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ANTHROPOGEOGRAPHICAL INVESTIGATIONS IN BRITISH NEW GUINEA.*

By C. G. SELIGMANN, M.B., M.R.C.P., and W. MERSH STRONG,
M.A., M.D.

LET me, in the first place, make it clear that the Daniels Ethnographical Expedition was in no sense an exploring expedition, and the results brought before you to-night are but the geographical gleanings of an ethnographical expedition. I cannot even offer you fearsome ethnographical details of

“ . . . the cannibals that each other eat,
The Anthropophagi, and men whose heads
Do grow beneath their shoulders,”

though we did hear of, but unfortunately had no opportunity of personally investigating, a tribe the members of which, before sitting down, scratched a hole in the ground with their spears to accommodate their tails.

For the purely geographical observations made to the west of Port Moresby, Dr. Strong is responsible, but he did not visit the Massim district. I am indebted for a very large amount of the material I have used in that section of the paper which deals with the south-eastern extremity of the island to the organizer and chief of the expedition, Major Cooke Daniels, whom I take this opportunity of thanking for allowing me to some extent to anticipate his results. My best thanks are also due to Captain Pim, who made the plan of Tokunu and Gawa and the sections of the islands of the Marshall Bennet group which are reproduced in this paper, and whose description of Kwaia-wata I have quoted almost verbatim.

* Read at the Royal Geographical Society, December 18, 1905. Map, p. 324.
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Thus, while I have not hesitated to draw on my colleagues for material, the responsibility for its presentation and for any inferences drawn from it must rest on myself.

Dr. John E. Marr and Messrs. W. G. Fearnside and H. Woods have very kindly examined and identified the rocks and fossils mentioned in this paper, and to them my best thanks are due for enabling me to give a more coherent account of the districts visited than would have been possible otherwise. The majority of the photographs were taken by my colleague, Mr. A. H. Dunning.

The districts it is proposed to discuss to-night are three in number, viz.—

(1) British New Guinea, west of Bugi, *i.e.* the extreme west of the possession between Strachan island and the Anglo-Dutch boundary.

(2) The valley of the St. Joseph river and its neighbourhood, situated some 60 miles to the west of Port Moresby.

(3) An area in which raised coral masses are a prominent feature. This includes portions of the eastern and south-eastern administrative divisions, that is, the district which has been called by Dr. Haddon the Massim district.

THE WESTERN EXTREMITY OF BRITISH NEW GUINEA.

On the trip to the western end of the possession, and the partial ascent of the Bensbach river at the Anglo-Dutch boundary, we had the advantage of accompanying a Government party, to the members of which our thanks are due for much courtesy and consideration. Three whaleboats, one of which we occupied, were towed by the steam-launch *Ruby*.

West of Bugi the country is a vast flat swampy plain, presenting for the most part a uniform edge of mangrove swamp to the sea, broken only by the mouths of sluggish rivers and creeks whose banks are as a rule covered with mangrove in the lower reaches. Here and there, however, a sandy foreshore occurs; this is the case at Wallarter point, the eastern extremity of Jerai bay, where behind a sand-beach there rises to a height of about 4 feet a plain of loosely compacted sand and grit, from the edge of which we obtained recent semi-fossil shells of land and marine genera *Helix*, *Arca*, and *Cerithium*. Some 40 miles west of Wallarter point the mouth of the Bensbach river appeared as a break in the green-grey mangrove line, which hitherto had stretched as far as the eye could see, marking the junction of grey sea and greyer mud. For the first 9 miles the banks are fringed with mangrove, and present the appearance of a typical rhizophora swamp; above this Nipa palms become common, and the mangroves disappear. A little beyond this the banks are raised at intervals as much as 2 to 3 feet above the river, and bear a fairly open jungle containing many eucalypti, some of which resemble the larger Australian ti trees. On one such raised

area our first camp was made. Further up, lengths of this kind of jungle alternate with open grassy swamps, which, without any definite margin, seem to fuse with the reeds and sedges of the river-bed.

Above this a few coconuts appear at some distance from the river-bank, and soon native gardens, with a few patches of forest trees, occur on the higher banks. Throughout the distance ascended, the river, which presents a very winding course, varies considerably in width, some reaches being very noticeably broader than others they alternate with. About half a mile up-stream from its mouth, Lieut. Meyjes, of the Dutch navy, found that the river was 150 yards broad, and had narrowed to between 50 and 60 yards, where the mangrove belt began to give place to other vegetation. After the first day's travel there was enough drifting weed to obstruct the screw and necessitate frequent stoppages to free it.

