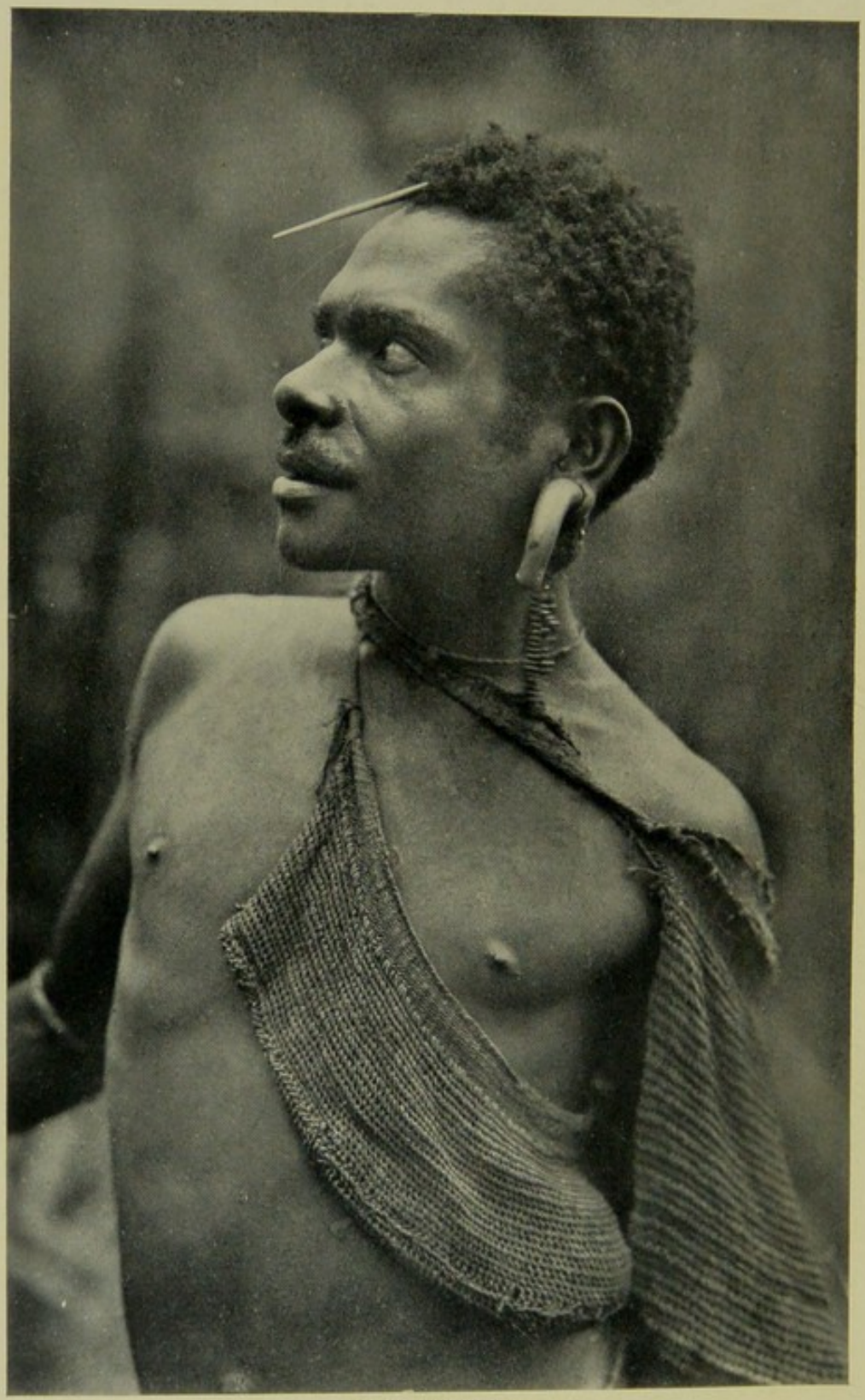
Pygmies and Papuans : the stone age today in Dutch New Guinea / / by A. F. R. Wollaston, with appendices by W.R. Ogilvie-Grant, A. C. Haddon and Sidney H. Ray.

PYGMIES & PAPUANS

A. F. R. WOLLASTON

F. D. Drewitt –

PYGMIES AND PAPUANS



A TAPIRO PYGMY. [*Frontispiece.*

PYGMIES & PAPUANS

THE STONE AGE TO-DAY IN DUTCH NEW GUINEA

BY

A. F. R. WOLLASTON

AUTHOR OF "FROM RUWENZORI TO THE CONGO"

WITH APPENDICES BY
W. R. OGILVIE-GRANT, A. C. HADDON, F.R.S.
AND SIDNEY H. RAY

WITH ILLUSTRATIONS AND MAPS

LONDON
JOHN MURRAY, ALBEMARLE STREET, W. 1.
1912

PREFACE

THE Committee who organised the late expedition to Dutch New Guinea, paid me the high compliment of inviting me to write an account of our doings in that country. The fact that it is, in a sense, the official account of the expedition has precluded me—greatly to the advantage of the reader—from offering my own views on the things that we saw and on things in general. The country that we visited was quite unknown to Europeans, and the native races with whom we came in contact were living in so primitive a state that the second title of this book is literally true. The pygmies are indeed one of the most primitive peoples now in existence.

Should any find this account lacking in thrilling adventure, I will quote the words of a famous navigator, who visited the coasts of New Guinea more than two hundred years ago:—"It has been Objected against me by some, that my Accounts and Descriptions of Things are dry and jejune, not filled with variety of pleasant Matter, to divert and gratify the Curious Reader. How far this is true, I must leave to the World to judge. But if I have been exactly and strictly careful to give only *True* Relations and Descriptions of Things (as I

am sure I have;) and if my Descriptions be such as may be of use not only to myself, but also to others in future Voyages; and likewise to such readers at home as are desirous of a Plain and Just Account of the true Nature and State of the Things described, than of a Polite and Rhetorical Narrative: I hope all the Defects in my Stile will meet with an easy and ready Pardon."

To Dr. Alfred Russel Wallace, who has allowed me to inscribe this volume to him as a small token of admiration for the first and greatest of the Naturalists who visited New Guinea, my most sincere thanks are due.

To Mr. W. R. Ogilvie-Grant, Dr. A. C. Haddon, and Mr. Sidney Ray, who have not only assisted me with advice but have contributed the three most valuable articles at the end of this volume, I can only repeat my thanks, which have been expressed elsewhere.

To my fellow-members of the expedition I would like to wish further voyages in more propitious climates.

A.F.R.W.

LONDON,
May, 1912.

CONTENTS

PAGE

PREFACE vii

INTRODUCTION xix

CHAPTER I

The British Ornithologists' Union—Members of the Expedition—Voyage to Java—Choice of Rivers—Prosperity of Java—Half-castes—Obsequious Javanese—The Rijst-tafel—Customs of the Dutch—Buitenzorg Garden—Garoet 1

CHAPTER II

Expedition leaves Java—The "Nias"—Escort—Macassar—Raja of Goa—Amboina—Corals and Fishes—Ambonese Christians—Dutch Clubs—Dobo 13

CHAPTER III

New Guinea—Its Position and Extent—Territorial Divisions—Mountain Ranges—Numerous Rivers—The Papuans—The Discovery of New Guinea—Early Voyagers—Spanish and Dutch—Jan Carstensz—First Discovery of the Snow Mountains—William Dampier in the "Roebuck"—Captain Cook in the "Endeavour"—Naturalists and later Explorers 21

CHAPTER IV

Sail from the Aru Islands—Sight New Guinea—Distant Mountains—Signal Fires—Natives in Canoes—A British Flag—Natives on Board—Their Behaviour—Arrival at Mimika River—Reception at Wakatimi—Dancing and Weeping—Landing Stores—View of the Country—Snow Mountains—Shark-fishing—Making the Camp—Death of W. Stalker 35

CHAPTER V

PAGE

Arrival of our Ambonese—Coolie Considerations—Canoes of the Natives—Making Canoes—Preliminary Exploration of the Mimika—Variable Tides—Completing the Camp—A Plague of Flies—Also of Crickets—Making "Atap"—Trading with the Natives—Trade Goods 50

CHAPTER VI

Difficulties of Food—Coolies' Rations—Choice of Provisions—Transporting Supplies up the Mimika—Description of the River—A Day's Work—Monotonous Scenery—Crowned Pigeons—Birds of Paradise and Others—Snakes, Bees, and other Creatures—Rapids and Clear Water—The Seasons—Wind—Rain—Thunderstorms—Halley's Comet 65

CHAPTER VII

Exploration of the Kapare River—Obota—Native Geography—River Obstructions—Hornbills and Tree Ducks—Gifts of Stones—Importance of Steam Launch—Cultivation of Tobacco—Sago Swamps—Manufacture of Sago—Cooking of Sago—The Dutch Use of Convict Labour 82

CHAPTER VIII

Description of Wakatimi—The Papuan House—Coconut Palms—The Sugar Palm—Drunkenness of the Natives—Drunken Vagaries—Other Cultivation—The Native Language—No Interpreters—The Numerals—Difficulties of Understanding—Names of Places—Local Differences of Pronunciation 95

CHAPTER IX

The Papuans of Wakatimi—Colour—Hair—Eyes—Nose—Tattooing—Height—Dress—Widows' Bonnets—Growth of Children—

PAGE

Preponderance of Men—Number of Wives—Childhood—Swimming and other Games—Imitativeness of Children—The Search for Food—Women as Workers—Fishing Nets—Other Methods of Fishing—An Extract from Dampier 109

CHAPTER X

Food of the Papuans—Cassowaries—The Native Dog—Question of Cannibalism—Village Headman—The Social System of the Papuans—The Family—Treatment of Women—Religion—Weather Superstitions—Ceremony to avert a Flood—The Pig—A Village Festival—Wailing at Deaths—Methods of Disposal of the Dead—No Reverence for the Remains—Purchasing Skulls . . 124

CHAPTER XI

Papuans' Love of Music—Their Concerts—A Dancing House—Carving—Papuans as Artists—Cat's Cradle—Village Squabbles—The Part of the Women—Wooden and Stone Clubs—Shell Knives and Stone Axes—Bows and Arrows—Papuan Marksmen—Spears—A most Primitive People—Disease—Prospects of their Civilisation 141

CHAPTER XII

The Camp at Parimau—A Plague of Beetles—First Discovery of the Tapiro Pygmies—Papuans as Carriers—We visit the Clearing of the Tapiro—Remarkable Clothing of Tapiro—Our Relations with the Natives—System of Payment—Their Confidence in Us—Occasional Thefts—A Customary Peace-offering—Papuans as Naturalists 155

CHAPTER XIII

Visit of Mr. Lorentz—Arrival of Steam Launch—A Sailor Drowned—Our Second Batch of Coolies—Health of the Gurkhas—Dayaks the Best Coolies—Sickness—Arrival of Motor Boat—Camp under Water—Expedition moves to Parimau—Explorations beyond the Mimika—Leeches—Floods on the Tuaba River—Overflowing Rivers—The Wataikwa—Cutting a Track 169

CHAPTER XIV

PAGE

The Camp at the Wataikwa River—Malay Coolies—"Amok"—A Double Murder—A View of the Snow Mountains—Felling Trees—Floods—Village washed Away—The Wettest Season—The Effects of Floods—Beri-beri—Arrival of C. Grant—Departure of W. Goodfellow 184

CHAPTER XV

Pygmies visit Parimau—Description of Tapiro Pygmies—Colour—Hair—Clothing—Ornaments—Netted Bags—Flint Knives—Bone Daggers—Sleeping Mats—Fire Stick—Method of making Fire—Cultivation of Tobacco—Manner of Smoking—Bows and Arrows—Village of the Pygmies—Terraced Ground—Houses on Piles—Village Headman—Our Efforts to see the Women—Language and Voices—Their Intelligence—Counting—Their Geographical Distribution 196

CHAPTER XVI

Communication with Amboina and Merauke—Sail in the "Valk" to the Utakwa River—Removal of the Dutch Expedition—View of Mount Carstensz—Dugongs—Crowded Ship—Dayaks and Live Stock—Sea-Snakes—Excitable Convicts—The Island River—Its Great Size—Another Dutch Expedition—Their Achievements—Houses in the Trees—Large Village—Barn-like Houses—Naked People—Shooting Lime—Their Skill in Paddling—Through the Marianne Straits—An Extract from Carstensz—Merauke—Trade in Copra—Botanic Station—The Mission—The Ké Island Boat-builders—The Natives of Merauke described—Arrival of our Third Batch of Coolies—The Feast of St. Nicholas—Return to Mimika 209

CHAPTER XVII

Difficulty of Cross-country Travel—Expedition moves towards the Mountains—Arrival at the Iwaka River—Changing Scenery—The Impassable Iwaka—A Plucky Gurkha—Building a Bridge

PAGE

—We start into the Mountains—Fording Rivers—Flowers—Lack of Water on Hillside—Curious Vegetation—Our highest Point—A wide View—Rare Birds—Coal—Uninhabitable Country—Dreary Jungle—Rarely any Beauty—Remarkable Trees—Occasional Compensations 229

CHAPTER XVIII

Departure from Parimau—Parting Gifts—Mock Lamentation—Rawling explores Kamura River—Start for the Wania—Lose the Propeller—A Perilous Anchorage—Unpleasant Night—Leave the Motor Boat—Village of Nimé—Arrival of "Zwaan" with Dayaks—Their Departure—Waiting for the Ship—Taking Leave of the People of Wakatimi—Sail from New Guinea—Ké Islands—Banda—Hospitality of the Netherlands Government—Lieutenant Cramer—Sumbawa—Bali—Return to Singapore and England—One or two Reflexions 246

APPENDIX A

Notes on the Birds collected by the B.O.U. Expedition to Dutch New Guinea. By W. R. Ogilvie-Grant 263

APPENDIX B

The Pygmy Question. By Dr. A. C. Haddon, F.R.S. 303

APPENDIX C

Notes on Languages in the East of Netherlands New Guinea. By Sidney H. Ray, M.A. 322

INDEX 347

LIST OF ILLUSTRATIONS

(*Except where it is otherwise stated, the illustrations are from photographs by the Author.*)

	FACING PAGE
A Tapiro Pygmy	*Frontispiece*
Near the Mouth of the Mimika River	4
A Convict Cooly of the Dutch Escort	12
A Malay Cooly from Buton	12
Dobo, Aru Islands	20
Camp of the Expedition at Wakatimi (Photo by C. G. Rawling and E. S. Marshall)	48
A House for Ceremonies, Mimika (Photo by C. G. Rawling and E. S. Marshall)	48
Making Canoes	50
Canoes, Finished and Unfinished	54
Making "Atap" for Roofing	60
Papuan Woman Canoeing up the Mimika	64
Jangbir and Herkajit, (Photo by C. G. Rawling and E. S. Marshall)	68
Hauling Canoes up the Mimika	70
Typical Papuans of Mimika	74
Upper Waters of the Kapare River	82
Vegetation on the Banks of the Kapare River	86
Papuan Woman carrying Wooden Bowl of Sago	90
Papuan Houses on the Mimika	96
Papuan of the Mimika	100
Papuan of the Mimika	100

FACING PAGE

A Papuan Mother and Child 106
Cicatrization (Photo by C. G. Rawling and E. S. Marshall) . 112
Papuan with Face Whitened with Sago Powder . . . 112
Women of Wakatimi 114
Papuan Woman and Child 120
A Papuan of Mimika 128
A Papuan of Mimika 134
Disposal of the Dead : A Coffin on Trestles 139
Splitting Wood with Stone Axe, (Photo by C. G. Rawling and E. S. Marshall) 148
A Tributary Stream of the Kapare River 159
Typical Jungle, Mimika River 178
At the Edge of the Jungle 182
Camp of the Expedition at Parimau 184
The Camp at Parimau : A Precaution against Floods . . 188
The Mimika at Parimau : Low Water 190
The same in Flood 190
A Tapiro Pygmy 196
Making Fire (1) 200
Making Fire (2) 202
Wamberi Merbiri 204
A House of the Tapiro 206
Mount Tapiro from the Village of the Pygmies . . . 208
Types of Tapiro Pygmies 212
A Papuan with Two Tapiro 216
Natives of Merauke 226
Looking up the Mimika from Parimau 232
Bridge made by the Expedition across the Iwaka River . 234
Looking West from above the Iwaka (Photo by C. H. B. Grant) 238
Cockscomb Mountain seen from Mt. Godman (Photo by C. G. Rawling and E. S. Marshall) 238
Supports of a Pandanus 242
Buttressed Trees 246
Screw Pines (Pandanus) 250

FACING PAGE

At Sumbawa Pesar 252
Near Buleling 256

COLOURED ILLUSTRATIONS

(from Drawings by G. C. Shortridge)

Carved Wooden Clubs and Stone Clubs 36
Head-Dresses, Worn at Ceremonies 78
Stone Axe, Head-Rests and Drums 142
Blades of Paddles, and Bamboo Penis-Cases 144
Bow, Arrows and Spears 150
Ornaments of Papuans 222

MAPS

A Language Map of Netherlands New Guinea 342
Map of the District Visited by the Expedition . . . *at End*

INTRODUCTION

THE wonderful fauna of New Guinea, especially the marvellous forms of Bird- and Insect-life to be found there, have long attracted the attention of naturalists in all parts of the world. The exploration of this vast island during recent years has brought to light many extraordinary and hitherto unknown forms, more particularly new Birds of Paradise and Gardener Bower-Birds; but until recently the central portion was still entirely unexplored, though no part of the globe promised to yield such an abundance of zoological treasures to those prepared to face the difficulties of penetrating to the great ranges of the interior.

The B.O.U. Expedition, of which the present work is the official record, originated in the following manner. For many years past I had been trying to organise an exploration of the Snow Mountains, but the reported hostility of the natives in the southern part of Dutch New Guinea and the risks attending such an undertaking, rendered the chances of success too small to justify the attempt.

It was in 1907 that Mr. Walter Goodfellow, well-known as an experienced traveller and an accomplished naturalist, informed me that he believed a properly

equipped expedition might meet with success, and I entered into an arrangement with him to lead a small zoological expedition to explore the Snow Mountains. It so happened, however, that by the time our arrangements had been completed in December, 1908, the members of the British Ornithologists' Union, founded in 1858, were celebrating their Jubilee, and it seemed fitting that they should mark so memorable an occasion by undertaking some great zoological exploration. I therefore laid my scheme for exploring the Snow Mountains before the meeting, and suggested that it should be known as the Jubilee Expedition of the B.O.U., a proposal which was received with enthusiasm. A Committee was formed, consisting of Mr. F. du Cane Godman, F.R.S. (President of the B.O.U.), Dr. P. L. Sclater, F.R.S. (Editor of the *Ibis*), Mr. E. G. B. Meade-Waldo, Mr. W. R. Ogilvie-Grant (Secretary), and Mr. C. E. Fagan (Treasurer). At the request of the Royal Geographical Society it was decided that their interests should also be represented, and that a surveyor and an assistant-surveyor, to be selected by the Committee, should be added, the Society undertaking to contribute funds for that purpose. The expedition thus became a much larger one than had been originally contemplated and included :—

Mr. Walter Goodfellow (Leader),

Mr. Wilfred Stalker and Mr. Guy C. Shortridge (Collectors of Mammals, Birds, Reptiles, etc.),

Mr. A. F. R. Wollaston (Medical Officer to the Expedition, Entomologist, and Botanist),

Capt. C. G. Rawling, C.I.E. (Surveyor),

Dr. Eric Marshall (Assistant-Surveyor and Surgeon).

To meet the cost of keeping such an expedition in the field for at least a year it was necessary to raise a large sum of money, and this I was eventually able to do, thanks chiefly to a liberal grant from His Majesty's Government, and to the generosity of a number of private subscribers, many of whom were members of the B.O.U. The total sum raised amounted to over £9000, and though it is impossible to give here the names of all those who contributed, I would especially mention the following :—

S. G. Asher,
E. J. Brook,
J. Stewart Clark,
Col. Stephenson Clarke,
Sir Jeremiah Colman,
H. J. Elwes,
F. du Cane Godman,
Sir Edward Grey,
J. H. Gurney,
Sir William Ingram,
Lord Iveagh,
Mrs. Charles Jenkinson,
E. J. Johnstone,
Campbell D. Mackellar,
G. A. Macmillan,
Mrs. H. A. Powell,
H. C. Robinson,
Lord Rothschild,
Hon. L. Walter Rothschild,
Hon. N. Charles Rothschild,
Baron and Baroness James A. de Rothschild,
P. L. Sclater,
P. K. Stothert,
Oldfield Thomas,
E. G. B. Meade-Waldo,
Rowland Ward,
The Proprietors of *Country Life*,
The Royal Society,
The Royal Geographical Society,
The Zoological Society of London.

The organization and equipment of this large expedition caused considerable delay and it was not until September, 1909, that the members sailed from England for the East. Meanwhile the necessary steps were taken to

obtain the consent of the Netherlands Government to allow the proposed expedition to travel in Dutch New Guinea and to carry out the scheme of exploration. Not only was this permission granted, thanks to the kindly help of Sir Edward Grey and the British Minister at the Hague, but the Government of Holland showed itself animated with such readiness to assist the expedition that it supplied not only an armed guard at its own expense, but placed a gunboat at the disposal of the Committee to convey the party from Batavia to New Guinea.

On behalf of the Committee I would again take this opportunity of publicly expressing their most grateful thanks to the Netherlands Government for these and many other substantial acts of kindness, which were shown to the members of the expedition. The Peninsular and Oriental Steam Navigation Company did all in their power to further the interests of the expedition, and to them the Committee is very specially indebted. To the proprietors of *Country Life* the thanks of the Committee are also due for the interest and sympathy they have displayed towards the expedition and for the assistance they have given in helping to raise funds to carry on the work in the field.

In various numbers of *Country Life*, issued between the 16th of April, 1910, and the 20th of May, 1911, a series of ten articles will be found in which I contributed a general account of New Guinea, and mentioned some of the more important discoveries made by the members of the expedition during their attempts to penetrate to the Snow Mountains.

In Appendix A to the present volume will be found a general account of the ornithological results. A detailed report will appear elsewhere, as also, it is hoped, a complete account of the zoological work done by the expedition.

As the reader will learn from Mr. Wollaston's book, the great physical difficulties of this unexplored part of New Guinea and other unforeseen circumstances rendered the work of the B.O.U. Expedition quite exceptionally arduous; and if the results of their exploration are not all that had been hoped, it must be remembered that they did all that was humanly possible to carry out the dangerous task with which they had been entrusted. Their work has added vastly to our knowledge of this part of New Guinea, and though little collecting was done above 4000 feet, quite a number of new, and, in many cases, remarkably interesting forms were obtained.

There can be no doubt that when the higher ranges between 5000 and 10,000 feet are explored, many other novelties will be discovered and for this reason it has been thought advisable to postpone the publication of the scientific results of the B.O.U. Expedition until such time as the second expedition under Mr. Wollaston has returned in 1913.

The death of Mr. Wilfred Stalker at a very early period of the expedition was a sad misfortune and his services could ill be spared; his place was, however, very ably filled by Mr. Claude H. B. Grant, who arrived in New Guinea some six months later.

As all those who have served on committees must

know, most of the work falls on one or two individuals, and I should like here to express the thanks which we owe to our Treasurer, Mr. C. E. Fagan, for the admirable way in which he has carried out his very difficult task.

W. R. OGILVIE-GRANT.

PYGMIES AND PAPUANS

CHAPTER I

The British Ornithologists' Union—Members of the Expedition—Voyage to Java—Choice of Rivers—Prosperity of Java—Half-castes—Obsequious Javanese—The Rijst-tafel—Customs of the Dutch—Buitenzorg Garden—Garoet.

In the autumn of 1858 a small party of naturalists, most of them members of the University of Cambridge and their friends and all of them interested in the study of ornithology, met in the rooms of the late Professor Alfred Newton at Magdalene College, Cambridge, and agreed to found a society with the principal object of producing a quarterly Journal of general ornithology. The Journal was called "The Ibis," and the Society adopted the name of British Ornithologists' Union, the number of members being originally limited to twenty.

In the autumn of 1908 the Society, which by that time counted four hundred and seventy members, adopted the suggestion, made by Mr. W. R. Ogilvie-Grant, of celebrating its jubilee by sending an expedition to explore, chiefly from an ornithological point of view, the unknown range of Snow Mountains in Dutch New Guinea. A Committee, whose Chairman was Mr. F. D. Godman, F.R.S., President and one of the surviving original members of the Society, was appointed to organise the expedition, and subscriptions were obtained from

members and their friends. The remote destination of the expedition aroused a good deal of public interest. The Royal Geographical Society expressed a desire to share in the enterprise, and it soon became evident that it would be a mistake to limit the object of the expedition to the pursuit of birds only. Mr. Walter Goodfellow, a naturalist who had several times travelled in New Guinea as well as in other parts of the world, was appointed leader of the expedition. Mr. W. Stalker and Mr. G. C. Shortridge, both of whom had had wide experience of collecting in the East, were appointed naturalists. Capt. C. G. Rawling, C.I.E., 13th Somersetshire Light Infantry, who had travelled widely in Tibet and mapped a large area of unknown territory in that region, was appointed surveyor, with Mr. E. S. Marshall, M.R.C.S., L.R.C.P., who had just returned from the "Furthest South" with Sir E. H. Shackleton, as assistant surveyor and surgeon; and the present writer, who had been medical officer, botanist, and entomologist on the Ruwenzori Expedition of 1906–7, undertook the same duties as before.

Prolonged correspondence between the Foreign Office and the Dutch Government resulted, thanks largely to the personal interest of Sir Edward Grey and Lord Acton, British Chargé d'Affaires at the Hague, in permission being granted to the expedition to land in Dutch New Guinea on or after January 1, 1910. The date of landing was postponed by the Government until January in order that there might be no interference with the expedition of Mr. H. A. Lorentz, who it was hoped would be the first to reach the snow in New Guinea by way of the Noord River, a project which he

successfully accomplished in the month of November, 1909.

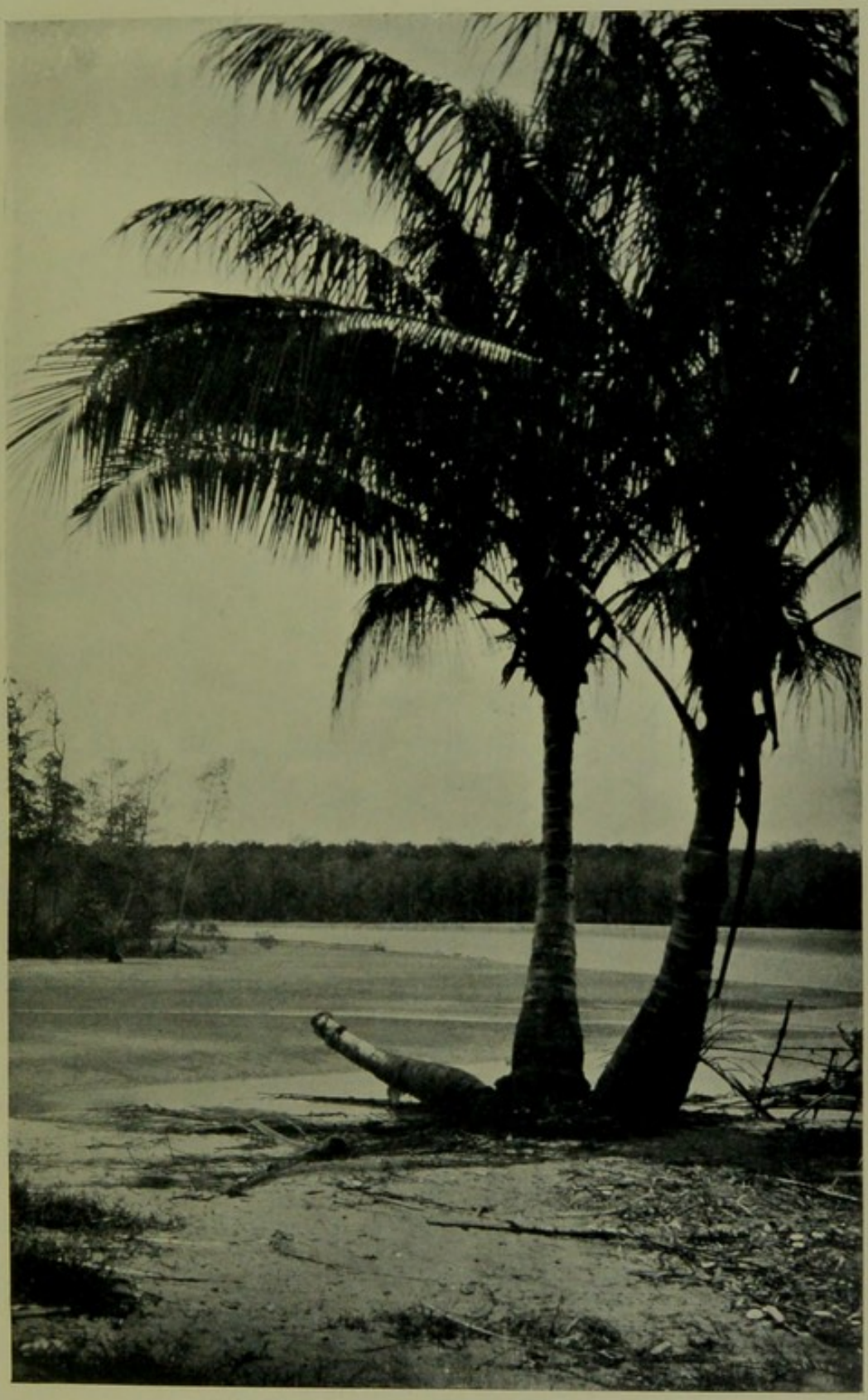
On October 29th four of us sailed from Marseilles in the P. & O. s.s. *Marmora*. Mr. Stalker and Mr. Shortridge, who had already proceeded to the East, joined us later at Batavia and Amboina respectively. At Singapore we found the ten Gurkhas, ex-military police, who had been engaged for the expedition by the recruiting officer at Darjiling; though some of these men were useless for the work they had to do, the others did invaluable service as will be seen later. We left Singapore on November 26th, and as we passed through the narrow Riou Straits we saw the remains of the French mail steamer *La Seyne*, which had been wrecked there with appalling loss of life a few days earlier. It was believed that scores of persons were devoured by sharks within a few minutes of the accident happening. Two days' steaming in the Dutch packet brought us to Batavia in Java, the city of the Government of the Netherlands East Indies.

We had hoped that our ten Gurkhas would be sufficient escort for the expedition and that we could do without the escort of native soldiers offered to us by the Dutch Government, but the local authorities decided that the escort was necessary and they appointed to command it Lieutenant H. A. Cramer of the Infantry, a probationer on the Staff of the Dutch East Indian Army. The Government also undertook to transport the whole expedition, men, stores, and equipment, from Java to New Guinea. The undertaking was a most generous one as the voyage from Batavia by mail steamer

to Dobo in the Aru Islands would have been most costly, and from there we should have been obliged to charter a special steamer to convey the expedition to the shores of New Guinea.

When we left England we had the intention of approaching the Snow Mountains by way of the Utakwa River, which was the only river shown by the maps obtainable at that time approaching the mountains. After a consultation with the Military and Geographical Departments at Batavia it was decided that, owing to the bad accounts which had been received of the Utakwa River and the comparatively favourable reports of the Mimika River, the latter should be chosen as the point of our entry into the country. This decision, though we little suspected it at the time, effectually put an end to our chance of reaching the Snow Mountains.

