

Medicine. — *An endemic focus of rhinoscleroma in Sumatra (Dutch East-Indies).* With remarks on the bacteriology and epidemiology.
By E. P. SNIJDERS. (Communicated by W. SCHÜFFNER.)

(Communicated at the meeting of December 19, 1931.)

I.

In 1918 the first case of rhinoscleroma has been observed in Sumatra in a woman coming from Asahan, who visited the policlinic of Dr. KNEBEL, in the neighbourhood of Medan (1). Dr. KNEBEL diagnosed a neoplasm of the nose and the upper-lip. The patient was operated upon, by Dr. STOLL, who sent me the resected tissue for microscopical examination, as he was struck by "the unusual aspect of the tumour".

The sections showed all outstanding characteristics of rhinoscleroma, viz. dense infiltration with plasmacells, cells of Mikulicz, eosinophilous globes of Pellizari, and encapsulated bacteria. Afterwards Dr. MANÇOER informed us, that this patient was of Battak-(Tobanese)-origin and that she had come to Asahan with the emigrants from the Toba-Highlands, who descend from time to time to the coastal plains in great numbers, following the paths along the large Asahan-river. As a matter of fact, the population of Asahan is mostly of Battak-origin, and shows clearly the characteristic features of that tribe (2).

In 1923 Dr. DOORENBOS sent me the second case (3). It was a woman from the same part of Asahan and probably of Battak-origin too. The clinical histological and bacteriological diagnosis was clearly positive. In cultivating from the depth of the diseased tissue (operation-wound), I obtained a pure culture of *Klebsiella rhinoscleromatis*, showing the following features:

Rods, non-motile, encapsulated, Gram-negative.

Gelatin-stab: no liquefaction; white, like a nail with a big convex head.

Gelatin-colonies: circular, white, convex, entire.

Agar-colonies: white, slimy, smooth, glistening.

Agar-slope: slimy, white, sliding down into the condensation-water.

Indole not formed.

Broth: turbid, with deposit, marked ring-growth, viscosity.

Potato: yellowish-white, slimy.

Milk: not coagulated.

Litmus-whey: (Petruschky) bluish-lilac, no reduction of the litmus.

Litmus-glucose-agar: no reduction of the litmus.

Medium of Rothberger-Oldekop (neutral red-glucose-agar) ; no change (no reduction).

In the sugar (and alcohol)-media : *no production of gas*.

In glucose, mannitol, maltose and saccharose acid is formed in 24—48 hours.

Lactose is not changed in 3 days. In 10 days in the incubator, at 37° C. some acid is formed, but *no gas*.

In galactose, lacvulose, xylose, arabinose, dextrin, salicin and sorbitol acid is formed, *but never gas*.

Dulcitol and glycerine : not changed.

Amygdalin : not dissociated.

By the demonstration of these two cases in the meetings of the Medical Society at Medan, the general attention was drawn to this disease, and when clinically suspect cases were seen, material was sent to the laboratory for verification.

Case 3 was observed in a Karo-Battak woman, by Dr. PANETH (4), who made an excision for diagnosis, which he sent to me for microscopical examination. The sections were positive.

Case 4, a Battak woman from Simelungun was detected by Dr. BAIS (5).

The next patient, case 5, was a Javanese woman, living in Sumatra since about 15 years. Though this is not quite sure, the infection most probably did not start till after her arrival in Sumatra. This woman lived all the time at Tandjong Bringin in Langkat, where also a common route of emigration leads from the Battak-plateau to the coastal plains, along the river Wampoo. So in this case too a contact with the Battaks is quite possible.

The case was a very typical one in all respects ; the strain grown from the scleromatous tissue itself proved identical with the strain of case 2. In the microscopical section all pathognomonic criteria of rhinoscleroma were present (case 5 of the thesis of Dr. DE MOOR (6)).

Case 6 again concerns a Battak woman, of Simelungun. The microscopical examination revealed the typical features and the culture was positive. This new specimen was identical with both the other ones. (Case 6 of Dr. DE MOOR).

Case 7 was an adult male Battak. Here, as in case 4, the diagnosis was based entirely on the very characteristic clinical symptoms, microscopical examination and cultivation of the microbes not being possible (6).

The origin, of these sporadic cases, observed during 9 years in rather extensive a region and at a distance one from another of 100 K.M. and more, was a rather mysterious one ; the more so, as according to the most probable hypothesis rhinoscleroma is a human infectious disease spreading from man to man. The only logical connection, I could find between the scattered patients, is the contact with the population of the

Battak-plateau, situated in the centre of the Northern part of the Isle of Sumatra, among which most of the cases have been observed.

