PART ONE

THE ATONI AND HIS WORLD

CHAPTER I

THE PEOPLE AND THEIR ENVIRONMENT

1. THE ATONI

The people who inhabit the greater part of Indonesian Timor designate themselves as the Atoni Pah Meto (= the people of the dry land). The extreme western part of the island is inhabited by the Helonese, who used at one time to form a separate political community under the ruler of Kupang. In the course of the centuries, but particularly after the Dutch first settled in Kupang in 1653, the Helonese were pushed gradually further back to the west, as indicated on map no. 1 of the languages spoken in Timor. According to the most reliable census, namely that of 1930, the total number of Atoni came to approximately 180,000; in 1952 it came to approximately 300,000, and in 1966, according to a provincial survey, to 600,000.

The Atoni’s eastern neighbours are the Belu, who were once united with the Atoni in one ritual, dual monarchy. The number of Belunese in 1930 came to approximately 85,000, and in 1952 to approximately 100,000. These figures are no more than rough estimates, as on both occasions on which a census was taken the fact that the district of Belu is also inhabited by Bunak and Kemak was not taken into account (see map no. 1). The Tetun-speaking Belunese also inhabit large parts of Portuguese Timor. They were formerly also the subjects of the united kingdoms of the Belunese and the Atoni.

2. GEOGRAPHICAL POSITION

The south coast of Timor is separated from the Australian continent by the shallow Timor Sea, here approximately 500 km. wide. It shows
some similarity with the Australian continent as far as the climate, flora and fauna are concerned, but culturally there is a wide difference between the Indonesian and Australian culture provinces, even though they have a few features in common.

In Timor we find traces of Melanesian and Papuan culture, although it is extremely difficult to find any sort of concrete evidence for influences exercised by these cultures.

Timor is a marginal area also in the sense that in contrast to western Indonesia, which was subject to Buddhist and Hindu cultural influences from India for about fifteen centuries, there are no traces of these to be found in Timor, which, however, is not proof that there has not been some indirect influence via Java. But it is difficult to establish what might be its heritage from the ancient Indonesian culture and what may have been imported later from Java or other parts of Indonesia.

Islam, too, has virtually by-passed Timor. Except that since the days of the Dutch East India Company there have always been a number of Muslims among the government officials, and the police and military personnel who came from Java or other Muslim areas in Indonesia.

The island of Timor shares this marginal position — by-passed as it was by the main culture streams which have brought Indonesia into contact with the worlds of Buddhism, Hinduism and Islam for the past 2000 years — with the major part of the eastern Timor archipelago, made up of Sumba, Flores and the Solor archipelago, as well as Timor itself. An exception to this is formed by a part of the Solor archipelago, namely the Padji area, which became Muslim as far back as approximately 1600, mainly out of protest against Portuguese overlordship.¹ This was also the case in part of Pantar and Alor. Similarly Islam has won some followers in and around Ende, the principal town of Flores.

Some of these islands clearly belong to the Indonesian culture province, as does Manggarai in West Flores, as well as Sumba.² The similarities in social structure, for instance, between these and Minangkabau and the Batak area in Sumatra show this only too clearly. The point in question is to what extent the same applies to Timor, and especially to the eastern Atoni area which is the more specific object of this study. It can be said at the outset that there are similarities as

² Cf. Onvlee, 1949; also personal communication.
regards the negative factor of being by-passed by the main culture streams of Indonesia.

3. THE PEOPLE

We may turn to physical anthropology to supply the answer to our question concerning the extent to which the peoples of the Timor archipelago are related or otherwise.

Bijlmer \(^3\) clearly sees Melanesian influences in Timor, as opposed to Sumba, which is rather more Indonesian. Vroklage has collected a great deal of material in North Central Timor which has been worked out by Lammers. The latter concludes that "a statistical analysis of Vroklage's material has indicated that the population of East Dawan must be a mixed population".\(^4\) If we take into account the hypothesis according to which "the result of mixing different racial components is not a number of intermediate characteristics but, as it were, a mosaic of characteristics",\(^5\) this conclusion is not a surprising one, and may hold universally true for all peoples.

He considers two elements especially important: a Melanoid one (probably the oldest) and a more recent, Proto-Malay component. Veddoid characteristics, for which there are a few indications, may equally be explained as resulting from Proto-Malay influence. Lammers excludes the possibility of Deutero-Malay influence with almost one hundred per cent certainty. Moreover, judging from the regional differences in the eastern Atoni area, it is "probable that Malay influence decreases from east to west".\(^6\)

This we see clearly in the differences between the South Belunese — who have wavy to almost straight hair, like the girl in photograph 5 — and the Atoni, who have frizzy or spirally hair, like the people from Amanatun in photograph 6. The Atoni also have more facial hair. This, however, they regularly pluck out with the aid of a pair of tweezers (naunu) (see photograph 7), in which groups of men sitting together are often seen to be engaged. So cultural habits can in

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\(^3\) Bijlmer, 1929, p. 91.

\(^4\) Lammers, 1948, p. 273. Dawan is the Tetun name for the language of the Atoni. It used to be and still is generally used by the Roman Catholic Mission, which entered the eastern Atoni area from Belu.


many cases bring about deceptive differences in physical appearance. (See photograph 7).