During the month of December, while stores were being accumulated, and the steamer was being prepared for our use, we had leisure to visit, and in the case of some of us to revisit, some of the most interesting places in Java. A large German ship filled with fourteen hundred American tourists arrived at Batavia whilst we were there, and the passengers "did" Java, apparently to their satisfaction, in forty-eight hours. But a tourist with more time could find occupation for as many days and still leave much to be seen. Germans and Americans outnumber English visitors by nearly fifty to one, and it is to be deplored that Englishmen do not go there in larger numbers, for they would see in Java, not to mention the beauty of its scenery, perhaps the most successful tropical dependency in the world, a vast monument to



NEAR THE MOUTH OF THE MIMIKA RIVER.

the genius of Sir Stamford Raffles, who laid the foundation of its prosperity less than one hundred years ago.

Some idea of the progress which has been made may be learnt from the fact that, whereas at the beginning of the last century the population numbered about four millions, there are to-day nearly ten times that number. Wherever you go you see excellent roads, clean, and well-ordered villages and a swarming peasant population, quiet and industrious and apparently contented with their lot.

There are between thirty and forty volcanoes in the island, many of them active, and the soil is extraordinarily rich and productive, three crops in the rice districts being harvested in rather less than two years. So fertile is the land that in many places the steepest slopes of the hills have been brought under cultivation by an ingenious system of terracing and irrigation in such a way that the higher valleys present the appearance of great amphitheatres rising tier above tier of brilliantly green young rice plants or of drooping yellow heads of ripening grain. The tea plantations and the fields of sugar-cane in Central Java not less than the rice-growing districts impress one with the unceasing industry of the people and the inexhaustible wealth of the island.

One of the features of life in the Dutch East Indies, which first strikes the attention of an English visitor, is the difference in the relation between Europeans and natives from those which usually obtain in British possessions as shown by the enormous number of half-castes. Whilst we were still at Batavia the feast of the

Eve of St. Nicholas, which takes the place of our Christmas, occurred. In the evening the entire "white" population indulged in a sort of carnival; the main streets and restaurants were crowded, bands played and carriages laden with parents and their children drove slowly through the throng. The spectacle, a sort of "trooping of the colours," was a most interesting one to the onlooker, for one saw often in the same family children showing every degree of colour from the fairest Dutch hair and complexion to the darkest Javanese. It is easy to understand how this strong mixture of races has come about, when one learns that Dutchmen who come out to the East Indies, whether as civilian or military officials or as business men, almost invariably stay for ten years without returning to Europe. They become in that time more firmly attached to the country than is the case in colonies where people go home at shorter intervals, and it is not uncommon to meet Dutchmen who have not returned to Holland for thirty or forty years. It is not the custom to send children back to Europe when they reach the school age; there are excellent government schools in all the larger towns, and it often happens that men and women grow up and marry who have never been to Europe in their lives. Thus it can be seen how a large half-caste population is likely to be formed. The half-castes do not, as in British India, form a separate caste, but are regarded as Europeans, and there are many instances of men having more or less of native blood in their veins reaching the highest civilian and military rank.

One or two curious relics of former times, which the

visitor to Java notices, are worth recording because they show the survival of a spirit that has almost completely disappeared from our own dominions. When a European walks, or as is more usual, drives along the country roads, the natives whom he meets remove their hats from their heads and their loads from their shoulders and crouch humbly by the roadside. Again, on the railways the ticket examiner approaches with a suppliant air and begs to see your ticket, while he holds out his right hand for it grasping his right wrist with his left hand. In former times when a man held out his right hand to give or take something from you his left hand was free to stab you with his *kris*. Nowadays only a very few privileged natives in Java are allowed to carry the *kris*.

Another very noticeable feature of life in the Dutch East Indies, which immediately attracts the attention of a stranger, is the astonishing number of excessively corpulent Europeans. If you travel in the morning in the steam tramcar which runs from the residential part of Batavia to the business quarter of the town, you will see as many noticeably stout men as you will see in the City of London in a year, or, as I was credibly informed, as you will see in the city of Amsterdam in a month. It is fairly certain that this unhealthy state of body of a large number of Europeans may be attributed to the institution of the Rijst-tafel, the midday meal of a large majority of the Dutchmen in the East.

This custom is so remarkable that it is worth while to give a description of it. The foundation of the meal, as its name implies, is rice. You sit at table with a

soup plate in front of you, a smaller flat plate beside it and a spoon, a knife and a fork. The first servant brings a large bowl of rice from which you help yourself liberally. The second brings a kind of vegetable stew which you pour over the heap of rice. Then follows a remarkable procession ; I have myself seen at an hotel in Batavia fourteen different boys bringing as many different dishes, and I have seen stalwart Teutons taking samples from every dish. These boys bring fish of various sorts and of various cookeries, bones of chickens cooked in different ways and eggs of various ages, and last of all comes a boy bearing a large tray covered with many different kinds of chutneys and sauces from which the connoisseur chooses three or four. The more solid and bony portions find a space on the small flat plate, the others are piled in the soup plate upon the rice. As an experience once or twice the Rijst-tafel is interesting ; but as a daily custom it is an abomination. Even when, as in private houses, the number of dishes is perhaps not more than three or four, the main foundation of the meal is a solid pile of rice, which is not at all a satisfactory diet for Europeans. The Rijst-tafel is not a traditional native custom but a modern innovation, and there is a tendency among the more active members of the community to replace it by a more rational meal.

The houses of the Europeans are of the bungalow type with high-pitched roofs of red tiles and surrounded by wide verandahs, which are actually the living rooms of the house. The Dutch are good gardeners and are particularly fond of trees, which they plant close about their houses and so ensure a pleasant shade, though

they harbour rather more mosquitoes and other insects than is pleasant. In strange contrast with the scrupulous cleanliness of the houses and the tidiness of the streets, you will see in Batavia a state of things which it is hard to reconcile with the usual commonsense of the Dutch. Through the middle of the town runs a canalised river of red muddy water, partly sewer and partly bathing place and so on of the natives, and in it are washed all the clothes of the population, both native and European. Your clothes return to you white enough, but you put them on with certain qualms when you remember whence they came. The town has an excellent supply of pure water, and it is astonishing that the authorities do not put an end to this most insanitary practice.

Dutch people in the East Indies have modified their habits, especially in the matter of clothing, to suit the requirements of the climate, and while they have to some extent sacrificed elegance to comfort, their costume is at all events more rational than that of many Englishmen in the East, who cling too affectionately to the fashions of Europe and often wear too much clothing. The men, who do the greater part of the day's work between seven in the morning and one o'clock, wear a plain white suit of cotton or linen. The afternoon is spent in taking a siesta and at about five o'clock they go to their clubs or other amusements in the same sort of attire as in the morning. The ladies, except in the larger towns where European dress is the custom, appear in public during the greater part of the day in a curiously simple costume. The upper part of the body is clothed in a short white cotton jacket, below which the coloured

native *sarong* extends midway down the leg. Low slippers are worn on bare feet, the hair hangs undressed down the back and the costume is usually completed by an umbrella. It must be admitted that the effect is not ornamental, but the costume is doubtless cool and comfortable, and it prevents any risk there might be of injury to the health from wearing an excessive amount of clothing. They appear more conventionally dressed about five o'clock, when the social business of the day begins. The ladies pay calls while the men meet at the club and play cards until an uncomfortably late dinner at about nine o'clock.

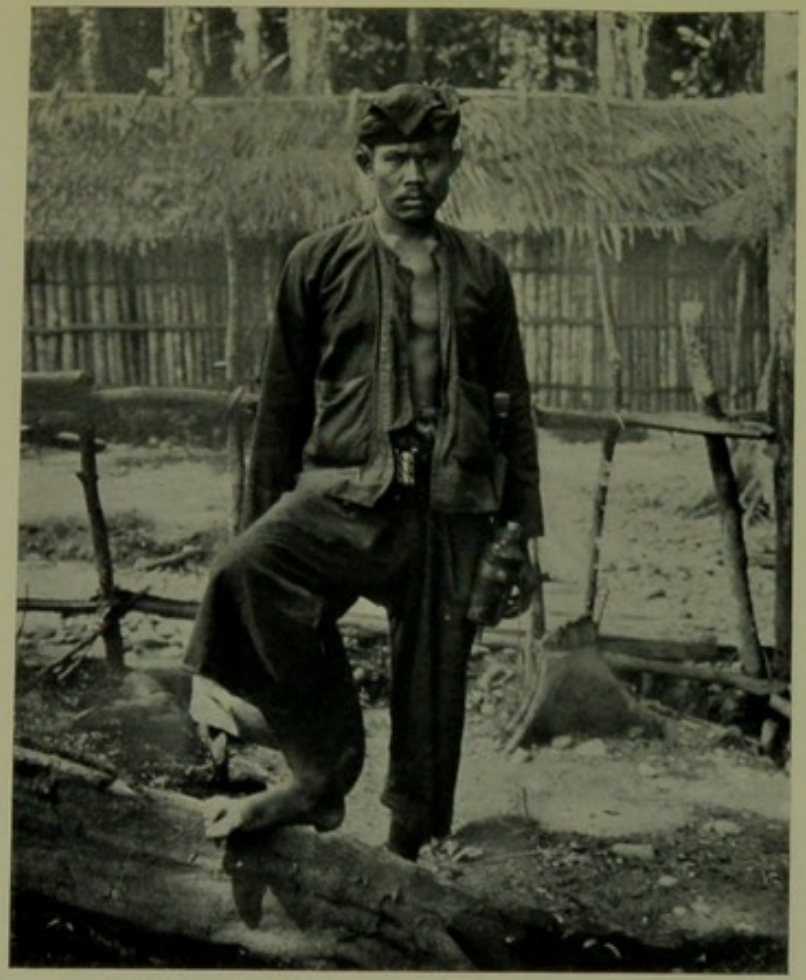
About an hour's journey by railway from Batavia is the hill station of Buitenzorg. Although it is hardly more than eight hundred feet above the sea the climate is noticeably cooler (the mean annual temperature is 75°), and one feels immediately more vigorous than down in the low country. The palace of the Governor General, formerly the house of Sir Stamford Raffles, stands at the edge of the Botanic Garden, which alone, even if you saw nothing else, would justify a visit to Java. Plants from all the Tropics grow there in the best possible conditions, and you see them to advantage as you never can in their natural forest surroundings, where the trunks of the trees are obscured by a tangle of undergrowth. Every part of the garden is worth exploring, but one of the most curious and interesting sections is the collection of Screw-pines (*Pandanus*) and Cycads, which have a weirdly antediluvian appearance. Another very beautiful sight is the ponds of Water-lilies from different parts of the world. The

native gardener in charge of them informed me that the different species have different and definite hours for the opening and closing of their flowers. I tested his statement in two instances and found the flowers almost exactly punctual. There was no cloud in the sky nor appearance of any change in the weather, and the reason for this behaviour is not easy to explain. At Sindanglaya in the mountains a few miles distant is an offshoot from the Buitenzorg garden, where plants of a more temperate climate flourish, and experiments are made on plants of economic value to the country.

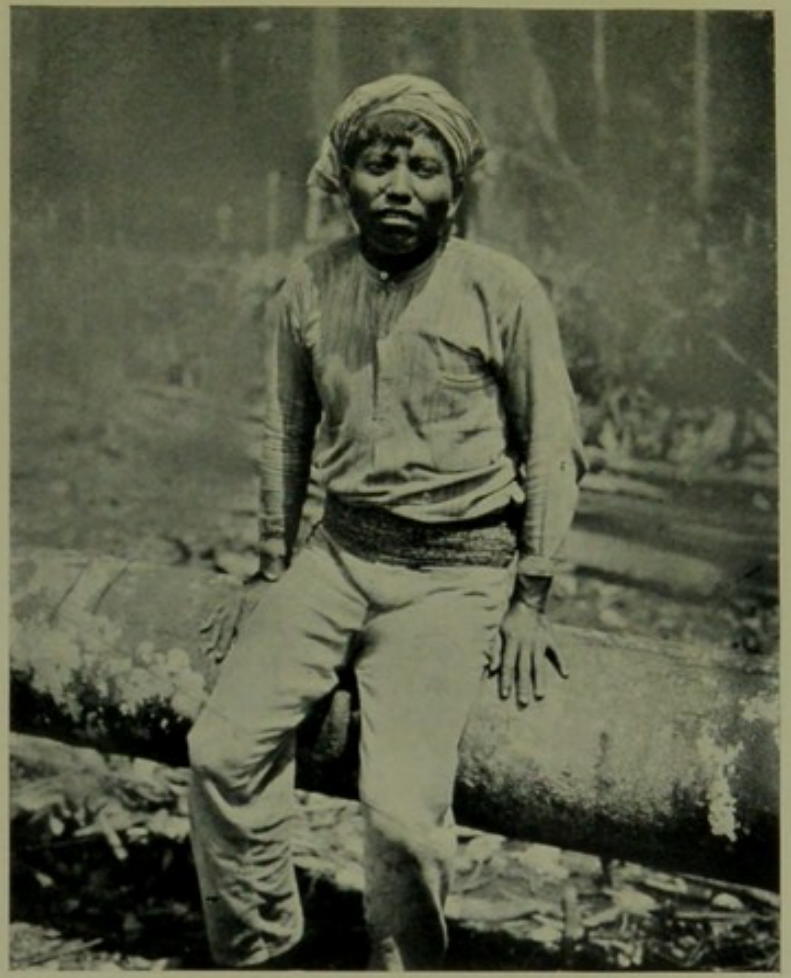
A few hours' journey east from Buitenzorg is Garoet (2,300 feet above the sea), which lies in a beautiful fertile valley surrounded by forest-covered mountains. The climate is an almost ideal one, the nights are cool and the days are not too hot. A very remarkable feature of the country about Garoet is the great flocks, or rather droves, of ducks which you meet being driven along the roads from the villages to their pastures in the rice fields. These ducks differ from the ordinary domestic duck in their extraordinary erect attitude, from which they have been well called Penguin ducks. Whether their upright posture is due to their walking or not I do not know, but they are excellent walkers and are sometimes driven long distances to their feeding grounds. When a duck is tired and lags behind, the boy who herds them picks it up by the neck, and you may sometimes see him walking along with a bunch of two or three ducks in either hand.

Others of our party visited Djokjakarta and the Buddhist Temples of Boro-Boder in Central Java and the

mountain resort of Tosari in the volcanic region of Eastern Java. Tosari is more than five thousand feet above the sea, and is of great value to the Dutch as a sanatorium for soldiers and civilians from all parts of the Archipelago. The rainfall is comparatively scanty and the climate is like that of Southern Europe at its best.



A CONVICT COOLY OF THE DUTCH ESCORT.



A MALAY COOLY FROM BUTON.

CHAPTER II

Expedition leaves Java—The "Nias"—Escort—Macassar—Raja of Goa—Amboina—Corals and Fishes—Ambonese Christians—Dutch Clubs—Dobo.

On December 21st we left Batavia, and on Christmas Day, 1909, we sailed from Soerabaja in the Government steamer *Nias*, Capt. Hondius van Herwerden. The *Nias*, a ship of about six hundred tons, formerly a gun-boat in the Netherlands Indies Marine, is now stripped of her two small guns and is used by the Government as a special service vessel. Her last commission before embarking us has been to transport Mr. Lorentz on his expedition to the Noord River in New Guinea three months earlier. Now she was full to the brim of stores and gear of all sorts and her decks were crowded with men. There were five of us and ten Gurkhas. The Dutch escort consisted of Lieutenant H. A. Cramer in command, two Dutch sergeants and one Dutch medical orderly, forty native Javanese soldiers and sixty convicts, most of them Javanese. The convicts were nearly all of them men with more or less long sentences of imprisonment and some of them were murderers in chains, which were knocked off them to their great relief the day after we left Soerabaja. One of the best of the convicts, a native of Bali, was a murderer (see illustration, page 12), who did

admirable service to the expedition, and was subsequently promoted to be *mandoer*.*

At Macassar we stopped a few hours only to add to our already excessive deck cargo, and to hear a little of the gossip of Celebes. I was interested to learn that the power of the Raja of Goa, whom I had visited a few years before, had come to an end. That monarch was an interesting survivor of the old native princes of the island. His kingdom extended to within three miles of Macassar, and he was apparently not answerable to any law or authority but his own. The place became a refuge for criminals fleeing from justice, and it was a disagreeable thorn in the side of the Dutch authorities, who were at last compelled to send a small expedition to annex the country. The Raja himself, it was said, came to a very unpleasant end in a ditch.

There had also been a small war on the east side of the island, which resulted in the pacification of the large and prosperous district of Boni. Now the Island of Celebes, which only a few years ago was dominated by savage tribes and where it was unsafe for an European to travel, has been almost completely brought within the Dutch administration, and it seems likely that its enormous mineral and agricultural wealth will soon make it one of the most prosperous islands of the Archipelago.

On December 30th we anchored in the harbour of Amboina, where we were joined by the last member of the expedition, Mr. W. Stalker, who had been for some months collecting birds in Ceram, and recently

* *i.e.* leader of a gang.

had been engaged in Amboina in recruiting coolies for the expedition. It had been expected that he would go to engage coolies in the Ké Islands, a group of islands about three hundred miles to the south-east of Amboina, where the natives are more sturdy and less sophisticated than the people of Amboina; but circumstances had prevented him from going there, and we had to put up with the very inferior Ambonese, a fact which at the outset seriously handicapped the expedition. We stayed for two days at Amboina, or, as the Dutch always call it, Ambon, buying necessary stores and making arrangements with the Dutch authorities, who agreed to send a steamer every two months, if the weather were favourable, to bring men and further supplies to us in New Guinea.

Amboina is an exceedingly pretty place, and a very favourite station of the Dutch on account of its climate, which is remarkably equable, and its freedom from strong winds or excessive rain. There is a volcano at the north end of the island which has slumbered since 1824, and the place is very subject to earthquakes. A very serious one occurred as recently as 1902, which destroyed hundreds of lives and houses, whose walls may still be seen lying flat in the gardens, but as in other volcanic places the inhabitants have conveniently short memories, and the place has been re-built ready for another visitation.

Like most of the other Dutch settlements in the East, Amboina has been laid out on a rectangular plan, but the uniformity of the arrangement is saved from being monotonous by the tree-planting habits of the

Dutch. The roads and open spaces are shaded by Kanari trees, which also produce a most delicious nut, and the gardens are hedged with flowering Hibiscus and Oleander and gaudy-leafed Crotons. Roses, as well as many other temperate plants, in addition to "hot-house" plants, flourish in the gardens, and the verandahs of the houses themselves are often decorated with orchids from Ceram and the Tenimber Islands. Birds are not common in the town itself except in captivity, and you see, especially in the gardens of the natives' houses, parrots and lories, and pigeons from the Moluccas and New Guinea, and you may even hear the call of the Greater bird of paradise. Attracted by the many flowering plants are swarms of butterflies, some of them of great beauty. One of the most gorgeous of these is the large blue *Papilio ulysses*, which floats from flower to flower like a piece of living blue sky.

The harbour of Amboina is a wide deep channel, which nearly divides the island into two, and in it are the wonderful sea-gardens, which aroused the enthusiasm of Mr. Wallace.* They are not perhaps so wonderful as the sea-gardens at Banda and elsewhere, but to those who have never seen such things before the many coloured sea-weeds and corals and shells and shoals of fantastic fishes seen through crystal water are a source of unfailing interest. The sea is crowded with fish of every size and form and colour. Nearly eight hundred species have been described from Ambonese waters, and it is worth while to visit the market in the early morning, when the night's haul is brought in, and before

* *Malay Archipelago*, Chapter XX.

the very evanescent colours of the fish have faded. Nearly every man in the place is a fisherman during some part of the day or night, and nobody need starve who has the energy to throw a baited hook into the sea. Most of the fish are caught either in nets very similar to our seine-net or in more elaborate traps which are mostly constructed by Chinamen.

The market is also worth visiting to see the variety of fruit and spices that grow in the island. Amboina has a peculiar form of banana, the *Pisang Ambon*, with white flesh, dark green skin, and a very peculiar flavour. Besides this there are many other kinds of bananas, mangoes, mangostines, guavas, sour-manilla, soursop, pineapples, kanari nut, nutmeg, cloves, and a small but very delicious fruit, the garnderia.

The native inhabitants of Amboina are a curious mixture of the aboriginal native with Portuguese, Dutch, and Malay blood. There is a strong predominance of the Portuguese type, which shows itself in the faces of many of the people, who still use words of Portuguese origin, and preserve many Portuguese names. A large number of them are Christians, and they rejoice in such names as Josef, Esau, Jacob, Petrus and Domingos.

New Year's Eve was celebrated by a confusion of fireworks and gun-firing, which lasted from sunset until the small hours of 1910, and by an afternoon service in the Church attended by many hundreds of people. The women, who are usually in Amboina dressed entirely in black, wore for the occasion long white coats, black *sarongs* and white stockings. The men went more variously clad in straw hats, dinner

jackets, low waistcoats, white or coloured starched shirts, coloured ties, black trousers, and brown boots. We were interested to find that the great bulk of the stuff from which clothes are made in Amboina is imported from England, and we were assured by a merchant who was interested in the trade that a man can dress himself in so-called European fashion as cheaply in Amboina as he can in this country.

An agreeable feature of life at Amboina, as at other places in the Netherlands Indies, is the hospitality of the Dutch people. A stranger of at all respectable social position is expected to introduce himself to the club, and the residents in the place feel genuinely hurt if he fails to do so. The Societat, or "Soce," as it is everywhere called, is more of a café than a club according to English ideas, and it exists for conviviality and gossiping rather than for newspaper reading and card playing. It is not even a restaurant in the sense that many English clubs are; the members meet there in the evening but they invariably dine, as they lunch, at home. On the verandah in front of the club is a round table, at which sit after dark large men in white clothes smoking cigars and drinking various drinks. The foreigner approaches with what courage he may and introduces himself by name to the party severally. They make a place for him in the circle and thereafter, with a courtesy which a group of Englishmen would find difficulty in imitating, they continue the conversation in the language of the foreigner. An Englishman is at first a little staggered by the number of *pait* (*i.e.* bitter, the name for gin and bitters) and

other drinks that his hosts consume, and which he is expected to consume also, but, as I remember noticing in the case of their neighbours the Belgians in the Congo, it appears to do them little if any harm.

In the larger places there is a concert at the club once or twice a week—at Bandoeng in Java I heard a remarkably good string quartette—and in almost every place there is a ladies' night at the club once a week, when the children come to dance to the music of a piano or gramophone, as the case may be. It is a pretty sight and one to make one ponder on the possible harmony of nations—" Harmonie " is commonly a name for the clubs in the Netherlands Indies—to see small Dutch children dancing with little half-castes and, as I have more than once seen, with little Celestials and Japanese.

We left Amboina on New Year's Day in a deluge of rain, and all that day we were in sight of the forest-covered heights of Ceram to the North. On January 2nd we passed Banda at dawn, and at sunset we got a view of the most South-west point of New Guinea, Cape Van de Bosch. On the morning of January 3rd we dropped anchor in the harbour of Dobo in the Aru Islands. For several miles before we arrived there we had noticed a marked difference in the appearance of the sea. Since we left Batavia we had been sailing over a deep sea of great oceanic depths, sometimes of two or three thousand fathoms, which was always clear and blue or black as deep seas are. Approaching the Aru Islands we came into the shoal waters of the Arafura Sea, which is yellowish and opaque and never exceeds one hundred fathoms in depth. We were, in fact, sailing

over that scarcely submerged land, which joins the Aru Islands and New Guinea with the Continent of Australia.

Dobo has doubtless changed a good deal in appearance since Mr. Wallace visited it in 1857, as the majority of the houses are now built of corrugated iron in place of the palm leaves of fifty years ago; but it cannot have increased greatly in size, for it is built on a small spit of coral sand beyond which are mangrove swamps where building is impossible. The reason of its existence has also changed since the time when it was the great market of all the neighbouring islands, for now it exists solely as the centre of a pearl-fishing industry controlled by an Australian Company, the Celebes Trading Company. Messrs. Clarke & Ross Smith, the heads of this business, rendered us assistance in very many ways, and the sincerest thanks of the expedition are due to them. The primary object of pearl-fishing is of course the collection of pearl-shell which is used for knife handles, buttons, and a hundred other things. Shell of a good quality is worth more than £200 a ton. The pearls, which are occasionally found, are merely accidentals and profitable extras of the trade. Some idea of the extent of this business may be learnt from the fact that more than one hundred boats employing about five thousand men are occupied in the various fleets.

We left Dobo, the last place of civilisation that many of us were to see for a year and more, on January 3rd; and here, as we are almost within sight as it were of our destination, it may be opportune to state briefly the geographical position of New Guinea, and to give a short account of its exploration.

DOBO. ARU ISLANDS.

CHAPTER III

New Guinea—Its Position and Extent—Territorial Divisions—Mountain Ranges—Numerous Rivers—The Papuans—The Discovery of New Guinea—Early Voyagers—Spanish and Dutch—Jan Carstensz—First Discovery of the Snow Mountains—William Dampier in the "Roebuck"—Captain Cook in the "Endeavour"—Naturalists and later Explorers.

THE island of New Guinea or Papua lies to the East of all the great islands of the Malay Archipelago and forms a barrier between them and the Pacific Ocean. To the South of it lies the Continent of Australia separated from it by the Arafura Sea and Torres Strait, which at its narrowest point is less than a hundred miles wide. To the East is the great group of the Solomon Islands, while on the North there are no important masses of land between New Guinea and Japan. The island lies wholly to the South of the Equator, its most Northern point, the Cape of Good Hope in the Arfak Peninsula, being 19′ S. latitude.

The extreme length of the island from E. to W. is 1490 miles, and its greatest breadth from N. to S. is rather more than 400 miles. New Guinea is the largest of the islands of the globe, having an area of 308,000 square miles (Borneo has about 290,000 square miles), and it is divided amongst three countries roughly as follows: Holland 150,000, Great Britain 90,000, and Germany 70,000 square miles. The large territory of

the Dutch was acquired by them with the kingdom of the Sultan of Ternate, who was accustomed to claim Western New Guinea as a part of his dominions: it is bounded on the East by the 141st parallel of East longitude and partly by the Fly River and thus it comprises nearly a half of the island.

The Eastern half of the island is divided into a Northern, German, and a Southern, British, part. The German territory is called Kaiser Wilhelm Land, and the islands adjacent to it, which have received German substitutes for their old names of New Britain, New Ireland, etc., are known as the Bismarck Archipelago. British New Guinea, which is now administered by the Federal Government of Australia, has been officially renamed the Territory of Papua, and with it are included the numerous islands at its Eastern extremity, the D'Entrecasteaux and Louisiade Archipelagoes.

Only in the British territory has a serious attempt been made at settling and administering the country; the headquarters of the Government are at Port Moresby, and the country is divided into six magisterial districts.

The German possessions are governed from Herbertshöhe in Neu Pommern (New Britain), which is the centre of a small amount of island trade, but the settlements on the New Guinea mainland are few and far between, and it cannot be pretended that the country is German except in name.

The Dutch territory has been even less brought under control than the German. For more than half a century there has been a mission station at Dorei in the N.W. but until 1899 when the Dutch assumed the direct

control of the country, which was till that time nominally governed by the Sultan of Tidor (Ternate), there was no sign of Dutch rule in New Guinea. Now there are Government stations with small bodies of native soldiers at Manokware, an island in Dorei Bay, and at Fak-fak on the shore of MacCluer Gulf; more recently a third post has been established at Merauke on the South coast near the boundary of British New Guinea, with the object of subjugating the fierce Tugere tribe of that region.

The most important physical feature of New Guinea is the great system of mountain ranges, which run from West to East and form the back-bone of the island. The Arfak Peninsula in the N.W. is made entirely by mountains which reach an altitude of more than 9000 feet. In the great central mass of the island the mountains begin near the S.W. coast with the Charles Louis Mountains, which vary in height from 4000 to 9000 feet. Following these to the East they are found to be continuous with the Snowy Mountains (now called the Nassau Range, the objective of this expedition) which culminate in the glacier-covered tops of Mount Idenberg (15,379 feet), and Mount Carstensz (15,964 feet), and to the East of these is the snow-capped Mount Wilhelmina (15,420 feet), and Mount Juliana (about 14,764 feet).

Leaving Dutch New Guinea and proceeding further to the East we come to the Victor Emmanuel and the Sir Arthur Gordon Ranges, which lie near the boundary of German and British New Guinea. Still further East is the Bismarck Range, often snow covered, and extending

through the long Eastern prolongation of the island are the great range of the Owen Stanley Mountains, which reach their highest point in Mount Victoria (13,150 feet), and the Stirling Range.

As might be expected in so mountainous a country there is a large number of rivers and some of them are of great size. On the North coast the Kaiserin Augusta River rises in Dutch territory and takes an almost Easterly course through German New Guinea to the sea, while the Amberno (or Mamberamo) rises probably from the slopes of the Snowy Mountains and flows Northwards to Point d'Urville. On the South coast, in British New Guinea besides the Purari, Kikor and Turama Rivers, the most important is the Fly River, which has been explored by boat for a distance of more than five hundred miles. In Southern Dutch New Guinea there are almost countless rivers: chief among them are the Digoel, which has been explored for more than four hundred miles; the Island River, by which a Dutch expedition has recently reached the central watershed of New Guinea; the Noord River by which Mr. H. Lorentz approached Mount Wilhelmina; the Utakwa and the Utanata.

The natives of New Guinea are Papuans and the island is indeed the centre of that race, which is found more or less mixed with other races from the island of Flores as far as Fiji. Though the Papuans in New Guinea itself have been in many places altered by immigrant races, for instance by Malays in the extreme West, and by Polynesian and Melanesian influences in the South and East, there yet remain large regions,

particularly in the Western half of the country, including the district visited by this expedition, where the true Papuan stock holds its own.

The name Papua, it should be said, comes from the Malay wood *papuwah*, meaning " woolly " or " fuzzy," and was first applied to the natives on account of their mops of hair ; later the name was applied to the island itself.

Even among those Papuans who are pure-blooded—in so far as one may use that expression in describing any human race—there are very considerable varieties of appearance, but it is still possible to describe a type to which all of them conform in the more important particulars. The typical Papuan is rather tall and is usually well-built. The legs of the low country people are somewhat meagre, as is usually the case among people who spend much of their time in canoes, whilst those of the hill tribes are well developed. The hands and feet are large. The colour of the skin varies from a dark chocolate colour to a rusty black, but it seems to be never of the shining ebony blackness of the African negro. The lips are thick but not full, the teeth are strong but not noticeably good, and the jaws are strong but they can hardly be called prognathous. The forehead is receding, the brows are strong and prominent, and the shape of the face is somewhat oval. The hair is black and " frizzly " rather than " woolly," it is crisp and hard to the touch, and in some tribes it is grown to a considerable length and dressed in a variety of ornamental fashions. Short hard hair is also found frequently on the chest and on the limbs,

but on the face it is scanty and frequently altogether absent.

The most characteristic feature is the nose, which is long and fleshy and somewhat "Semitic" in outline, but flattened and depressed at the tip. But these characteristics of the nose would not alone suffice to distinguish the Papuans from others were it not for the fact that the *alae nasi* are attached at a remarkably high level on the face, and so an unusually large extent of the *septum* of the nose is exposed. It is owing to this curious formation of the nose that the Papuan is enabled to perform his almost universal practice of piercing the *septum nasi* and wearing there some ornament of bone or shell.