This is why in March 1931 I made together with Dr. HAMSAH (of Battak origin himself), a tour of all the polyclinics of his district (Simelungun), part of the Battak territory. Here we found out three more cases (case 8, 9 and 10, of the list (7)).

Now a thorough revision of the *historia morbi* of all 10 cases in collaboration with Dr. HAMSAH, seemed to indicate a connection with the Tobapart of the Battakland, more especially the coast of lake Toba and the isle of Samosir (a large island of 90.000 inhabitants, situated in the middle of this lake).

According to the Battak legends this region is the cradle of the race. At the same time it is the most isolated part of the Battakland, the contact with the Europeans being of very recent date.

Pursuing this idea I then visited the hospitals of the Protestant mission in Toba. Dr. JOHANNSEN of Pearadja informed me that he had observed a case, in which he had made the diagnosis of rhinoscleroma because of the resemblance with the photographs he had seen of the other Sumatran patients. I had the opportunity to see this case afterwards (Ladjang, N^o 11 of the list (7)), and to be able to examine an excision of the affected tissue, and to cultivate the bacteria from it. The sections and the culture were typical for rhinoscleroma. The patient was born and lived on the isle of Samosir. Moreover the military surgeon of Tarutung (Dr. LARSEN) and the missionaries, were all aware of having seen cases of "big nose" at the polyclinics of the island. All these data lead us to the hypothesis of a focus of rhinoscleroma in the centre of the Battak-Highlands.

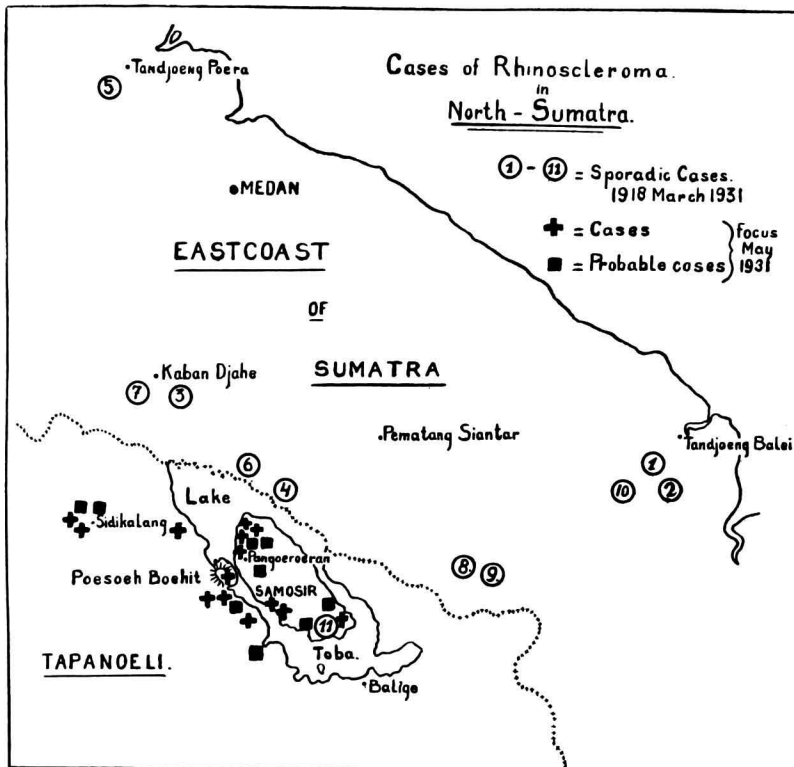
In May of the year 1931, I was able to organize a small expedition to lake Toba and Samosir with the collaboration of Dr. KOUWENAAR, the Director of the Central Pathological Laboratory of Medan. In a few days we discovered cases 12 to 21, confirmed microscopically and culturally and cases 22 to 28, which, though not verified in the laboratory, are reasonably sure too on clinical grounds.

Later on Dr. MAASLAND, (Medical Inspector of the residency of Tapanuli), who accompanied us on the expedition, noted 5 more cases (3 of which have been confirmed in the laboratory), in the neighbourhood of Silalahi and Sidikalang on the west coast of the lake Toba.

So the number of the known cases till now amounts to 33, 23 of which are concentrated on Samosir, and in the neighbourhood of the Poesoeh-Boehit (Mount "Umbilicus", see map), an extinct volcano on the coast of the lake, facing the spot, where the island is separated from the mainland only by a narrow canal.

