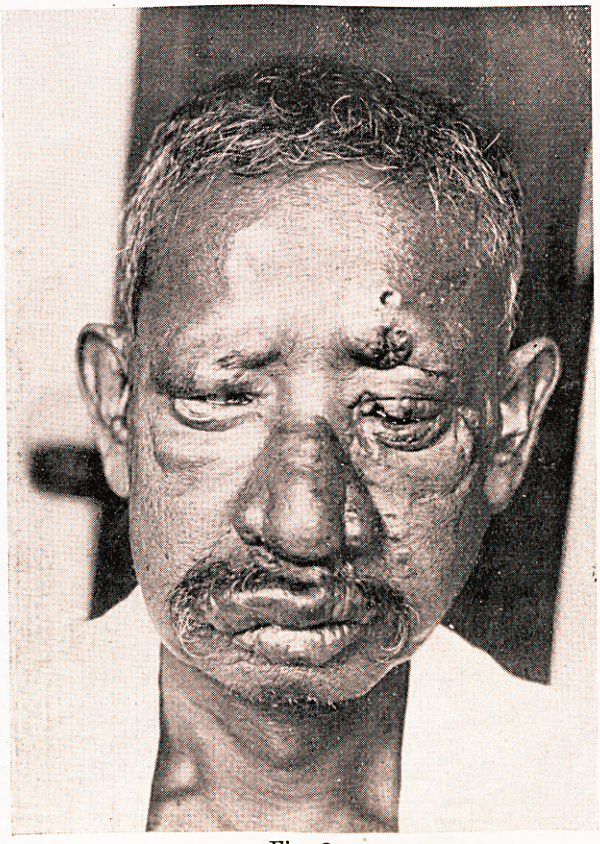


Fig. 8.

Fig. 9.

Fig. 10.

for by the delay in development of the dermal lesions as the average is only about 2 years. It is obvious that as the age advances the patient becomes more liable to develop dermal lesions.

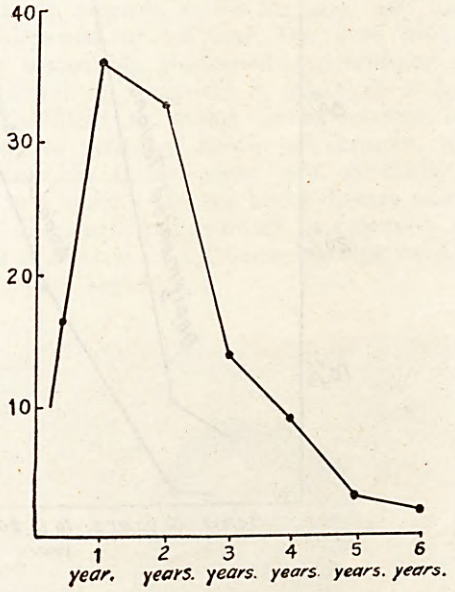
Discussion.

There is a considerable diversity in the type of skin lesion produced by this parasite—a number have been described and it seems very probable that many have not yet been recognized. The butterfly erythema was described by Dr. Brahmachari who thought that it was a manifestation of dermal infection with leishmania, because in the case he described it was associated with nodular lesions in which he was able to demonstrate the parasite, but the proof that his surmise was correct is provided in the analysis of this series of cases where this particular type of lesion is shown to be associated repeatedly with other dermal lesions caused by leishmania. On the other hand of the case in which the verrucose lesions were present one was diagnosed as dermal leishmaniasis on account of lesions in the face—the other lesions on the feet and fingers being diagnosed as tuberculides; it was almost by chance that the latter lesions were examined and also found to contain enormous numbers of leishmania. In the same way the diagnosis in the case shown in Plate III, fig. 7, was made during a routine examination of a cutting, and in the case of the girl in Plate IV, fig. 9, Dr. J. M. Henderson found leishmania in a smear made from her nasal mucous membrane which he was examining for lepra bacilli. Nevertheless, the typical lesions in this condition are so characteristic and the cases are, comparatively speaking, so common that it is still a matter of the greatest surprise why they were overlooked for so long and why they are so rare or, at any rate, so rarely reported in other kala-azar endemic areas.