We met natives belonging to the Toro tribe on the third day of our ascent of the river soon after scattered clumps of coconuts had become frequent on the higher ground at a little distance from the river. Our camp was pitched on the right bank of the river, on a small knoll on which grew an isolated clump of bamboo.

The natives were living at a place which appeared to be called Tivi, some 3 miles from our camp in a north-easterly direction, and thus on the opposite side of the river. This was stated to be a recent, perhaps temporary settlement, made among the marshes on account of the fear inspired by Tugere raiders from over the Dutch border. The track to the village passed through extremely rich taro gardens, the ground being drained by many cuttings about 1 foot deep and 18 inches to 2 feet across. Tivi itself seemed a poor village, with few things except the bare necessities of life. The houses stood upon the ground, and were not more than 5 feet high and 9 feet long. Their rounded roofs were made of ti tree bark. All the houses were open in front; many were also open at their opposite end, so that they were, in fact, mere roofed tunnels. In the better-built houses the bark roof was continued over what must be regarded as the back of the house, to within 1 foot or 18 inches of the ground. These houses were, in fact, similar in shape and general appearance, but smaller, than one figured in the Annual Report on British New Guinea (1900-1901), described as a house in the village of Gwaigar, on the Morehead river.

The Toro, for this appeared to be the tribal name for these Bensbach natives, are spare and moderately tall, with thin legs and often thin bony faces, projecting zygomata, and marked supraorbital ridges. Facially, they seem to vary more than other western tribes, some of them closely resembling examples of the less intelligent European types. The hair of all was frizzly, and the nostrils were generally bored, in some cases in two places. In many these holes had become very small, so that the plugs that some men wore were evidently not considered

important articles of toilette. Their noses are generally long and coarse, with moderately broad ridges, and often coarse fleshy tips which are never hooked. Generally speaking, the Toro appear long faced.* In some of the older men the front teeth had gone, in others the fangs were exposed by receding gums, but in every case their teeth were white, and no sign of betel-chewing was seen, nor were any lime-gourds noted. One of their favourite attitudes was to stand on one leg, with the sole of the other applied just above the knee of the leg which supports the weight of the body; in fact, they assumed the attitude figured by Grogan for the Dinkas of the Nile swamps.

With the exception of nose, hair, and arm ornaments, most of the men went naked. A few, however, wore a pubic shell. These were said not to have been traded, but to have been fetched by the Toro themselves from the coast between the Bensbach and Morehead rivers. As a rule, the shells were not ground, or in any way worked, though in one melo shell the curve had been so ground away as to expose the columella. Even this scant covering was as often as not worn at the side of the hip or behind as in front. Many of the men had tinea, and the only baby seen had yaws.

The women, of whom we saw very few, wear two kinds of covering—one that is practically a perinæal bandage, as on the Fly, the other a true petticoat.

Their weapons are bows, arrows, and clubs. The latter were few and extremely rough, and were certainly imported. Their bows are made of bamboo, and with these they make fairly good practice, as the following details show: A target about 3 feet long and 2 feet broad was put up at a convenient height, at a distance of about 40 yards. Sixteen men had each one shot at this, and, though no hits were recorded, many of the arrows went very near the target. It appeared that the time the arrow took to traverse the 40 paces was between 1 and $1\frac{1}{5}$ seconds. Each of four of the best shots then fired four arrows, with the result that but one of these hit the target once. The same men shooting at 80 yards scored no hits; but there was no general falling off in the shooting, their arrows being pretty thick all round the target. Their bows were strung with strips of rattan, and their release is that known as "secondary."

During our stay we saw a fair number of canoes. These consist of a hollowed tree-trunk, pointed at each end, and with no outrigger; they pole along with bamboos. As far as we could determine, paddles were unknown. We saw none, nor could we hear of any; but in spite of this a good pace was attained even in deep water, their

* Measurements bear out the impression of variability already referred to. The cephalic index of twenty-one men varied from 69 to 86, with an average of 74 and a maximum below 74.

unsplit bamboo poles being used as paddles by men standing in the bows and stern respectively.

At Tivi we saw a number of tobacco-pipes of the same type as those common throughout the Possession; in spite of this, tobacco did not prove good trade. Their own tobacco was light coloured, and seemed extremely mild.

The only musical instruments met with were the drum and whistle. The latter consisted of an excavated nut-like fruit, and a note was produced by directing the breath into a small opening in the way that

A MAN OF THE TORO TRIBE, BENSBAH RIVER.

a note may be produced with a key. The tympana of their drums consist of kangaroo skin, and the drums themselves were larger than those we had previously seen in this district. It should, however, be noted that far larger mammal-skin covered drums are said to be used some distance up the Bamu river.