The regional groups — Beboki, Insana and Noemuti in Miomafo — studied by Lammers display remarkable differences in respect of each other from east to west.⁷ Beboki and Insana have more in common with one another than with Noemuti, and the differences between Noemuti and Beboki are, on the average, wider than those between Noemuti and Insana. Skin pigmentation is darkest in Noemuti and lightest in Insana, while growth of body- and facial hair is stronger in Noemuti than in Insana and Beboki. There is also an extraordinary increase in the cephalic index from east to west, the result of both a decrease in the length of the head (185.4; 183.1; 180.2) and an increase in the width of the head (146.0; 145; 150.8), so that Beboki and Insana are mesocephalic (79.1 and 79.4) and Noemuti brachycephalic (83.7).

Van Bork-Feltkamp,⁸ who worked out Meijer's data on Roti and Fatu Matabia in eastern Portuguese Timor, considers Papua influence possible in Timor, whilst Nyèssen⁹ says: “In Timor we have the same situation more or less as in New Guinea, with small retarded meso-morph hominids in the interior which have preserved the original form, and tall dolichomorphs along the coast!” Exactly the same findings as in the case of the Kilimanjaro and the Nuba in Africa.

Mendes Corrêa¹⁰ considers that for the whole of Portuguese Timor Proto-Malay influences are dominant, with both Europoid and Indo-Melanoid traits occurring, but without either Negroid or Mongoloid characteristics being found. There are also very few more or less Mongoloid Deutero-Malay elements. And in the extreme interior are found Veddo-Australoid elements, related to the Melanesians and Papuans.

When later on he returned to Timor for another month he wrote that the population of Timor is not the result of recent migrations and that its earliest inhabitants were contemporary with the pithecanthropos, Homo Soloensis and Homo Wadjakensis, with whom there was considerable intermixing a very long time ago. Timor is "mais um centro ou uma área de diferenciação racial, antropogenética, do que, como se tem presendid.o, uma Babal resultante da convergência das mais variadas

⁸ Van Bork-Feltkamp, 1951, p. 61.
¹⁰ Mendes Corrêa, in Felgas, 1956, p. 145.
estirpas humanas, um cadinho de fusão inextricável de raças" 11 (rather a centre or an area of ethnic differentiation, anthropologically speaking, so that it is like a Babel resulting from the convergence of more varied ethnic groups, or an inextricable melting-pot of ethnic groups).

Our conclusion must be, then, that Timor is indeed a marginal area as regards its physical types, although it is impossible to draw an accurate line of demarcation. It is furthermore a marginal area in the sense that clearly distinguishable ethnic groups are still found here.

Melanesian and Proto-Malay elements have blended with earlier ethnic groups, purer elements of which may still be found in the mountains of eastern and central Timor.

It is also quite likely that the present inhabitants have lived there for many centuries. Whether or not the earliest inhabitants existed as early as the pithecanthropos is of little relevance for our present study. It is further impossible to make an estimate on the basis of these data as to when the last migrations may have taken place. Nor is there any more certainty as to whether the Proto-Malay groups arrived earlier or later than the Melanesian ones.

There was probably very little intermixing, or none at all, between these ethnic groups for many centuries. Although there was some mixing with neighbouring groups, as Lammers' study has revealed, there was none over larger distances. Culturally speaking this is indicative of only a low frequency of social contacts over greater distances. Of course this proves little as regards differences or similarities in culture. It is only to be expected, however, that isolated groups will preserve their own culture and that with different groups a culture will evolve differently, irrespective of any differences or similarities there may have been to begin with.

One more implication — though a negative one — of the data supplied by physical anthropology for a cultural anthropological study is that any migrations which may have taken place from areas beyond Timor will be beyond our historical range of vision. Hence the data derived from myths of origin will not be considered for historical verification.

All we can say with regard to the culture is that we must be prepared to find Indonesian traits in the culture of the Timorese, while non-Indonesian elements may also be present. It is also to be expected that a distinctive cultural type developed because the last immigrants entered the area many centuries ago.

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11 Mendes Corrêa, Um mês em Timor, 1955, in Felgas, 1956, p. 137.
4. THE LANGUAGE

The languages of most of the peoples of the Timor archipelago fall into two groups: a western one, to which belong the languages of Savu, Sumba, Bima and the Manggarai, and an eastern one, which, according to Jonker,12 is probably one of a large group of languages which extends from Roti, Timor, East Flores, Ceram and Buru to the Kei and Aru Islands.

Timorese, the language of the Atoni, and Rotinese have the closest mutual affinities with Tetun, Galoli and Mambai on the one hand and Helon on the other. Besides these there are the mutually closely related languages of Kisar and Leti which also clearly reveal some similarity with Tetun, Timorese and Rotinese.13 Approximately the same degree of affinity exists between the languages of the Timor group and the mutually more closely related languages of Solor and Sika in Flores.