Apart from physical characteristics many observers have found mental qualities in which the Papuans differ from, and are superior to, neighbouring races; but these things are so difficult to define, and they vary so much according to local circumstances, that it is not wise to use them as conclusive evidence. It may, however, be said without fear of contradiction that no person, who has had experience of Malays and of Papuans, could believe for a moment that they are anything but two very distinct races of men. The origin of the Papuans is not definitely known, and the existence in different parts of the island of small people, who are possibly of Negrito stock, suggests that the Papuans were not the original inhabitants of New Guinea.

The history of the earliest discovery of New Guinea

is not precisely known, but it is safe to disregard the legends of navigators having found the island before the Portuguese reached the Moluccas and founded a trading centre at Ternate in 1512. The earliest authentic record is of the Portuguese Don Jorge de Meneses, who was driven out of his way on a voyage from Goa to Ternate in 1526, and took refuge in the island of Waigiu. Two years later a Spaniard Alvaro de Saavedra taking spices from the Moluccas to Mexico appears to have reached the Schouten Islands in Geelvink Bay. From there he sailed North and discovered the Carolines and the Mariana Islands, but unfavourable winds drove him back to the Moluccas. In 1529 he set out again, and sailed along a long expanse of coast, which was doubtless the North coast of New Guinea.

In 1546 Ynigo Ortiz de Retes sailed from Ternate to Mexico in his ship *San Juan*. He touched at several places on the North coast where he hoisted the Spanish flag, and called the island Nueva Guinea, because the natives appeared to him to resemble the negroes of the Guinea coast of Africa. The name, spelt Nova Guinea, appears printed for the first time on Mercator's map of 1569.

The last important Spanish Expedition was that of Luis Vaz de Torres, who sailed with two ships from Peru, and in 1606 reached the south-east corner of New Guinea. He sailed along the South coast from one to the other end of the island, of which he took possession in the name of the King of Spain. Torres' voyage through the strait which now bears his name was the first to show that New Guinea was an island,

but the account of the voyage was not published and the fact of his discovery remained unknown until after 1800.

The seventeenth century was chiefly notable for the explorations of the Dutch, whose East India Company proclaimed a monopoly of trade in the Spice Islands to the exclusion of people of other nationalities. In 1605, Willem Jansz sailed from Banda to New Guinea in the *Duyfken*. The Ké and Aru Islands were visited and the Cape York Peninsula of Australia was reached, but the importance of that discovery was not realised. On the mainland of New Guinea nine men of the ship's company were killed and eaten, and the expedition returned to Banda.

Jacques Le Maire and Willem Schouten made an important voyage in 1616 in the *Eendracht*. Sailing from Europe by way of Cape Horn they crossed the Pacific and discovered New Ireland, where they had trouble with the natives, who (it is interesting to note) gave them pigs in exchange for glass beads. The Admiralty and Vulcan Islands were seen and then, after reaching the coast of New Guinea, they discovered the mouth of the Kaiserin Augusta River and the Schouten Islands.

The next important voyage, and in this chronicle the most important of all, was that of Jan Carstensz (or Carstenszoon) who sailed from Amboina in 1623 with the ships *Pera* and *Arnhem*. After visiting Ké and Aru they reached the S.W. coast of New Guinea, where they met with trouble. "This same day " (February 11) the skipper of the yacht *Arnhem*, Dirck

"Meliszoon, without knowledge of myself or the sub-
"cargo or steersman of the said yacht, unadvisedly
"went ashore to the open beach in the pinnace, taking
"with him fifteen persons, both officers and common
"sailors, and no more than four muskets, for the purpose
"of fishing with a seine-net. There was great disorder
"in landing, the men running off in different directions,
"until at last a number of black savages came running
"forth from the wood, who first seized and tore to
"pieces an assistant named Jan Willemsz Van den
"Briel who happened to be unarmed, after which they
"slew with arrows, callaways, and with the oars which
"they had snatched from the pinnace, no less than
"nine of our men, who were unable to defend them-
"selves, at the same time wounding the remaining
"seven (among them the skipper, who was the first to
"take to his heels); these last seven men at last returned
"on board in very sorry plight with the pinnace and
"one oar, the skipper loudly lamenting his great want
"of prudence, and entreating pardon for the fault he
"had committed."

The incautious skipper died of his wounds on the following day and so he did not take a part in the most momentous discovery of the voyage. "In the morning
"of the 16th (February) we took the sun's altitude
"at sunrise, which we found to be 5° 6′; the preceding
"evening ditto 20° 30′; the difference being divided
"by two comes to 7° 42′; increasing North-easterly
"variation; the wind N. by E.; we were at about
"one and a half mile's distance from the low-lying
"land in 5 or 6 fathom, clayey bottom; at a distance

"of about 10 miles by estimation into the interior we "saw a very high mountain range in many places white "with snow, which we thought a very singular sight, "being so near the line equinoctial. Towards the "evening we held our course E. by S., along half-sub-"merged land in 5, 4, 3, and 2 fathom, at which last "point we dropped anchor; we lay there for about "five hours, during which time we found the water to "have risen 4 or 5 feet; in the first watch, the wind "being N.E., we ran into deeper water and came to "anchor in 10 fathom, where we remained for the "night."

That is the brief account of the first discovery of the Snow Mountains of New Guinea by Jan Carstensz, whose name is now perpetuated in the highest summit of the range. Very few ships have sailed along that coast in three hundred years, and there are very many days in the year when not a sign of the mountains can be seen from the shore, so it is not very astonishing to find ships' captains sailing on those seas who still disbelieve the story of the snow. On the same voyage Carstensz crossed the straits and sailed a considerable way down the Cape York Peninsula believing that the land was still New Guinea.

In 1636 Thomas Pool explored a large tract of the S.W. coast; Pool himself was killed by natives, but the expedition discovered three large rivers, the Kupera Pukwa, Inabuka (? Neweripa), and the Utakwa. Tasman sailed along the North coast of New Guinea in 1642 after his discovery of Van Diemen's Land (Tasmania); and in 1644 he was sent to find out whether there was

a passage between New Guinea and the large "South Land" (Australia). Apparently he cruised along the coast about as far as Merauke, and also touched Australia, but the strait was not discovered.

Throughout the seventeenth century the Dutch East India Company maintained their monopoly of the cloves and nutmegs of the Moluccas, and great consternation was caused when the English tried to obtain these spices direct by sending ships to the Papuan islands. The Moluccas were protected by forts and their harbours safe, therefore in order to prevent the English from obtaining the spices outside the sphere of direct Dutch influence, all trees producing spices were destroyed.

The most important of the English voyages was that of Capt. William Dampier in the *Roebuck*. He sailed by Brazil and the Cape of Good Hope to Western Australia and thence to Timor. On January 1, 1700, he sighted the mountains of New Guinea; he landed on several islands near the coast, captured Crowned pigeons and many kinds of fishes, which he described in his book. Rounding the N.W. corner of the island he sailed along the North coast and discovered that New Britain was separated from New Guinea by a strait to which he gave his own name.

After the voyages of Philip Carteret, who proved that New Ireland is an island, and of de Bougainville in 1766 the most important is that of Captain James Cook in the *Endeavour*. He sailed from Plymouth in August 1768, rounded Cape Horn, reached and charted New Zealand, reached the East coast of New Holland (Australia) in April 1770, and sailed along the coast to

Cape York, which he named. Looking Westward he decided that there was a channel leading from the Pacific to the Indian Ocean, and after sailing through it he came to the coast of New Guinea to the N.W. of Prince Frederick Henry Island, where he was attacked by natives and thence he sailed to Batavia. Thus Captain Cook by sailing through his Endeavour Strait, now called Torres Strait after the original navigator, repeated the discovery of Torres after an interval of more than a century and a half, and the general position and outline of New Guinea became known to the world.

After the voyage of Cook many important additions were made to the charts of New Guinea and its neighbouring islands, notably by the voyages of La Perouse (1788), John MacCluer (1790–1793), D'Entrecasteaux (1792–1793), Duperrey (1823–1824), D. H. Kolff (1826), and Dumont d'Urville (1827–1828).

But during all this time New Guinea was practically no man's land, and except at Dorei and about the MacCluer Gulf explorations were limited to views from the deck of a ship. Flags were hoisted now and then and the land taken possession of in the name of various sovereigns and companies, amongst others by the East India Company in 1793, but no effective occupation was ever made. The Dutch regained their title to the Western half of the island, but it was not until 1884 that a British Protectorate was proclaimed over the S.E. portion of the island, and over the remainder by Germany in the same year.

Although numerous naturalists, notably Dr. A. R.

Wallace, Von Rosenberg, and Bernstein, and missionaries had spent considerable periods of time in the country, no very serious attempt was made to penetrate into the interior until 1876, when the Italian naturalist, d'Albertis, explored the Fly River for more than five hundred miles. Since that time a very large number of expeditions have been undertaken to various parts of the island, and it will only be possible to mention a few of them here. In 1885 Captain Everill ascended the Strickland tributary of the Fly River. In the same year Dr. H. O. Forbes explored the Owen Stanley range, and in 1889 Sir William Macgregor reached the highest point of that range.

In Dutch New Guinea very little exploration was done until the beginning of the present century. Professor Wichmann made scientific investigations in the neighbourhood of Humboldt Bay in 1903. Captains Posthumus Meyes and De Rochemont in 1904 discovered East Bay and the Noord River, which was explored by Mr. H. A. Lorentz in 1907.

During the period from 1909 to 1911, whilst our party was in New Guinea, there were six other expeditions in different parts of the Dutch territory. On the N. coast a Dutch-German boundary commission was penetrating inland from Humboldt Bay, and a large party under Capt. Fransse Herderschee was exploring the Amberno River. On the West and South coasts an expedition was exploring inland from Fak-fak, another was surveying the Digoel and Island rivers, and a third made an attempt to reach the Snow Mountains by way of the Utakwa River. But the most successful of

all the expeditions was that of Mr. Lorentz, who sailed up the Noord River and in November 1909 reached the snow on Mount Wilhelmina, two hundred and eighty-six years after the mountains were first seen by Jan Carstensz.

CHAPTER IV

Sail from the Aru Islands—Sight New Guinea—Distant Mountains—Signal Fires—Natives in Canoes—A British Flag—Natives on Board—Their Behaviour—Arrival at Mimika River—Reception at Wakatimi—Dancing and Weeping—Landing Stores—View of the Country—Snow Mountains—Shark-Fishing—Making the Camp—Death of W. Stalker.

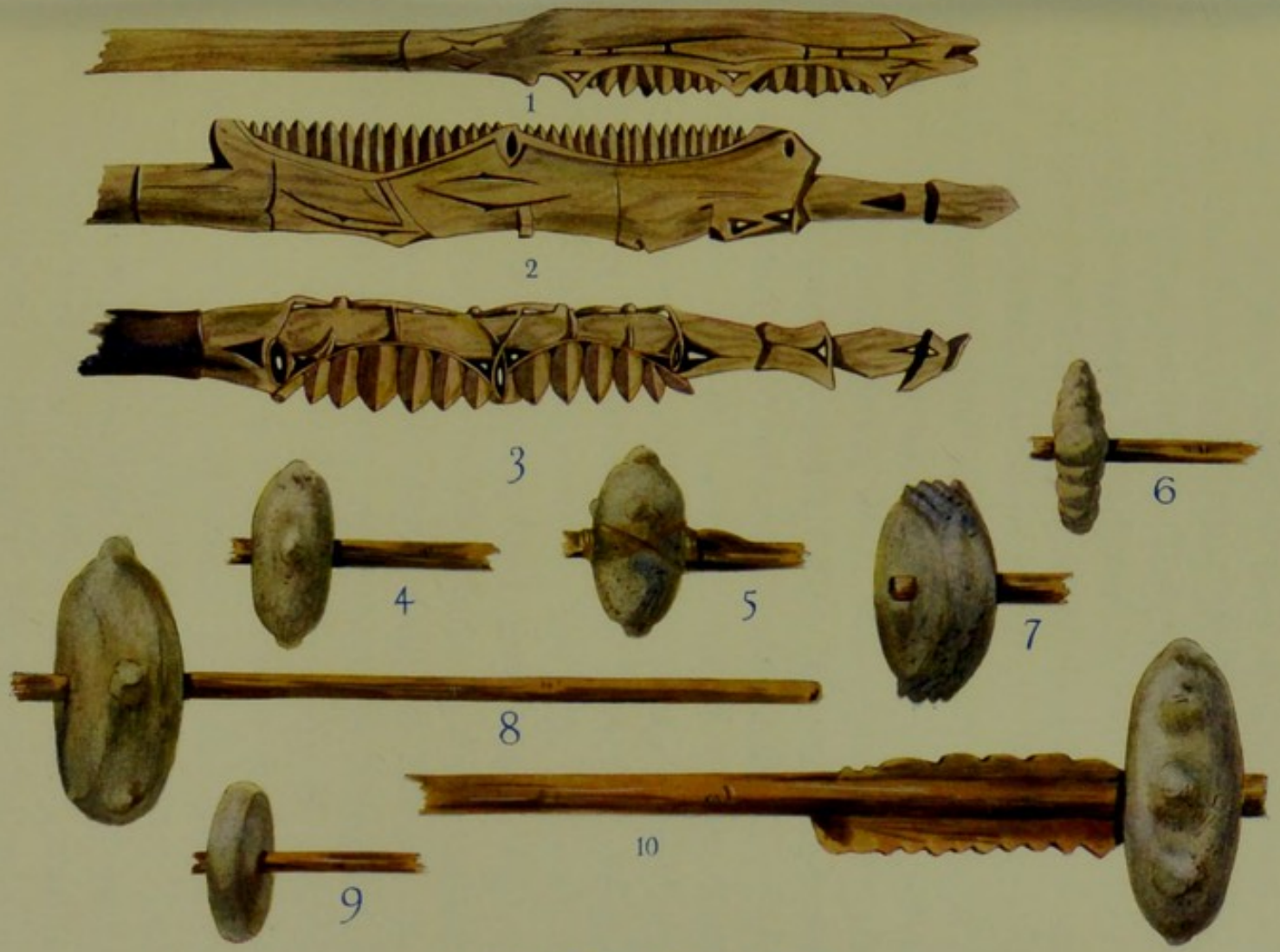
WHEN we left the northernmost end of the Aru Islands behind us the wind rose and torrents of rain descended, and the Arafura Sea, which is almost everywhere more or less shoal water, treated us to the first foul weather we had experienced since leaving England. At dawn on the 4th January we found ourselves in sight of land, and about five miles south of the New Guinea coast. A big bluff mountain (Mount Lakahia) a southern spur of the Charles Louis range determined our position, and the head of the *Nias* was immediately turned to the East. As we steamed along the coast the light grew stronger, and we saw in the far North-east pale clouds, which presently resolved themselves into ghostly-looking mountains one hundred miles away. Soon the rising sunlight touched them and we could clearly see white patches above the darker masses of rock and then we knew that these were the Snow Mountains of New Guinea, which we had come so far to see. Beyond an impression of their remoteness and their extraordinary steepness we did not learn much of the formation of the mountains from that great distance and they were

quickly hidden from our view, as we afterwards found happened daily, by the dense white mists that rose from the intervening land.

Following the coast rather more closely we soon found that our approach was causing some excitement on shore. White columns of the smoke of signal fires curled up from the low points of the land and canoes manned by black figures paddled furiously in our wake, while others, warned doubtless by the signals, put off from the land ahead of us and endeavoured to intercept us in our course.

In some of the larger canoes there were as many as twenty men, and very fine indeed they looked standing up in the long narrow craft which they urged swiftly forward with powerful rhythmic strokes of their long-shafted paddles. At the beginning of each stroke the blade of the paddle is at right angles to the boat. As it is pulled backward the propelling surface of the paddle is a little rotated outward, a useful precaution, for the stroke ends with a sudden jerk as the paddle is lifted from the water and the consequent shower of spray is directed away from the canoe.

The shore was low and featureless, and it was impossible to identify the mouths of the rivers from the very inaccurate chart. It was not safe for the *Nias* to approach the land closely on account of the shoal water, so Capt. Van Herwerden dropped anchor when he had been steaming Eastwards for about eight hours, and sent the steam launch towards an inlet, where we could see huts, to gather information. A bar of sand prevented the launch from entering the



1. 2. 3. Carved Wooden Clubs.
4-10. Stone Clubs.

inlet, so they hailed a canoe which ventured within speaking distance, and by repeating several times "Mimika," the only word of their language that we knew at that time, learnt that we had overshot our destination by a few miles. That canoe, it should be noted, was remarkable on account of two of its crew. One of them held aloft an ancient Union Jack; the other was conspicuously different from the scores of men in the canoes about us, who were all frankly in a bare undress, by wearing an old white cotton jacket fastened by a brass button which was ornamented with the head of Queen Victoria. How the flag and the coat and the button came to that outlandish place will never be known, but it is certain that they must have passed through very many hands before they came there, for certainly no Englishman had ever been there before.

When the launch returned to the ship a crowd of natives, fifty or sixty at the least, came clambering on board leaving only one or two men in each canoe to paddle after the steamer as we slowly returned towards the Mimika. Two men were recognised by Capt. Van Herwerden as having belonged to a party of natives from this coast, who had been taken some years earlier to Merauke, the Dutch settlement near the southernmost point of New Guinea. At Merauke they had got into mischief and had been put in prison from which nine of them escaped, and these two men, probably the only survivors of the party, had contrived to find their way along four hundred miles of coast, peopled by hostile tribes, back to their own country.

The behaviour of our new fellow passengers was very

remarkable and different from what one expected, though it was obvious enough at the first glance that these were people totally different from the Malayan races both in appearance and demeanour; yet there was none of that exuberance of spirits, child-like curiosity and exhibition of merriment and delight in their novel surroundings described by Wallace * and Guillemard † and which I had myself seen on the coast of German New Guinea. A few of them shook hands, or rather held hands, with us and talked loudly and volubly, while the rest stared dumbly at us and then wandered aimlessly about the ship seeking a chance to steal any loose piece of metal. They showed no fear nor did they betray any excitement nor any very keen curiosity about the marvellous things that they were seeing for the first time. They were quite unmoved by the spectacle of the windlass lifting up the anchor, and a casual glance down the skylight of the engine room was enough for most of them. They appeared to take everything for granted without question, and a stolid stare was their only recognition of the wonderful works of the white man's civilisation. In one respect it is true they were not quite so apathetic and that was in their appetite for tobacco, which they begged from everyone on board, brown and white alike. When they had obtained a supply, they sat in groups about the deck and smoked as unconcernedly as though a passage in a steamship were an affair of every-day occurrence in their lives.

* *Malay Archipelago*, Chapter XXIX.

† F. H. H. Guillemard, *The Cruise of the "Marchesa,"* Chapter XXI.

By the time that we eventually anchored off the mouth of the Mimika River it was beginning to grow dark, and Capt. Van Herwerden ordered the natives on board to leave the ship, not having noticed that the canoes had already departed towards the shore. No doubt this was a preconcerted scheme of the natives who wanted to stay on board, but by dint of much shouting two canoes were persuaded to return and take away some of our passengers. It was then quite dark and there was a white mist over the sea, and the spectacle of the procession of black figures passing down the gangway into an apparent abyss, for the canoes were invisible in the gloom, was singularly weird. There was not room for all in the canoes, so about a score of fortunate ones had to stop on board, where they slept in picturesque attitudes about the deck. Five young men chose a place where the iron cover of the steering chain made a pillow a few inches high; they lay on their sides all facing the same way, their arms folded across their chests and their bent knees fitting into the bend of the knees of the man in front, and so close together that the five of them occupied a space hardly more than five feet square.

Soon after daylight on the following day the steam launch left the ship with a party to proceed up the Mimika and find a suitable place for a base-camp. The river has a fine wide mouth about a mile across guarded by a sand bar, through which runs a narrow channel navigable at all stages of the tide except during rough weather. For some distance the river is a noble stream two or three hundred yards wide winding in fine sweeps

between low mangrove-covered banks. About three miles from the sea the river divides into an East and West branch. The East branch, the Mimika proper, brings down not more than one-quarter of the volume of water of the West branch, of which it may be said to be a tributary. It is remarkable that the party who visited the Mimika in 1902 apparently overlooked the fact that the West branch is actually the main river. Above the junction of the two branches the water of the Mimika is of a brown chocolate colour which proclaims it, though we did not know it at the time, to be a mere jungle stream rising from comparatively low ground. The water of the West branch on the contrary is pale in colour and at times of flood almost milky-white, being charged with lime-stone from the high mountains where it rises.

Proceeding for two or three miles up the Mimika, which had become above the junction a comparatively insignificant stream forty or fifty yards across and very tortuous, the exploring party in the steam launch arrived at the village of Wakatimi situated on the right bank of the river. The village was crowded with natives, numbering perhaps one thousand people, who gave the visitors a most remarkable reception. As soon as the boat appeared in sight the natives crowded down to the bank and shouted shrilly, men, women and children. When they came nearer the people threw themselves into the shallow water and many of them plastered themselves with mud, while the women performed their curious dance, if dance it can be called. It is not a concerted performance,

but rather a *pas seul* executed by each woman independently of the others, and it is a peculiarly ungraceful exhibition. The body is bent forward from the hips, the hands rest on the knees or on the hips, and then with a shuffling movement of the feet the woman swings herself from side to side or up and down, always presenting her back and the narrow strip of barkcloth, which usually hangs down like a tail behind, to the astonished gaze of the spectator. She sings all the while a monotonous whining chant and occasionally looks back over her shoulder, as if to see that the onlooker is properly appreciative of her charms. Many of the people both men and women on this and other occasions of great excitement were so overcome with emotion that they actually shed tears of rapture.* For many days after this boats were constantly coming up the river from the ship, and they were always welcomed in a similar manner by the natives.

The river was explored for a few miles further up, but the only suitable place for a camp was found to be on the left bank of the river immediately opposite to Wakatimi. Lieut. Cramer and a party of his soldiers established themselves there the same afternoon and the work of clearing the ground and landing the stores was immediately begun. The *Nias* was anchored about two miles outside the river and the

* A note in the *Geographical Journal*, Vol. xxxviii. p. 211, points out the interesting fact that this custom of shedding tears in welcome was observed by some of the early travellers in many places on the American Continent, both North and South. It has also been noticed among the Andamanese and other Negroid inhabitants of South-Eastern Asia and Australasia.

launch went very slowly when it had two or three heavily laden boats to tow against the strong current of the river, so the business of landing the expedition was a very slow one, and as there was at first but very little space for pitching tents on the camping ground some of us remained for a few days on board. During those days that were spent on the ship outside the Mimika we had opportunities in the early morning of getting a general idea of the broad features of the country.

At the top of the white sandy beach was in most places a narrow belt of *Casuarina* trees, which are accustomed to grow on sandy or stony soil. They resemble pines and their pale stems have a fresh green foliage, which is a pleasing contrast to the dense monotonous green of the majority of the trees in the country. Behind the *Casuarina* belt dense jungle, for the first few miles consisting entirely of Mangroves and beyond that of various trees, extends with hardly any rise of altitude to the foot of the mountains thirty miles away. This last observation was one of supreme importance and it affected the whole prospect and conduct of the expedition. Those of us who had been to New Guinea before had been accustomed to seeing a steep shore rising very quickly to the hills. This is the usual formation along practically the whole of the North coast of the island, also along a considerable extent of the South-east coast and again on the West coast in the neighbourhood of MacCluer Gulf. It was known of course that the South coast on both sides of the mouth of the Fly River and about Prince

Frederick Henry Island was low swampy country, but it was assumed that, considering the fact that the highest peaks of the Snow Mountains were known to be not more than seventy miles from the sea, the foot-hills would certainly extend to within a short distance of the coast.

Before we had reached the country we had had the idea that in a few days' march we should find ourselves in the hills at perhaps three or four thousand feet above the sea, but the view of the country which we saw from the *Nias* effectually put an end to any hopes of that kind. It is probable that more searching enquiries made at Batavia would have revealed the existence of this wide belt of low land, but it seldom occurs to you to question the truth of such an assumption. However that may be, a serious mistake was made and we paid for it dearly enough. The mountains appeared to rise very steeply from the low ground, and seen from a distance they appeared to be composed of parallel ridges lying one behind the other, each one successively higher than the one in front of it. It was only in certain lights, and more particularly when the clouds began to form on them, that you could distinguish deep and narrow valleys running into the mountains. The nearer ranges rose steeply enough, but were not too steep to be covered with dense forest easily discernible from a distance. The furthermost ridge on the other hand rose in huge precipices of bare rock, which showed reddish yellow in the morning sunlight with here and there downward stripes of black colour, presumably water, and in other places

streaks of pure white rock. This precipice, of which more will be said later, grew smaller towards the West until it ended at the deep valley, which divides the Snow Mountains from the range of the Charles Louis Mountains.

In the opposite direction towards the East the range rises gradually, until at a point about North-east from the Mimika three snow-capped tops are seen. I use the word "top" advisedly, for these three points are not peaks but are elevations on an otherwise fairly even mountain outline. The vertical extent of the snow is not very great, a few hundred feet at the most, the South face of the mountain being so steep that snow cannot lie on it save on the horizontal terraces of the strata, which could plainly be distinguished. Continuing the ridge East from the three snow tops (Mount Idenburg) is a long plain of almost level snow about three miles long. From the East end of the snow plain a ridge of shattered rock, looking like Dolomite towers from that great distance, forms a connection with Mount Carstensz, the highest point of the range.

Seen from afar, Mount Carstensz appears to be of a different formation from the rest of the range. Mr. Dumas of the Dutch Expedition to the Utakwa River clearly identified masses of slate on the Southern face from a distance of twenty miles, and this would quite account for its different appearance. There are two principal tops, a Western black and irregular rock with scattered patches of snow, and an Eastern top more even in its outline and entirely covered with snow. Between the two a glacier of moderate size flows down

the South face of the mountain. Still further East from Mount Carstensz could be seen yet other ridges, apparently a continuation of the Carstensz ridge. Occasionally these were covered with snow in the early morning, but no other points of permanent snow could be seen from the Mimika, and indeed there is no other until Mount Wilhelmina is reached more than one hundred miles to the East. But studying the mountains with field glasses was an occupation which could only be pursued for a short time, for the clouds formed early on the ridges and by nine o'clock at the latest all the higher mountains were hidden from view.

During the first two days that we lay off the Mimika we were visited by numbers of natives in canoes, who came some to trade and some merely to stare at the ship and the people on board. The articles that they brought for sale consisted chiefly of fish, coconuts and bananas of a very poor kind, though we afterwards came to regard these latter as a delicious luxury. They also brought a few young pigs, young cassowaries, and other birds and they received payment in beads, scraps of cloth, empty bottles and tins and pieces of metal. It is worth while to record, as showing the indolence of these people, that on the third day no natives came to visit us. Those who had before come to look at us had presumably satisfied their curiosity, while the others who had come to barter were content with the treasures they had won, although they might have added greatly to their wealth if they had had the energy to catch a few fish or pick a few more coconuts.

Another occupation, which served to pass the time,

was fishing for the sharks with which that shallow sea abounds. They are blunt-nosed animals with large dusky patches on the skin. It is very seldom that you see them at the surface of the water, and they appear to feed always at the bottom. The first that was caught was found to be full of fragments of large crabs. Nobody on board was found willing to eat the flesh, though it is probable that a few months afterwards they would have been less fastidious, so the fish was thrown overboard, and an hour or two later a second shark, a monster about twelve feet long, was hauled on board, and on being opened it was found to be full of large undigested lumps of (presumably) the first.

On January 8th those of us who had remained on the *Nias* left the ship and proceeded to Wakatimi, where we found that Lieut. Cramer and his men had already done an immense amount of work in clearing the ground for the camp. It appeared that the place chosen had been cleared of forest at some time, for there were no large trees growing on it, but it was covered with a dense jungle of shrubs and small trees a foot or so in thickness and a tangle of creepers. Already in four days a strip along the river bank about eighty yards long and thirty yards wide had been cleared of bush, and as time went on the clearing was gradually extended until there were twenty acres or more of open ground about the camp.

During the first two or three days the natives, who had assembled in large numbers at the village of Wakatimi, helped a good deal in clearing the ground and landing the stores. When the steam launch towing

the laden boats arrived at the camp they fell upon the boats in hordes and quickly carried everything up the steep mud bank, but this amusement palled upon them very soon, and they stood about doing nothing and hampered the men at their work of unpacking. Accordingly a stout wooden fence was built about the landward side of the camp and over this they were content to gaze from morning till night. They stood packed together five or six deep, and the press of those at the back trying to catch a glimpse of what was going on was so great that two or three times the fence fell bodily inwards, and with it a struggling mass of black humanity; but it was not many days before their curiosity was satisfied, and though they did not afford us very much assistance it was fortunate that they were not inclined to molest or interfere with us in any way.

We had only been in our camp at Wakatimi for one day and it already seemed as if the place was beginning to show some sign of order, when a melancholy tragedy threw a gloom over the spirits of the whole expedition. On the afternoon of January 9th Mr. Wilfred Stalker, who had had plenty of experience of tropical and Australian jungles, went out from the camp taking his collecting gun to shoot some birds. The usual daily rain began at about four o'clock, but as we were all busy with various occupations in our tents his absence was not noticed until after six o'clock, when it was already pitch dark and the rain was falling in torrents. Beyond the camp was dense jungle intersected by creeks and pools of water, difficult enough

to traverse by day but absolutely impassable in darkness, so there was nothing to be done that night but to hope anxiously that Stalker's bushcraft had prompted him to make a shelter of some kind, if disaster had not already overtaken him. At dawn Lieut. Cramer sent out parties of soldiers in all directions, and soon all of us, Europeans, Gurkhas, and native soldiers were out searching and shouting and firing shots. With some difficulty we explained to the natives what had happened, and we offered them large rewards if they were successful in finding him, and many of them joined with us; but though the ground was carefully quartered and the search was continued all that day and a part of the next not a trace of him was found anywhere, and it was evidently hopeless that he could ever be found alive. On the second day, when the search had been abandoned, the natives were convinced of his fate, and two of the more important people came over from the village and wailed loudly outside his empty tent.

On January 12th all doubts as to his end were set at rest when a canoe manned by four Papuans, smeared with mud as their custom is in such circumstances, brought back his body from a creek about half a mile from the camp, where it had been found. Up to that moment there had been present in our minds the horrid suspicion that he might perhaps have fallen the victim to foul play. We thought that natives finding him wandering alone might have been tempted by his possessions and have murdered him, but it was evidently not so and we could only hope that by drowning death had come swiftly to him.

CAMP OF THE EXPEDITION AT WAKATIMI.

A HOUSE FOR CEREMONIES, MIMIKA.