The Toro are a totemistic folk, with descent of the totems in the male line. Perhaps the majority of the totems are birds. A number of palm-wood bullroarers were collected, but we could learn nothing about their use. Since, however, the Morehead river natives, whom the Toro closely resemble, use the bullroarer in their initiation ceremonies, it is probable that the Toro do the same.

THE VALLEY OF THE ST. JOSEPH RIVER AND ITS NEIGHBOURHOOD.

The area constituting the plain and delta of the Angabanga is inhabited by a number of tribes which may be grouped into three main divisions, according to the language they speak. The first of these, the Roro-speaking group, stretches from Kivori near Cape Possession to Hisiu, to the east of Cape Suckling. Hisiu and the neighbouring village of Nabuapaka are, however, comparatively recent colonies from Waima; and Delena, which is in part composed of the descendants of a Roro-speaking stock, should probably be considered their old eastern limit. The native name for Yule island, which is inhabited by that one of the Roro-speaking tribes which gives the language its name, is also Roro, but in this paper the island will be called by its English name, Yule island, and the term Roro will be used only when speaking of the tribe in question.

Inland of the Roro-speaking tribes is a region which may conveniently be called Mekeo. This is inhabited in the main by two closely related tribes, the Biofa and Vee. The villages of these tribes, once the coastal Roro-speaking zone is left behind, stretch up the broad valley of the Angabanga till the foothills of the main range are reached. Mekeo seems originally to have been a Roro, or possibly Motu, term, and to have been applied in the sense just indicated; but the term should be extended to include a small and uncertain number of villages on the upper reaches of the Biarua river, possibly originally populated by Biofa-Vee folk, and with whom the present-day Biofa-Vee of the St. Joseph river valley intermarry. The whole of Mekeo lies east of long. $146^{\circ} 40'$, and, with the exception of the Vee village, Inawabui Kipo south of lat. $8^{\circ} 40'$.

The lower portion of the course of the St. Joseph river, *i.e.* about the first 20 miles from its mouth, flows through a flat and often swampy country, much of which is liable to inundation. Yule island at its mouth is, however, hilly, while a series of low hills stretch from Pokama to and beyond Epa. An isolated hill of bare basaltic breccia exists to the north of Eboa. Upon this hill, in shallow caves and under overhanging rocks, are exposed the Eboa dead. A few low ridges exist to the north-west of Obo, and there is at least one other outcrop of bare basaltic breccia. North-west of Bereina the country becomes hilly, the edge of the hills at first running more or less parallel with the coast, which it afterwards approaches, till at Cape Possession (Waimatuma) the foot of the hills is washed by the sea. These hills are covered with more or less rank grass and scanty eucalypts, and carry a good head of wallaby. Behind Waima the hills are about 400 feet high and about a mile from the sea. Here a considerable creek, called Uirakapa, in part fringed with mangroves, runs near their base and separates them from the villages of the Waima clans. These hills

consist, at any rate in part, of raised coral reef, since obvious corals were seen in the rocks skirted by the track from Waima to Bereina.

Along the coast of Yule island are a number of caves. One of the largest of these is called Paavi. Its walls consist partially of a coarse sandstone, becoming clayey in places; at the mouth of the cave the rock has weathered hard, and from it we obtained a number of recent fossils. Among these Mr. Woods identified an *Ostrea*, a *Lucina*, and *Pecten pallium*. At another point on the island *Spondylus spectrum* was obtained, as well as *Pecten pallium*. On the floor of the cave there is a rich black mould, which a few yards from the mouth gives place to a loose sandy soil. A fair amount of the cave floor was turned over, but no signs of occupation were found.

Along the shore between Pinupaka and Waima the beach consists of sand. Extending for some distance from Pinupaka there is a mangrove fringe, which is never far behind the beach, and in places approaches the edge of the surf, while here and there mangrove stumps can be seen below the present high-water mark. Besides these, and bordering the shore above high-water mark for a considerable distance, there stand the still erect dead bare trunks of large mangroves, not *Rhizophora*.

The meaning of these mangroves is ambiguous, but, with other facts adduced, would seem to point to recent elevation, the trees being killed by the increasing upward deposit of sand which now forms the beach.

Beyond Waima, between Cape Possession and Oiapu, is a free cliff edge of hard rock, which rises for the most part almost vertically from the sandy beach. In this are embedded many corals and marine shells. Among others, Mr. Woods has identified *Conus parvus*, *Arca Deshayesi*, and species of *Loborium* (Triton), and *Balanus*.