As tradition has it, after the creation of the world, the first Battak couple (Si Asi Asi and Si Deang Nagoerasta), sent to earth by the principal God Moela Djadi Nabolon, settled on this spot and founded the first "Kampong" (native village). It is extremely interesting to note that

the focus of the rhinoscleroma is found just in the original centre of the Battak-population, thus suggesting in a certain measure, that the disease is a survival of ancient times, like leprosy is in Europe.



II.

There are some special points which merit to be emphasized.

1. First of all the hypothesis, that rhinoscleroma is contagious, has been the leading idea of our research. It leads us to look for an endemic focus as the source of infection of the hitherto observed sporadic cases and to search for this focus especially in the neighbourhood of lake Toba. The fact that we actually did find it there is a strong argument in favour of the view that rhinoscleroma is a typically specific contagious disease.

2. It is a remarkable fact that the geographical distribution of rhinoscleroma and that of leprosy have much in common, though leprosy has a much wider range. All the known foci of rhinoscleroma are localised in areas (and among that part of population) where leprosy is occurring, mostly in endemic form. This holds true even for the small foci in Europe e.g. in Switzerland: Canton Wallis; in Italy: Reggio Emilia; in Germany: East Prussia (Memel). The conditions under which both diseases can spread and maintain themselves must be much the same.

The Battak-land too is a leprosy-area of high endemicity, as a matter of fact one of the highest of the whole Archipelago.

3. The bacterium (*Klebsiella rhinoscleromatis*) has been cultivated by us now in 20 cases (including those of Dr. MAASLAND, in which Dr. WOLFF isolated the microbes). All the cultures grown from the scleromatous tissue itself proved to be pure, and culturally identical. (See description in case 2). They proved all to be identical too with the strains obtained in Europe under the same precautions. Previously Dr. DE MOOR (6) had shown already that the smooth- as well as the rough-form of the Sumatran and European strains he tested, are identical in their antigenic structure and could be differentiated easily by precipitation- and agglutination-tests from the Friedländer- and *Ozaena*-bacteria.

If we cultivate from the nasal mucus only, we get nearly always a very mixed culture: cocci, proteus (which is spreading quickly over the plate, covers all other colonies and makes the pure culture of the latter impossible), sometimes bact. pseudo-diphtheriae, bacteria of the coli-, the lactis aërogenes (aërobacter)- and of the Friedländer-group. The microbes of the latter three groups can be differentiated readily from the *klebsiella rhinoscleromatis* by their more intensive and extensive fermentative power. They produce gas in nearly all of our common sugar- (and alcohol)-media. Lactose and glycerine are fermented (with very few exceptions) in 24—48 hours with gas-formation. Moreover in the medium of Rothberger-Oldekop (agar with glucose and neutral-red) all these microbes cause gas-production and a change of the red colour into green or yellow.

Now I do not mean to deny the importance of an examination of the nasal flora in sufferers from scleroma and contact-persons. On the contrary, as I pointed out in a former publication (7), it is an interesting fact, that the nasal mucus of the Battak in the focal area showed a richer and more divergent flora than the less filthy Javanese on the estates in the neighbourhood of Medan, especially in respect of the bacteria of proteus-, coli-, aërobacter-, and *klebsiella*-groups. This may be — and probably is — of epidemiological significance.

But I mean to lay full stress on the following essential points. In rhinoscleroma only the strains cultivated from the depth of the diseased tissue itself, are absolutely comparable; and all those isolated in this way proved to be identical in our hands. This uniformity of the strains from the isolated focus on the central Highlands of Sumatra and those from the great complex of foci in central and South-Eastern Europe is a striking fact. Thus we are forced to consider them as representing a well defined species or at least a "fixed variety". It is therefore not allowed to classify a bacterium as a *klebsiella rhinoscleromatis* because of the mere fact of its being a *klebsiella* cultivated from the nasal mucus of a probable case of rhinoscleroma or a contact-person; it can only be diagnosed definitely as such by means of its specific cultural and antigenic properties. These facts are not yet recognised in the handbooks, in BERGEY's Manual of

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(DUTCH EAST-INDIES).

PLATE I.

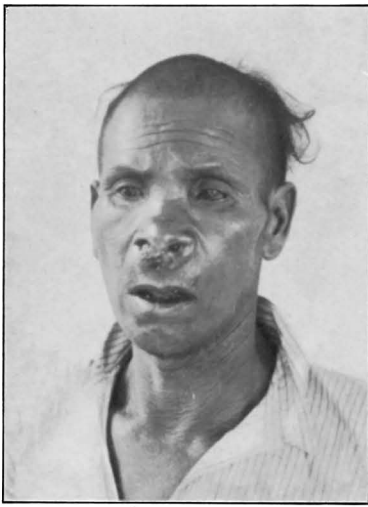


Fig. 1. Ama ni Paroema nr. 15 of the list. Typical case in a Tobanese.