As regards the languages of the Timor group, i.e. Timorese, Rotinese, Helon, Tetun, Galoli and Mambai, there are important similarities with their closest geographical neighbours, i.e. the language group comprising Savu, Sumba, Ende and Bima14; such as, for instance, the absence of Indonesian suffixes in word formation and the especially strong tendency to form compound words which is apparent in both Rotinese and the Bima-Sumba group. These are also found in Timorese.15

The difference in genitive constructions on which Brandes based his classification is, as Jonker16 demonstrates, a development of more recent date. This makes it difficult to demarcate a clear boundary between Roti and Savu which may act as the dividing line between the two language groups.

Capell17 draws the conclusion that there are two types of language in Timor, namely the Indonesian type and a non-Indonesian, probably pre-Indonesian type. This seems to be the case, in fact. The non-Indon-

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14 Jonker, 1915, XIII, XIV.
16 Jonker, 1915, XI.
esian and even non-Austronesian languages are found mainly in the interior of East and Central Timor. Moreover, according to him the Indonesian languages can be divided into two sub-groups, the dividing line between which would coincide with the border line running between the Atoni and Tetun areas. But he mistakenly draws the line from Oekusi to an opposite point on the south coast, which places the regions of Insana and Beboki in the Tetun area although they belong completely to the Atoni language area.

Capell arrived at this conclusion in what was only an introductory summary written during the war period when contacts were impossible. Later on, in his general survey of the languages of Oceania, he classified Bunak, Makassai and Dagada among the non-Austronesian languages. Probably the languages of the peoples driven into the interior, namely Idaté, Cairai, Midic, Naumic and Nauhete, also belong to this group. In Alor and north Halmahera too, non-Austronesian languages are found. These linguistic data make a further interpretation possible of what indications we have from physical anthropology.

The small, dolichocephalic people of Fatu Matabia, data about whom have been worked out by Van Bork-Feltkamp, live in the non-Austronesian language area in the interior of eastern Portuguese Timor. And the man who, according to Bijlmer, looked exactly like an Australian aborigine, lived in the Bunak language area. Nyèssen's conclusion that here we have the autochthonous, at any rate much older inhabitants, is therefore quite plausible. Because of this we should certainly also consider the possibility of some degree of relationship with the Papuans, as Van Bork-Feltkamp supposes with respect to the people of Fatu Matabia. Just as the north Halmahera languages reveal vague resemblances with Papuan languages, we may suppose that the same may be the case with Bunak and the languages of other peoples driven into the interior. Berthe suggests, however, that Bunak is not a Papuan language, but that it contains words related to the Proto-Malay of the Semang in the Malay Peninsula. This hypothesis has been refuted conclusively by Cowan, who arrived at the conclusion that Bunak

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19 Personal communication Onvlee.
20 Van der Veen, 1915, p. 225.
21 Van Bork-Feltkamp, 1951.
22 Bijlmer, 1929, photograph no. 27, cf. p. 92, and Nyèssen, 1944/5, p. 97.
is related to the southern group of western Papuan languages. The fact that only a few of the 200 words listed by Berthe show some relationship to western Timorese languages would corroborate this.

5. THE PHYSICAL ENVIRONMENT

In a cultural anthropological approach to the questions posed in this study, which are focused primarily on the political system, it should be borne in mind that the basis of the culture of a community is formed by the use that is made of the natural background in which that culture exists, namely the tillage (colere) of the soil and the possibilities of survival offered by the land, and that its climax is the religious ‘cult’. All that lies in the magnetic field between the two poles colere and cultus is connected with both and cannot be understood without a knowledge of both these poles of culture. Colere conveys that man fashions his culture and cultus implies man’s awareness of his dependence.

The way in which man fashions his existence is determined by, among other things, the soil on which he constructs his house, or in other words, his culture. Our first concern is therefore to investigate what kind of land the Atoni cultivates, and subsequently the way in which he does this.

These questions concerning the physical environment of the Atoni and what he has done with it have been answered, in a manner difficult to excel, by Ormeling in his thesis entitled “The Timor Problem”. This work will be the point of departure for the present sub-chapter. A little more will be added about the areas of Insana, Beboki and Mio-mafo, however, which will be the focal point of this study. The location of these prinnedoms is approximately 9° S.Lat. and 124° E.Long.25

a. The soil

Together with Roti, Savu and Sumba, Timor forms a chain of islands which, unlike the other islands of this part of the archipelago, lack recent volcanic deposits. They do contain large areas of lime and marl soils, however, and are therefore a great deal less fertile. The oldest geological rock types are found in the central mountains, whilst in the north of Indonesian Timor and in part of Portuguese Timor there are occurrences of old volcanic rock, making that part of Timor more fertile, provided it is not too dry. This is the case in Manamas,

25 See map no. 4.
where this ancient black, volcanic rock type can be seen in a deep chasm with black cliffs, hundreds of metres in height, with loose, black, extremely fertile soil at their foot. The river bed, on the other hand, is gravelly, the water seeping away immediately, even in the wet season (see photograph 8). In the crevices and on the inaccessible, steep sides of these mountains many kinds of broad-leaved trees grow instead of the usual eucalypts.