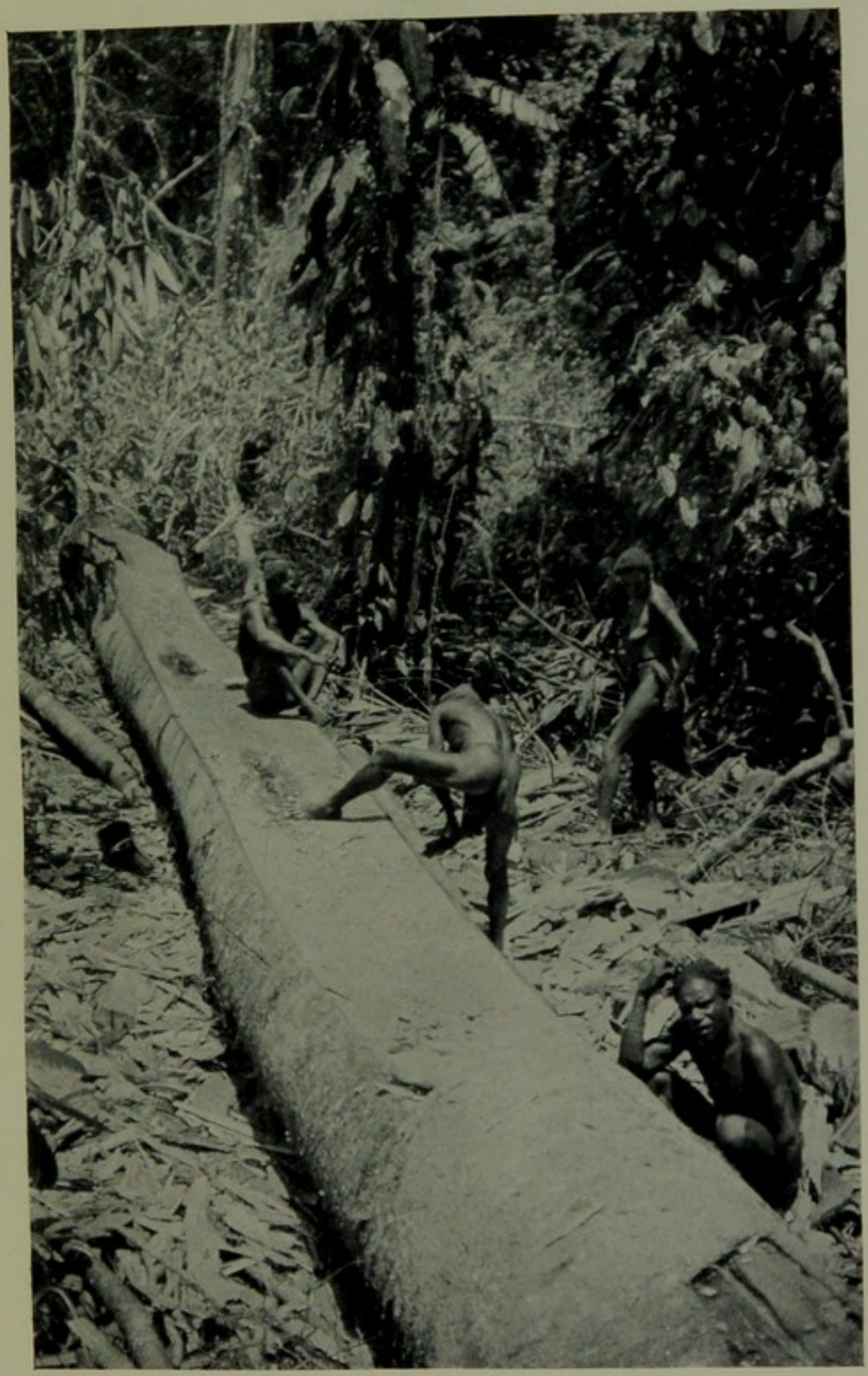
We buried him under a tree about one hundred yards behind the camp, and in the absence of the leader of the expedition, who had gone away with Rawling and Cramer to reconnoitre the river above Wakatimi, I read the short burial service. Besides Marshall and Shortridge and myself there were a Dutch soldier, two convicts and about fifty Papuans, who stood quietly in a wide circle about the grave. I think the ninetieth psalm was never read to a more remarkable congregation. The grave was the first of the graves of many who left their bones in New Guinea.

Wilfred Stalker was in his thirty-first year when he died. Previously he had spent many years as a naturalist in Australia and several months in New Guinea. Early in 1909 he returned to the East where he spent a part of his time in engaging coolies for the New Guinea Expedition, and he had time to make an interesting journey in the Island of Ceram, where he made a remarkable zoological collection. He joined us at Amboina on January 1st so that we had not time to know him well, but his unflagging energy in the preparations at the base-camp, where he landed with the first party, showed that he was a man whom the expedition could ill afford to lose.

CHAPTER V

Arrival of our Ambonese—Coolie Considerations—Canoes of the Natives—Making Canoes—Preliminary Exploration of the Mimika—Variable Tides—Completing the Camp—A Plague of Flies—Also of Crickets—Making "Atap"—Trading with the Natives—Trade Goods.

AFTER all the stores and equipment of the expedition had been landed at Wakatimi, an operation which took six days and some ten or more journeys of the steam launch towing many boats to accomplish, the *Nias* returned to Dobo, and brought back from there on the 14th January our Ambonese coolies, who had arrived there by mail steamer from Amboina. To those of us who had had experience of native carriers in other countries, the appearance of the ninety-six Ambonese came as something of a shock. When the boats crowded with them came within sight of the camp the natives cried out that our women were coming, and they might well be excused for their mistake. With their wide straw hats and coloured coats and shirts and gay *sarongs* they had not much the appearance of men, and we wondered what sort of people they would be to force a way through the trackless country. When they landed, our first impression of their unsuitableness was rather strengthened than otherwise. Every man (to give them a dignity which very few of them deserved) had a large wooden or tin box as well as a huge bundle



CANOE-MAKING: ROUGHLY SHAPING THE FELLED TREE.

of bedding and mats. Their average age appeared to be about sixteen years, and though they were said to be the best men obtainable in Amboina, the physique of most of them was wretched. It was evidently useless to keep so many feeble creatures, so it was decided to keep fifty of the more promising and send the rest back to Amboina by the *Nias*, which was waiting at the mouth of the Mimika until the following day. The whole gang was paraded and a more hopeless looking lot it would be hard to imagine. With great difficulty we picked out fifty who, though they had little appearance of strength, were not obviously crippled by disease, and the forty-six others were sent away without having done a single day's work.

The question of coolies, as we were to find by bitter experience during the ensuing months, is the point that determines the success or failure of an expedition. Mr. Stalker had left England charged with the duty of engaging coolies for this expedition. It was hoped that he would be able to get a number of men in the Ké Islands, but failing to engage them there he had seen in Amboina his only chance of recruiting a sufficient number of men. No blame can be attached to him, for he had had no experience of the kind before and his instructions were not very detailed, but it was a mistake which seriously delayed the progress of the expedition.

As well as the trouble involved in trying to make a silk purse of efficient coolies out of the sow's ear of the Amboina rabble we were confronted by another difficulty of transport. It has been mentioned above

(page 43) that before we arrived in the country it was expected that we should find rising ground close to the sea, and that in a few days' journey at the most we should reach an altitude of three thousand feet or upwards, but the discovery that there was a tract of level country hardly above sea level extending from the coast to the foot of the mountains thirty miles inland entirely upset our calculations. Had we known this before we should necessarily have brought a launch and boats to tow our stores up the many miles of navigable river, and by so doing we should have saved ourselves many weeks of valuable time and an infinity of labour. It is worth while to record this fact, not for the object of drawing attention to any deficiencies in the organisation of the expedition, but to demonstrate the uselessness of entering an unknown country without having made a preliminary reconnaissance.

An urgent message was despatched to the Navy Department in Java begging them to supply us with a steam launch at the earliest opportunity, but communications are slow in that part of the world, and it was not until ten weeks afterwards that the launch arrived at the Mimika. Its career was brief and inglorious. It made two or three journeys at snail's pace up the river before it finally broke down altogether and was sent back to Java.

In June we purchased from the pearlfishers at Dobo a petrol motor-boat, which made several successful trips up the river towing large quantities of stores, and then it was badly damaged by coming into violent contact with a sunken tree, and it was several months

before it could be repaired sufficiently to float. Thus it happened that nearly all the river transport of the expedition was laboriously carried out in canoes.

The canoes used by the natives on the Mimika and neighbouring rivers are simple "dug-outs," that is they are made from one tree trunk without any joinery at all. They vary considerably in size but the length of an average canoe is about thirty-five feet. The sides curve inward towards the gunwale so that in section the canoe forms a large segment of a circle. The breadth at the gunwale is about eighteen inches and the breadth at the widest part from eighteen to twenty-four inches. The gunwales are almost horizontal, though in some boats there is a considerable "sheer" towards the end of the canoe. They end in a square bow and at the stern they come together to a fine point. The bottom of a canoe—there is no keel—slopes finely up from the middle towards the ends so that when the canoe is afloat several feet of its length at bow and stern are out of water.

The square bow of the canoe is carved in a more or less symmetrical fashion and there is usually a narrow margin of ornamental carving at intervals along the sides. A common feature of this carving, as also of the other native ornaments, is an object which is intended to represent the human eye. Occasionally they attach to the bow of the canoe, one on either side and one in the middle, three long boards carved in a sort of fretwork manner and painted red and white. These project about four feet in front of the bow and give it somewhat the appearance of a bird's beak.

The inside of the canoe is sometimes whitened with lime or sago powder but is otherwise not ornamented. A few feet from the stern, where the bottom begins to slope upwards, a low partition of wood is left forming as it were a sort of bulkhead; the space behind this is filled with sand on which a fire is kept burning.

Before we came to the country the whole business of canoe-making from the first felling of the tree to the final hollowing out of the inside was done with stone axes and the carving was done with sharpened shells, a labour which it is difficult to realise, so it is not surprising that the natives take very great care of their boats. They never allow water to stand in them for long, and at the end of a storm of rain the first thing they do is to go to the river and bail the water out of their canoes, which they do by scooping it out with the blade of a paddle. They also take good care of the outside and frequently char them with fire to kill the worms, which otherwise quickly destroy wood in brackish water.

The tree most commonly used for making canoes is *Octomeles moluccana*, which has a smooth pale trunk devoid of branches for a long way above the ground. When they can do so they choose a tree growing close to the river bank, but this is not always possible and we found a place where a tree for a canoe had been felled fully three hundred yards from the water. The trunk is roughly shaped where it lies and is then hauled with immense toil over logs laid on a rough track to the river; thence it is towed to the village where the hollowing and shaping is done at leisure. We saw a

CANOES, FINISHED AND UNFINISHED.

large number of canoes made at Parimau, and in nearly every case the balance was perfect when they were first put into the water.

The canoes are usually propelled by paddles with long thin shafts and wide blades which are often beautifully carved, but in shallow places or rapid water the natives generally employ a long pole in the use of which they are very expert. It is easy enough to stand up and paddle or pole in large canoes, but the smaller craft are very top-heavy, and the natives perform wonderful feats of balancing in navigating them. Their education begins early for we saw in one of the villages small canoes three or four feet long, in which the children begin to learn the craft of the waterman almost before they have learned to walk.

Though the people value their canoes very highly they were anxious enough to part with them in exchange for our knives and pieces of metal, of which they had none at all, and we very soon had a small fleet of canoes. The first two were bought for a knife apiece, but the price soon rose to an axe for a canoe, and in the course of several months it had still further risen to two axes or even two axes and a knife.

Within a few days of the arrival of our coolies we had purchased half a dozen canoes and preparations were made to send an exploring party up the river. At that time we were none of us skilful canoe-men and it was considered safer to use the canoes as rafts by lashing two side by side and securing a platform of bamboos across the top. This was a most cumbrous arrangement which added enormously to the labour

of paddling, and after the first journey it was never repeated.

On the 18th January, Goodfellow, Rawling, and Shortridge with twenty-four coolies, six Gurkhas, and a small party of Javanese soldiers in the charge of a Dutch sergeant started up the river. They took with them about a dozen natives, hoping that they would work hard at paddling and would be useful in other ways, but they were a perpetual nuisance calling out for their wives and wanting to stop to eat or sleep; they finished by stealing one of the canoes and deserting the night before they would have been sent back to their homes. With them went another of our cherished illusions that we should be able to get a great deal of assistance from the natives of the country. The party proceeded up the river at an incredibly slow rate on account of the clumsy rafts, and for four days saw no signs of inhabitants. On the fifth day they found one isolated hut, and two days later after passing a few scattered huts they arrived at the village of Parimau, above which place the river appeared to be hardly navigable.

The welcome accorded to the party by the natives of Parimau was as enthusiastic as that at Wakatimi described above, the people showing their delight by smearing themselves with mud and shedding copious tears. During the following days, when a camp was being made, hundreds of natives flocked into the place to see the strange white men, who were exhibited to the new-comers with a sort of proprietary air by the natives of Parimau.

In the meantime a great deal of work was necessary to put in order the base-camp at Wakatimi, and to render it secure against an attack, should the natives ever alter their friendly attitude towards us. The bush was completely cleared for some distance and a stout fence built about the camp. Then it was found that at high tide, and especially at spring tide, a large part of the camp was flooded and this necessitated a great amount of levelling and trenching and banking, a task which appealed to the fenland instinct of Cramer. The tide made itself felt in the river for several miles above Wakatimi, where there was a rise and fall of about ten feet, but the exact tidal movements were very difficult to recognise. On some days two tides were distinctly seen, while on many others there appeared to be only one. Their movements were further complicated by the very variable amount of water brought down by the river. Sometimes the river was almost stagnant, but at other times it swept down bank-high with a strong current for days at a time, and no flow of the tide could be noticed. The river Watuka, which joins the Mimika a few miles below Wakatimi, had a much greater volume of water than the latter river, and often when the tide was rising its waters were easily recognisable by their white colour floating up past the camp and holding back the waters of the Mimika in the same way that the Blue Nile, when it is in flood, forms a pond of the White Nile.

It was unfortunate that no suitable place for the base-camp could be found above the tidal water, because it increased the difficulty of supplying the camp with

drinking water, and at times when there was not much fresh water coming down the river the ebb and flow of the tide washed the refuse backwards and forwards in front of the camp. Water was boiled and filtered every day in quantities large enough for every man in the camp to have as much as he wished, but the value of this precaution was to a large extent neutralised by the Malay habit of washing out the mouth with the water in which the man bathes.

A wooden landing stage for canoes was built out over the muddy bank, and a bathing place was cut off from the river by a wooden fence to protect bathers from crocodiles and sharks, both of which were occasionally seen, but as the natives bathed constantly without showing any fear of either animal the precaution was perhaps needless.

At that time when the ground was being cleared we began to be plagued by large blue-bottle flies, which swarmed about the camp and laid their eggs everywhere. One of their favourite laying grounds was in our bedding, which in a hot damp climate must always be hung out to air when the sun shines. You would find two folds of your blanket stuck together with horrible masses of eggs and if, as sometimes happened, you did not scrape them all away you would wake up at night and find yourself crawling with maggots. There are some people who are afraid of spiders, but the most timorous of mortals must find the homely spider preferable to the loathsome blow fly. The house where we mostly lived at Wakatimi and where we had our meals was immediately filled

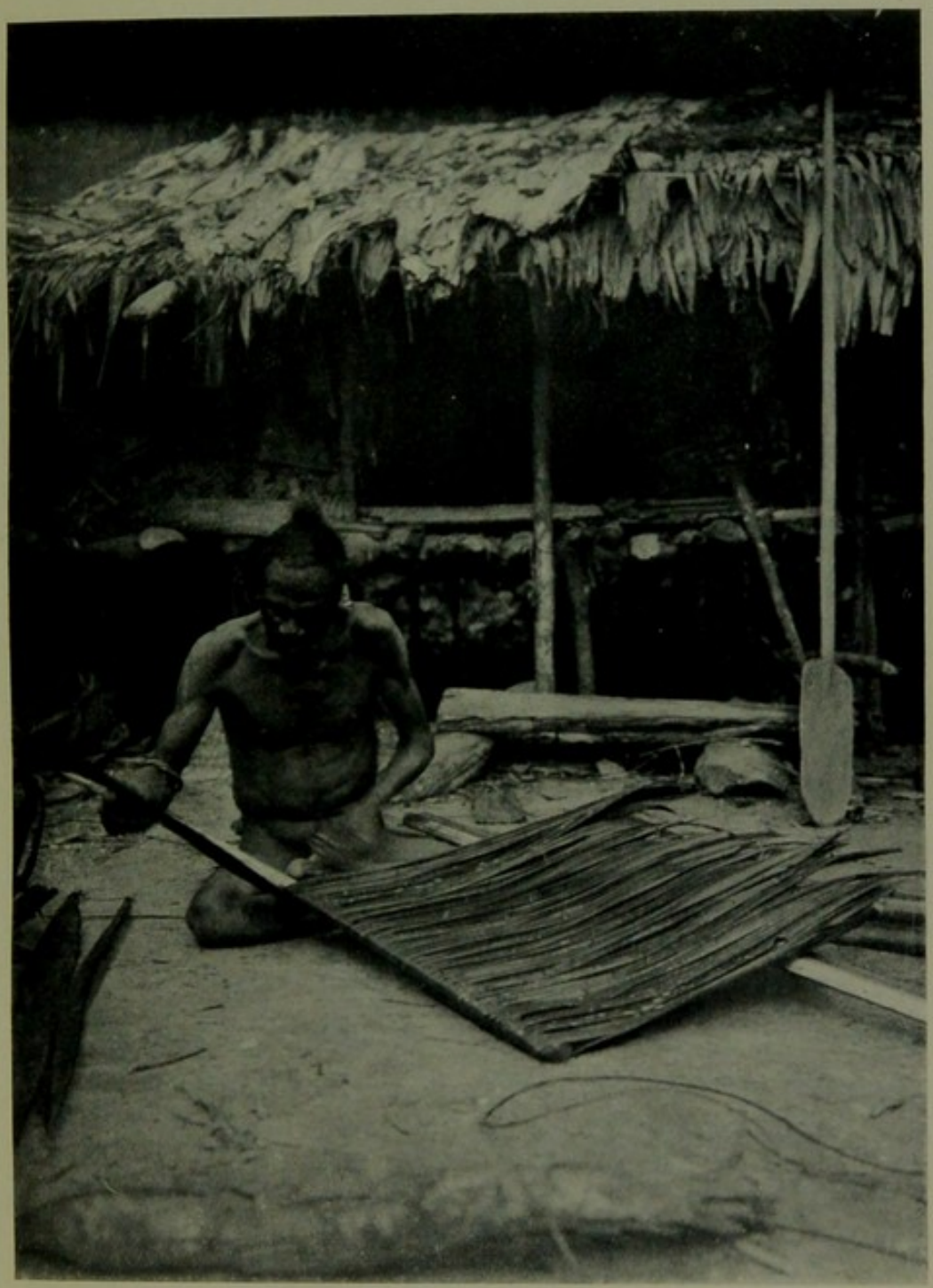
with blue-bottles the moment our food was brought in, so we encouraged the larger sort of spider to live there and one old fellow who lived under the corner of the table used to come out at meal times and take his toll of flies, and in the course of time he became so tame that he would take a living fly out of your fingers.

At the same time, and indeed during the whole of our stay in the country, we were greatly annoyed by the depredations of very large crickets. Not content with making a most distracting noise by night these horrible creatures did endless damage to our eatable possessions. They invaded the sacks in which we kept our scanty garments, socks, vests and the like, and riddled them into holes, and they appeared to have a special partiality for sponges and brushes, which they devoured completely. Even more serious were their attacks on folded tents or sacks of rice and flour, which had to be constantly taken out of the store houses and repaired. When these things were taken out of the house a large number of crickets were taken out too, and then was the chance for the Kingfishers (*Halcyon sanctus*) which darted down and snapped them up. A pair of these beautiful little birds haunted the camp and became so tame that they would fly down from the roof of a house and pick up a cricket within a foot or two of a man.

When the ground had been well cleared and levelled, we set about the business of building barracks for the men and store houses for the provisions and equipment. The Dutch contingent had brought with them regulation army barrack frames, pieces of seasoned wood of

definite lengths which are fitted together by bolts and screws, and form the skeleton of excellent houses. We had nothing of the kind, but the jungle supplied plenty of wood and our houses, though less regular than those of the Dutch, were very soon built. It is easy enough to put up the framework of a house in a place where there is plenty of timber, but the walls and the roof are a more difficult matter. Fortunately the natives were adepts in the art of making "atap," which they use for roofing their own huts, and they were soon eagerly making it for us in exchange for our trade goods.

The best "atap" is made from the leaves of the Nipa palm (*Nipa fruticans*) which grows abundantly in the swampy country. Almost equally good "atap" can be made from the Sago palm, but the leaves of the Coconut palm shrivel quickly and are of no use for the purpose. The method of the manufacture of "atap" is briefly as follows: Leaflets of the palm are stripped from the stem, which is then split into three or four sticks of about an inch and a half in diameter and five or six feet in length. The man begins by taking up a leaf and folding it in the middle, thus breaking the mid-rib of the leaf. He then frees the mid-rib from the surrounding leaf for a short distance and breaks off a piece about three inches long for use presently. Then holding the stick near the end he pushes the free end of the mid-rib, which is separated from the leaf, into the soft substance of the stick and folds the leaf once round the stick in such a way that its two free ends lie one upon the other. He then clips



MAKING "ATAP" FOR ROOFING.

together the free ends with the short piece he had broken from the mid-rib. He then repeats the process with another leaf, making each one slightly overlap the last, until the stick is completely covered with folded leaves. It should be said that each leaf is about three inches wide and four feet long so that the free ends, when the leaf is folded, lie about two feet from the stick. "Atap" is always made by the men, never by the women, and a quick worker will make a complete piece in about ten minutes.

The method of roofing with "atap" is very simple. Pieces are fixed by strands of rattan to the timbers of the roofing beginning from below and overlapping each other like tiles. The stick end of the "atap" is uppermost and the free ends point downwards. When there is no lack of "atap" and the pieces can be laid on the roof very closely together it forms a most efficient thatch, which keeps the house tolerably cool in the hot weather and is impervious to the heaviest downfall of rain.

The demand for "atap" started our regular trade with the natives, it brought us into friendly relations with them and they soon discovered that they could put confidence in us. When they found that we really paid them, as we promised, in beads and cloth, there was keen competition in the "atap" trade and they brought us as much as we wanted. For a few pieces only they received beads, while for ten pieces and upwards we paid them in cloth and they adopted various tricks to obtain cloth, when they knew that the amount they brought was only worth beads. One of their

dodges was to bring old pieces of "atap" from their own houses to increase the size of the pile, and sometimes a man would steal two or three pieces from the pile of another man who had already been paid, but they were always found out and were not in the least ashamed of themselves. It was important to keep the price low, because we very well knew that when the people had obtained as much cloth and as many beads as they wanted they would never do any more work, and that did occur after a few months. They greatly enjoyed a little foolery. For instance, when you were paying them in cloth it was much more appreciated if you wound it artistically about the recipient's head than if you merely thrust it into his hands; and in paying a man in beads it was thought a great joke if you let them slowly trickle into his palm out of your closed fist. His smile would grow with the pile of beads in his hand, and he always hoped to find some more concealed between your fingers.

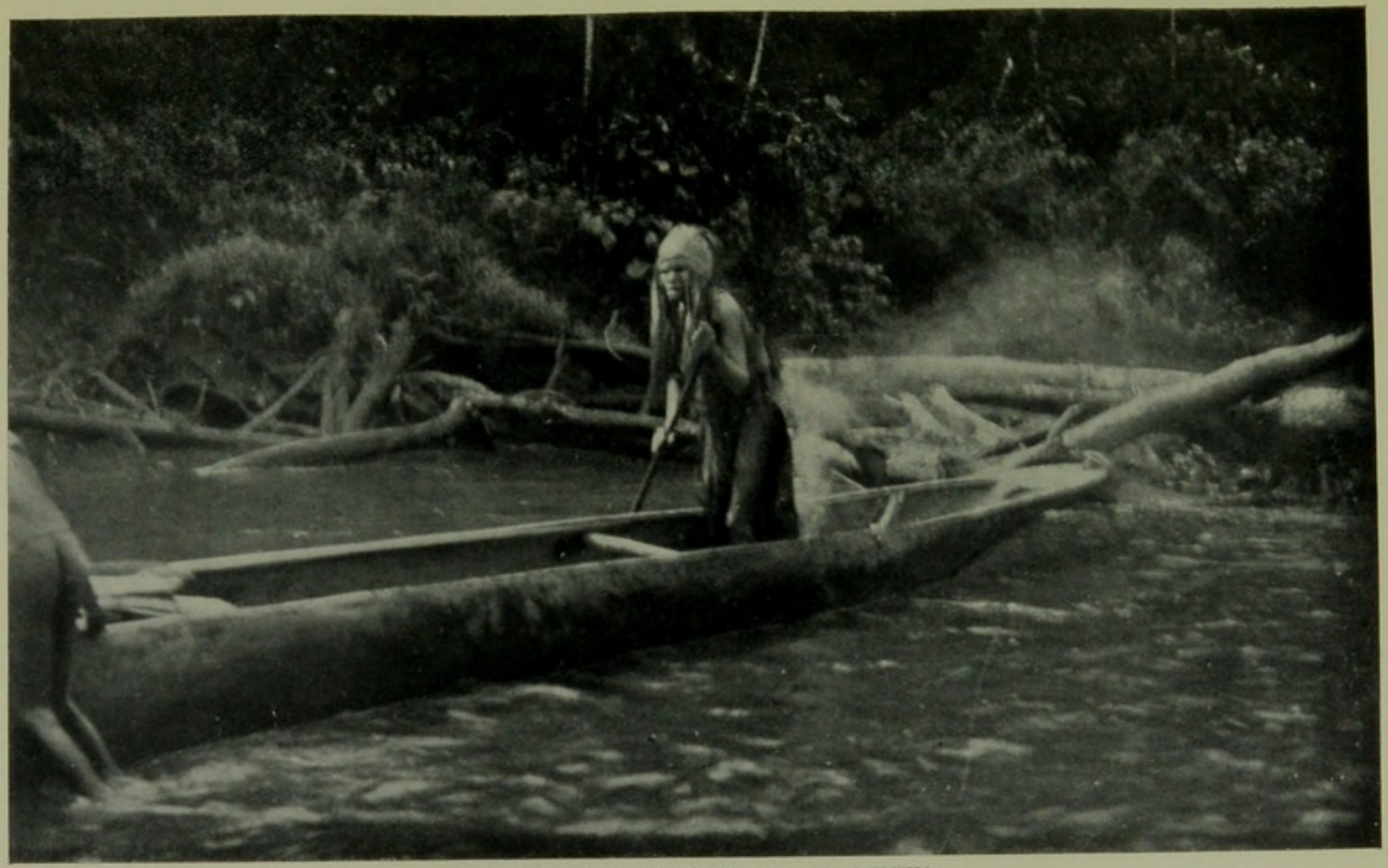
In addition to "atap" they also brought other things for trade, sometimes fish from the sea which were generally uneatable, and sometimes delicious prawns six or eight inches long from the river estuary. There was a constant trade in coconuts which grew in some numbers about Wakatimi, and occasionally we bought a bunch of bananas. Living birds of many kinds, cassowaries, pigeons, kingfishers, lories and parrots were often brought for sale, but the poor creatures were generally taken straight from the nest, and the soldiers and coolies who bought them quickly stuffed them to death with rice. Some of the lories throve and

became tame enough to fly about at liberty, and the cassowaries became quite a pest in the camp.

So keen did the people become on trading that they would barter all their worldly possessions for European goods. Stone clubs and axes, bows and arrows, spears and drums, the skulls of their forebears, indeed all their moveable goods were brought to us for exchange. It may sound rather a mean transaction to buy from a Papuan a stone axe, which has probably been in his family for generations, for a small knife or coloured handkerchief, but he was always delighted with the exchange and when both parties to it are satisfied a bargain may be considered a just one.

Our trade goods consisted mostly of coloured beads, red cloth, knives of various sizes, and axes. Of these the red cloth was by far the most useful and the most sought after. The Dutch had cloth of various shades and patterns, but the natives, with a true eye for colour, knew that our red stuff suited their dark skins better than any shade of green or blue. The axes were given in exchange for canoes, and knives were mostly used to pay the men who carried for us in the interior. Fish hooks were greatly appreciated by the natives of the coast villages, but the Jews' harps of which we had a large quantity, though they are greatly in demand among the Papuans of British New Guinea and in some of the Pacific Islands, were of no use to us for trade, and the few we gave away were used either as ornaments round the neck or as ear-rings. There was always a great demand for cast-off clothing, but a Papuan wearing a pair of tattered trousers or a fragment of

a shirt was so unpleasant to look at and he generally became so demoralised in character, that we made it a rule not to give them any of our rags. Empty bottles were of course greatly sought after and the many thousands of tins which we emptied during the course of the expedition were wealth untold to a people, who up to that time had possessed no sort of vessel.



PAPUAN WOMAN CANOEING UP THE MIMIKA.

(Smoke is seen from the fire in the stern.)

CHAPTER VI

Difficulties of Food—Coolies' Rations—Choice of Provisions—Transporting Supplies up the Mimika—Description of the River—A Day's Work—Monotonous Scenery—Crowned Pigeons—Birds of Paradise and Others—Snakes, Bees and other Creatures—Rapids and Clear Water—The Seasons—Wind—Rain—Thunderstorms—Halley's Comet.

ONE of the principal obstacles in the way of successful exploration in Dutch New Guinea is the lack of food in the country itself. It is true that in the low-lying swampy districts near the coast there are plenty of Sago-palms, but the majority of Malays are not sago eaters except under compulsion, and the preparation of sago to make it only tolerably palatable is a tedious business. Moreover the first object of an expedition to the mountains is to leave the swamps behind as soon as possible. So it follows that every scrap of food, for the coolies as well as for the Europeans, has to be brought into the country from outside, and it will be evident that, when the means of transport are distressingly slow, the provisions must diminish considerably in quantity as they are carried towards the interior.

The mainstay of the food of Malay coolies and soldiers is rice, of which the daily ration is one *katti* (1⅓ pounds); to this is added about a quarter of a pound of dried meat or dried fish. Once or twice a

week the rice was replaced by *kachang ijau*, a small round green bean, which is supposed to be of use in preventing the onset of beri-beri, though it is very doubtful whether this is the case; the beans are boiled and are eaten either with salt or with brown Javanese sugar. A full ration for a coolie also includes tea, coffee, salt and chillies. When it is remembered that the numbers of the expedition were never less than one hundred and twenty and were often more than one hundred and sixty, and since it was considered advisable always to have a supply for several months in advance in the eventuality of communication with Amboina becoming impossible, it can be imagined that the amount of stores necessary for the whole party was no small thing. The management of the stores of Cramer's party alone, of which every detail had to be accounted for to the Government, occupied the full time of a Dutch sergeant and a native clerk.

Not only was a great deal of labour involved in dealing with such an immense bulk of stores, but there was considerable difficulty in preserving them from the ill effects of the climate. Our first consignment of rice arrived in sacks, and the futility of that method of packing was apparent, when a great quantity of it was spoilt by a shower of rain between the steamer and the base-camp. The next lot was packed in tins with lids; when these were turned upside down the rice trickled out or water trickled in, and again a large quantity was lost or spoilt. After that it was put into tins of which the tops were soldered down, but even

that was not quite successful, for it often happened that a pin-hole was left unsoldered, through which moisture would eventually find its way and the rice be spoilt.

Even more difficult than the rice to keep dry were the dried fish and dried meat, which were sent to us packed in wooden boxes; the stuff quickly became sodden from the moisture-laden atmosphere, and although we kept coolies constantly employed in drying it in the sun, an enormous amount of it became rotten and was thrown away. The only effectual method of preserving the dried meat and fish is to seal it up like the rice in soldered tins. The tin always used for this purpose is the rectangular tin in which kerosene oil is imported to the East; filled with rice it weighs about forty pounds.