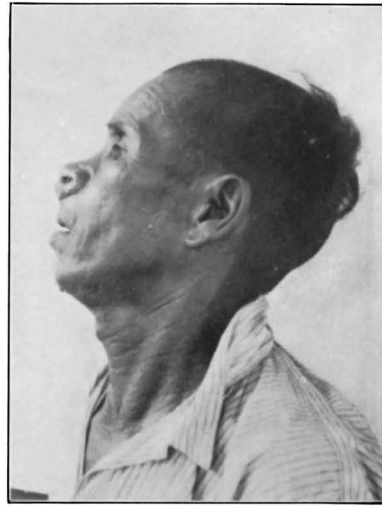


Fig. 2. The same. (Note the Indian way of shaving the head, and the wavy hair).

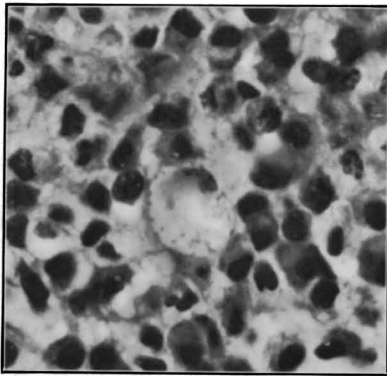


Fig. 3. Same. Section. 840 \times .
Plasma-cells. Cell of Mickulicz. Bacteria.

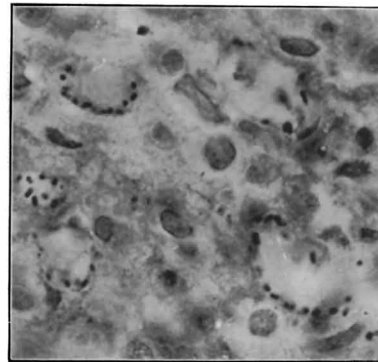


Fig. 4. Same. 840 \times .
Levaditi-stain. Bacteria in wreath-form.

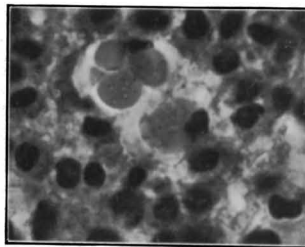


Fig. 5. Same. 840 \times .
Eosinophil. globes.

E. P. SNIJDERS: AN ENDEMIC FOCUS OF RHINOSCLEROMA IN SUMATRA
(DUTCH EAST-INDIES). PLATE II.



Fig. 1. Ama ni Lehem nr. 18 of the list.



Fig. 2. The same. Gangosa-like features.

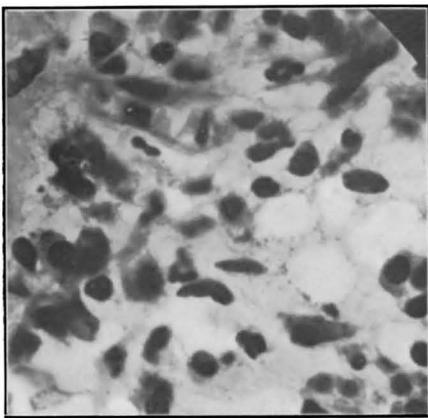


Fig. 3. The same. Section. 840 X. Plasmacells; Vacuoles with wreaths of bacteria.

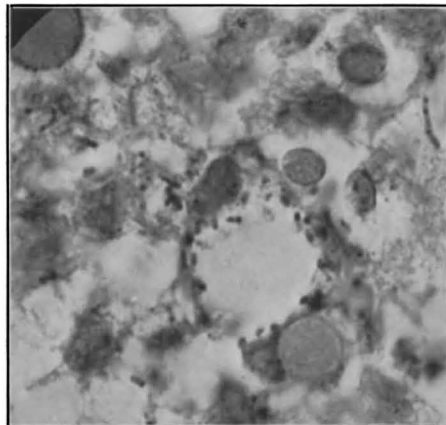


Fig. 4. The same. 1350 X. Levaditi. Bacteria in wreath-form. Hyaline globes (left corner above, right corner below).