The formation of the mountain chains is very irregular and the mountains frequently slope at an angle of 25° or more. Such slopes occur mainly in the central mountains of the interior, from Fatu Le’u to Nuaf Miomafo, and in Amanatun and Amanuban in the south. Parts of the landscape of Miomafo are very mountainous, containing among others the Koki or Tufuf, the twin of the Mutis; it is 2251 metres high. A large portion of Miomafo and Insana consists of a 400 to 450 m. high central plain, relieved in Insana by slightly undulating hill country, after which it continues, extending as far east as southeastern Beboki and Atambua in Belu. Here it is still over 300 m. high. The heavy, loamy soil of the plain, which has a high calcium content and has a very poor drainage in Beboki, moreover, is muddy and boggy in the wet season. In the dry season fissures as deep as two metres appear in the soil. For these reasons the great plain does not favour communications. Traffic on horseback, still the most important means of transport, is difficult in both the wet and the dry season. In an experiment with mechanized cultivation in a part of this plain near Sekon, in Insana, the fertility of the soil turned out to be disappointing. The yield was lower than had been anticipated and this corresponded with the results of a test of the different soil types, which, however, was carried out too late. Red soil is frequently found higher up; eucalyptus trees have a special preference for this type of soil. A group of eucalyptus trees on a plain is certain to be an indication of an elevation with red top-soil. This soil is mixed with gravel. It is avoided by the Atoni in their choice of suitable land for garden plots. Red soil occurs frequently in the hill country of Bikomi and Noimuti, where there are extensive eucalypt forests, as on the

26 See Ormeling, 1955, map no. 11, p. 34.
27 The name Nefomasi is incorrect on the map. This is the name of the lowest point of the ridge joining the two summits. In ritual language its name is often Babnain; p. 65 below.


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northern side of the watershed, i.e. in Ablal, Nilulat and Manamas. Red clay is also found, especially in Noiltoko and surroundings; it contains no gravel and is fertile, though very hard. Another soil type found here is grey loam, popularly known among roadbuilders as “soap earth”, because it is known to cause landslides. This loam is frequently found in the hills on the northern side of the plain and is less fertile than the red clay, perhaps partly because it is much subject to erosion. Only a few eucalyptus and acacia trees and some grass grow here. Lastly, there is a great deal of karang rock in Noinuti, a corallite which is predominant in Western Timor.

On the north coast, in northern Insana and northern Beboki, lies an extensive plain which is dry and consequently of little value for agriculture. As a result of a low rainfall and the limited size of the catchment area, and more especially because of the extremely wide riverbeds of sand and gravel, the water level of the rivers is low, even during the wet season. Between this plain and that of Central Timor lies a rugged mountain range, constituting the watershed between the Noil-Benain, the largest river in Timor, which flows into the Timor Sea in South Belu, and the smaller rivers which flow into the Savu Sea in the north. This range forms the boundary of the Portuguese enclave of Oekusi or Ambenu; its highest summit, the Bifemnasi (old woman), lies to the north of Kefamnanu. In one part of this range in Beboki there are valleys which are difficult of access, partly as a result of the steepness of the mountainsides but also because of the grey, slippery loam in which a horse may sink up to its knees in the wet season and in which deep fissures appear in the dry season.

b. Climate

Judging by its geographical position one would expect the climate of Timor to conform to the general Indonesian pattern with its characteristic succession of monsoons. This it does, in fact; but it also displays a marked difference with the rest of Indonesia as a result of the influence of the Australian continent, because of which the easterly monsoon is particularly dry.

During this season the nights are cool. In Kefamnanu, at an altitude of 400 m., temperatures may be as low as 12° or 13° C. The lowest temperature reading I ever took was 8½ degrees centigrade just before sunrise in August, 1946, at the foot of the Mutis, at an altitude of approx. 1950 metres.
season the temperatures probably correspond with those reported by Mohr, that is, 18° - 13° C. in the tropical mountain country between 1000 and 1800 m. high and 27° - 25° C. in the lowlands under 200 m. The difference is that between a temperate and a hot climate. In the dry season a large part of Timor is barren. Most of the trees shed their leaves at this time. The eucalyptus forests especially, which have no undergrowth, make a "wintery" impression with their white trunks and bare branches. But just before the rains break the buds begin to swell and burst into leaf at the first rainfalls or just before. Within a week after this "spring" makes its entrance in all its glory, with as many different shades of green as are to be seen in Europe in the month of May, if not more, with the trees which have retained their leaves (such as the waringin 32 or banyan) adding their older, darker greens.

Another important characteristic of the climate of Timor is the tremendous variability of the rainfall caused by differences in altitude and location in respect of the mountain chains. Moreover, the rainfall is very unevenly distributed over a period of years. Ormeling33 for instance, reports a rainfall of 1041 mm. for Lahurus in 1930 and 7482 mm. in 1934. The year 1930 was admittedly a dry year for the whole of Timor, and, moreover, the rains had fallen irregularly in October of 1929 so that the first crop failed in many parts.34 The year 1934 was a wet year for almost the whole of Timor except for Kupang. A tropical cyclone as the one that occurred in May 1939, when within the space of one week the rainfall was between 350 mm. and 600 mm. in some places, has a misleading influence on the average rainfall figures for the month of May over a large number of years.