In writing the history of this expedition I should not be honest if I were to refrain from mentioning the fact that some of our own stores were, to say the least, ill-chosen. It appeared that a large quantity of stores had been bought from the Shackleton Expedition, which had returned from the Antarctic a few months before we left England. However suitable those provisions may have been for a Polar expedition, they were not the sort of thing one would have chosen for a journey in the Tropics. For instance, large tins of "bully-beef" are excellent in a cold climate, but when you open them near the Equator you find that they consist of pallid lumps of pink flesh swimming in a nasty gravy. Pea-soup and pea-flour, of which we had nearly four hundred pounds' weight, strike terror

into the stoutest heart, when the temperature is 86° in the shade. Pickles are all very well in their way for those that like them, but one hundred and sixty bottles was more than a generous allowance. *Punch*, in commenting on a newspaper misprint which stated that "the British Ornithologists' Union Expedition "to Papua was joined at Singapore by ten pickled "Gurkhas," suggested that it was "no doubt a mis-"print for gherkins." We were glad that Mr. Punch was mistaken and that we had not increased our store of pickles at Singapore.

The packing was almost as remarkable as the choice of the stores themselves: they were secured in strong packing cases of large and variable size fastened with bands of iron and an incredible number of nails, suitable enough to withstand the banging of Polar storms, but not well adapted to their present purpose. The boxes were all too big for convenient transport, and as each one was filled with food of one kind only every box had to be opened at once and a selection made from them.

Here it must be said that, in response to our comments on the stores and the packing, the Committee sent out to us an excellent supply of provisions from Messrs. Fortnum and Mason, properly packed in light "Vanesta" cases. These reached us at the end of August and during the rest of our stay in the country we fared well.

We took with us a small supply of whisky and brandy, which was often acceptable, and I believe that in an excessively damp climate a small quantity of alcohol

JANGBIR AND HERKAJIT, GURKHAS.

may be beneficial. The Dutch took with them dry Hollands gin, which is drunk with a small quantity of bitters before dinner; it certainly has the effect of coaxing your appetite for tinned foods, all of which, when you have lived on them for a few months, have the same dull taste.

It may be thought that the above discourse on the subject of food is unduly long, but I shall make no apology for it, because equally with the question of transport the question of food is of paramount importance. The recital of some of the mistakes that we made may serve as a warning to others, who wish to visit a similar district. In countries like Africa and many parts of Asia, where the people cultivate the soil and where there are numbers of game animals, you may always look forward to varying your fare with some fresh food, either animal or vegetable; but when you go to New Guinea you must be prepared to live wholly on dried and tinned foods, and that is only possible when they are varied and of the best manufacture.

During the first months of our stay in New Guinea most of the energies of the expedition were spent in transporting supplies from the base-camp at Wakatimi to the camp at Parimau up the Mimika River. And indeed it may be said that this was one of the principal occupations of the expedition from beginning to end; for our coolies were very soon worn out by sickness and the unaccustomed labour, so that they had to be sent back to their homes, and by the time that a fresh batch of coolies arrived in the country the store of

provisions at Parimau was exhausted and the process of taking up a fresh supply had to be begun again.

It was not until our third batch of coolies came at the end of December, that we were able to accumulate enough stores at Parimau to serve as a base for a moderately long expedition from that place. Before that time it had never been possible to make a longer march than three days from Parimau, and there had been long periods when from lack of coolies everything had been at a standstill. Those times were of course excessively trying both to the health and to the tempers of the members of the expedition. It was irksome beyond words to see day after day the mountains in the distance and to be unable to move a step nearer to them.

The distance from Wakatimi to Parimau, though only twenty-two miles as the crow flies, was about forty miles by water, and it took from five to seven days, according to the state of the river, to accomplish the journey in canoes. While the coolies were still comparatively fresh, we sometimes sent off as many as six canoes at a time from Wakatimi to Parimau, but with sickness and fatigue their numbers quickly diminished and two or three canoes laden with stores, accompanied by one "escort" canoe manned by Javanese soldiers and convicts, was the size of the usual river "transport." The larger canoes were paddled by five or six and the smaller by four men; the average load carried by one canoe was about eight hundred pounds' weight, of which a considerable amount was consumed on the journey. The men were given one

HAULING CANOES UP THE MIMIKA.

day's rest at Parimau, they came down the river in two days and rested for two days at Wakatimi before starting up the river again. One of us accompanied them on nearly every journey with a view to preventing the men from lingering too many days on the voyage and partly as a protection from the natives, who paid great respect to us but were inclined to behave rudely to the coolies, if they were not accompanied by an European.

Those days of canoeing up the Mimika River were some of the most monotonous of my life and I shall never forget them. For the first few miles above Wakatimi the river is about as wide as the Thames at Windsor, the banks are covered with smallish trees with here and there clumps of palm trees, from which fresh young coconuts may be gathered. Occasionally the rising tide helps you on your way, and if you are particularly fortunate you may even see at the end of a straight reach of the river a glimpse of the distant mountains. But very soon the river narrows to half its width, the huge trees of the regular New Guinea jungle shut out all except a narrow strip of sky, and the river twists and meanders towards all the points of the compass, until you wonder whether it will not eventually bring you back to the point whence you started. There was one bend of the river which was particularly remarkable; it made an almost complete circle of about a mile and a half in circumference, ending at a point exactly forty yards distant from its commencement, so that by landing and walking across a narrow neck you could wait for more than half an hour for the canoes to overtake you.

The rate of travel varied with the efficiency of the coolies and according to the strength of the current in the river, which was sometimes very sluggish, and at other times came swirling down at three or four miles an hour. We cleared camping places at various points along the river, and, if the pace was good, the average stage was about six hours, though it often took ten or even twelve hours when the river was in flood. The pleasantest camping places were on mud-banks, where the coolies could bathe and pitch their tents without trouble, but they were very liable to be flooded by a sudden rise of the river during the night, and we generally had our own tents pitched on a space cleared in the jungle at the top of a steep bank.

It will be convenient to describe a day's voyage up the Mimika by taking an extract from my diary :—

"May 13. The monotony of the river is beyond "words, and one day is almost exactly like another. "I get up at six o'clock and breakfast off cocoa "and biscuits and butter, whilst the camp is coming "down, *i.e.* tents, etc., being packed. Spend the "next hour or rather more in hurrying on the "coolies with their food, which they ought always "to begin to cook half an hour earlier than they "do. See everything put into the canoes and "then start with the last. After that anything "from five to twelve hours' sitting on a damp tent "with one's feet in more or less (according to the "weather) water swishing from side to side of "the canoe. Sometimes I paddle, but not so much "now as I did the first time I came up the river,

"not from laziness but because the irregular time "is so horribly irritating. If the coolies would "only paddle lazily but regularly all would be "well, but they will not; they paddle all together "furiously for perhaps twenty or thirty strokes "and then vary between a haphazard rag-time "and doing nothing at all.

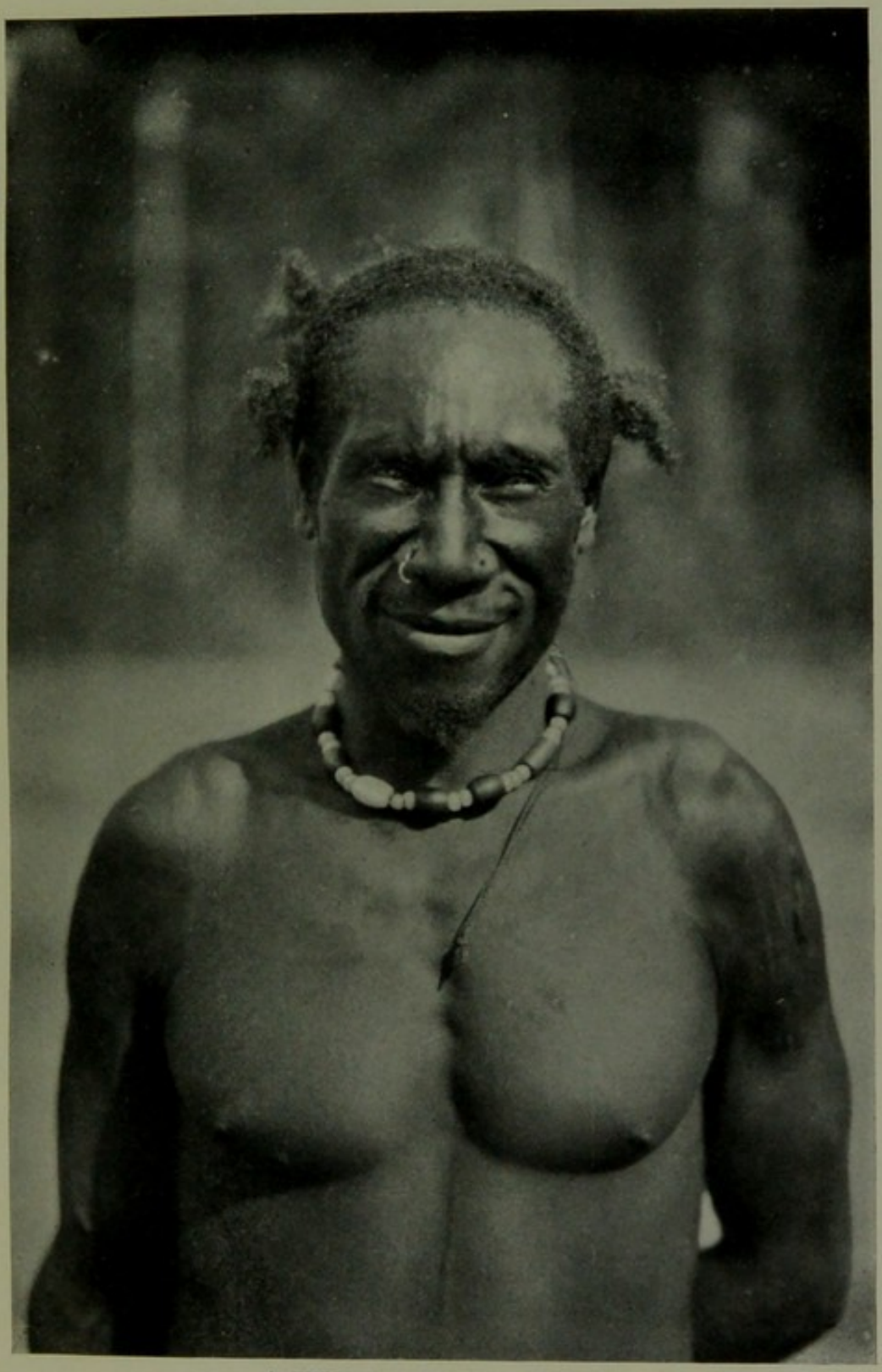
"Most of the time I watch the banks go by "and wonder how long it will take us to get to "the end of this reach, which bears a remarkable "resemblance to the last and to the next. The "jungle is as ugly as it can be, rank undergrowth, "trailing rattans and scraggy rotting trees. In "forty miles I do not think there are half a dozen "big trees worth looking at. Very occasionally "you see a flowering creeper, one with clusters of "white flowers is here and there, and I have seen "a few of the gorgeous flaming D'Albertis creeper "(*Mucuna pruriens*). Butterflies are seldom seen "and birds one hardly hears at all. The banks "are steep slimy brown mud, littered with the "trunks and limbs of rotten trees, which also "stick up all over the river like horrid muddy "bones.

"Altogether it is as gloomy and depressing as "it can be, there is no view, not even a glimpse "to shew that we are getting near a mountain "range. In the midst of all this it generally rains "hard and you arrive in camp soaking wet. Then "see everything taken out of the canoes, tents "pitched, canoes securely moored, food given out

" to the coolies, and by that time it is well on into " the afternoon. Wet wood is somehow coaxed " into boiling a kettle and I get a cup of tea, very " good. At six o'clock the meal of the day, rice " or a tin, but one eats very little on these journeys. " After dinner a book and tobacco and to bed about " nine o'clock, or earlier if the mosquitoes are " troublesome. It does not compare favourably " with being ' on safari ' in Africa, and I frequently " wish myself back on one of those interminable " roads which I have so often cursed."

But it must not be supposed that there were not occasional pleasant moments, which to some extent were compensation for the monotony of those days. Sometimes you saw a Crowned Pigeon (*Goura sclateri*) by the water's edge, and by paddling quietly you could approach within a few yards before it flew lazily across the river and alighted on a low branch. The Crowned Pigeon is one of the handsomest of New Guinea birds; it is as big as a large domestic fowl, of an uniform mauve grey colour with a large white patch on the wings, and on its head is a crest of delicate grey plumes, which it opens and shuts like a fan. These birds feed mostly on fruits, but they also eat small molluscs and crabs, which they pick up on the river bank. As they were almost the only eatable birds in the country, we killed a good many of them, but their numbers appeared to be in no way diminished when we left the country; the flesh is white and excessively dry.

The little red King Bird of Paradise (*Cicinnurus regius*) is heard calling everywhere, and from the upper



A TYPICAL PAPUAN OF MIMIKA.

waters of the river you hear the harsh cry of the Greater Bird of Paradise (*Paradisea novae guineae*), but both of these are birds of the dense forest and I do not remember ever having seen one from the river.

Green and red Eclectus Parrots (*Electus pectoralis*) and white Lemon-crested Cockatoos are fairly numerous and their harsh screams, though sufficiently unpleasing are a welcome interruption of the prevailing silence.

Lories were not often seen on the river journeys, but they were extremely common near Wakatimi, where a certain clump of trees was used by them as a regular roosting-place. For an hour or more before sunset countless hundreds of Lories (*Eos fuscata*) flew in flocks from all directions towards the roosting-trees, chattering loudly as they flew and even louder after they had perched. Often a branch would give way under the living weight and then the whole throng would rise in the air again and circle round and round before they alighted once more and the shouting and chattering continued until it was dark.

Crocodiles were very seldom seen, but Iguanas of two or three feet in length were often seen sunning themselves on a log or a stump, from which they would splash hurriedly into the water as the canoes approached. Several times at night I heard a splash as loud as the plunge of a man into water, but I could never discover what was the animal that caused it; there may yet possibly be some large unknown reptile in the river. Snakes were sometimes seen curled up in the overhanging vegetation and very commonly they were

found swimming in the water ; one day I counted eleven small harmless snakes swimming within half a mile of the same place.

On many days during the months of May and June the river swarmed with large bright yellow flies very similar to, but about twice the size of, the Green Drake of the fly-fisher. They hatched out about mid-day and took longer or shorter flights over the water, rising from it and alighting again like miniature aeroplanes. Many of them fell a prey to swallows and bee-eaters and other insect-eating birds, while the rest were quickly drowned, and I have seen long stretches of the river completely covered by the dead insects.

At some of the camps on the river and elsewhere we were a good deal bothered by small bees, the Stingless Honey-bee (*Melipona praeterita*). These annoying little creatures—they are about half the size of the common house-fly—buzzed about you in swarms and strove most persistently to settle on any exposed part of your body in pursuit of the sweat, which is never absent from you in those places. No matter how you beat about and killed them they were back again immediately and once, while writing, I kept my hands quite still on the book and in a few moments I counted forty-six on my two hands before their crawling became unbearable. They have a disagreeably sticky feeling as they crawl over you and your hands, when you have squashed a number of them, become sticky too.

At night, when the rain was not drumming ceaselessly on the roof of the tent, the silence was broken now and then by the grating call of a Brush Turkey

(*Talegallus fuscirostris*) * ; or a flock of Pale Crows (*Gymnocorax senex*), which are curiously nocturnal in their habits, would fly over the camp cawing like muffled rooks. Lizards and frogs uttered all sorts of strange cries and whistles, and the mournful unbirdlike note of the Frogmouth (*Podargus papuensis*) was heard on every side.

Sometimes, even when there was no wind stirring, you would hear at night a noise like thunder as some great tree went crashing down. Most of the trees in the jungle do not attain a very great girth, but they grow up very rapidly to reach the light and in their upper branches there is soon accumulated a dense mass of climbers and parasitic plants, which in the course of time become too heavy for the tree and cause it to collapse. The floor of the jungle is strewn with the limbs and trunks of fallen trees and the smell of rotting wood is everywhere.

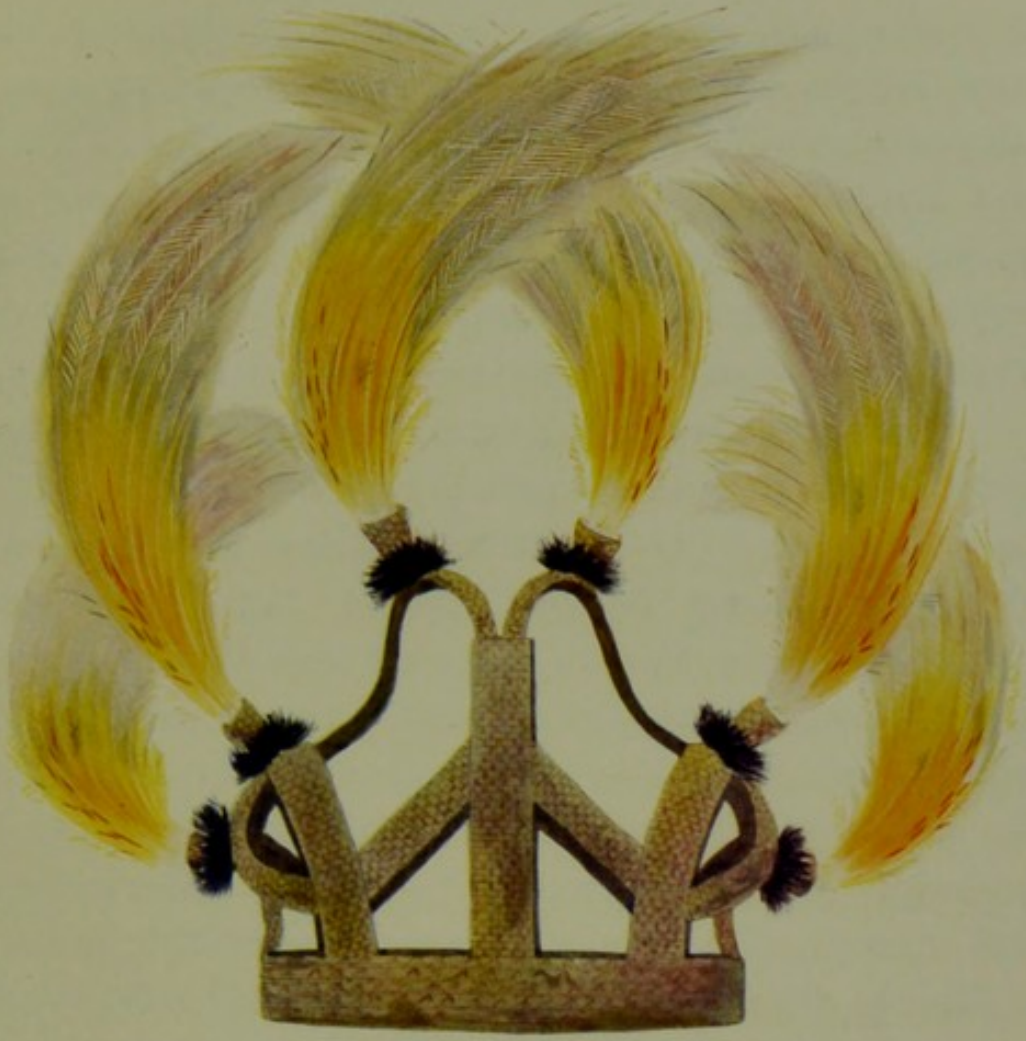
The last, usually the fifth, day of the journey up the river was always pleasant, partly because one knew that there were only a few more hours of the tedious voyage, and partly because the scenery was beginning to change. Beautiful Tree-ferns appeared upon the banks and the soil, firmer than in the swampy lands near the coast, supported trees of finer growth. Scattered pebbles and then banks of clean sand and shingle began

* Like the Megapodes the Brush Turkeys are most interesting birds, which have the habit of making large mounds of rubbish in which they place their eggs, where they are hatched by the heat of fermentation. This species is about the size of a domestic hen, and its large brown egg is very good eating.

to take the place of the hideous mud of the lower river, and after spending, as frequently happened, many weeks at Wakatimi, where the smallest pebble would have been an object of wonder, it was a peculiar pleasure to feel the grit of stones under your feet again. At the same time the cocoa-brown water became clear and sparkling and one drank it for the very pleasure of drinking. Going further we came to rapids, where the river ran over stones, or piled-up barriers of fallen trees. Passages were cut through many of these obstacles, but every succeeding flood brought down more trees and new barriers were formed.

When the river was low, the last four miles to Parimau were covered by wading and hauling the canoes over or under the great logs. Every man had to get out of the canoe and do his share of the work, and sometimes we had to take the cargo out as well, when the canoe had to be dragged over a particularly high obstacle. When the river was in flood, the last day's journey was the most arduous of all, and it sometimes took twelve or fourteen hours' hard labour to accomplish it. The water was then too deep for poling, and the current was so swift that vigorous paddling hardly did more than prevent the canoe from following the stream, and it was only by dodging from one side of the river to the other and by hauling on overhanging branches that progress was made.

Considering the want of skill of the coolies and the great number of journeys that were made up and down the river, it was wonderful that no accidents of any consequence occurred. It is true that a good



1

2

3

HEAD-DRESSES MADE OF PLAITED FIBRES, WORN AT FESTIVALS AND CEREMONIES. 1. IS ORNAMENTED WITH TUFTS OF PLUMES OF THE GREATER BIRD OF PARADISE.

many canoes capsized—I think all of us had at least one involuntary ducking—but a well-laden canoe is comparatively steady, and most of the upsets happened to empty canoes going down the river and nothing was lost but coolies' scanty baggage, which was easily replaced. The Javanese coolies of the escort, who were even less skilled watermen than ours, suffered rather more accidents, but one boat-load of provisions and two rifles were the total of their losses.

There were periods, lasting for several weeks, when the river was almost continually in flood, and there were other, but always shorter, periods when the river was low; but though we spent fifteen months in New Guinea the time was not long enough to determine at all accurately the limits of the seasons, for the first three months of 1911 differed considerably from the corresponding months of the previous year. Speaking generally, it may be said of the Mimika district that the weather from mid-October to the middle of April is finer than the weather from the middle of April to the middle of October. These two periods correspond more or less with the monsoons, but it is notable that whereas in British New Guinea the period of the Eastern monsoon, May to November, is the drier, here the reverse is the case. The finest weather appears to be in November and December, and the wettest weather is in July, August and September. The terms "fine" and "wet" are used only relatively, for it is almost always wet. In the first twelve months of our stay rain fell on three hundred and thirty days. It was very unfortunate that we did not provide ourselves

with rain-gauges for use at Wakatimi and Parimau, where interesting observations might have been recorded for a year or more. A roughly constructed rain-gauge, which was used for a short time, more than once recorded a fall of over six inches of rain in one night, and that was in the comparatively dry season of March.

A great deal of the rain fell in thunderstorms. From January 4th, 1910, to January 4th, 1911, I heard thunder on two hundred and ninety-five days, not including days on which I saw distant lightning but did not hear the thunder.

Before we left England it was thought that the party ought to include a geologist, but it was impossible to add to our numbers, which were already sufficiently great. As it fell out, we hardly reached geological country at all and a geologist would have spent an idle time, but there would have been plenty of occupation for a well equipped hydrologist.

The winds, whether from the East or from the West, were very variable both in force and constancy. Sometimes there would blow a fierce wind for two or three days followed by several days of calm. At other times a steady wind would blow for two or three weeks and so great would be the surf on the sea-shore that no ship could approach the mouth of the river. The wind usually dropped before sunset and the nights were calm.

It followed naturally from the heavy rainfall that the nights were seldom clear, and at one time Marshall waited for three months before he could take an observation from a star. But there were times even in the

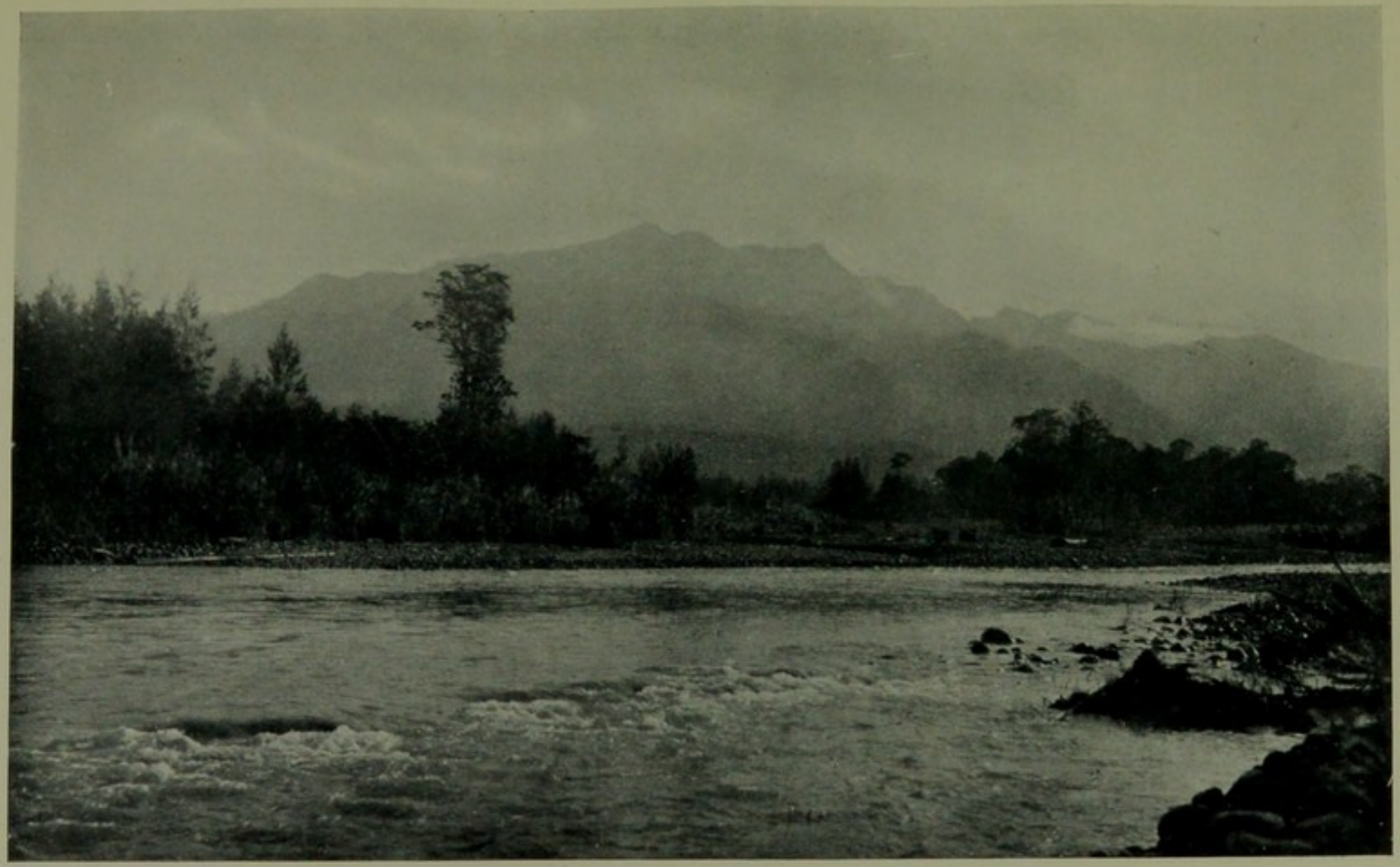
wet weather, when the rain poured down during the day and at night the heavens were clear. One of these times fortunately occurred in May, when Halley's Comet was approaching the Earth. On May 9th the comet, looking like a muffled star, was seen in the East and its tail, a broad beam of brilliant light, extended upwards through about thirty degrees. Below the comet and a little to the South of it Venus shone like a little moon, appearing far bigger than any planet I have ever seen. The comet grew enormously and in the early morning of May 14th, the last time that we saw it completely before it had passed the Earth, the tail blazed across the heavens like an immense search-light beam to the zenith and beyond. On May 26th it appeared again in the evening, reduced in size to about forty-five degrees, and several nights we watched it growing always smaller, until it vanished from our sight. Superlative expressions will not describe Halley's Comet as we saw it in New Guinea ; it was a wonderful appearance and one never to be forgotten. Our coolies and the Javanese declared that it portended much sickness and death. Though we tried to question them about it, we never learnt how it impressed the minds of the natives.

CHAPTER VII

Exploration of the Kapare River—Obota—Native Geography—River Obstructions—Hornbills and Tree Ducks—Gifts of Stones—Importance of Steam Launch—Cultivation of Tobacco—Sago Swamps—Manufacture of Sago—Cooking of Sago—The Dutch Use of Convict Labour.

TOWARDS the end of January Capt. Rawling, who had gone up the Mimika River with the first party to Parimau, made an excursion to the N.W. of that place, and at a distance of about four miles he came to a river, which we afterwards learnt to know as the Kapare, of much greater volume than the Mimika, and therefore likely to spring from mountains much higher than those that gave rise to the Mimika. Had we known at the time that our real objective, the highest mountains of the range, lay far to the N.E., we should have neglected the Kapare River, and by so doing we should have spared ourselves many weeks of labour; but at the same time we should have missed seeing a wide area of unknown country, and we might possibly have failed to make the discovery of the pygmy tribe, who inhabit the hilly country between the Kapare and the upper waters of the Mimika River.

It appeared that the Kapare might offer a better route to the higher mountains than the Mimika, so it was decided that we should explore its lower waters and see whether it was possible to reach it from our base-camp. Accordingly on February 14th Lieut. Cramer,



UPPER WATERS OF THE KAPARE RIVER. MOUNT TAPIRO IN DISTANCE.

Marshall and I set out in three canoes, taking with us provisions sufficient for a week's journey. Two miles below Wakatimi we entered and began to ascend the Watuka River, of which, as has been noted above (p. 40), the Mimika is but a tributary. After proceeding a mile or two up the Watuka we came to another junction of two rivers, and for the first time we began to realise the extraordinary network of waterways, which traverse the low-lying lands of that part of New Guinea. We learnt afterwards that there are inland channels joining several of the rivers to the East of the Mimika in such a way that it is possible to travel by water from Wakatimi to villages far distant along the coast without going by sea, and no doubt the same is true in a Westerly direction.

The junction we had then reached was formed by a wide river coming, apparently, from due North and a much smaller branch, not more than ten yards wide, but deep and swift, joining it from the West. It appeared to be quite certain that the river we were in search of must be the Northern branch, and we should have followed it at once had not a number of natives appeared on the bank, and asked us to go and visit their village, which, they explained, was a short distance up the Western branch.

We soon reached Obota, as the village was called, a collection of about one hundred huts on both banks of the narrow river, and there we were accorded the usual welcome by a large crowd of people. As it was still early in the day we were anxious to continue our journey, and we proposed to go up the Northern branch, but the natives assured us that that led to nowhere and broke

up into branches in the jungle, while the small stream which flowed through the village was the river flowing directly from the mountains.

It should be explained that this information was conveyed to us partly by long speeches of which we understood little or nothing, but chiefly by means of maps drawn on the ground. Some of the men drew their rivers crossing one another in a rather improbable manner, but many of them drew charts very intelligently, and at different times we obtained from the natives a good deal of geographical information which was substantially correct. On this occasion their maps all agreed in tracing the big river to branches in the jungle, and the small river to the mountains, so we were rather reluctantly persuaded that they were right, and we tried to induce some of them to go with us. Many of them offered to go the next day, but not one would start then—it was too late, it was going to rain, they had not eaten, and many other excuses—so we got into our canoes and attempted to paddle up the stream and found, what the natives doubtless knew, that we could not advance at all. Several times we tried, but were always driven back by the strong current, to the great delight of the natives who lined the banks and laughed at our feeble efforts, so there was nothing for it but to make a camp near the village and wait till the next day.