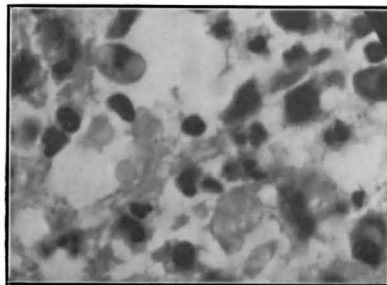


Fig. 5. The same. 840 X. Strong local hyalinisation.

determinative Bacteriology, nor in the mayor part of the current literature. They are however of first importance.

4. The cases observed by us were all patients in whom the nose was principally affected. This does not mean, that other primary localisations did not occur. They were not observed, but it is highly probable that a more thorough investigation with collaboration of a laryngologist would discover also cases of primary scleroma of the larynx or trachea, of the so-called "laryngitis subglottica hypertrophica" (CZERMAK) or "sicca" (SCHRÖTTER) or "chorditis vocalis inferior hypertr. chron" (GERHARDT), or "blenorrhoica chronica nasi, pharyngis et laryngis" (STÖRK (9)).

Some cases are of special interest because of the fact that clinically they showed much more features of gangosa (rhinopharyngitis mutilans) than of typical rhinoscleroma, Case N^o. 18 of the list, Ama ni Lehem is a good instance.

Ama ni Lehem, marga Simbolon, male Battak, Tobanese, \pm 50 years; he was born and lived in Kampong Boehit (1300 M. above Sea-level) on Samosir. He had never left the island for longer then a few days to go to Siantar.

According to his informations he never had framboesia, nor did he show any clinical symptoms disproving this statement.

His disease began about 8 years ago, with itching and swelling of the nose, followed by epistaxis and a bloody-purulent secretion.

This is a typical anamnesis of rhinoscleroma, as we got it nearly in all our cases. The swelling was accompanied afterwards by ulceration, followed by retraction of the scars, resulting in a monstrous deformation of the face. This is better demonstrated by the photographs than by a long description (figure 1 and 2 of plate II).

A part of the bean-sized swelling in the left upper angle of the ulcerating surface was resected for histological examination. All characteristic symptoms of rhinoscleroma were present in the microscopical sections (see fig. 3 to 5). From the depth of the operationwound cultures were made on agar: pure cultures of typical *klebsiella rhinoscleromatis*.

Doubtless this is a case of rhinoscleroma. One could be inclined to take it as a combination of scleroma and gangosa, the latter as a manifestation of tertiary framboesia. But the negative anamnesis (in men who know yaws very well) and the absence of distinct framboesiatic scars, makes this supposition highly improbable. Moreover I am not quite satisfied that the syndrom, we call gangosa, is always and everywhere to be described as tertiary framboesia only. Though I am not willing to deny the probability that in the majority of cases framboesia plays an important part in the etiology, I think that we must keep an open mind for other possibilities. As I suggested in my first communication on the subject, a scleromatous process with ulceration and extensive scarring may cause also the picture of gangosa. Up till now I saw 3 such cases. Further investigations in this direction may prove of value.

5. The question arises where does this mysterious isolated focus come from? Taken as granted that scleroma is a contagious disease confined to man, we are forced to ask if there is any possible connection with foci elsewhere. The nearest country where the disease is observed is India.

In 1890 KEEGAN (8) (in Indore) discovered the first cases in "Hindus", from the Central Provinces. In 7 years he saw 11 patients. RAYE (9) saw a case in a Mohammedan woman of a low class, and CASTELLANI and CHALMERS observed one in Ceylon in an "Indian coolie" (10).

Lately Prof. ACTON, pathologist of the Calcutta School of Trop. Med. informed me that in the last 10 years he saw 8 cases of rhinoscleroma, two from the Punjab (one in a Sikh), one from Nepal (in a man with "dravidian" features), the others from Bengal, Bihar, Orissa and the Central Provinces. He thinks that the disease must exist in a sporadic form throughout the country. All descriptions however relate to very advanced cases, searching relief for their troubles. Many slighter cases must be supposed to occur unnoticed. But up to the present an investigation to detect the possible foci did not take place. Most of the cases are observed in patients of "dravidian" origin, and low social standing. If we draw a parallel with our Sumatra experience, we safely may accept the existence of foci of rhinoscleroma among the more primitive tribes of the old "(pre)dravidian" stock, (Central Provinces, Bihar, Orissa, where indeed cases among the *Santals* are noticed; and the Deccan).