The constant association of this condition with a history of kala-azar, together with the presence of the parasites morphologically and culturally identical with those of kala-azar, has led to the assumption that the dermal condition is a sequel of kala-azar. The only other explanation which seems at all possible is that the skin condition is caused by a subsequent infection with leishmania in a patient who has already acquired a degree of immunity to systemic infection. The widespread nature of the lesions and the fact that they appear so constantly in covered parts of the body make it certain that in the genesis of the condition there must at some time have been a generalized infection. In this series 80 per cent. give a history of a previous attack of kala-azar, whereas in the previous smaller series only about 50 per cent. gave this history. Graph I shows that there is a very definite association between the kala-azar attack and the onset of the dermal lesions, the peak of the curve being at the first and second year. The lesions develop slowly, and it is quite comprehensible that, commencing when the generalized infection subsides, they would take this length of time to become clinically noticeable, whereas it is difficult to understand why, if it is a case of reinfection, this should occur at so constant an interval after the primary kala-azar attack.

GRAPH I.

Time between kala-azar attack and onset of symptoms of dermal leishmaniasis.



There is no evidence whatsoever that the treatment plays any part in causing this condition to develop in a kala-azar patient. The condition occurs in persons who give a typical history of an attack of kala-azar but who had no treatment for the disease, no one form of treatment appears to produce any special susceptibility towards the disease, nor is there much evidence that insufficient treatment is a predisposing factor.

In this analysis only one point regarding the epidemiology of the disease has come out—that is the later age incidence of dermal leishmaniasis as compared to kala-azar and the marked difference between the age incidence of the nodular and that of the depigmented lesions (Graphs II and III).

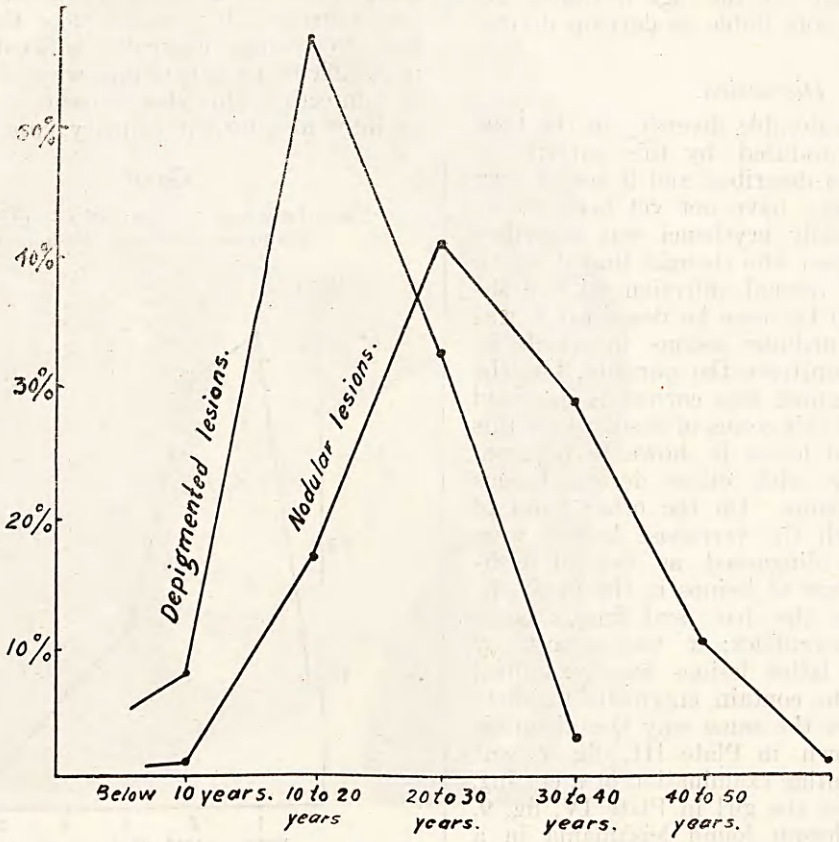
Acknowledgments.

A very large percentage of the cases in this series were sent on to us from either the Skin Disease Out-Patient Department or the Leprosy Department of this School. We take this opportunity of thanking the officers in these departments for the assistance they have thus rendered us.

Our thanks are also due to Dr. A. Basu for some help in note taking and smear examination.