Dr. Marr and Mr. Woods point out that the fossils obtained from Yule island and from the cliff between Cape Possession and Oiyapu leave no doubt but that the strata from which they were collected are post-Tertiary, and must be regarded as recent. This view conflicts with that set forth by Mr. Gibb Maitland, and represented in his geological map of New Guinea, published in the Reports.* In the paper alluded to, he describes Yule island and the strip of coast country between Bereina and Yokea, the latter west of Oiapu as the former is east of Waima, as consisting of Tertiary "Port Moresby beds." It must, however, be remembered that at the time Mr. Maitland's account was published the fossils he collected had not been critically examined.

Eastwards and southwards of the Roro-speaking tribes is Pokao, a district of low hills and rolling downs intersected by narrow belts of forest in its shallow valleys, but in the main constituting a country covered with long grass and sparse eucalypts. In many ways it

* 'Annual Report on British New Guinea, 1891-1892.'

resembles the country round Port Moresby, but is less arid, and carries an abundance of game. Its language does not resemble Roro, while its social system, as far as it is known, is also different. In spite of this, Pokao and Waima have long been closely associated, the Waima folk making comparatively prolonged stay in the Pokao villages on hunting expeditions. The return for this hospitality might be, and often was, a gift of coconuts; but the intimacy between the tribes went further than this. A generation ago one Poa Oa of Waima excelled in carving, and much of the best work on the older Waima marea was done by him or under his direction. He was asked to come to their village by the folk of Diumana of Pokao, and to carve the posts of their club house. This he did, and although the loe, as the Pokao club houses are called, for which he carved the posts has recently been burnt down, the majority of the posts carved by him or under his direction are still to be seen at a short distance from the present Diumana site.

The folk of Pokao, at any rate in certain villages, are conspicuous for their often wavy and even almost straight hair; indeed, as far as our present knowledge extends, there is here a larger percentage of individuals with hair which is curly or wavy than elsewhere in New Guinea.

Following the coast-line, immediately east of Pokao is a marshy area through which meander a number of streams. Of these the Aroa is the most eastward of any considerable size, while on the west the Veimaui river opens into the head of Galley reach. The district between these rivers known as Kapadi, or Kapatzi, we did not visit, but were able to ascertain that it was peopled by a folk who are the descendants of a faction which several generations ago split from the Mekeo village of Afai, and after many wanderings settled in Kabadi. This information, obtained at Mekeo, was interestingly confirmed at a big feast given by the administrator, Captain F. R. Barton, to which all the accessible tribes of the central district were invited. Here we saw the men of Kabadi wearing, as they danced, the feather clan badges proper to the Mekeo and Roro-speaking tribes, and in this case derived from and representing the kangakanga of the former.

The social system of the Mekeo-speaking tribes, though presenting features of great interest, will be but briefly alluded to here, and that only sufficiently to render the scant information gathered by the Rev. Father Egidi concerning the mountaineers behind Mekeo intelligible. †

The Mekeo tribes consist of a number of clans, representatives of which are as a rule to be found in several villages. A number of clans claiming common descent form a ngopu group. For each clan there was a group called ufuapie, into which, it was stated, its clansmen should marry, and which took a prominent part in the death rites of its intermarrying clan. Every clan had an iauafangai, generally a

plant, which it did not avoid eating, and a *kangakanga*, an animal or plant which would not be eaten, though it might be killed, and its feathers, or if it were a plant its dried leaves, would be worn by the clansmen when dancing. Apparently all the clans belonging originally to a *ngopu* group had originally the same *iaufangai*, and the same name for their club house (*ufu*). Each local division of each clan would have at least two chiefs, called *lopia faa* and *io lopia*. The latter was practically a war chief, and, except during actual warfare,

NARA WOMAN WITH WAVY HAIR.

his authority was greatly inferior to that of the *lopia faa*. Both offices are hereditary, with the practical limitation that no one not a successful warrior could in the old fighting days have been an *io lopia*.

The *Lapeka*, living some 10 miles west of *Oriopetana*, are a folk akin to the *Biofa* and *Vee*, and some of the clans now living in the *Vee* villages appear to have originally come from *Lapeka*. A few *Lapeka* visitors seen at *Iffu* closely resembled the *Mekeo* folk proper.

Of the mountains inland of the *Mekeo* plain our knowledge is more limited, but that at least two groups of tribes, at present ill defined, but speaking different languages, inhabit these mountains is clear. These are the *Kuni* and the *Kamaweka*, the latter being the tribal name applied by Captain Barton to the hill folk living in the

neighbourhood of Inauvorene. Dialects which, as far as our present knowledge extends, show no obvious similarity are spoken by these two folk, that of the Kuni belonging to the group which includes Pokao and Motu. In spite of this linguistic difference, the two folk are alike in general appearance and dress, the women in both instances wearing a narrow perineal band instead of a petticoat. Neither group appears to be homogeneous, since the cephalic indices of the Kuni (15) vary from 75 to 82, with an average of 78, while the Kamaweka (11) vary from 73 to 81, also with an average of 78. Both folk are shorter and darker than the people inhabiting the Mekeo plain, and their hair is always frizzly.