The term "dravidian" is not always used in the same sense. RISLEY (11) took it as the name for the original (at least the oldest known) population of India: dark-skinned, with a short (or low medium) stature, dolichomesocephalic, platyrrhine and more or less cymotrichous. Many other investigators (THURSTON (12), HADDON (13)), call this the "pre-dravidian" type, reserving the name of "dravidian" for the type with finer features (leptorrhine and mesorrhine) and higher stature, supposed to have emerged after (according to others, from) the pre-dravidians. As a matter of fact the two types are very often mixed, and in South-India the higher castes exhibit the characters of the finer type (aryo-dravidians of RISLEY, dravidians s.s. of HADDON a.o.) the lowest castes and out-castes the coarser type ("dravidians" of RISLEY, pre-dravidians of other writers), while the intermediate castes show various degrees of mixture. The question of the origin of the "coarse type" is not quite settled, but it is now accepted by the majority of authors, that an important part of the "pre-dravidian population", viz. the tribes of the Chota Nagpur-tableau, the Mundas, *Santals*, Hos, etc. speak languages (Munda, Kolarian) of the Austric family. This Austric family is divided into the Austro-Asiatic subfamily (with the Mon-Khmer and the Mundabranh) and the Austro-Nesian subfamily, to which the Indonesian languages belong. Here we see the probability of a very old connection between an old stratum of the population of India and the so-called Indonesian component of the Malay Archipelago (the Mon-Khmer-problem: KERN, SCHMIDT). There are reasons to accept (as it is urged in the last Census-report of India, 1921) that a good deal of the tribes and lower castes, especially of the part of South-India surrounding the Munda-area, are of the same stock, though they are speaking nowadays dravidian languages. In descending from

their original dwellingplaces in the plains amongst the higher civilised population, they accepted the other language, but retained their physical type. As it is daily seen now, they then prefer to be called "Hindus", though their Hinduism does not differ much from their original Animism.

Be this as it is, but it struck me, that among the Battaks many individuals show a great resemblance to the coarse, "dravidian" type, as I saw it among the Indian labourers in the Federated Malay States and on the photographs in the book of RISLEY (11): The people of India.

Now I am quite aware that anthropology is largely a hypothetical science, especially as far as concerns the races of Southern Asia, and it is an easy matter to find amidst the fullness of suggested hypotheses, one fitting to a special point of view (13*b*). Exact anthropological data however are rare, but as far as the latter are available concerning the Battak (HAGEN (14), BRENNER (15), VOLZ (16)) they are in accordance (in any case are not conflicting) with those of the tribes of Chota Nagpur (RISLEY (11)): Dolicho-mesocephalic cranes, often cymotrichy, short (low medium) stature, platyrrhiny. Amongst the Battaks also platyrrhiny is predominant. Especially among the Tobanese of the North-Western part of Samosir and the Pak-Pak of Diari, the colour of the skin can be rather dark. In the Munda-tribes as well as in the Battak sometimes oblique eyes may be seen. Moreover it is interesting to note that the so-called biological race-index $\left(\text{blood-group-index} = \frac{A + AB}{B + BA} \right)$ of the Munda-, Santal- and Orāon-tribes of Chota Nagpur is found: 0.81 (MALONE and LAHIRI (17)) and that of the Battak 0.82 (BAIS and VERHOEF (18), DE HAAS (19)).

Besides the anthropological data, the ethnological data also have much in common. But this is a domain of science still more uncertain and surfeited with hypotheses. Still it may be noted, that the Battak (15, 16*b*, 20) as well as the Chota-Nagpur-tribes (11) are animists, and that in their religion (deities myths) as well as in their customs there is much likeness (exogamic septs, bargain-marriage; according to VOLZ (16*b*) remains of totemism among the Battaks; and many more special points, it would take too long to quote here). Though the positive value of these facts be small, we may conclude at least that there are no conflicting data.

All these arguments (linguistic, anthropological, and perhaps ethnological) point in the direction of an ancient connection between the Battak as rather pure representatives of a very old stratum of the people of the Malay Archipelago and a primitive population in India. And one is inclined to suggest the possibility that migrating parts of the same people in a stage of expansion, may have carried diseases as leprosy and rhinoscleroma with them, from a common original home.