Annual and even monthly averages recorded over a period of years do not, therefore, give a reliable representation of the actual situation, especially as the times at which the rains actually set in vary a great deal. In 1936 no rain fell at all in Kefamnanu in October and November, as against an average of 141 mm. for those months. It is especially difficult to present an accurate picture because frequently the rains commence to fall only to cease again for three weeks or so, resulting

32 One of the most common varieties of the waringin is the Ficus benjamina L.; Tim. nunu tili. Also, among others, Ficus callosa, Willd.; Tim. hau lazi; and Ficus gibbosa, Bl.; Tim. nunu isu. The Timorese language distinguishes between 22 varieties of banyan. Meijer Drees, 1950, p. 39.
33 Ormeling, 1955, p. 19. We have gone into the variability of the rainfall at some length as it has important bearings on the position of the ruler.
34 Van Alphen, 1933, p. 116.
in the failure of the first crop of corn. This is not necessarily indicated by monthly rainfall figures.

Differences in altitude result in considerable differences in rainfall and temperature. Of old the dry season in some areas of Timor has been roughly estimated at nine, six or three months.\textsuperscript{35} The north coast of central Timor for instance, has nine dry months and during the three wet months the precipitation is heavy and irregular, with frequent falls of 100 mm. or so. The wet season here usually sets in a little before January. Similarly the entire area which lies to the north of the central mountains in the interior, with peaks as high as 1774 m. (the Fatu Timau) and 2427 m. the (Nuaf Mutis), has a positively long dry season even at very high altitudes. On the southern side of these ridges, which coincide approximately with the watershed between the north and south coasts, the rainfall is much more favourable. The wet season sets in earlier here, usually in November on the plains, and even in the months of April and May the precipitation is over 600 mm., though under 100 mm.

Consequently these months, according to Mohr,\textsuperscript{36} may be classified neither as dry nor as wet months. They are “damp” months. The same phenomenon can be observed in the mountain country of the centre on the southern side of the divide, except that it occurs later on in the year; in Noiltoko, which lies at an altitude of 550 m. at the foot of the Miomafo (height 1397 m.) May and June are the “damp” months. Here, however, Mohr’s classification falls short. According to Mohr a month may be termed “wet” in the tropics if it has a rainfall of over 100 mm., because in that case the rate of absorption by the soil is higher than the rate of evaporation; if the rainfall is less than 60 mm. the amount that evaporates is greater than that which falls, so that the ground dries out. In Wini, on the north coast, where the average rainfall in February is approximately 100 mm. and rain falls in only a small number of heavy downpours, the ground probably does dry out, whereas in Noiltoko, where the rainfall in May and June is slightly lower, it hardly dries out at all. According to Mohr\textsuperscript{37} Noiltoko can be classified as tropical hill country, 200—1000 m. high, with temperatures of 24°—19° C. In Kefamnanu, 400 m. high, temperatures of 12°—13° C. occur in May, however, so that the rate of evaporation is lower. Moreover, these orographic rains in the easterly monsoon often fall as drizzle coupled with fog and lengthy periods of cloud, so that these months must by all means be termed “wet”. In the rolling mountain country between the Miomafo and the Mutis, at an altitude of 1000—1400 m., the grass remains lush and green all the year round except in the extremely dry period of 1946, which continued for months even here, when the grass was withered in October. The rainfall has never been recorded here, but it is probably higher than in Kapan where, at an altitude of 1000 m., it is 2000 mm.

\textsuperscript{35} Such as L. J. C. van Es, quoted by Kruyt, 1821, p. 776.

\textsuperscript{36} Mohr, 1932, I, 1, pp. 105 ff.

\textsuperscript{37} Mohr, 1933, I, 2, p. 215.
Mohr was the first to make a satisfactory classification according to variations in the rainfall, based on the number of wet and dry months. This method has been improved upon by Schmidt and Ferguson, whose point of departure is the quotient of the average number of dry and wet months, thus calculating the average length of the dry season. This way they arrived at eight groups, numbered from A to H. Groups A and B are covered by the category of three dry months as against nine wet months ($q = 0.33$). Most of Indonesia, as well as the greater part of Java, falls under these. Group C is defined by a quotient of 0.60 and D by one of 1.00, i.e. a maximum of 6 dry months as against 6 wet months. Group C occurs in northern and eastern Java and also mainly in the Lesser Sunda Islands. The major part of Timor, namely the north and south-west, is covered by group E and the north coast by F, the latter being defined by a $q$ of 3, i.e. nine dry months to three wet months. However, if we consider the "damp" months in Noiltoko as wet months the quotient becomes approximately 0.50 for this part, so that it is then included in group C instead of D. And for Soë the quotient becomes approximately 0.85 instead of 1.096, i.e. D instead of E. Kapan, with only little more than two dry months as against over nine wet months, belongs to group B instead of C as indicated on the Schmidt and Ferguson chart. Ormeling observes in passing that the chart of Timor prepared by Meijer Drees does not sufficiently take into account the differences in altitude. This is perfectly correct. All of the mountain country of the centre and part of the hill country on the southern side of the divide should be classified one category wetter whilst, conversely, the driest parts of the north coast belong to group G instead of F; Manatuto to the east of Dilly, with only one month (December) with a rainfall of 103 mm. and 8 months with 60 or less and in total only 44 rainy days even belongs to group H. Felgas, who uses the Schmidt and Ferguson classification in his statistics — but unfortunately not in his chart — does not take these divergencies in both directions into account either.