On leaving the Mekeo plain and going north-eastwards from Inawabui Kipo towards the Kuni villages, two species of oak with oval entire leaves and broad squat acorns were met with. Tree-ferns, too, were seen, but were not abundant. The road, the merest jungle track, often overgrown, lay up and down a number of clay ridges, all densely covered with old jungle. At the bottom of each of these a stream runs, and it is on the crest of such a ridge, reached at the end of a long day's walk, that Foloa, the Kuni village nearest the Mekeo plain, is perched. It consists or consisted of four wretched houses, and a marea surrounded by a frail palisade. A day's walk beyond this lies Emene, a larger and more important settlement. The village occupies the whole plateau of trodden clay, measuring some 150 by 30 yards, which constitutes the top of the hill. The houses are placed round this area, from which run a couple of paths passing steeply down the hill to the gardens and creek. There is a marea (club-house) at each end of the village, said to belong respectively to the two chiefs Makua and Kapulau; these are similar in structure, and 18 to 20 feet long by some 10 to 12 feet broad. The roof was square behind—that is, at the back of the house, but rounded in front overhanging the verandah. The roof ends some 5 feet from the ground, being in this respect unlike the dwelling-houses, in which the roof comes down to within a few inches of the ground. The marea is two-storied; the first floor, level with the verandah, is made of split areca-like wood, and is about 3 feet from the ground; the second floor is $6\frac{1}{2}$ feet above the first. Three main poles hold up the roof, which is about 18 feet above the ground. Along the middle of the floor of both stories, and interrupted only by the central main pole, is a fireplace about a yard broad, consisting of a thick layer of ashes between palm-trunks. A couple of tree-trunks are lashed along the sides of each house about 2 feet from the floor of the second story; these serve as shelves, and, in spite of the slope of the roof, were generally tenanted by sleeping boys. The houses of the village are small and miserably built; they tend to be circular, and, when seen on end, give the idea of being so. One which was measured was, however, 12 feet long by between 6 and 7 feet broad.

The door is but a hole in the thatch, which comes low down. There is invariably a gap in the side of the house left for pig, and there may or may not be a raised floor of planks, partial or complete. There were twenty houses in the village. Bows and shields did not appear to be used, the only weapons we saw or could hear of being spears and clubs.

Concerning the social organization and the customs of these mountaineers, the only information I possess is that derived from a letter from the Rev. Father Egidi, of the Sacred Heart Mission, who has recently been stationed at Dilava, which is, he states approximately, in lat. $8^{\circ} 35' 15''$ S., and long. $146^{\circ} 53' 45''$ E.* He

A KUNI VILLAGE.

(From a photograph by the Rev. Father A. M. Fillodeau.)

points out that he could find no trace of intermarrying groups or groups of clans claiming common descent. The Dilava folk marry into all the surrounding villages, and when a death occurs it is the head of the family of the deceased who says when mourning shall cease. There appears to be no chiefship comparable with the system of hereditary war chiefs of Mekeo; any one who has killed his man and who has enough force of character may become a war chief, and this title implies no responsibility or specialization of function at feasts and ceremonies.

* I take this opportunity, on behalf of my colleagues as well as on my own, of thanking the Mission of the Sacred Heart for much help rendered and hospitality shown to us while working in the Roro and Mekeo districts. Among the staff of this mission, our thanks are more especially due to Mgr. de Boismenu and the Reverend Fathers Vitali, Egidi, Guibert, Cochard, Louis, and Paget.

The ufu system seems less developed than in Mekeo. A peculiar ceremony is undertaken by the women and children of a dead man. These hold their face in the steam arising from a small pot in which is put a fragment of pork, while the rest of the village feast upon the pig from which the fragment is taken.

Of the Kamaweka of the Inauvorene district our knowledge is even scantier, and by the term Inauvorene district nothing more is meant than an ill-defined mountainous area north-east of Mekeo, some 20 miles from the Mekeo Government station, a portion at least of which is inhabited by the Kamaweka. It is reached by passing through Rarai and Ififu. Beyond the latter there is only a native bush track, at times difficult to follow. For the first six hours' walk this track passes through a swampy district, intersected by many creeks; over some of these the natives have constructed rude bridges by cutting down a tree standing in such a position that it could be made to fall across the creek it was desired to bridge. Towards the latter part of the first six hours' march the ground becomes covered with large water-worn stones, evidently brought down in the wet season from the hills. Near here the Biaru river is reached. When visited in 1904, the rainy season had scarcely finished, and the river was running swiftly with a depth of from 3 to 4 feet.