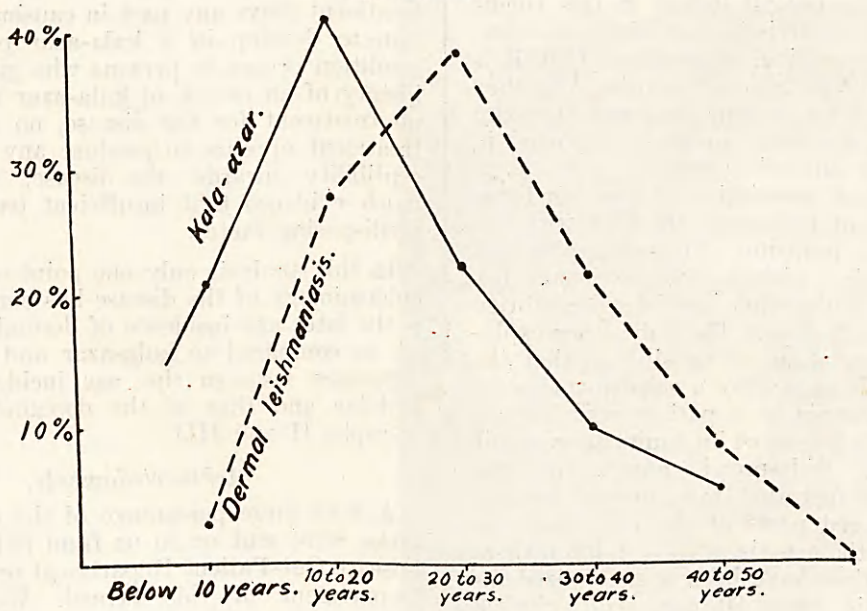
GRAPH II.

Age incidence.



GRAPH III.

Age incidence.



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THE DIFFERENTIAL DIAGNOSIS OF LEPROSY AND DERMAL LEISHMANIASIS.

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DERMAL LEISHMANIASIS was first described by Brahmachari (1922) and later in more detail by Acton and Napier (1927). The first case described by Acton and Napier in their paper was originally brought to the leprosy clinic at the Calcutta School of Tropical Medicine under the supposition that he was suffering from leprosy. Since then patients suffering from this disease have frequently been sent to the leprosy clinic. Up to the end of 1928 the number of these patients was not recorded, but thereafter an accurate record was kept, and it was found that during the first 10 months of 1929 nine such cases appeared, while during November no fewer than five supposed cases of leprosy were diagnosed as suffering from dermal leishmaniasis. Out of these fourteen cases we found *L. donovani* in the skin of eight cases, while in the remaining six the diagnosis was made from clinical signs.

In three cases, seen previous to 1928, both leprosy and dermal leishmaniasis were present at the same time.

There are two types of dermal leishmaniasis lesions which are apt to be confused with corresponding leprosy lesions:

(1) Depigmented skin areas. In early cases of leprosy, especially in children, depigmented patches often appear, which are bacteriologically negative and without any definite signs of anæsthesia that can be detected. Such cases are diagnosed only because of a very definite history of contact with an infectious parent, or by the lesions taking on subsequently more definite signs of leprosy. It is this type of lesion from which the depigmented areas of dermal leishmaniasis have to be distinguished. In leprosy the areas are larger and fewer in number; and show signs of growth at the margin, which however fades more gradually into the surrounding dark skin than it does in the other disease. They tend to be situated more on the extensor surfaces of the body.

In dermal leishmaniasis on the other hand the depigmented areas are smaller and often punctate. They are more numerous and tend to cluster round certain areas such as the nose, mouth, chin, the inner sides of the thighs and the shoulders and scapular regions. The margin is somewhat more clearly defined than in leprosy. The skin of this type of lesion is not generally positive for *L. donovani*.

(2) The nodular type of dermal leishmaniasis (called the "xanthoma" type by Acton and Napier) has been even more frequently mistaken for the nodular type of leprosy. The lesions are similar in distribution, but have a like tendency to group themselves round the nose and mouth, only that in the former disease the ears are comparatively exempt, whereas in leprosy, when the nose and mouth are thickened or nodular, the ears also are almost invariably thickened and nodular also. The differential diagnosis in this type of lesion is not difficult to make, as in leprosy large numbers of acid-fast bacilli are present, while in leishmania *L. donovani* can generally be found in a smear. In the latter disease another useful diagnostic point which is generally present is a history of kala-azar having occurred a few years before.

Fig. 1. Dermal leishmaniasis.

Photographs are given of a patient who for 35 years suffered all the mental distress which the social ostracism of leprosy implies. When 10 years of age he suffered from a severe attack of fever, and this was followed by the appearance of depigmented patches which later became red and thickened. The patient was brought as a case of leprosy for consultation, and the