There was some difficulty about inducing the men to start in the morning, for it was raining, and, like other naked peoples, the Papuans dislike being wetted by rain, but we got off eventually with two natives,

one at the bow and one at the stern, in each canoe, in addition to the crews of four Javanese soldiers and convicts. It was soon evident that without the help of the natives we could not possibly have ascended the river. For a mile or two above Obota the water ran like a mill-race in a very narrow channel full of rocks and sunken trees, and it was only by the most skilful poling and, when a chance occurred, by hauling the canoes along a side channel that we were able to proceed. When we returned a few days later, we skimmed in fifteen minutes down the rapids which we had taken more than three hours to ascend.

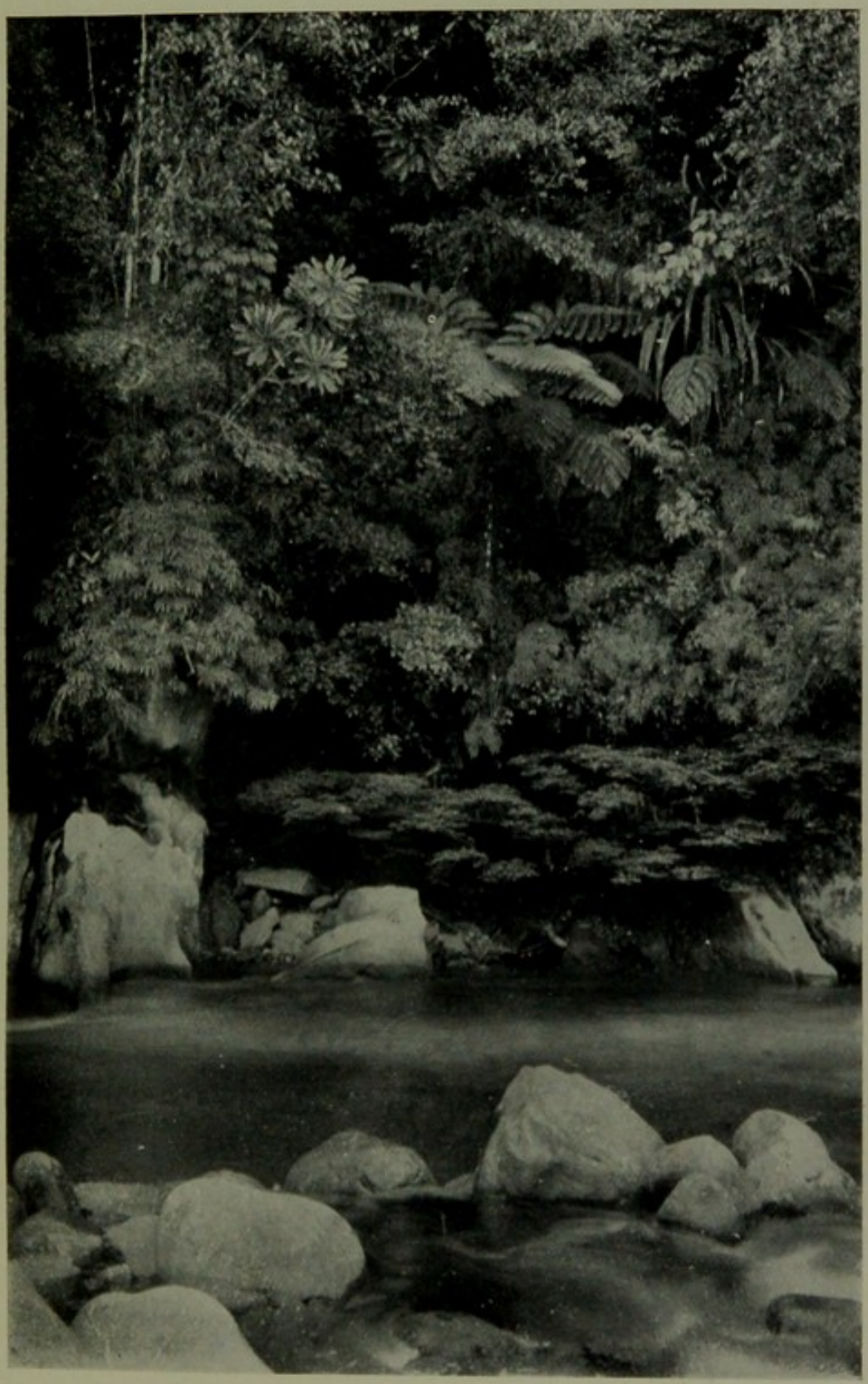
Above the rapids the river widened to about forty yards and the strength of the current was proportionately less, but in a few miles we met with another difficulty. At a sharp bend of the river the whole channel was blocked by an enormous barrier of huge trunks and limbs of trees piled high upon each other and wedged below into a solid mass. For larger boats this might have meant a delay of many days spent in cutting a channel, but the dug-out canoe is narrow and, if not flexible, it can be squeezed through the most unlikely openings, so that we passed the barrier without the loss of many hours.

When we started from Obota we had been doubtful whether it was possible that so small a river could possibly come from the mountains; but a little way above the barrier of logs our doubts were set at rest, when we found that our river was a mere off-shoot from another more than twice its volume, which flowed down to the sea at a village called Periepia. The main

river, the Kapare, where we joined it, was more than a hundred yards wide, and in the next two days' journey it hardly diminished at all in size. The character of the river differed markedly from that of the Mimika; its bed was of sand, denoting its mountain origin, in contrast to the brown mud of the Mimika and other jungle rivers, and its course was a procession of magnificent bends, quite unlike the paltry windings of the Mimika.

Paddling slowly up the river we disturbed companies of Hornbills (*Rhytidoceros plicatus*) which were feeding at the tops of the trees. These peculiarly hideous birds bark like dogs, and the loud "swishing" of their wings, as they slowly take flight, has been likened (not inaptly) to the starting puffs of a railway train. On this and on the other rivers we were often pleasantly reminded of home by the note of the Common Sandpiper (*Totanus hypoleucus*) which seemed to be quite as much at home in New Guinea as in its northern haunts. The last of these were seen in early April, and they began to reappear before the end of July. Very interesting birds, of which we saw a great number on this river, are the black and white Tree Ducks (*Tadorna radjah*). They have the curious habit of perching very cleverly on the topmost branches of the trees, and they make a pretty whistling by night.

There were no signs of human habitation along the banks, until on the third day we came to a small village of a dozen huts, in the middle of which was a tall house built of bamboos, used for ceremonials and dancing. The few people inhabiting the place were of a very low



VEGETATION ON THE BANKS OF THE KAPARE RIVER.

order of intelligence, if one may judge from the apathy with which they received us and saw us go on our way.

As we proceeded further, on the fourth day the river became a good deal smaller, having derived several tributaries from the low hills which were by that time not far distant on the right bank, and as the current became increasingly swifter it was evident that the Kapare did not promise a better means of approach by water to the mountains than the Mimika.

We were rather amused, when we came to the first bank of shingle, by the natives who were with us bringing us gifts of stones, as though they were something new and rare: probably they thought that as we came, for all they knew, from the sea, we had never seen such things before.

On the fifth day we left the baggage behind and went on in one unladen canoe, hoping to reach the point where Rawling had met the Kapare River by walking overland from the Mimika, but we were stopped a few miles short of that place by heavy rapids, which effectually prevented any further investigation of the river.

The excursion up the Kapare was a further illustration, if one had been needed, of the futility of undertaking an expedition in that country without a steam launch or motor-boat. When it was found that the Mimika was only an insignificant river, which the first excursion up it would have shown, the Kapare River might have been explored from Periepia, a matter which could have been done in two days instead of the seven occupied by the journey in canoes, and after that

other rivers to the East might have been explored until one convenient for approaching the mountains had been found.

After spending a night on a sand bank from which we were very nearly washed away by a sudden flood, we paddled leisurely down the river and came in one day again to Obota. Though the two places are so close together and communication between them is very frequent, the inhabitants of Obota are a much better lot of people than those of Wakatimi. The Obota men, who came up the river with us, worked steadily for several days, a thing we never could persuade the Wakatimi men to do, and, a more striking sign of their superiority, the Obota people cultivate the soil, whereas the Wakatimi people never do anything of the kind.

Many acres of ground on both sides of the river were cleared of bush and planted with bananas and sweet potatoes; we never succeeded in obtaining any of the latter, but bananas were brought for us to buy and in the circumstances they seemed to us to be excellent. The most extensive crop cultivated at Obota is tobacco; they plant out the seedlings and shelter them with a low roof of bent sticks covered with leaves, until the young plants are strong enough to bear the full force of the sun and rain. Almost every native smokes, men and women, and very often the children. A small handful of the dried leaves is taken and very carefully rolled up in the form of a cigar, and then wrapped round with a *sirih* leaf, which has been previously warmed over the fire; the ends are bitten square, and sometimes the leaf is tied round the middle with a thread of fibre to

prevent its unrolling. The tobacco is strong in flavour, but not at all unpleasant to smoke. The only other place, except among the pygmy people of the hills, where we found cultivation was up the Keaukwa River, a few miles to the E. of the Mimika River.

The distribution of tobacco in New Guinea is rather a puzzling question. There are many places on the coast where its use was unknown until quite recently, while at the same time the mountain people, for example, in the Arfak Mountains and on the upper reaches of the Fly and Kaiserin Augusta Rivers, have been accustomed to cultivate it and to barter it with their neighbours in the lowlands. The Tapiro pygmy people, who live in the mountains, cultivate tobacco and exchange it with the Papuans of the upper Mimika who grow none themselves. These facts have led some people to suppose that the tobacco plant is indigenous in New Guinea.

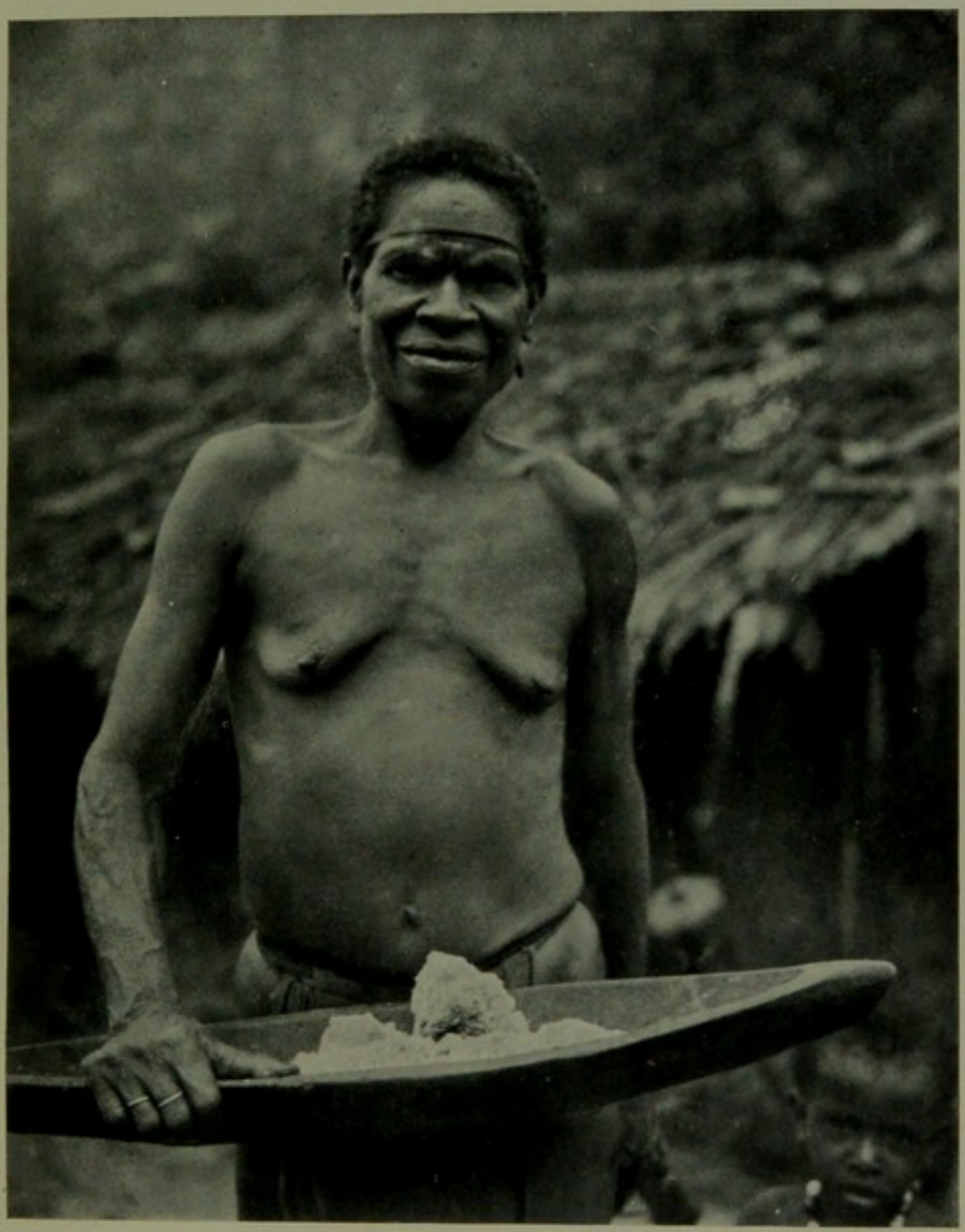
The people of Obota were rich in worldly possessions, for as we walked through the village we saw two Chinese brass gongs and a large porcelain pot, which they told us came from "Tarete." It may be that at some time a Malay or Arab trader from Ternate came over to this part of the coast, but it is impossible to know; perhaps the things had been stolen and exchanged from one village to another, from the West end of the island, which is often visited by Ternate traders.

But the chief reason for the prosperity of Obota is the fact that it lies at the edge of an extensive sago swamp, and sago is the mainstay of the food of the Papuans. Sago is made from a palm (*Sagus rumphii*)

which always grows in wet places, generally in low ground near the sea, and it will even grow where the water is brackish.* The palm is thicker than a man's body, and its height is about 25 or 30 feet. The trunk is covered with large leaves bearing long hard spines. A mature tree produces a large vertical spike of flowers and then dies. When they wish to collect sago, the natives cut down a full-grown palm and clear it of its leaves and leaf-sheaths. A wide strip of the bark is then cut off from the side of the tree which lies uppermost and the sago is exposed. The bark of the tree is really nothing more than a shell about an inch in thickness, enclosing the pith or sago, which is a brownish pulpy substance separated by fibrous strands. The pith is separated from the bark by means of the sago-beater, which is a sort of wooden hammer made in two pieces, a handle about a foot and a half long, carrying a head about twelve inches long; the hitting face of the head is about two inches in diameter, and it often bears a rather sharp rim which is useful in clearing the pith from the bark.

When all the pith has been beaten out of the shell of the tree it is carried away to the nearest water, where the sago is extracted. A trough made of two wide basin-like leaf-bases of the sago palm is set up on crossed sticks about three feet from the ground in such a way that one basin is a little higher than the other. Lumps of the pith are then kneaded in the upper part

* The very interesting discovery was made by Mr. Staniforth Smith of sago growing at an altitude of 3500 feet in the region of Kikor River, British New Guinea.—*Geog. Journal*, vol. xxxix. p. 329.



PAPUAN WOMAN CARRYING WOODEN BOWL OF SAGO.

of the trough with water which is constantly poured into it; the water carries away the sago into the lower part of the trough, and nothing remains above but the coarse fibrous stuff which is thrown away; the lower trough gradually becomes filled with sago and the water flows away. The sago, a dirty white substance with a rather sour smell, is made into cylindrical cakes of about 30 lbs. weight, and neatly wrapped up in leaves of the palm to be carried back to the village. Most of the work of collecting and preparing the sago is done by the women.

According to Mr. Wallace, one fair-sized sago palm will supply one man with food for a year, so it will be seen that the amount of labour required to feed a community in a district where sago is plentiful is not very overwhelming.

The usual method of cooking employed by the Papuans is to roll the sago into lumps about the size of a cricket ball and roast them in the embers of a fire. On one or two occasions I saw them prepare it in a different way, which was to wrap up the sago in banana leaves and cook it on hot stones; the result was probably more wholesome food than the charred lumps that they usually eat.

Very often the natives of the Mimika eat the crude sago, that is to say, the pith simply as it is cut out of the tree, without having been washed or pounded. The stuff is roasted in the usual way and the separation of the sago is done in the mouth of the eater, who spits out the uneatable fibre.

As well as providing the Papuans with the bulk of

their food, the sago palm supplies them with excellent building poles in the mid-ribs of the leaves, which are straight and very strong, and are sometimes fifteen to twenty feet long, and the leaflets themselves are used for making "atap" in the districts where the *Nipa* palm is not found.

It was mentioned above that the crews of our canoes on the excursion up the Kapare River were made up of Javanese soldiers and convicts. Our first batch of Ambonese coolies had by that time failed us, so Lieut. Cramer very kindly lent us some of his men for the occasion, and we had an opportunity of testing their worth. Speaking generally, it is not unfair to them to say that the Javanese are wholly unsuited to rough work in a savage country; they are a peaceful race of peasants and their proper place is in the rice fields. As soldiers they appear to the civilian eye to be clod-hoppers masquerading in (usually misfitting) uniform. They have no military bearing and no alertness, and one ceases to wonder that when the Netherlands East Indian native army is almost exclusively composed of Javanese, the war-like people of Atjeh have kept the field for so many years. It is a matter for surprise that the Dutch do not enlist more of the warlike Bugis of Celebes, and natives of the Moluccas, and even the Achinese prisoners themselves; ten thousand of such men would surely be of more worth than the 30,000 Javanese who fill the ranks of their native army. Of course there are exceptions; there are men among them who have performed splendidly valorous deeds in time of war; but the majority are of a stuff of

which it would be impossible to make soldiers, they are soft and unathletic and of a curiously feminine form of body, as a glance at a group of bathing Javanese will show.

The Javanese convicts were the same sort of material, but their case was not quite the same as that of the soldiers, for they had not voluntarily entered a profession (if the condition of convict can be called a profession) that involved service in foreign lands. The justice of the Dutch practice of employing convicts as coolies in military and exploring expeditions is very much open to question, but it need not be discussed at length here. The transport for the military operations in Atjeh is carried out almost entirely by convict labour, and all the Dutch exploring parties in New Guinea have made use of convict coolies, assisted in two instances by paid Dayaks. It is intended officially that only long-sentence men shall go on expeditions, so that by good behaviour they may earn some substantial remission of their sentences, but that is not invariably the case, for several young men left our expedition because their terms had expired. It is also supposed that only men shall be sent on expeditions who volunteer to go; but the supply of convict volunteers is not inexhaustible, and there were men with us whose last wish would have been to come to New Guinea.

But even if they were all volunteers and all long-service men, it is doubtful whether it is justifiable to send any but free men to work in a country so full of risks as New Guinea. The native of Java is a poor

creature, particularly susceptible to beri-beri and other diseases of the tropics, and when I saw convicts die, as did unfortunately happen, I came to the conclusion that the balance went heavily against the system. It must, however, be recorded that the convicts are extremely well treated. Except in the matter of pay —convicts on expeditions receive about one guilder (1*s.* 8*d.*) a month—they are treated in all essentials exactly like the native soldiers; they have the same rations of food and the same tent accommodation, and many of them enjoy themselves a good deal more than if they were occupied in sweeping the roads in a town in Java. Their hours of labour in camp are comparatively short, and the loads they are given to carry on the march are by no means excessive. Nothing could exceed the kindness of Cramer's treatment of the men under his command, and I have no doubt that the same may be said of the treatment of convicts elsewhere.

CHAPTER VIII

Description of Wakatimi—The Papuan House—Coconut Palms—The Sugar Palm—Drunkenness of the Natives—Drunken Vagaries—Other Cultivation—The Native Language—No Interpreters—The Numerals—Difficulties of Understanding—Names of Places—Local Differences of Pronunciation.

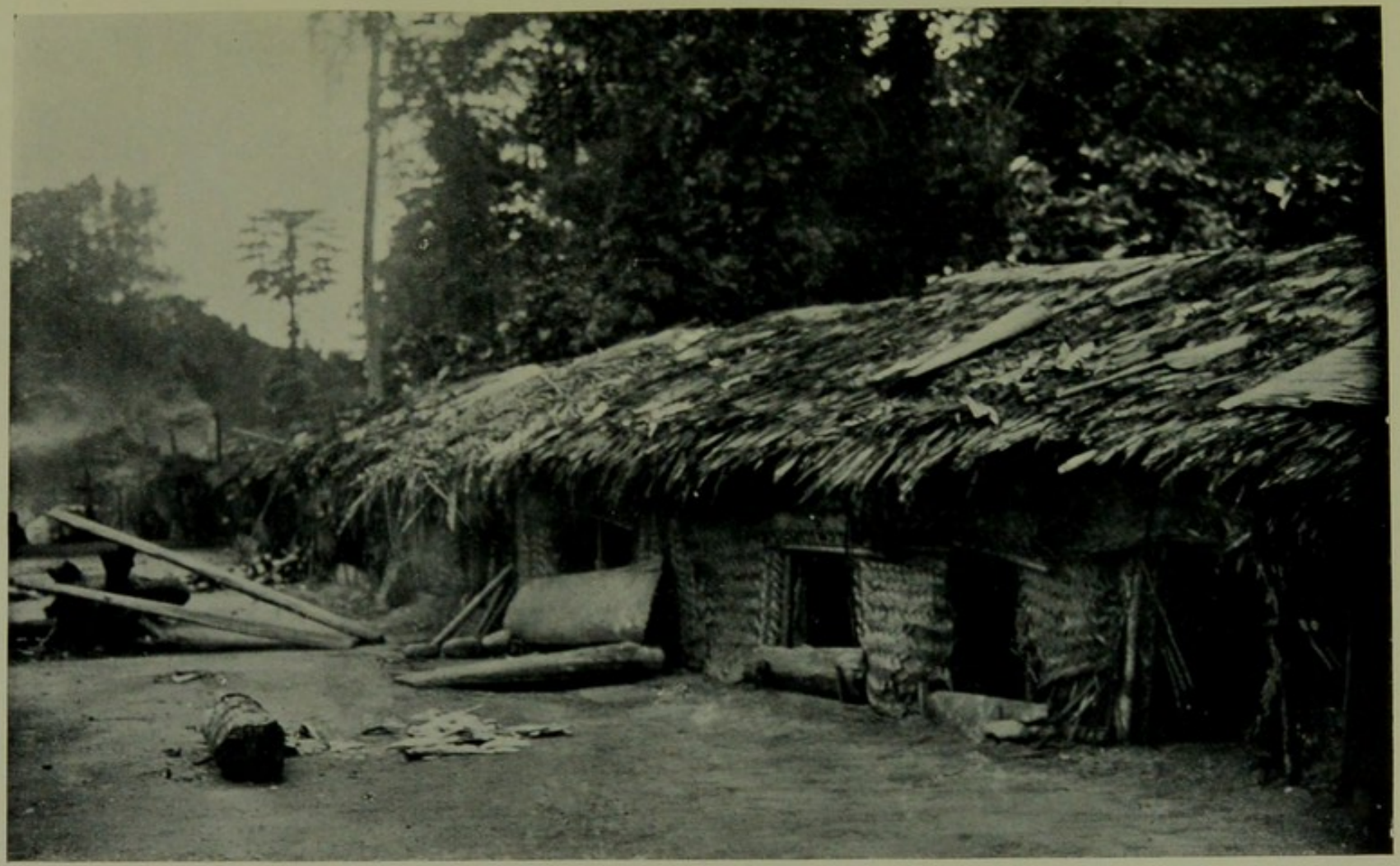
THE native village of Wakatimi lay directly opposite to our base-camp on the W. bank of the Mimika, which was there about 150 yards broad. Beyond the margin of the river was a strip of grass intersected by muddy creeks, where the natives moored their canoes, and beyond that was Wakatimi. The village consisted of a single street about two hundred yards long lined on one side by huts, which usually numbered about sixty. But occasionally, as for instance when we first arrived, and once or twice subsequently when large crowds of natives from other villages visited the place, it happened that the street was a double row of houses, and every available spot of dry ground was occupied.

Shifting house is a very simple affair, as most of the building materials are carried about in the canoes, and the canoes come and go in the most casual and unaccountable manner. Sometimes there were perhaps a thousand people at Wakatimi, and then there would be days when there was not a soul in the village. There were times when for weeks together there were large villages at the mouth of the river, and there were other

times when the coast was utterly deserted and hardly a trace of the villages remained. We were never able to learn what it was that prompted these migrations of the natives, but it is probable that the pursuit of food was the guiding motive. The wandering habits of the people will certainly make it very difficult to administer the country and civilise the people, if an attempt to do so is ever made.

The typical native house of the Mimika district is a simple rectangular structure with a framework of light poles driven into the ground, the cross-pieces and roof pole being tied to the uprights by strands of rattan. In some houses the roof is a simple slope downwards from front to back, but in most cases there is a central ridge pole from which the roof slopes to the back and front, that at the back being longer and going lower than that in front. The height of the ridge is about eight feet ; after we had been for some time in the country the people improved their building in imitation of our houses and built their huts ten, and even twelve feet high. The roof is made of "atap," the thatch described above (p. 60), and the walls are mats made from the leaves of a Screw-pine (*Pandanus*). The area of an average hut is about 9 by 12 feet, the longer dimensions being from front to back.

The floor is covered with sand to a depth of several inches, which is prevented from escaping into the street by a board placed on its edge along the front of the hut. The sand is brought from the seashore and must be of great value in preserving the health of the people : the huts are frequently under water in the big floods



PAPUAN HOUSES ON THE MIMIKA.

and without the sand, which quickly dries, it would be impossible for them to live there. Unfortunately the sand aggravates the sores and ulcers from which too many of them suffer, but that is perhaps a lesser evil than always sleeping on sodden ground. Racks made of sticks, on which are stowed bundles of arrows, spears, clubs, tobacco, sago and all the other portable property of the family, extend from one wall to another, so that it is almost impossible to stand upright inside a hut. The door is an opening about two feet square in the front wall ; as well as being the means of entrance for the members of the household the door serves as the principal means of escape for the smoke of the fire, which is constantly kept burning inside.

It is only rarely that a house remains for long separated from others ; when a second house is built it is attached to the side of the first, and the dividing wall is removed. In a large village the houses are built in rows of varying length, according to the nature of the ground, and there may be as many as fifty or sixty joined together. If you go inside you find that it is a single long house without any dividing walls, but each family keeps to its own particular section and use its own private entrance. When the place is crowded with people, and a number of fires are burning, the atmosphere inside the house may be more readily imagined than described.

The feature that most distinguishes Wakatimi from all the other villages that we saw is its fine grove of coconut palms. The village street is bordered with them on the side opposite to the houses, and there

must be three or four hundred trees in all. They afford a very pleasant shade to the village, and their graceful trunks curving this way and that are really picturesque and conveniently relieve the ugliness of the Papuan houses. It is rather dangerous to live so close to coconut trees, and sometimes when the wind blew in gusts before the rain we heard warning shouts and the heavy thud of a nut falling to the ground; but accidents never seemed to happen. The nuts are, of course, a source of great wealth to the Wakatimi people, who exchange them for bananas and tobacco with the people of Obota, and while we were in the country they brought us altogether thousands of nuts for which they received riches undreamt of before. At one or two places near the sea, and at several places on the Mimika River we found coconut palms, but far up the river they did not occur, nor did we see any on the Kapare River; and I believe all those we saw were planted by the natives, and that none of them were self-sown.

The method of cultivation is extremely simple. A ripe nut is left out on the roof of a hut and allowed to sprout; when the shoot is about a foot or more in length, a small patch of ground is cleared, preferably in a sandy place on the river bank or near the sea shore, a hole is dug and the sprouting nut is planted. From time to time, if he remembers to do so, the native will clear away the strangling vegetation from the young plant, and in about five years, under favourable conditions, the palm begins to bear fruit.

Growing commonly near Wakatimi is another species of palm, which, though it has not the value

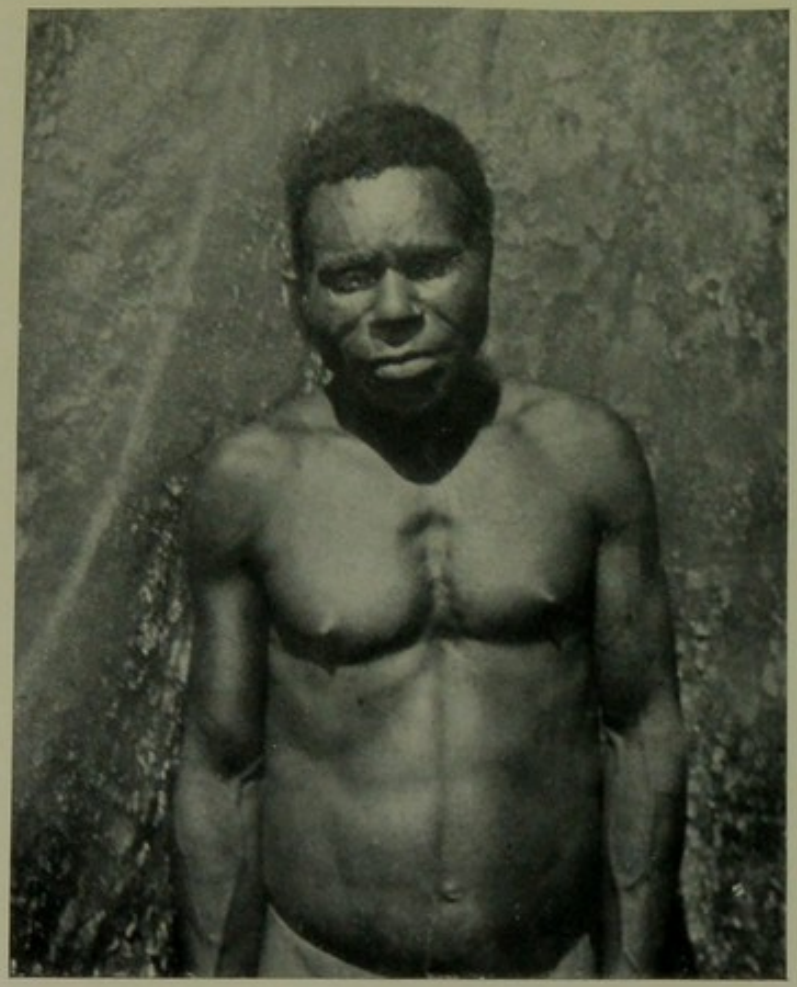
of the coconut palm, is yet more prized by the natives. This is the Sugar palm (*Arenga saccharifera*), and from it is made a very potent and intoxicating liquor. When the palm is in fruit—it bears a heavy bunch of dark green fruit—a cut is made in the stem below the stalk of the fruit, and the juice trickles out and is collected in the shell of a coconut. Apparently the juice ferments very rapidly without the addition of any other substance, for it is drunk almost as soon as it is collected and the native becomes horribly intoxicated.