We can therefore conclude that the rainfall in Timor is sufficiently irregular for the perfected classification of Schmidt and Ferguson to fall short here.

The mountain climate is better than these classifications would lead one to believe, in spite of the fact that a rainfall of 1500 to 2000 mm. is low for the tropics. Areas such as Lahurus and some areas in Portuguese Timor, with a rainfall of 3800 mm. and over, generally really only belong to group C (in which the quotient of dry and wet months is 0.60) even if the necessary corrections of the Schmidt and Ferguson classification are taken into account, whilst a similar rainfall in Java or elsewhere is usually classified under B. Most of the areas in question lie at high

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40 Felgas, 1956, p. 63. The average monthly rainfall figures over a period of 24 years are: 74, 86, 97, 60, 37, 11, 4, 3, 7, 9, 24, 103 mm. respectively, which is equivalent to an annual total of 515 mm. This is less than in Palu in Celebes, the most arid area in the Indonesian Archipelago, classed under category H.
5. Girl from Wekimidar in South Belu. See also photograph 11.
6. Family in Lobar in Amanatun. Note the tattoo marks on the woman's arms. The cooking-pot is resting on the three hearth-stones. See p. 431.

7. Man from Manlea in Central Belu, the physical types of which are similar to those in Beboki and Insana.
8. Entrance to the chasm between Manamas and Wini, on the north coast of Miomato.
9. Mountain grasslands with mountain eucalypts (*anypuru*) in the central ranges near Mt. Mutis (altitude approx. 1500 m.).
altitudes but lie on the northern side of the mountain ranges. Here the rains are very heavy during the westerly monsoon, while the dry season is longer. In the drier areas the irregularity of the rainfall often has disastrous effects, for, as Ormeling states: "in general, the variability increases as the amount of rainfall decreases".

We have here, therefore, widely divergent types of climate, ranging from very dry to tropically humid as far as the rainfall is concerned, and from hot to temperate as regards temperature. According to Schmidt and Ferguson's classification they range from B up to and including G and in Portuguese Timor even as far as H. The latter is as arid as Alice Springs in Australia, therefore.

The question is, then, to what extent these wide climatological differences have exercised an influence on the culture. The period when the supposition that culture is determined by the environment found so much credit has passed with Vidal de la Blache, as Ormeling observes. Man is creative. Culture is what man makes it. But he fashions this culture out of what he finds ready at hand. He has to till the fields at his disposal. Differences in culture are therefore to be expected.

c. Flora and fauna

The soil and climate have been discussed in the light of their relevance to the culture, in relation to the possibilities presented to and the restrictions imposed on man in this respect. The flora and fauna will also have to be dealt with in this connection. Ormeling, in the first lines of his section on the natural vegetation, which is a subsection of his chapter on The Physical Environment as a Factor preceding the chapter on The Human Factor, refers to a competition between all elementary schools in North Central Timor which I organized in 1947. Its aim was to discover which school and which individual pupil could sum up the highest number of names of trees, shrubs and animals. The schoolchildren of Sufa, in Beboki, assisted by their teachers and all their relatives won the prize, because they knew 670 names of trees and plants. A partial explanation for Sufa's winning the competition is probably that in Beboki almost all young families live uxorilocaly until, in many cases after many years, the

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42 Schmidt and Ferguson, 1952, p. 9.
44 Op. cit., p. 54
bridewealth has been fully paid. In addition people here often have affinal alliances extending over quite large distances within Beboki, so that families from various districts live in Sufa. The raja family, for instance, originally came from the arid plain in the north. Sufa itself lies in the mountains, at an altitude of approx. 800 m. and the extensive Euroki Plain lies at a distance of barely 10 km. from Sufa, at an altitude of 350 m. As a result the trees and shrubs of these climatologically widely different areas could be included in Sufa's list.

Nearly all of the other schools, however, submitted at least 500 names. The individual prize was awarded to a girl from a village near Kefamanu who had collected, with the assistance of all her relatives, 331 names in the space of a few weeks. The above may serve as an illustration of the Atoni's strong attachment to his natural environment, in particular to plant life. Not only is it remarkable that a village community, and especially one family, should know such a large number of names, but this knowledge commands even more respect when we compare it with the number of trees and shrubs that actually grow in Timor. Meijer Drees has carried out socio-botanic research in Timor, making use of the Beboki list. He has compiled a list of approximately 575 Atoni names in various dialects, among which only 118 Beboki names, and subsequently a systematic list of the Latin names which, in his own words, "is probably virtually complete". The latter contains 529 names as well as the Atoni renderings of 343 names of trees and shrubs.

The conclusion to be drawn is not only that Meijer Drees did not make intensive use of the Sufa school list in his research, but also that a village community knows almost every tree and shrub growing in its surroundings.