There is still another possibility. Since the beginning of the historical period (a few centuries after the beginning of our era) we can find traces of a commercial traffic and intellectual intercourse between South-India

and Sumatra. Especially Baros was famous as the harbour for camphor and benzoin. As Professor VAN EERDE informed me, it is from this time that ethnologists date the beginning of the distinct Hindu-influence in North Sumatra, directly, but also indirectly, by means of Atchin and later of the Hindu-kingdoms of Java and Palembang. It is supposed that from this time date the Battak-alphabet, the PUSTAHA's (augury-books), the Hindu-element in the Battak-Art and language, the chess-game etc. In this period possibly also the Sěmbiring (the Black) made their appearance, one of the 5 headmarga's of the Karo-Battak. The customs of these marga have a certain resemblance to dravidian customs, especially the funeral-ceremonies (pekualu-feast, JOUSTRA (20*b*)), and the names of the sub-marga's are decidedly of Dravidian origin (KERN (21)). The physical type still reminds of the Singhalese Type in India (the finer dravidian or Aryo-dravidian of RISLEY): the Sěmbiring are often leptorrhine, rather dark-skinned and perhaps of higher stature than the other marga's.

It seems doubtful to my mind whether the supposed prehistoric relation and the ascertained historic intercourse were separated distinctly by a long period of isolation. There may have been connections over a long period we are not aware of. But we are not yet in a position to discuss this question.

There are no convincing arguments however for the importation of scleroma into the Battak-country, within recent historical times. None of our cases belongs to the Marga Sěmbiring and as I pointed out above the focus is situated just in the old centre of the Battak-lands, a rather inaccessible region, where foreign influences have penetrated more difficultly than in the lower parts: Baros, Singkel and surroundings. In the latter region however no cases have been observed (though a more thorough investigation would be worth the trouble).

I am inclined therefore to accept that rhinoscleroma is a very ancient disease clinging to a very old and primitive stratum of the population. I am quite aware that the argumentation is rather hypothetical, but this hypothesis gives some indications for further research. In the first place for a comparative investigation into the anthropology of the Battak and the pre-dravidian tribes in India. In the second place it may stimulate further research on the occurrence of scleroma in our Archipelago, especially among the rests of the primitive population showing affinity to the "Battak-type".

LITERATURE.

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2. HAMERSTER. *Bijdrage tot de kennis v. d. afdeeling Asahan. Mededeeling No. 13.* Oostkust v. Sumatra Inst. 1926.
3. SNIJDERS and DOORENBOS. *Geneesk. Tijdschr. v. Ned. Ind.* 1924. Vol. 64, p. XLIII.

LIST OF THE CASES OF RHINOSCLEROMA.