Near here the Ififu and Rarai people had built some ramshackle houses for their use when hunting and fishing. So far since leaving Rarai the track had lain through dense forest, which quite hid the surrounding country. A little distance beyond the native shelters a large branch of the Biaru is crossed, and the character of the scenery begins to change, and hilly country, with the Biaru flowing at the bottom of a gorge some 30 or 40 feet in depth, is soon reached.

The sides of this gorge are composed of rounded stones set in fine sand and gravel. It seems clear, before the Biaru had cut its present channel, it had flowed at a higher level, and had covered the country with washings from the hills. The path here keeps close to the river for some three hours' march, and then begins to steadily ascend, when the character of the ground soon changes. Instead of the ground being strewn with rounded pebbles, metamorphic rocks *in situ* are visible in the few places where the vegetation allows them to be seen. Some four hours beyond the native houses already alluded to is a sheer precipice some 30 feet high, which was descended by means of a bamboo ladder constructed on the spot. Probably this rock face was due to faulting. For a short time the path continues to descend, but it soon begins to rise again, and with few interruptions continues to rise, passing through dense forest almost until the top of a pass between the two Tulli peaks is reached. Beyond this lies a densely wooded valley with the Biaru flowing over its bottom. Beyond Tulli pass the road descends until almost the river-level is reached, after which it rises

steeply to the village of Inauvorene. This village is built on a ridge or grat, and, excepting on one side, is surrounded by precipices. A stockade surrounds it for the most part. The entrance to the village is on that side where there is no precipice, and here the second stockade has been built without the first. From Inauvorene several villages could be seen on the slopes of the opposite valley, at the bottom of which the Biaru river flows. By descending the slope of the Inauvorene ridge opposite to that previously ascended, and then travelling along the south-western slopes of the valley, the village of Ofafa was reached. The Kamaweka appear to be cannibals, and dispose of their dead by exposure on rough platforms in the forest.

WAGA AT TUBE TUBE: ENGINEER GROUP.

THE EASTERN AND SOUTH-EASTERN DISTRICTS.

At the south-eastern extremity of the possession our first prolonged stay was made at Tube Tube, in the Engineer group. This island, situated roughly halfway between the mainland and the Louisiades, supports one of the chief trading populations of the eastern archipelagos. The social system of these folk is substantially that which later we found to extend throughout a wide area in the eastern and south-eastern divisions of British New Guinea. Essentially this is a condition in which a community consists of a number of totemistic clans with descent of the totems in the female line. Each clan has at least three totems—a bird, a fish, a snake, and often a fourth, a plant. Each

clan in a given locality consists of a number of hamlets, each consisting of, say, from three to five houses, inhabited by a single family group. A number of such hamlets, scattered over a considerable area and inhabited by members of different clans, constitute a village.

One of the most interesting features of Tube Tube was a collection of waga, the large sea-going built-up outrigger canoes in which the men of Tube Tube made their voyages. The most careful inquiry failed to do more than elicit guesses as to the meaning of the carving with which the waga are ornamented. But since the Tube Tube folk knew that some at least of the waga were built on Murua, and since this was not far from the direction in which we must sail to reach the Trobriands, which Major Daniels had determined to visit, our journey from Tube Tube resolved itself into an island cruise in the track of the waga. And I may so far anticipate the order of our cruise as to say that waga are built not only at Murua, but also in the islands of the Marshall Bennet group, and probably, though to a less extent, at Misima, as they certainly are at Kiriwina.

Here, then, the waga are built and brought in one step or in a series of stages to Tube Tube, carrying with them almost always and wherever they go the original names given to them by their makers.* Without entering in detail into the technology of their building, it will be sufficient here to point out that these craft seem to represent the highest development of Papuan shipbuilding. Their length over all is often quite 50 feet, and their sides are built up with three or four broad hewn planks to a moulded depth of 4 or 5 feet, yet without a nail being used anywhere in their construction, and no wooden pegs are employed, except in connection with the outrigger. Nevertheless, the hull is strong enough to bear, not only the strains of heavy loads and high seas, but the even more trying stresses of continual beaching and launching. It is sufficiently rigid to hold the caulking in the seams, yet with a pliancy lent by its lashed fastenings which allow it to give when a rigid nailed fabric, unless enormously stout and heavy, would be very apt to tear itself apart and break up. The canvas of the waga consists of a single oval sail made of strips of pandanus leaf sewn together, while the ropes made, at any rate when repairs are necessary at Tube Tube, of hibiscus bast, form excellent stays and running rigging. Its size made the waga unhandy to paddle without a very large crew, or else at a very slow rate, and though a few paddles of the ordinary sort were carried, as well as the large one used for steering, they were seldom called into service, except in such an emergency as the wind failing and a current drifting the canoe into some position of danger. The craft was only intended to be used under canvas and for offshore work, or, as we should say, for deep-water