A knowledge of the names of trees and shrubs is an indication of the ability to distinguish between the different kinds and to some extent implies an equally good knowledge of their uses. Giving names to phenomena in the environment is a cultural act of the first degree. In the description of a culture it is impossible to discuss the vegetation without relating it to man. Even if, or especially if we are to give a general impression of the landscape of Timor, the question arises whether it is the result of man's interference, whether it is "man-made" in other words, or whether it is a natural consequence of the interaction between climate and soil.

Endert points out that because of the development of agriculture

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46 Endert, 1946, pp. 166 ff.
and the possibilities offered by re-afforestation it is of the utmost importance to know whether or not the treeless alang-alang plains and the hilly savannah country that gradually merges into what Kuperus justifiably calls a park landscape were part of the original, "natural" scenery of Timor.

In the latter case there is less likelihood of man's interference than if the savannah country were the result of the activities of man. Van Steenis states: "It was man who degraded all types of vegetation in semi-arid areas by one degree or more and who has turned forest into treeless areas, savannahs into steppes and grasslands into deserts". It goes without saying that North Africa during the Roman period is listed here as an example of and proof for the destructiveness of man's activities: once cities and thriving agriculture, now desert. However, if we consider that Hadrian was revered as a god in North Africa because the first rain for five years fell on the day of his arrival, it may be supposed that the reverse holds at least equally true and that man is also capable of turning deserts into fertile land.

As far as Timor is concerned, the question as to how much of the present landscape is man-made and how much of it is in its original natural state is a difficult one to settle. Many a time the state of the soil has been a cause for alarm. In 1941, for instance, a forestry expert pointed out an area ten km. to the east of Kefamnanu where the grey loam of the mountainsides revealed deep fissures. There were traces of landslides and only grass and some eucalyptus and acacia trees grew here. He predicted that within fifteen years the soil in this area would be totally washed away and that there would be no vegetation left. And, moreover, that during the lifetime of the present generation the steep mountainsides of Timor, used for dry-rice cultivation, would be stripped of all their arable soil. At present the slopes to the east of Kefamnanu still reveal the same fissures and the same sparse vegetation. The situation is completely unchanged, and the Timorese are still, or again, using the same slopes for their dry-rice cultivation.

Mohr is inclined to wonder, therefore, "whether in former times, when the population was sparser, most of the island was, in fact, covered with forest". Probably one of the oldest eyewitnesses we can consult is

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47 Kuperus, 1936, p. 45.
51 Mohr, 1933, II, p. 105.
Bor,\textsuperscript{52} the secretary of De Vlaming van Oudshoorn, who took part in the expedition against Amarasi in 1656. On the way to Amarasi, approximately four miles before it, a heavy downpour took the company by surprise. They retraced their steps to the last halting-place to seek shelter, "for which there was no opportunity, it being a barren, hummocky mountain range". And on the second expedition the enemy could not be sighted in time because of the "trees growing here and there". The landscape is still exactly the same at present.

But even at that time man had probably been burning down the forests on the mountainsides for centuries in order to lay out his garden plots. He had also most likely been burning down grasslands every dry season to ensure the growth of young grass as soon as the first rains began to fall. This way rain forests, traces of which are still to be found on the slopes of the Mutis and the Miamofo, probably originally gave way to secondary forest with fairly thick undergrowth. In places where the dry season is severe the rate of recovery is slower, and where the grass is burnt on the plains all shrubs are likely to disappear altogether. Grazing cattle, too, and in particular goats, hamper the re-growth of shrubs. A striking example of deterioration is offered by Solor. In 1630 Miguel Rangel, O.P., wrote of this land "as an earthly Eden, where only man was vile. His account extols the island's upland rice, which did not need the laborious cultivation of the lowland paddy variety. He further praises its prolific sheep, goats and buffaloes, its tasty fruits and vegetables, and excellent drinking water".\textsuperscript{53} Rangel's description may be a little too lyrical, as he had just reconquered Solor. However that may be, when in 1939 I made a number of tours in Solor there was almost no spring water left, not even in the neighbourhood of the old fort. Most of the springs were even below the tidal line so that they invariably produced brackish water. There were practically no buffalo, sheep, fruit or vegetables left on the island, where no trees grew except for the lontar palm. At present it is predominantly barren hill country with large boulders scattered among the grass.

The strongly increasing pressure of population growth especially is making it necessary for the Atoni to return to their abandoned ladangs earlier than they themselves consider advisable, so that the trees barely have time to recover and only the bushes do. It is only to be expected that with frequent burning down the heavy downpours of

\textsuperscript{52} Bor, 1663, pp. 350, 353.
\textsuperscript{53} Rangel, Lisboa, 1635, see Boxer, 1947, p. 3.
the westerly monsoon will bring about erosion. After deforestation the soil has a lower moisture-absorption rate, moreover, so that in the dry season the springs supply less water.

But it is extremely difficult to establish with certainty whether this does take place, as the processes involved are slow, and as in most areas the soil has been tilled as far back as man can remember, while the springs have usually been carefully conserved. Of old the areas surrounding most of the springs have been taboo (nuni) for cultivation so that small groves have remained here.