N ^o .	NAME AND SEX	AGE	TRIBE	DWELLINGPLACE	PLACE AND DATE OF INFECTION	DURATION	LOCALISATION	DIAGNOSIS			REMARKS
								BACT.	HISTOL.	CLINIC.	
1	woman	± 45 — 50	Battak emigrated to Asahan	Tandjong-Balei Asahan. <i>Sumatra</i>	Probable the Battak-district. Centr. <i>Sumatra</i> 1915?	at least 15 years	nose, upper-lip, palate	not cultivated; typical bact. in the micr. sections	+	+	See: Geneesk. Tijdschrift v. Ned. Ind., 1919, Vol. 59, p. XXV. Transact. 4th Congress Far East Ass. of Trop. Med. 1921 Vol. II, p. 269. 1918.
2	woman	± 40	Probable of Battak origin	Asahan, village Simpang-Ampat	Battak-district or contiguous part of Asahan 1920?	at least 5 years	nose, upper-lip, palate	+	+	+	Geneesk. Tijdschr. v. Ned. Ind. 1924 Vol. 64, p. XLIII. 1923.
3	woman Pekenaken	± 35 — 40	Karo-Battak	Battak-Highlands, village Boelan-Djahé	Battak-district 1920?	at least several years	nose	not cultivated; bact. in the micr. sections	+	+	Geneesk. Tijdschr. v. Ned. Ind. 1924 Vol. 64, p. LXXIII. 1924.
4	woman	± 30	Battak	Battak-Highlands, Tiga Ras	" " 1921?	at least several years	nose, upper-lip	not cultivated	no excision	+	Arch. f. Schiffs- & Tropenhyg. Beihefte Bnd. 29 (1925), p. 360 (there are described cases 1—4). 1924.
5	woman	± 35 — 40	<i>Javanese</i> !	Tandjong Bringin Langkat	Lived already 15 years at <i>Sumatra</i> . 1912?	at least 15 years	nose, upper-lip, palate, lachrymal ducts	+	+	+	Geneesk. Tijdschr. v. Ned. Ind. 1927 Vol. 67, p. CXVI. 1927.
6	woman Goepoeang	± 40	Battak	Simelungun	Battak-district 1921	6 years	nose	+	+	+	Gen. Tijdschr. v. N. I. 1928 Vol. 68, p. LXXXII. Ned. Tijdschr. v. Geneesk. '28, I, p. 3105 (C. 5—6). 1927.
7	man	± 30	"	Battak-district	" " 1920?	several years	nose, upper-lip, right lachrymal duct	not cultivated	no excision	+	Cases 1—7 are described in the thesis of Dr. DE MOOR: Het Rhinoscleroma in het bijz. in de Tropen. 1929. Amsterdam. 1923.
8	woman Moïna	35	Toba-Battak	Simelungun	" " 1925	6 years	nose, palate	+	+	+	Ned. Tijdschr. v. Geneesk., 1931, IV, p. 5472.
9	woman Dortiana	30	" "	"	" " 1920	10 years	nose	+	+	+	Intimate friend of No. 8. Ned. Tijdschr. v. Geneesk. 1931, IV, p. 5472.
10	man Oeloeng	43	" "	"	Asahan 1915?	15 years	nose	+	no excision	+	Ned. Tijdschr. v. Geneesk. 1931, IV, p. 5472. The mother has had the same disease.
11	man Ladjang	± 30	" "	Isle of Samosir in lake Toba	Samosir 1920?	several years	nose, upper-lip	+	+	+	Ned. Tijdschr. v. Geneesk. 1931, IV, p. 5472.
12	man Ami ni Hapiling	± 40	" "	" "	" 1927	4 years	nose, upper-lip, palate	+	+	+	Not yet described.
13	man Jonathan Sinagar	40	" "	" "	" 1928?	3 years	nose, upper-lip	+	+	+	Not yet described.
14	man Hapal Pasariboe	25	" "	Limbong on the shore of lake Toba near Samosir	Limbong 1928?	3 years	nose	+	+	+	Not yet described.
15	man Ama ni Paroema	± 50	" "	" "	" 1929?	2 years	nose, upper-lip, palate	+	+	+	Not yet described. See plate I.
16	man Tanna Limbong	± 28	" "	" "	" 1928	3 years	nose, upper-lip	+? culture mixed with proteus	+	+	Not yet described. Brother of No. 27.
17	woman Karolina Goerning	± 20	" "	Isle of Samosir	Samosir 1921	10 years	nose, upper-lip	+	+	+	Not yet described. Daughter of No. 22. Sister of No. 23.
18	man Ami ni Lehem	± 50	" "	" "	" 1923	at least 8 years	nose, upper-lip, palate	+	+	+	Not yet described. Exulcerated, much retraction of the scars, great likeness to <i>Gangosa</i> . Plate II.
19	man Ama Radja Mira	± 35	" "	" "	" 1926	at least 4 years	nose, upper-lip, dacryocystitis, right side	+	+	+	Not yet described.
20	man Kleiophas	± 38	" "	" "	" 1930	8 years	nose, upper-lip	+	+	+	Not yet described.
21	woman Nansekka	± 35	" "	" "	" 1923	7½ years	nose	+	+	+	Not yet described. Niece of No. 28.

THE FOLLOWING CASES ARE NOT VERIFIED IN THE LABORATORY, BUT MOST PROBABLE ALSO RHINOSCLEROMA.

22	woman Gotang Boroe	± 50	Toba-Battak	Isle of Samosir	Samosir 19 ?	several years	nose, wings and septum infiltrated	?	no excision	+?	Not yet described. Mother of No. 17 and 23.
23	man, Lakanoes Goerning	± 22	" "	" "	" 1930?	½ year	nose, septum enlarged	?	"	+?	Complement-fixation with Rhinoscler.-Antigen pos. Wassermann neg. Kahn neg. Brother of 17, son of Nr. 22.
24	man Perhaling	± 40	" "	" "	" 1928?	several years	nose, hard and chron. swelling of top, wings, septum	?	"	+	
25	woman Kornela	± 25	" "	Saboelan on the shore of lake Toba near Samosir	Saboelan 1927?	4 years	nose, infiltration of the septum and the wings	?	"	+	
26	woman Teresiana	± 30	" "	Isle of Samosir	Samosir 1928?	± 2 years	nose, infiltration and clacatrisation of the wings	?	"	+	
27	man, Marinoes	± 25	" "	Limbong	Limbong 19 ?	?	nose, septum	—	"	+?	Brother of No. 16. (Tanna Limbong).
28	man, Ama Rhoelalan	± 45	" "	Isle of Samosir	Samosir 19 ?	?	nose, septum and wings	—	"	+	Uncle of No. 21. (Nansekka).

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