* The account of the waga here printed is condensed from Major Daniels' notes, as is that of Tokunu given on pages 240 and 241.

voyages. Tube Tube seamen aimed as far as possible to make a fair wind of it when they put out to sea, and the fortunate location of their island enabled them to go and come between many places during both seasons of the year, with at the worst a wind with which they could lay their course out and back. They could, however, work the waga to windward when their work lay that way, and although this was but slow travelling, their destination would be reached with speed enough to satisfy the easy-going natives.

The voyages of these folk are intensely interesting examples of primitive trading trips. Their crew always aimed to make a harbour every evening, and arranged their itinerary with this end in view, but they were not seriously disturbed if they had to spend a night at sea, either through failure of the wind, or when, as sometimes happened, they desired to reach a port more than a single day's sailing from the nearest starting-point. Without sufficient knowledge of the stars to sail by them at night, they could, in their island-strewn sea, if the weather were clear, generally see some land to guide them, and so kept on their way. If the night were thick, they lay to where darkness overtook them and waited for daylight. The storms of the north-west monsoon were probably the severest trial to their seamanship, for furious storms come up then almost without warning. These are, however, only of a few hours' duration, and when good management or good luck did not give them a haven somewhere under their lee, they downed sail, keeping the waga head to the sea, and rode it out as best they might. And what with good ships and good handling they must have had very few disasters, for we could not hear of a shipwreck within the memory of the oldest man on the island. Their trade route to Murua, where, it will be recollected, many of the waga were built, was, as they made it, about 120 to 135 miles. They would usually go during the monsoon and come back on the trade, as those winds served their itinerary best. Presuming that wind and weather served them throughout the passage, they slept the first night on an island called Ore, a couple of miles or so from Dawson island, the next night they made Panamoti, the third night they slept at Tokunu (the Alcesters), and by the fourth night they might reach Murua. As a matter of fact, this ideal passage was seldom or never made, and it was not at all unusual for canoes to be a month or more from Tube Tube to Murua, either because the wind and weather delayed them, or because the crew simply did not care to hurry themselves or found business to do *en route*.

Exports to Murua were varied, but included pots, and imports from there included stone implements and shell money (*sapisapi*). A considerable amount of food was brought to Tube Tube from Milne bay, a voyage which took two and a half to three days. They also made frequent voyages to East cape, South cape, and to Dobu, the latter being the island from which the Tube Tube people originally came.

The details just given, taken from Major Daniels' manuscript, embody information furnished by men who evidently had actual voyages in mind when they spoke. The time occupied for any journey but the very shortest was, however, different each time the voyages were made, and it is certain that the routes were often varied to suit some special commercial object. The specimen of the voyages given will serve to convey an idea of the nature and extent of this people's wanderings in pursuit of trade, and the number of places along their route with which they were at one time or another at war throws a lurid light on the courage and diplomatic skill without which they could never have gone so far or accomplished so much. We did not visit Wari (Teste island), but it did not seem to us that any other south-eastern natives we met had just the qualities of the Tube Tube folk, who sailed the troubled commercial waters and rough seas with something of the insouciance of the English merchant venturer of Elizabeth's days; laden for trade, but armed for combat, their spears were quite as sharp as their wit, and they themselves equally ready to use either as circumstances might require.

On leaving Tube Tube, we sailed for an island called Ore, whither the folk of Panamoti, who at times were said to act as the middle men in the matter of procuring waga for Tube Tube, had recently moved. As a matter of fact, we made Gabuyene, about 2 miles from Ore, where there are two small villages of Panamoti folk. Both Ore and Gabuyene belong to the Laseinie group. From Gabuyene we sailed north-eastward in the direction of Murua, anchoring on the first night after leaving Gabuyene off the Bonvouloir reefs. These are not as figured on the chart. A portion of the system, perhaps that alluded to in 'Sailing Directions,' consists of an oval atoll, which appears to be about a mile and a half long by three-quarters of a mile broad. On the windward side of the atoll are three low densely wooded islands, oblong in shape, one of which is Panamoti. There are a few small masses of reef and detached coral rocks to the east of the most easterly of these. On the lee side, near which we anchored, the reef is 2 to 4 feet deep at high water, and consists of land studded with rounded isolated masses of coral. The lagoon appeared to be from 4 to 6 fathoms deep.