Only in Manamas is the position slightly different. This formed of old a bone of contention between Ambenu and Tunbaba (see map no. 4) and later, in 1911, between Portugal and the Netherlands. In 1913 there were 600 refugees from Ambenu in this no-man's-land following an insurrection in Portuguese Timor. From the fact that when in 1915 it was brought under effective Dutch rule Tunbaba no longer asserted any claims to this area it may be concluded that it was practically uninhabited. It was then possible for Manamas to become a separate district, inhabited by the people from Ambenu. In 1947 an investigation brought to light that people were forced to return to old ladang fields too soon, within seven years in fact. The old people who could still remember the first years after 1913 unanimously agreed that the springs had supplied more water then than at present. But this information is not altogether reliable, as in 1946 there was an extremely short wet season, followed by an extraordinarily long dry season.

The picture presented by the three areas of North Central Timor is a varied one.

The nucleus of Miomafo is the area surrounding the 1400 m. high mountain of that name. Here are the evergreen mountain pastures with scattered adjau trees and large shade trees surrounding the springs. On the slopes of the central Mutis range grow the splendid, extensive, sparse, evergreen anpupu forests with remains of original, mixed forests. These are majestic, solitary forests alternating with mountain pastures, the whole giving an alpine impression (see photograph 9).

Not all of Timor is strictly speaking tropical. And in this area in particular one imagines oneself in a different world altogether. Lower

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54 Steinmetz, 1916, p. 73. Ezerman, 1917, p. 1216, states that the number of refugees was 600.
55 In Insana and Beboki: ajau; Indon. tjemara; Casuarina Jungh.
56 Eucalyptus decaisneana, according to Meijer Drees; according to Ormeling, 1955, p. 59, it is Euc. ptalyphylla Auct.
down, on the northern spurs, extend the vast eucalyptus forests on the reddish gravel soils which are covered with sparse grass.

To the east of the Mionafo the Noilnoni (or Gold River) flows through a very steep valley into the Noiltoko, which has cut a deep gorge through the mountains and flows into the Noilmuti. Here it becomes a typically Timorese river, its bed covered with boulders, sand and gravel, and having a width of 100-300 m. At this point we reach the vast central plain of Timor, with eucalyptus trees growing on the elevations, and in the flatter parts coarse grasses and only relatively little *alang-alang* ⁵⁷ (used for roofing). Here trees only grow in scattered clusters. Even if these plains have always existed here, which is not an unlikely supposition, ⁵⁸ they have undoubtedly expanded considerably as a result of annual burning down. Large numbers of cattle graze here; these have to be transferred to higher pastures during the driest months, however.

Such pastures are found in the hill country with its unusual park landscape and its acacia trees, which are so typical of the scenery of Timor with their umbrella-like foliage of tiny, rolled, needle-shaped leaves. These leaves are used as hand-fodder for cattle during the driest months. The largest number of herds graze here; but here the impenetrable *lantana* shrub is also found. Encroaching from the west it is found especially in Noimuti and even as far as Bikomi and Noiltoko, while it also occurs in Portuguese Timor. Its habitat is especially on rocky grounds rather than the black soils of the plain. The *lantana* serves as a vegetable manure, but as these shrubs usually grow in dense clusters there is no grass growing underneath them, so that there is little to bind the soil.

These hills merge into the low mountain country to the north of the plain, which rises up to a height of 1000 m. on the border with Oikusi and in Tumbaba. On some of the steeper mountainsides there are groves containing some excellent varieties of timber, such as *hau meni*, or sandalwood (*santalum album* L.), for which Timor has become famous.

The fauna of Timor is not as rich and varied as its flora. There are relatively few species of birds and mammals. The results of the inter-school competition in 1947 revealed that the Atoni knew only 53 names of animals. Of course this may only be an indication that they do not

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⁵⁷ *Tim. hoen* or *hoe musu*; *imperata cylindrica* L.
⁵⁸ Ormeling, 1955, p. 65.
distinguish between more than 53 varieties. All species of butterflies, for instance, are called napan, while on the other hand there are six different names for different kinds of flees which, as they are a greater nuisance, apparently are more important than butterflies. The Atoni is only moderately well acquainted with the birdlife, for 143 species and sub-species have been observed in the area. It should be noted here, however, that many of these species are confined to either the eastern or the western half of the island.\(^59\) There are no large beasts of prey.

Very important is the sporadically occurring crocodile. Its name, be’i, is the same word as that used for genetrix, grandmother. It occupies an important place in Atoni mythology. “She” is, for instance, the great ancestress (be’i) of the house of Senak, the lineage of the most important chief of Bikomi in Miomafo. A daughter of the first Senak was named Bikomi, and she was turned into a crocodile, thereby giving her name to the area. Killing crocodiles is taboo for the Atoni, and if one is killed in self-defence, for example, Senak has to bury “her” as though it were a human being.\(^60\) All over the island the crocodile is considered a holy animal, and is frequently depicted in weaving patterns.

It is extraordinary, though it typifies the Atoni, that he knows only a few names of fish, in spite of the fact that the seas surrounding Timor abound with fish. In Beboki, a large part of which borders on the sea, only thirteen names were known, while in Miomafo, which has only a short coastline, people were able to enumerate 27 names; the latter referred mainly to fresh-water fish, however.

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\(^{59}\) Mayr, 1944, p. 130.

\(^{60}\) Cf. p. 294 below.