During the first few weeks of our stay in the country the people were on their good behaviour, or else they found sufficient amusement in coming to see us and our works, but they soon tired of that and went back to their normal habits. Many of them went to the drinking places by day, and we often saw them lying or sitting at the foot of the tree, while one of their party stood at the top of a bamboo ladder collecting the palm wine. But the worst was a small gang of about a dozen men, the laziest in the village, whose custom it was to start off towards evening in canoes to their favourite drinking tree, where they spent the night drinking and making night hideous with their songs and shouts. In the morning they returned raving to the village and as often as not they started quarrelling and fighting and knocking the houses to pieces (a favourite occupation of the angry Papuan) before they settled down to sleep off the effects of their potations.

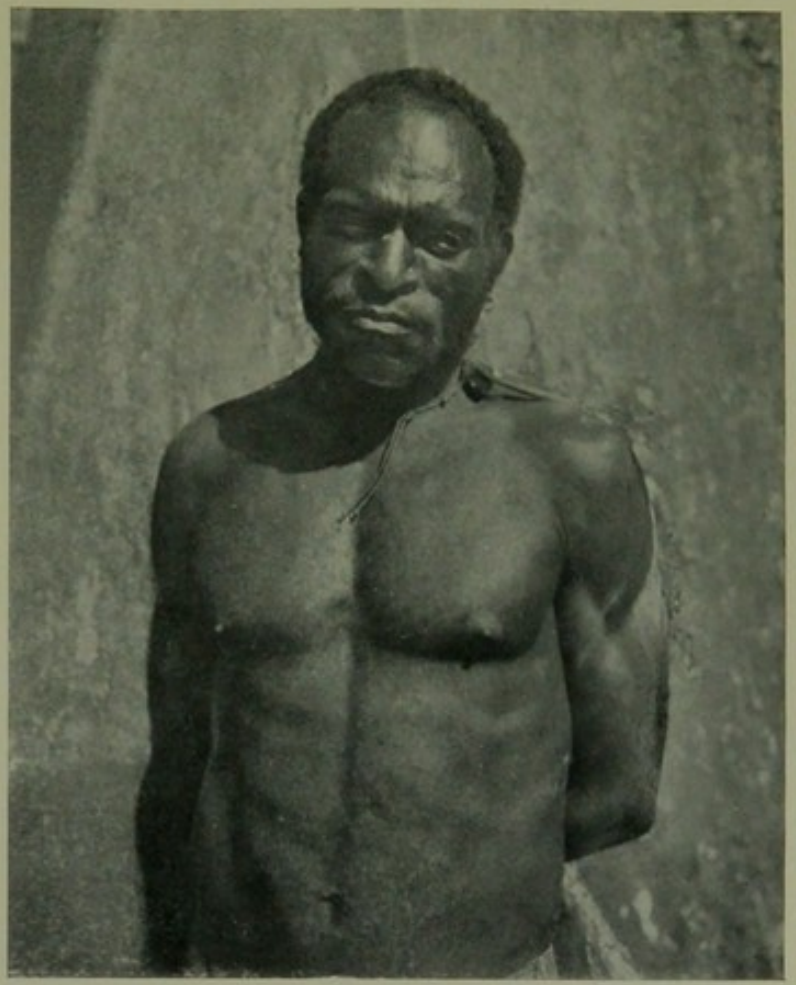
As a rule, the men were the worst offenders, and the women drank but seldom, but I well remember

one day seeing a man and his wife both hopelessly drunk come over to our camp. It was pouring with rain and their canoe was several inches deep in water, but they danced up and down in it and sang a drunken ditty; it was a ludicrous and at the same time heart-rending exhibition. The man, when we first knew him, was a fine fellow who one day climbed up a palm tree to get us coconuts, a feat which no man out of condition can perform; a few months later he was hardly ever seen sober, and in January he died. A smiling round-faced youth called Ukuma, who was one of our particular friends at first and was privileged to wander where he liked about the camp, attached himself to the drinking party, and before we left the country he looked an old man, and I had difficulty in recognising him.

Though the drunken vagaries of the natives were usually food for tears, they sometimes provided us with amusement. One afternoon one of the principal men of Wakatimi came down to the river bank quite intoxicated and took a canoe, which he paddled out into mid-stream and there moored it. From there he proceeded to shoot arrows vaguely and promiscuously at the village, raving and shouting what sounded to be horrible curses. Some of the arrows fell into the village and some sailed over the palm trees, and now and again he turned round and shot harmlessly into our camp, but nobody took the slightest notice of him except his wife, who went down to the river bank and told him in plain language her opinion of him. This caused him to turn his attention to her, but his aim



A PAPUAN OF THE MIMIKA.



A PAPUAN OF THE MIMIKA.

was wild and the arrows missed their mark, so he desisted and went back to the shore, where the woman broke across her knee the remainder of his bundle of arrows, while he cooled his fevered brow in the river. Then, while she delivered a further lecture, he followed her back to their hut looking like a whipped and ashamed dog. It can hardly be doubted that palm wine shortens the lives of many of the Papuans, but one must hesitate before condemning an absolutely untaught and savage race for excessive indulgence in one of the pleasures that vary their monotonous lives.

As well as coconuts the Mimika people have also bananas, papayas (*Carica papaya*), water-melons and pumpkins, all of them of a very inferior kind. It cannot be said that they cultivate these fruits; they occasionally get a banana shoot and plant it in the ground by the riverside, where it may or may not grow and produce fruit, but they make no clearings and take very little trouble to ensure the life of the plant. The papayas and the melons and pumpkins are sometimes seen growing about the native dwellings; but they, too, seem to be there more by accident than by any design on the part of the people. At Obota we found a few pineapples, which were probably the descendants of some that were brought to the Mimika by M. Dumas a few years earlier.

It has been stated in the previous chapters that the natives told us this or that, and that we asked them for information about one thing or another. From this the reader must not conclude that we acquired a very complete knowledge of the native language,

for that, unfortunately, was not the case, and even at the end of the fifteen months that we spent in their country we were not able to converse with them. Lieutenant Cramer and I compiled a vocabulary of nearly three hundred words,* and we talked a good deal with the people, but we never reached the position of being able to exchange ideas on any single subject.

In the Eastern and Northern parts of New Guinea it has always been found possible to communicate with the natives through the medium of some known language; even if there were many differences noticed in the language of a new district, there were always some common words which formed the foundation of a more complete understanding. The Western end of New Guinea has been for centuries visited by traders speaking Malay dialects, some of whom have settled in the country; or Papuans from those parts have travelled to Malay-speaking islands and have returned with a sufficient knowledge of the language to act as interpreters to people visiting those districts.

But the long stretch of the South-west coast from the MacCluer Gulf as far as the Fly River has been quite neglected by Malay-speaking traders, partly on account of the poverty of the country and partly by reason of the shallow sea and the frequent storms which make navigation difficult and dangerous, so that the Malay language was of no use to us as a means of talking with the natives. It is true that two men from the Mimika district had been taken a few years previously to Fak-fak, the Dutch Government post on the South

* See Appendix C.

side of the MacCluer Gulf, but though they spent two years there and attempts were made to teach them Malay, in 1910 the extent of their knowledge of the language was the two words *Tida, tuan* (No, master).

It is unfortunate that there is no common language along the S. coast, nor even a language with words common to all the dialects in use. We were visited on one occasion by the Dutch Assistant Resident from Fak-fak; the native interpreter who came with him, and who knew all the native dialects of the Fak-fak district, could not understand one word of the Mimika language. On another occasion some natives from Mimika were taken down by steamer to Merauke, the Government post in S.W. New Guinea, not far from the boundary of British Papua, and there they found the language of the natives quite unintelligible to them.

So we found ourselves confronted with the task of learning a language with neither grammar, dictionary nor interpreter. This may not seem to be an insuperable difficulty, nor is it perhaps where Europeans and educated people are concerned, but with Papuans it is a very different problem. The first thing to do —and very few of them would even grasp the idea—is to make them understand that you wish to learn their words. You may point at an object and look intelligent and expectant, but they are slow to take your meaning, and they soon tire of giving information. The facial expression, which amongst us conveys even to a deaf man an interrogation, means nothing to them, nor has the sideways shake of the head a negative meaning to Papuans.

In trying to learn a new language of this kind most people (I imagine) would begin, as we did, with the numerals. But our researches in this direction did not take us very far, for we made the interesting discovery that they have words for one and two only; *inakwa* (one), *jamani* (two). This is not to say that they cannot reckon beyond two, for they can, by using the fingers and thumbs, and beginning always with the thumb of the right hand, reckon with tolerable accuracy up to ten. For numbers above ten they use the toes, never, so far as we observed, two or three toes, but always all the toes together to indicate a large but uncertain number. Sometimes they opened and closed the fingers of both hands two or three times and uttered the word *takirt*, which appeared to mean "many." They did not, as some people do, use the word which means "hand" to indicate five or a quantity of about that number.

With patience we learnt a great number of substantives, the names of animals, the parts of the body, the various possessions of the natives and so forth, and with more difficulty we learnt some of the active verbs. But when we came to abstract ideas, our researches ceased abruptly for lack of the question words, who, how, where, when, etc.; these we were never able to learn, and it is impossible to act them.

Thus we were never able to find out what they thought of various things; we could point to the moon and be told its name, but we were never able to say, "What is the moon?" We learnt the names of lightning and thunder, but we never knew who they thought

produced them. We could not find out where their stone axes came from, nor how old they were, nor who made them; and a hundred other questions, which we should have liked to put, remained unanswered.

These limitations of our knowledge of the language were particularly annoying when we tried to find out the simplest ties of relationship. It may be thought very unintelligent of us that we never learnt the word for father, in spite of many attempts to do so. If you pointed to a child and asked a man, knowing him to be the father, what the child was, he would slap himself on the chest and answer, "*Dorota kamare*" (my penis); then if you pointed to himself he would tell you his own name, but never any word that could possibly be construed as father. If you tried the same thing with the mother she would point to the child and say, "*Dorota auwë*" (my breast). The child on being questioned pointed to the father and always said his name, the mother it would call *Aína* (woman), but perhaps this word also means mother.

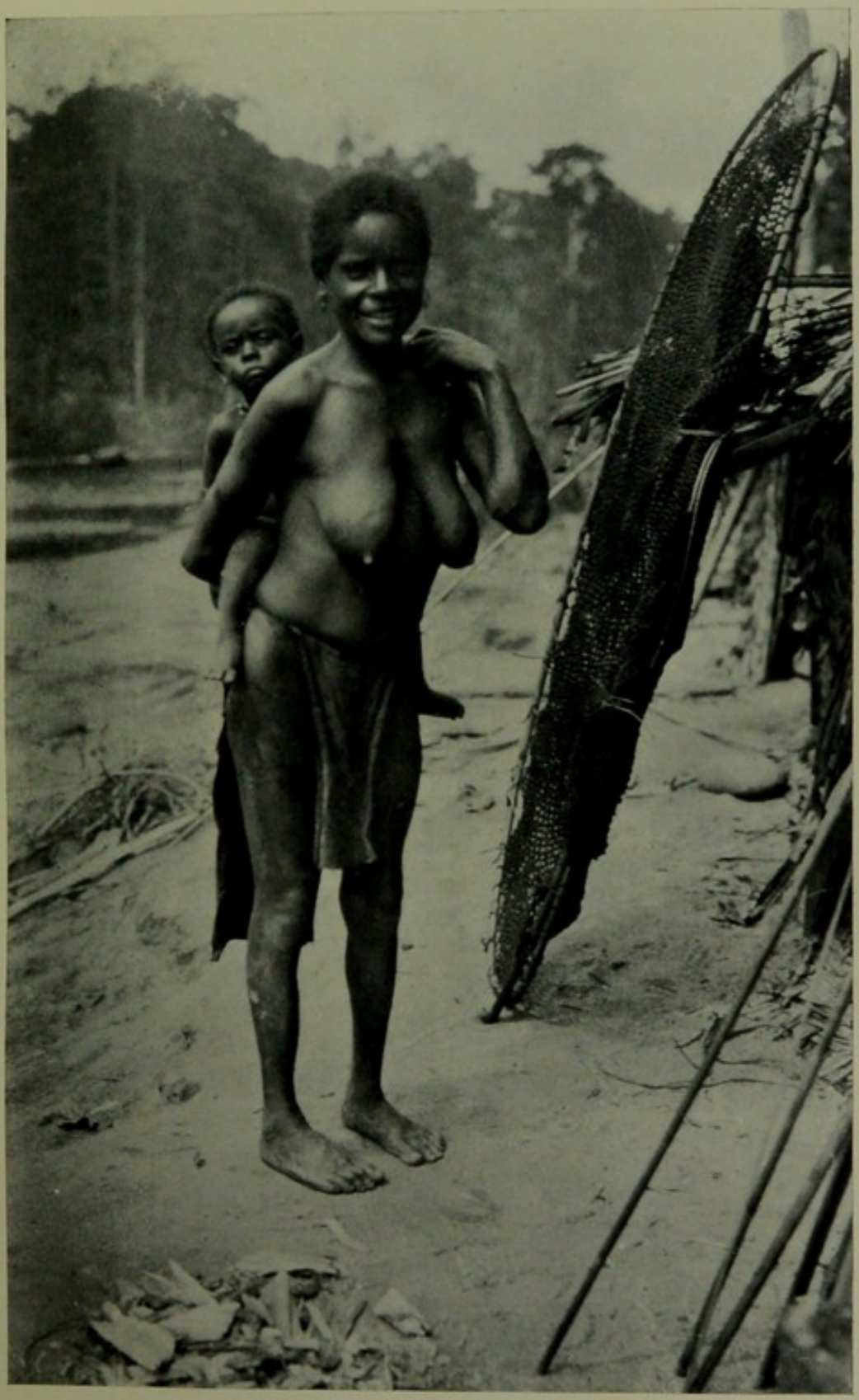
There were two men at Parimau so much alike as to be unmistakably brothers; we learnt their names and that they were *Inakwa kamare* (one penis), but we never found out the name of their relationship.

Seeing that some of the people have a very good idea of drawing on the ground a map of the country, I tried one day a graphic method of obtaining the relationships of a man whose name and whose wife's name and son's name I knew. I put sticks on the ground to represent him and his wife and son, and then in a tentative sort of way put in a stick to represent his

father, whose name he mentioned, but the game did not interest him and my researches came to an end.

Even the apparently simple matter of enquiring the names of places is not so easy as one would think. When the first party went up the Mimika to Parimau they pointed to the huts and asked what the village was called; the answer given was "Tupué," meaning I believe, the name of the family who lived in the huts pointed at. For several months we called the place Tupué, and the name appeared in various disguises in the English newspapers. When I was at Parimau in July, it occurred to me to doubt the name of Tupué, which we never heard the natives use, so I questioned a man elaborately. Pointing in the direction of Wakatimi, I said in his language: "Many houses, Wakatimi," and he nodded assent; then pointing in the direction of another village that we had visited I said: "Many houses, Imah," to which he agreed; then I said, "Many houses," and pointed towards Parimau. This performance was repeated three times before he understood my intention and supplied the word "Parimau," and then he shouted the whole story across the river to the people in the village who received it with shouts of laughter, and well they might. It was as if a foreigner, who had been living for six months in a place which he was accustomed to call Smith, enquired again one day what its name was and found that it was London.

The language spoken by the people of Mimika is by no means unpleasant to listen to, and with the customary sing-song intonation it would be almost musical, if it



A PAPUAN MOTHER AND CHILD.
(On the right is seen a fishing net.)

were not for the harsh voices of the natives, both men and women. There are many agreeably soft gutterals, and there is no hissing sound in the language, as they are unable to pronounce the letter "s." Many of their words are really very pleasing, notably some of their names, such as "Oonabë," "Inamë," "Tébo," "Magena," "Awariao," "Idoriaota," "Poandio," and "Mareru," to mention only a few; some of the names were so long that I never succeeded in writing them correctly.

The people who lived near the upper waters of the Mimika appeared to speak the same dialect as those living near the coast, with one noticeable difference. Those words containing a "k" in the language of the people at the coast lose the "k" in the mouths of the up-river natives, thus: *Ké* (rain) in the Wakatimi language becomes *'é* at Parimau; *Kie* (a leech) becomes *'ie*, *Pokanë* (an axe) becomes *Po 'anë*.

The only rule of grammar that we learnt was the simple method of constructing the possessive case by adding the suffix *ta*. Thus from *doro* (I) you have *dorota* (mine); from *oro* (you), *orota* (your), and in the same way *Tebota* (Tebo's); *Mareruta* (Mareru's), and so on.

They were curious to know our names and liked to address us by them; Goodfellow's and Rawling's names baffled them completely; Marshall's became "Martë"; they made a good attempt at mine in "Wollatona," and Cramer's they pronounced perfectly.

So far as I know, they never finish a word with a consonant, and when they adopted a Malay or Dutch

word which ended in a consonant, they always added a vowel; for instance, *tuana* (master), *Kapĭtana* (Captain), *maĭora* (Major).

Some of their newly-constructed words will puzzle future philologists who go there; for instance, the Malay word *pisau* (a knife) they called *pĭtau*, substituting "t" for the "s" which they cannot pronounce; *petau* was found easier to say than *pĭtau*, and eventually it became changed to *pautĭ*, which was the finally accepted version.

Probably the best means of learning the local dialect would be to encourage an intelligent child to visit your camp daily, where it would learn Malay and in course of time might be able to act as interpreter; but the process of education would be a slow one, and it would be constantly interrupted by the wandering habits of the natives. The time that we spent in the country was too short for any such attempt to be made, and indeed it was not until we had been there for several months that the children came fearlessly into our camp. But now that the natives have full confidence in Europeans a patient scholar might make a complete study of a quite unknown language.

CHAPTER IX

The Papuans of Wakatimi—Colour—Hair—Eyes—Nose—Tattooing—Height—Dress—Widows' Bonnets—Growth of Children—Preponderance of Men—Number of Wives—Childhood—Swimming and other Games—Imitativeness of Children—The Search for Food—Women as Workers—Fishing Nets—Other Methods of Fishing—An Extract from Dampier.

THE Papuans of the Mimika district may be divided into two classes or tribes: those who live in the villages on the lower waters of the river and make periodical migrations to the sea; and those who live on the upper waters of the river near the foot of the mountains and who never go down to the coast. There is a wide interval of uninhabitable country between the regions occupied by these two tribes, and communication between them, if it takes place at all, is very rare; but they resemble each other so closely, both in physical characters and in their manners and customs, that a single description will suffice for both.* The other native race of the district, the pygmy people who live in the mountains, will be described in a later chapter.

The skin of the Mimika native is a very dark brown, almost rusty black, but a dark colour without any of

* The number of individuals examined was not very great and the difference in their measurements are so insignificant, that they may be considered all to belong to one race.

the gloss seen in the skin of the African negro. Not infrequently we saw men of a lighter, nearly yellow, colour, and in the Wakatimi district there were three pure albinos, a man, a woman and a child. The man and woman were covered with blotches of a pinkish pigment and were peculiarly disagreeable to look at, the child, a sucking infant, and the offspring of black parents, was as white as any European baby, and was called, out of compliment to us, "Tuana." *

The hair is black and thick and frizzly; it never, or seldom grows long, so you do not see the ornamental coiffures characteristic of the natives of some other parts of the island; but they are skilful in plaiting what there is of it and take some pride in the result. Three- or four-pronged combs are worn in the hair more as a means of carrying a useful article than as ornaments. The hair of young children is often quite fair, but it becomes dark as they grow up; some of the adults have the custom, common in other places, of dyeing the hair yellow with lime.

The eye of the Papuan child is the eye of any bright dark-eyed child here or elsewhere; the white of the eye is white and the iris dark and clear. But very soon the white becomes bloodshot and yellow, and the iris blurred. The expression in the eyes is a thing that haunts one by its forlornness and hopelessness; it cannot be described, but you may see it in the eyes of certain animals. They show a strong disinclination

* *Tuan* = master, v. p. 103. The natives always addressed us as "Tuana," and many babies, of whom their parents were particularly proud, were called "Tuana."

to look you straight in the eyes, and when you rarely make them do so you seem to be looking into an unlighted and empty space.

The teeth are strong, but not conspicuously white and perfect like those of some other black races. A good many men file or chip the upper incisors to a point, but this has not, so far as we know, any particular significance.

The nose is almost bridgeless and is of a somewhat hooked and fleshy type with wide nostrils. The *septum* of the nose is pierced when the boys are young, and the hole is kept open by a rolled-up leaf thrust through it; in this way it is gradually dilated until the man is able to wear a carved ornament of a piece of the bill of a hornbill or a curved boar's tusk, with which he decorates himself on festal occasions. The nose-piercing is attended with a good deal of ceremony, but we were never fortunate enough to see it; it is done when the child is about five years old, and the operation is made (according to native accounts) with a piece of sharpened bone heated in the fire. Small ornaments are sometimes worn in holes in the *alae nasi* which are pierced in all the children, both boys and girls, when they are small infants.

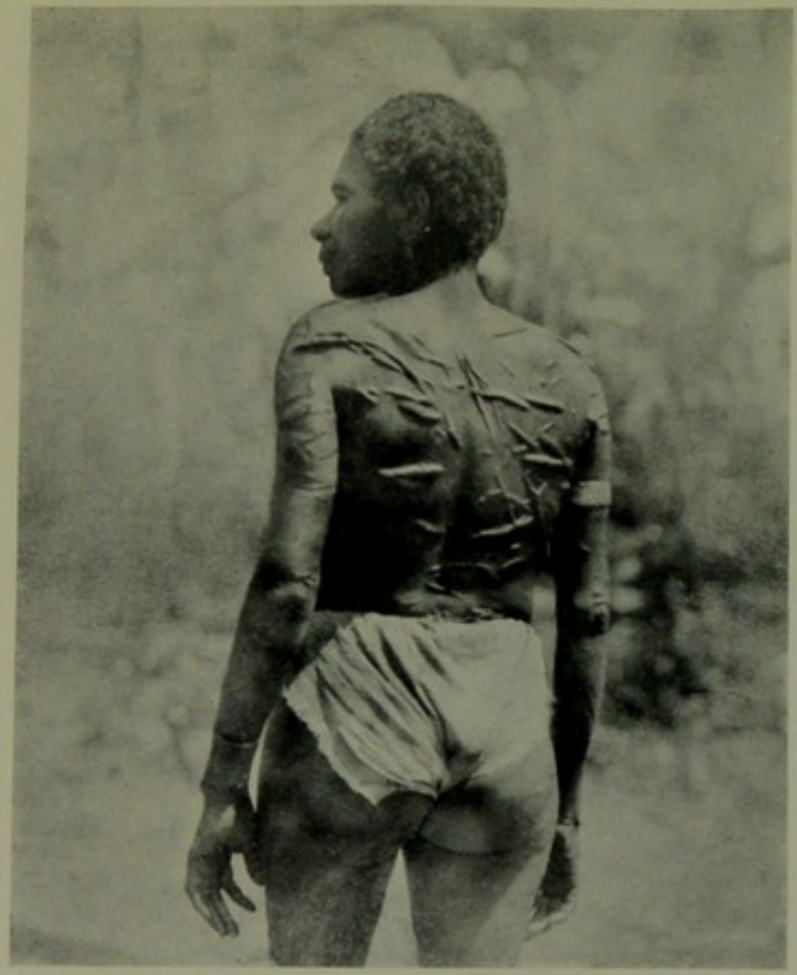
Many of the people pierce the lobes of the ear, but the custom is not universal. The ornaments worn in the ear are strings of two or three beads, or small rings of plaited fibres or rattan, or the claw of a cassowary. We took with us a large number of Jew's harps as trade goods, but the natives did not care for them, and two (the only two, I believe) that we did succeed

in making the people accept, were worn by them as ear-rings. Another man, a constant smoker, in default of a better cigar case always carried a cigar in the lobe of his ear.

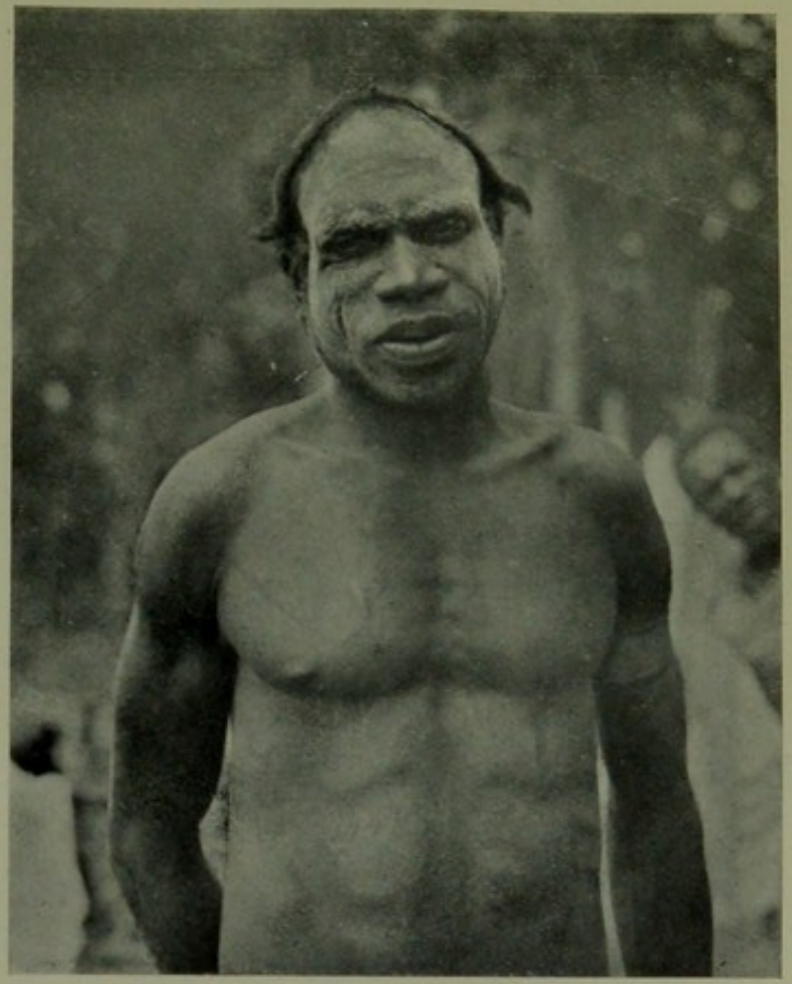
Tattooing, in the proper sense of the term, is unknown to the Mimika Papuans, but a great number of them practise cicatrisation or scarring. The usual places for these markings are the buttocks and the outer side of the upper (usually the left) arm. On the buttocks the marks are almost always the same, a cross, about two inches square, on the left buttock, and a cross surrounded by a circle on the right. The mark on the arm is about four inches long and sometimes represents a snake and sometimes a scorpion or a crayfish, but the meaning of it, and whether or not it had some totemistic significance we were unable to learn. Some of the women affect a scar between the breasts, which makes a very unsightly contraction, and we occasionally saw people with irregular scars all over the upper part of the breast and back, but it is probable that most of them were the signs rather of former quarrels than due to a spirit of coquetry.

They are found of painting their faces with a bright red earth, lumps of which they sometimes find and prize very highly, and not infrequently we saw men with their faces smeared black with a mixture of fat and charcoal, or whitened with powdered sago, but the reason, if there were any but vanity, for this adornment we did not discover.

The average height of men measured at Wakatimi and Parimau is 5 feet 6 inches. No women were



CICATRIZATION.



PAPUAN WITH FACE WHITENED WITH SAGO POWDER.

measured, but it would probably be found that the average height of the women was about two inches less than that of the men. Such a height is small compared with that of many races, but the first impression you get of the Papuans is that they are tall, for they hold themselves well, and all naked people look taller than those who go clothed. Their legs are thin and rather meagre, due in a great measure to the large proportion of their lives that is spent in canoes, but they walk with a good swinging gait and cover the ground easily.

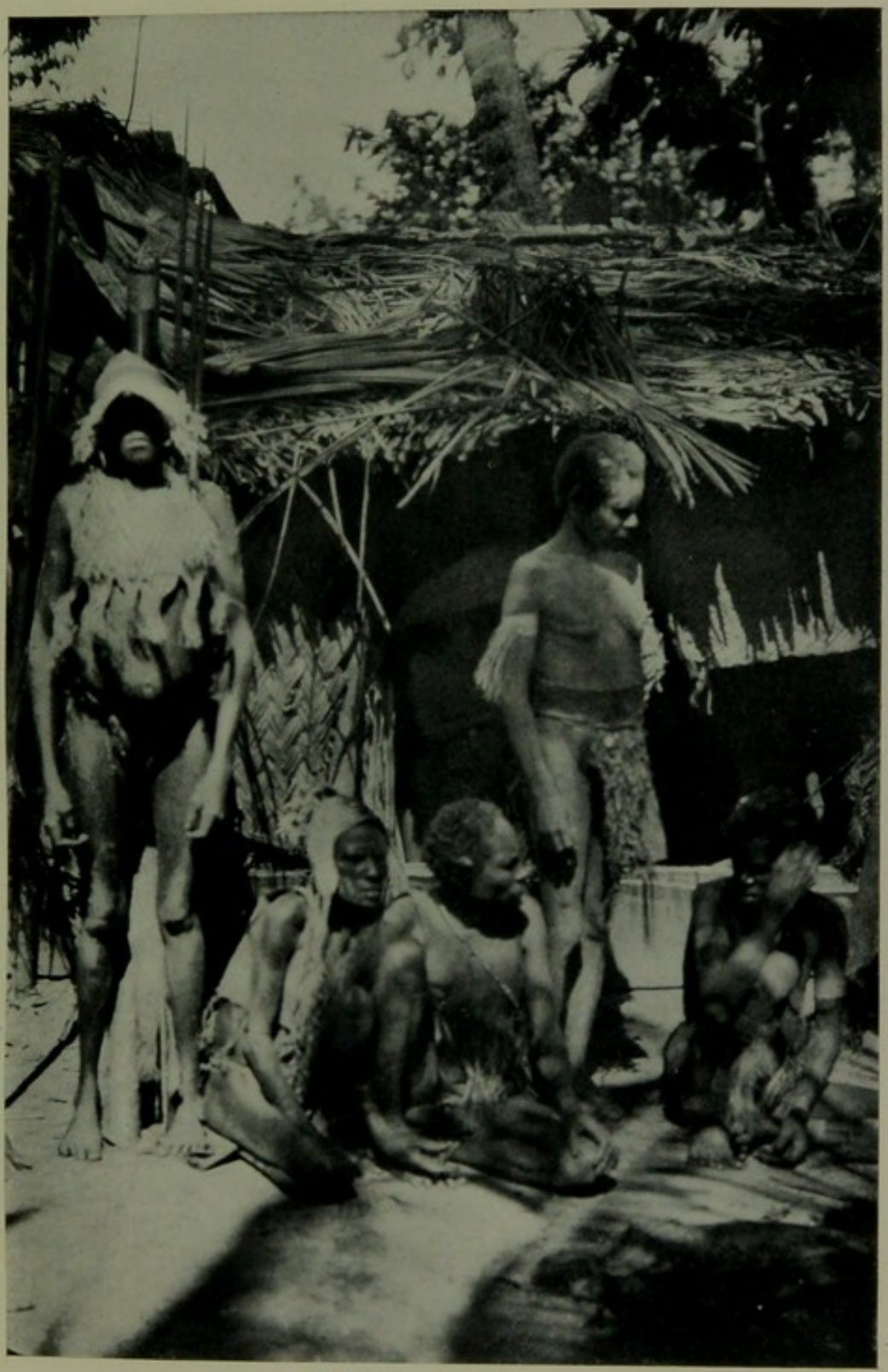
It is a curious thing that a black man never looks naked; a white man undressed looks a naked man, so too does a yellow man, but a Papuan—and nobody could wear much less in the way of clothes than he does—always seems to be sufficiently clad. The dress of the Papuan men, as has been suggested above, is scanty in the extreme. They have, or had before we visited them, no cloth except a very inferior bark cloth made from the bark of a species of fig tree. Some of the men wear a narrow strip of this bark cloth, which hangs down in front from a string round the loins and keeps up an ineffectual pretence of decency.