From the Bonvouloir reefs we made Sharp island *en route* to Murua, but, the weather proving thick, we put back to the Alcester islands. These, marked "position and extent uncertain" upon the charts, consist of two elongated flat-topped islands, which are densely vegetated. They rise at their highest point, at the eastern end of the larger island, to a height of some 180 feet above the water. The bigger island, called Tokunu, presents one small cove, in which nestles a village—that is to say, seven houses divided into four groups, each group belonging to and inhabited by men of one totem. In the 'Sailing Directory of the Pacific' it is stated that Tokunu "is inhabited by a roving tribe of

natives, who are reputed to be the most skilful canoe-builders in this part of the Pacific."

This information appears to have been gathered from the Report for British New Guinea for 1888, which contains a statement furnished to the Special Commissioner by Mr. W. Whitton. In this it is stated that many large canoes [waga] are built at Tokunu, and that there are no gardens on the island. The latter statement is certainly incorrect, and we have no reason to believe that waga are or were built at Tokunu. In fact, all the evidence points the other way. The present small population of Tokunu has been alluded to, while there is but scanty space on the strip of beach which constitutes the landing-place for the

TOKUNU. WAVE-CUT NOTCH IN CLIFF ABOVE PRESENT SEA-LEVEL.

building of any large canoe, and were there space it would be difficult to understand how the timber could be got into position, since the raised coral cliffs of which the island consists are elsewhere practically sheer. At the cove the cliff is roughly 100 yards from the sea, the intervening space being a sharp slope of broken, highly crystalline coral rock, filled in with black mould, and thickly forested. There is no appearance of stratification in any part of the cliffs of the island. At sea-level the cliff is slightly undercut, while there is similar evidence of wave-action in many places many feet above the present sea-level. A profile view of what was apparently a wave-cut notch many feet above present sea-level is shown above. On both the windward and

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leeward sides of both islands there is no fringing reef proper, and the islands are very steep too; but in certain places, sometimes off points, sometimes in bays, the water for 50 to 300 yards from the shore sloped gradually to 12 fathoms, with a bottom of coral sand and mushroom-shaped coral patches.

From a distance the island appears flat topped, and the cultivation ground in the centre of the western part, where the forest has been cleared from at least 300 acres, is remarkably level. The same conditions prevail in the forested parts, except that there is a slight rolling uplift along the leeward side, probably not over 4 to 5 feet high and 100 yards wide. On the windward side, very near the cliff-edge, and roughly following its present contour, is a ridge 8 to 15 feet high and 200 yards wide, of apparently tumbled coral masses. The whole top of the island is much weathered, low coral boulders everywhere making walking very difficult. The vegetation is luxuriant, consisting of great forest trees with far-spreading buttress roots, with but little undergrowth in the uncleared portions of the island. In the face of the cliff, whether on the windward or leeward side, there are numerous vertical cracks running from top to bottom, at intervals of, say, 30 to 200 yards. The cracks are narrow, certainly not more than 2 feet wide until 10 to 20 feet above water-level, where the undercutting action of the sea begins; here they widen out into caves from 3 to 10 feet wide, evidently running many feet back. The only path to the top of the island ends in 25 to 50 feet of what is practically an easy chimney climb. On the weather side of the island a long talus was noted at one spot; this was covered with pandanus and casuarina—elsewhere the latter plant was decidedly uncommon.

(To be continued.)

BRITISH EAST AFRICAN PLATEAU LAND AND ITS ECONOMIC CONDITIONS.*

By Major A. ST. HILL GIBBONS.

It will be remembered that some two years ago an offer of a considerable tract of territory was made by His Majesty's Government to the controllers of the Zionist movement. The principle involved in this offer is quite exceptional, whether viewed from an economic or an administrative standpoint. An autonomous province under a Jewish administration—but subject in certain respects to the control of the Administrator of British East Africa and the Home Government—was to be created within our East African empire. With the political aspect of the offer I have not—nor had I at any time—anything whatever to do, but all must agree that in this respect His Majesty's Government

* Read at the Royal Geographical Society, January 15, 1906. Map, p. 324.

Government roads shown thus _____
Native " " " " _____
Points astronomically determined for
latitude and longitude thus @
Heights in feet.
Between the astronomically determined
positions the map is based upon a
prismatic compass traverse.

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Scale, 1:250

KWAIAWATA ISLAND
East & West.

Scale 1:15,000 of
Without any exag
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