The more usual covering is the bamboo penis-case, which is kept in position by pulling the preputium through a hole in the lower end of the case. There are three or four different patterns of penis-cases, and they are always ornamented with carved designs. Another equally common fashion of covering is the shell; this is an oval or roughly squared segment of a large white sea shell, sometimes as much as six inches in diameter. It is worn on a string which passes through two holes

bored in it, and is tied tightly round the loins. The convex surface of the shell faces forwards, and the preputium is pulled upwards and clipped under the lower margin of the shell. Both the bamboo case and the shell are useful as a protection against the leeches and thorns of the jungle.

Small boys go quite naked until they reach the time of puberty, when for a short period they wear a sort of skirt made from the shredded leaves of the *pandanus*. Though the men like very much to wear round their heads strips of our coloured cloth, they do not normally use any kind of head-gear except on ceremonial occasions, when the men who beat the drums wear elaborate hats ornamented with the plumes of birds of paradise. Many of the men wear arm-bands above the elbow and leg-bands below the knee, made of tightly woven fibre or of fine strips of rattan.

The women are rather more clothed than the men, but it cannot be said that they are at all overdressed. The usual garment consists of a narrow belt of bark cloth or grass round the waist, from which there hang a narrow strip of bark cloth in front, reaching about half way down the thigh, and a wider strip, somewhat after the fashion of the tail of an Englishman's evening coat, extending as far as the knee behind. In addition to this, many of the women wear a sort of short waistcoat or sleeveless bodice made of plaited grass or fibre with tags or tassels hanging down in a sort of fringe from its lower edge. Newly-married women wear a sort of apron, or rather a long fringe of shredded leaves, which hangs down from the waist.



WOMEN OF WAKATIMI.

(On the left is a widow wearing the bonnet.)

The best dressed, or in any case the most dressed, members of the community are the widows, who wear, in addition to the other articles of female attire, what can only be described as a poke bonnet. In some cases the bonnet projects so far in front of the face as to obscure the features, in some it is of a conical design, and in others it resembles in shape nothing so much as the morion of a mediaeval man-at-arms.

Like the waistcoats worn by the women, the bonnets are made of ingeniously plaited fibre, and both of these look well when they are newly made, but they very quickly become hideous with damp and dirt, and the wearer is a person to be shunned. The small girls, unlike the boys, wear a narrow strip of bark cloth tucked between the legs almost as soon as they can walk. It is perhaps worth mentioning that these people have the art of sewing; they make eyed needles out of sharp fish bones, and with strands of fibre they contrive to sew pieces of bark cloth very neatly together.

There are no milk-producing domesticated animals in the country, so the women suckle their infants for a very long time, and you may occasionally see children of (apparently) three or four years old at their mothers' breasts; but whether young or old, it is very difficult to estimate the age of these people. In the course of a year we saw little children grow into active boys and we saw young men become middle-aged. I should say—but this is pure speculation—that a man is old at forty years and a woman at an even earlier age; it seems probable, too, that the life of a woman is shorter than that of a man.

Partly on account of the migratory habits of the natives, and partly owing to the fact that at no hour of the day until nightfall are all the people in or about the houses, it was never found possible to take a census of a village, but from our observations we arrived at the conclusion that the number of men was decidedly greater than that of women.

The number of a man's wives was a favourite subject for boasting and they often assured us that they had two or even three wives, but we only knew two men who certainly had two wives; on the other hand we knew a considerable number of men who had no wives at all. It appears that a man may take a wife from his own village or from a village in the same district; thus a Wakatimi man may take a wife from Obota or Periepia, and a Parimau man from Kamura. There were two women at Parimau who were said to come from Wakatimi, but whether they had been voluntarily exchanged or were the spoils of war we were not told.

It was unfortunate that we learnt nothing about the customs and ceremonies connected with marriage. A wedding took place at Wakatimi when we all happened to be absent, and the only definite description that we were able to get of it was that the bride, who arrived from another village by canoe, crawled on her hands and knees from the water's edge to the village, a distance of about a hundred yards, and most of it through mud.

Beyond question, the happiest time in the lives of the Papuans is their childhood, when they are free to play from morning to night and need not take part

in the ceaseless search for food, which occupies so much of the time of their elders. As infants they are carried on the backs of their mothers and very often of their fathers, secured by a wide strap of bark cloth, the ends of which are tied across the carrier's chest. It is very seldom that you hear them cry and they appear to give very little trouble; their mothers are very careful of the cleanliness of the infants. Very early in life they begin to walk and almost as soon they learn to swim. In fine weather they often spend the greater part of the day in the river and it is a very pretty sight to see a crowd of little Papuans playing together in the water. Sometimes they are joined by the women, who seem to enjoy the fun quite as much as the children. One of their favourite games is to pretend to be a school of porpoises, whose rolling headers they imitate admirably. They very soon become powerful swimmers, and I remember one day seeing a small boy, who cannot have been more than eight years old, swim across a river in tremendous flood, while the party of men who were with him had to seek a place where they could safely swim across half a mile lower down.

There are a number of games too that they play on dry land: they play the universal game of lying in wait for your enemy and suddenly pouncing out on him; they have great battles in which they are armed with miniature bows and arrows, and reed stems take the place of spears, and shrill yells make up for the lack of bloodshed. There is another game which I saw played three or four times in exactly the same manner, and which, by reason of it somewhat resembling a

children's game called "Nuts in May," is perhaps worth describing. Eight little boys, each one carrying a long flowering grass, stood in two parties of four facing each other a few yards apart. At first they waved their grasses and then danced towards each other, crossed and took the places that had been opposite to them; this they repeated twice. Then they ran round and round in a circle about five yards wide waving their grasses and shouting until they stopped suddenly and sat down in a bunch together. After a rest of about half a minute, they jumped up and ran round again in the same circle, now shouting and grabbing as they ran handsful of sand, which they threw over their heads into the air or between their legs into the face of the one behind; then a sudden stop and again they all sat down in a bunch. After this they jumped up, ran all together for a few yards shouting loudly, hurled all their grasses as high into the air as they could, and the game was ended.

Like the children of more civilised races, the young Papuans are fond of imitating their elders. The boys like to be seen walking about with men, to copy their swaggering walk, and to sit about smoking idly and watch the women at work. The little girls sometimes contrive to make grass garments like those worn by the women; they make small dolls' houses in which they themselves, or infants still smaller than they, are the dolls, and they like to be seen baling out the canoes or carrying sand for the houses. But in their case pretence is soon changed to reality, and when they are quite young they are made to accompany their

mothers in the serious business of life, while the boys are still leading a gay life with no responsibilities. Both boys and girls very early become proficient in the management of canoes, and a child of tender years will confidently steer a canoe through rough water which would end in certain shipwreck for one of us.

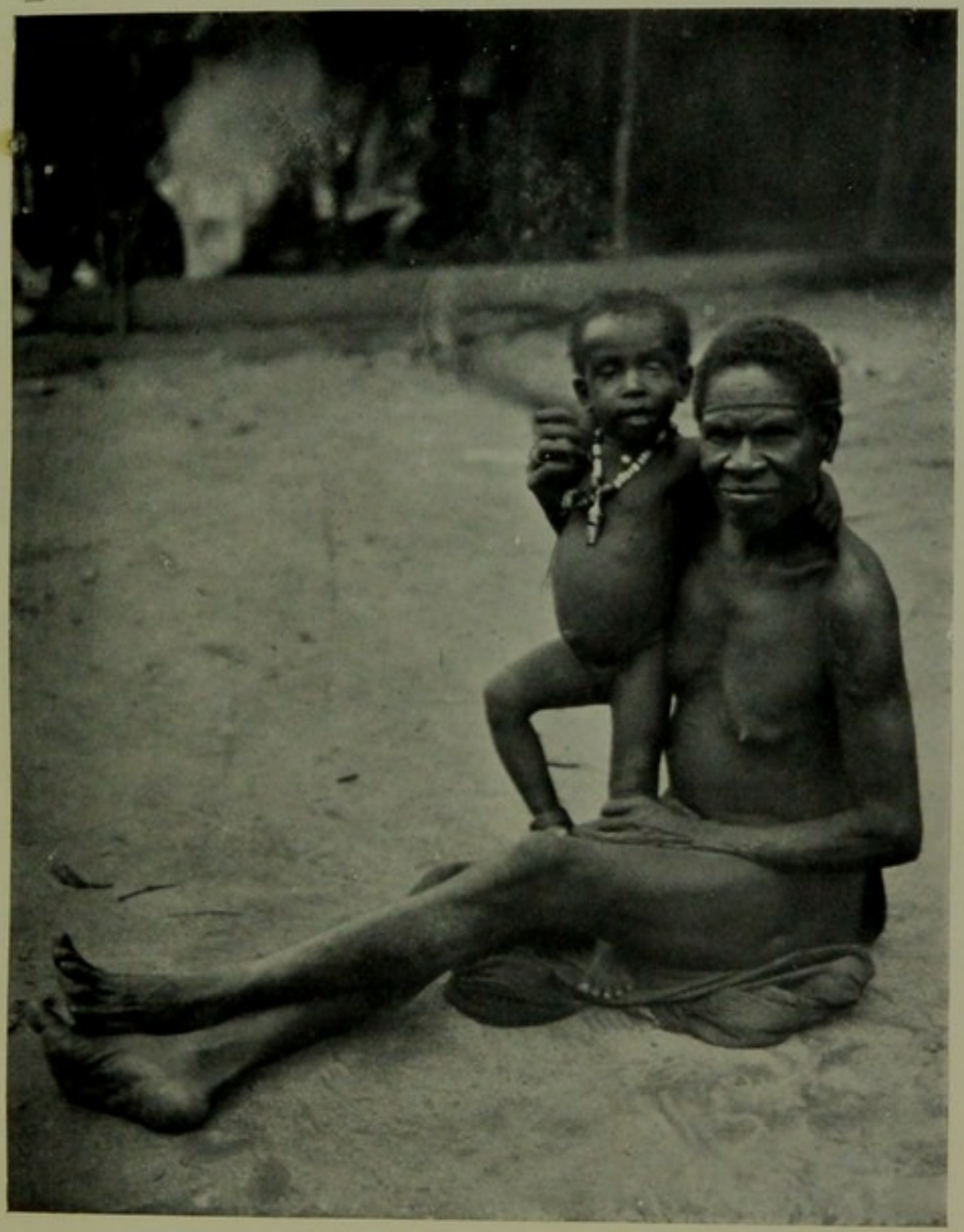
The chief business in the lives of the Papuans is that of all animals, human and others, namely, the search for food. But while the civilised races have learnt to foresee wants of the future, and have established a system of agriculture which provides food for everybody and leaves a part of the population free to pursue other occupations, the Papuans take no thought for the morrow, and the search for food becomes literally a hand to mouth business, which occupies the attentions of every member of the community.

They have no cultivation in the Mimika villages, and even at those places such as Obota (see p. 88) where there is some cultivation, the crops that they raise are not nearly sufficient for the whole population, so it can easily be imagined that an improvident people living in a country constantly liable to sudden floods, which swamp the land for weeks at a time, is frequently faced with a prospect of complete starvation. At first you are inclined to think that the whole of the business of collecting food falls on the shoulders of the women, while the men sit at home and do nothing. This is certainly true of a great many days in the year, but certain tasks can only be performed by the men, such as hunting for game in the jungle, and felling

trees to make the canoes, without which the people must inevitably starve.

Their working day begins fairly early, and by about eight o'clock the village is almost deserted by the women, who have all gone off in canoes to fish or collect sago. As a rule, two or three women go in each canoe, taking with them a few children, a dog or two, several fishing nets, rolls of matting, some spears and arrows, a little food, a bamboo filled with fresh water, if they are going down to the river mouth, and always a fire burning in the stern of the boat. The usual destination of the women is the muddy creeks among the mangrove swamps not far from the sea; there where the water is brackish and the tide rises and falls several feet they find in the mud banks large mussels (*Cyrena* sp.), which contain a good deal of food, and the shells of which are useful as knives and scrapers. Hopping all over the mud are seen hundreds of curious little fish (*Periophthalmus* sp.), whose eyes seem to be starting out of their heads; these little creatures climb up the steepest mud banks, and even up the stumps of trees.

The commonest type of fishing net is made in an oval framework of wood, or strips of rattan, about 5 feet long by 2 feet wide; the net is a close mesh of native string stretched tightly across the frame, except at the middle, where it sags a little. The usual method of using this kind of net is to grasp it at both ends and by wading through the shallow water to scoop up small fish much in the same way as shrimps are caught. There is another more ingenious method of using it, which



PAPUAN WOMAN AND CHILD.

sometimes results in large capture of little fish. When the tide is high the bushes along the river bank and many of the drooping branches of the trees are submerged; the natives approach quietly in their canoes, cautiously push the net under the submerged vegetation, and then with a sudden jerk lift it up out of the water, in this way capturing numbers of small fish which had been sheltering or looking for food among the leaves.

Another form of fishing net—though there is no netting in its construction—is made of long, thin strips of bamboo tied parallel to each other at intervals of about half an inch, forming a sort of screen or trellis-work, which can be rolled up if necessary. Strong wooden stakes are driven into the mud at the mouth of the creeks which join the river in many places, and at high water the screens are fastened to the stakes in such a way as to touch the bottom and close the entrance of the creek; the water can run back when the tide falls, but not the fish which are sometimes caught in considerable numbers.

The larger fish are all obtained by the men, who either catch them with a hook and line, or spear them in the shallow water near the river mouth, or along the sea shore. We saw very few hooks; one or two were made of rough metal, the others were neatly fashioned from fish bones, and all of them were plain without barbs. Now they have a large number of steel fish-hooks, which they greatly value.

The commonest types of fish-spear are made of thin bamboo or a light wood about ten feet long, and they end in three or four sharp prongs of bamboo or

hardened wood. They also use a barbed spear of which the head becomes detached from the shaft, when it becomes fixed in a fish ; a light line connecting the shaft with the head causes the shaft to act as a drag on the movements of the fish, which can easily be followed up and killed ; this kind of spear is only used for the larger fish, saw-fish and the like, but I never saw it in use. Considering the enormous number of fish that there are—at the mouth of the river the water is sometimes seen to be seething with large fish—it cannot be said that the men are very clever with their spears.

They also shoot fish, using single- or three-pointed arrows ; you may see a man standing quietly in a pool of water like a heron waiting for the fish to come up to him, or stalking a shoal of fish stealthily from the bank ; in either case he will probably shoot arrow after arrow without effect, for they are absurdly indifferent marksmen with the bow.

The most primitive methods of all of catching fish I saw practised one day coming down from Obota. A native paddling in the bow of my canoe saw a large fish near the bank, towards which he steered the canoe. When he judged that he was near enough to it, he hurled himself flat on to the water with a resounding splash that drenched everything in the boat, and a thud that would have stunned the fish at once had it not darted off an instant earlier.

The sight of a fish, however small it is, always rouses a Papuan to action. When we were travelling with natives, we sometimes came to pools where small fish had been left by some receding flood. Instantly

their loads were thrown down and everyone darted into the water with sticks and stones and shouts and as much enthusiasm as if the fish had been salmon and a full meal for everyone.

There is another method of fishing which was observed by the navigator, Captain Dampier, in use by the natives of this region. It is so remarkable that, although we did not see it employed by the people of the Mimika district, I shall make no excuse for repeating it here :—

"They strike Fish very ingeniously with Wooden "Fiss-gigs and have a very ingenious way of making "the Fish rise : For they have a piece of Wood curiously "carv'd and painted much like a Dolphin (and perhaps "other Figures ;) these they let down into the Water "by a Line with a small weight to sink it ; when they "think it low enough, they haul the Line into their "Boats very fast, and the Fish rise up after this Figure ; "and they stand ready to strike them when they are "near the Surface of the Water." *

There are times when the natives get more fish than they know what to do with, and other times when no fish can be caught ; but they have no idea of laying up a store for the lean times. It is true that they char some in the fire and keep them for a few days before the fish putrify, but if they learnt to smoke some of their surplus supply, they need never go hungry.

* *A Continuation of a Voyage to New Holland, etc., in the year* 1699, by Captain William Dampier.

CHAPTER X

Food of the Papuans—Cassowaries—The Native Dog—Question of Cannibalism—Village Headman—The Social System of the Papuans—The Family—Treatment of Women—Religion—Weather Superstitions—Ceremony to avert a Flood—The Pig—A Village Festival—Wailing at Deaths—Methods of Disposal of the Dead—No Reverence for the Remains—Purchasing Skulls.

THE search for food furnishes occasionally some very curious scenes. One of the most remarkable occurs when the river in flood brings down a tree-trunk in a suitable stage of decay. A canoe is sent out with men to secure it and tow it to the bank. When it has been left stranded by the falling water, the people, men, women and children come out and swarm around it like bees about a honey-pot, and you wonder what they can be doing. When you go close you find that some are splitting up the log with their stone axes and others are cutting up the fragments with sharpened shells in the same way that their ancestors—and perhaps ours too—did centuries ago. The objects of their search are the large white *larvæ* of a beetle, about the size of a man's thumb ; I have seen natives eat them just as they cut them out of the wood, but usually they roast them in the fire and consider them a great delicacy.

Nothing that can by any means be considered eatable comes amiss to the Papuans ; there are two kinds of water tortoises which they like to eat, and rats, lizards, frogs and snakes, and the eggs of crocodiles they devour

greedily. A number of different kinds of fruits, most of them disagreeable to European tastes, are found growing in the jungle and form a welcome addition to their fare. Birds they get occasionally, but their skill with the bow and arrow is not remarkable.

Most of their meat is obtained by hunting with dogs the wild pig, the wallaby and the cassowary. The pig (*Sus papuensis*), though it is not really a native of New Guinea, was introduced into the island so long ago that it has become as well established as the rabbit has become in this country. In some places, particularly near the foot of the mountains, pigs are fairly numerous, and the natives kill a good many; they are very savage beasts, and I saw a native terribly gashed by a large boar, which was shortly afterwards shot by one of our Gurkhas.

The Wallaby (*Dorcopsis lorentzii*) is a small kangaroo, about two feet in height when it stands upright; it seems to be fairly evenly distributed all over the district. When the natives bestir themselves they seem to be able to catch the wallaby fairly easily; in four consecutive days we saw the remains of thirteen brought into the village of Parimau. The flesh is coarse and has a very strong musky flavour.

There are two kinds of Cassowary in the Mimika district, a small species new to science (*Casuarius claudi*), which was discovered in the mountains at an altitude of about 1500 feet, and a large species (*Casuarius sclateri*), which was fairly abundant everywhere. We frequently heard their curious booming cry at night and we often saw their tracks in the mud of the jungle or on the river bank, but they are very shy birds and are seldom seen.

Once I had the luck to see an old cassowary with two young birds walking about in a stony river bed, a place which they particularly affect, and it was a very pretty sight to see how the mother bird, after she had caught sight of me, drove away the chicks to a place of safety and all the time kept herself between them and me. The natives hunt and kill and eat a good many cassowaries ; the feathers are used for ornamental head-dresses and belts and for decorating spears and clubs, and the claws are often used as the points of arrows.

The Papuan Dog, without whose help the native would seldom, if ever, be able to get any meat, is a sharp-nosed prick-eared creature about the size of a Welsh terrier. The colour is yellow, brown or black, and the tail, which is upstanding, is tipped with white. Usually the hair is short and smooth, but we saw one dog, brought down to Parimau by a party of pygmies, which had a thick furry coat like a chow dog, which it also resembled in the carriage of its tail. The dogs in the village of the pygmies which we visited, were smooth-coated like those of the Papuans, so it is possible that that thick-coated animal came from some remote district where the natives live at a higher altitude.

The Papuan dogs are very sociable creatures, and they like to accompany the natives on their journeys. They are particularly fond of going in canoes on the river, and two or three are seen in nearly every canoe even when the people are only out fishing. Their food is generally given to them by the women and it consists of raw meat, when there is any, and lumps

of sago. A remarkable peculiarity about them is that they never bark, but they make up for this defect by their extraordinary power of howling. Sometimes in broad daylight, if there was no wind, but more often on still fine nights, a party of dogs would sit together, usually on the river bank, and utter a chorus of the most piteous and blood-curdling howls. No amount of stone-throwing or beating with sticks, freely administered by their masters, had the smallest effect on them; they would only move away a few yards and begin again, apparently carried away by an ecstasy of sorrow.

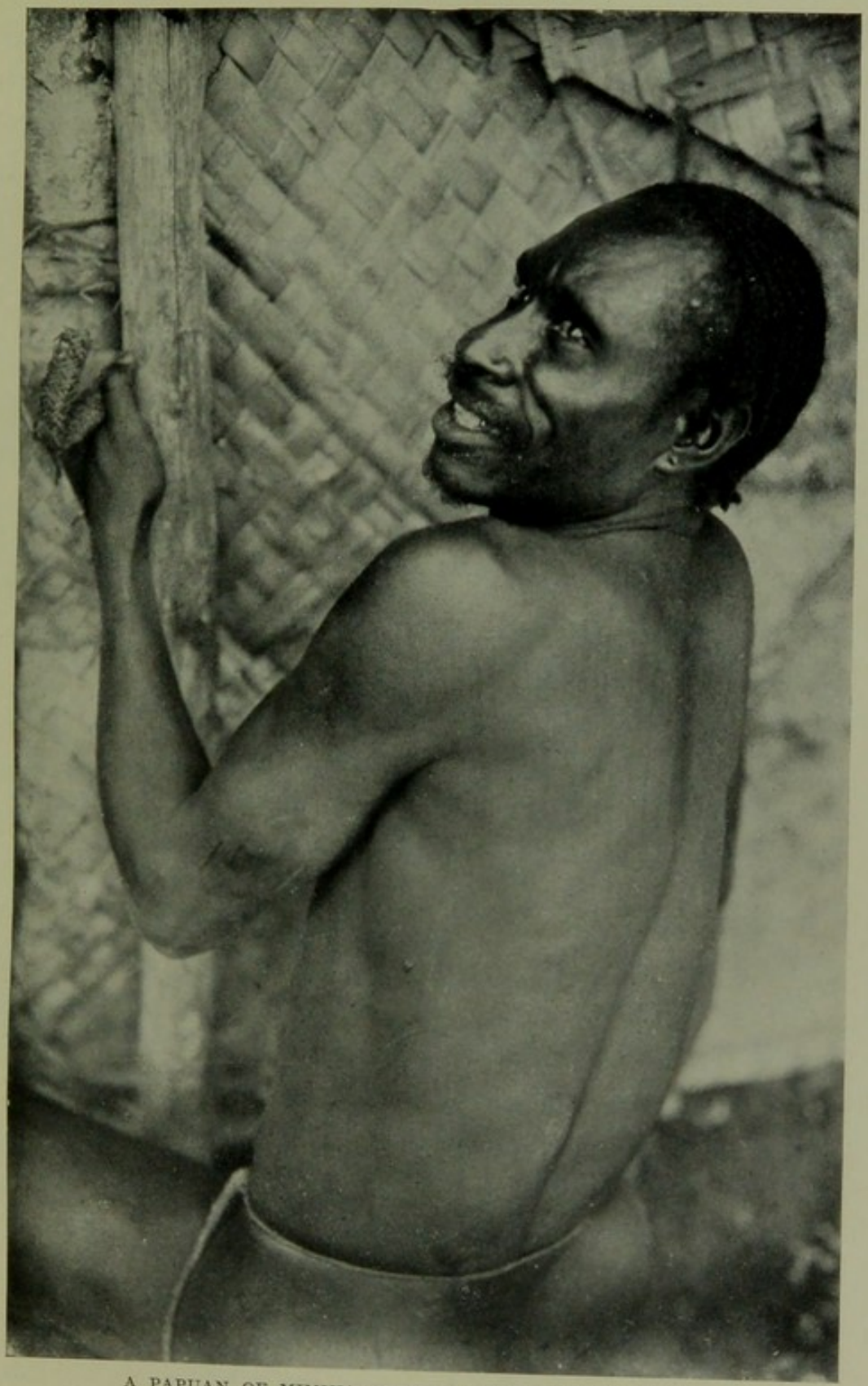
The natives value their dogs highly, as they well may do, for they provide the whole of their meat supply, and they use them to exchange for articles of which they have great need. The people at Parimau have a small piece of iron about the size of a chisel, used for carving their canoes and paddles, for which the enormous price of three dogs had been paid, so they informed us, to the people of the Wakatimi. One day one of our "boys" shot a dog, which had been in the habit of stealing food from our camp. When the natives knew that it was dead, all the people of the village began to wail in the same manner as they do when a person dies, and the owner of the dog smeared himself with mud and mourned bitterly. No doubt the display was somewhat exaggerated in the hope of getting a compensation from us, but at the back of it there was genuine emotion.

Before leaving the subject of the food of the Papuans and their means of obtaining it, a word must be said on the question of cannibalism. It is popularly

supposed that all the natives of New Guinea are cannibals, and fears were expressed by many of our friends that some, if not all, of us would end in a Papuan feast. But we saw no signs of cannibalism, and we have no reason to suppose that it is practised by the people of the Mimika district. Men whom we questioned about it denied it and showed expressions of disgust at the suggestion; but that is not a complete proof of their innocence, for I have known people elsewhere, who were undoubtedly cannibals, deny it in the same manner. The question of cannibalism is always difficult to decide without direct evidence, and in the case of these Papuans the verdict must be one of "Not proven."

The account given in a preceding chapter of the difficulties we experienced in learning the language of the Papuans will serve to explain how it was that we learnt so little about the nature of their social system. The people of Wakatimi were called *Wakatimi-wé* (people of Wakatimi), the people of Obota were *Obota-wé*, and the people of other villages in like manner, but we never heard one word that included them all, nor indeed do we know whether or not they consider themselves all to belong to the same tribe.

In every village that we visited there were one or two or even more men who called themselves *natoo*, a word signifying "chief." But in no case did the *natoo* appear to have any authority over the other people; their houses were no bigger than the rest, and (except in one instance) they had no more personal property than the other members of the community.



A PAPUAN OF MIMIKA WITH CLOSELY PLAITED HAIR.

The exceptional case was a man of unusual intelligence who became our intimate friend and gave us much information for which he was always well rewarded, so that before we left the country his house was filled with tins and bottles, and he was the possessor of axes and knives, yards of cloth and countless beads. In all the ordinary affairs of life the "chiefs" and their families have to work like everybody else, but it is possible that in their wars, of which we saw nothing at all, they may be persons of more consequence.

Generally speaking, one would say that the society of the Mimika Papuans is a group of small families. It cannot by any means be described as a socialistic community; with one exception there is no sign of community of property, but it is rather a case of every man for himself, or (more accurately) of every family for itself. A canoe belongs to the family of the man who made it; the coconut trees, which grow here and there along the lower Mimika, do not belong to the community but to individuals, presumably the men or some of the men who planted them. Sometimes the trees are protected by a fence, a very flimsy structure of three or four sticks, placed across the track which leads to the trees; in other cases a few palm leaves or some pierced shells threaded on a string are tied round the tree itself; both of these devices appear to be enough to ensure the security of the trees. The exception mentioned is seen when game is brought in by the hunters; the meat, as I observed on several occasions, is distributed to every house in the village.

As I have described above (p. 97) the houses in a

village are joined together under a common roof, but each family enters by its own doorway, and, except for the publicity resulting from the lack of dividing walls or partitions, it finds itself in its own private house. It is difficult to say exactly of what the "family-group" consists. There are the man and his wife and the children, and sometimes an extra man or two, and, rarely, an extra woman, who is, I believe, always a second wife of the man of the house; but the position of the extra men and their relationship to the rest of the family I cannot define. At the village of Obota a detached house, rather larger than the rest, was said to be occupied by young men only; we did not see any other instance of this elsewhere.

Families are small, as might be expected from the severity of their conditions of life and the long period of suckling by the mothers, and we did not know definitely of any couple who had more than three living children. Though the women do a large amount of the work of the community they are not mere drudges; they do a great deal of talking, and the men appear to pay considerable respect to their opinion. This was frequently noticeable when we wanted to buy something, such as canoes, from a native; he would say that he must first of all go and consult his wife, and when he returned it often happened that, prompted by his wife, he insisted on a higher payment than he had asked before.

On one occasion only did we see a woman ill-treated, and the performance was a particularly brutal one. Two men and a woman walked down from the village

of Wakatimi to the river bank, dragging another woman, who shrieked and struggled violently. After throwing her into the mud they dragged her into the shallow water and tried to drown her by holding her down under a fishing-net. We shouted at them, and were just going with some soldiers in a canoe across the river to rescue the woman, when they desisted and allowed the poor creature to crawl out on to the bank, where she lay for some time exhausted. Some natives who came over to us shortly afterwards laughed about it and treated the whole affair as a joke.

With regard to the superstitions and beliefs of the Papuans, owing to our unfortunate difficulties with the language we learnt nothing whatever. Religion, in the accepted sense of that term, I am sure they have not. It is true that they make curious carved effigies, but these are not idols, and there is no evidence to show that they ever consult or worship them; on the contrary, they treat them with contempt and often point to them with laughter. These images are ingeniously and skilfully carved out of wood, and they represent a human figure always grotesque and sometimes grossly indecent. They vary in size from a few inches to twelve or fourteen feet, and when they are not neglected they are ornamented with red and white paint.

We had opportunities of observing the outward signs of what were probably superstitions in connection with certain phenomena of the weather. For instance, the first peal of thunder that was heard in the day—it occurred almost every day—was greeted by the men

with a long-drawn tremulous shout. On the occasion of a particularly alarming thunderstorm, when the lightning flashes were almost unceasing, the men came out of doors and with long sticks beat the ground in front of their huts; then they waved the sticks in the air, shouting loudly meanwhile. Curiously enough the rare whistle of a certain bird, which we never identified, was always greeted by the men of Parimau with a shout precisely similar to that with which they greet the thunder.

The first sight of the new moon was signalised by a short sharp bark rather than a shout. Several times on the day following the first sight of the new moon I noticed a spear decorated with white feathers exposed conspicuously in the village, but whether it had any connection with the kalendar I cannot say.

When the first drops of rain of the day began to fall, the men were sometimes seen to snap their fingers four times towards the four quarters of the compass.

A curious ceremony was twice observed at a time of heavy rain, when the Mimika was rising rapidly and threatening to sweep away the village of Parimau. A party of men walked down to the edge of the river, and one of them with a long spear threshed the water, while the others at each stroke shouted, "*Mbu*" (water, flood). Then they went up to the village, and in front of each door they dug a hole, into which they poured a coconut-full of water; again they shouted "*Mbu*," and then filled up the hole with sand.

That they have some belief in the supernatural is certain. We learnt a word *niniki*, which undoubtedly

means ghosts; they described *niniki* as things which you could not see but were here and there in the air about you. When they were asked where a dead man had gone to, they talked of *niniki*, and pointed vaguely to the horizon, saying the word which means "far."

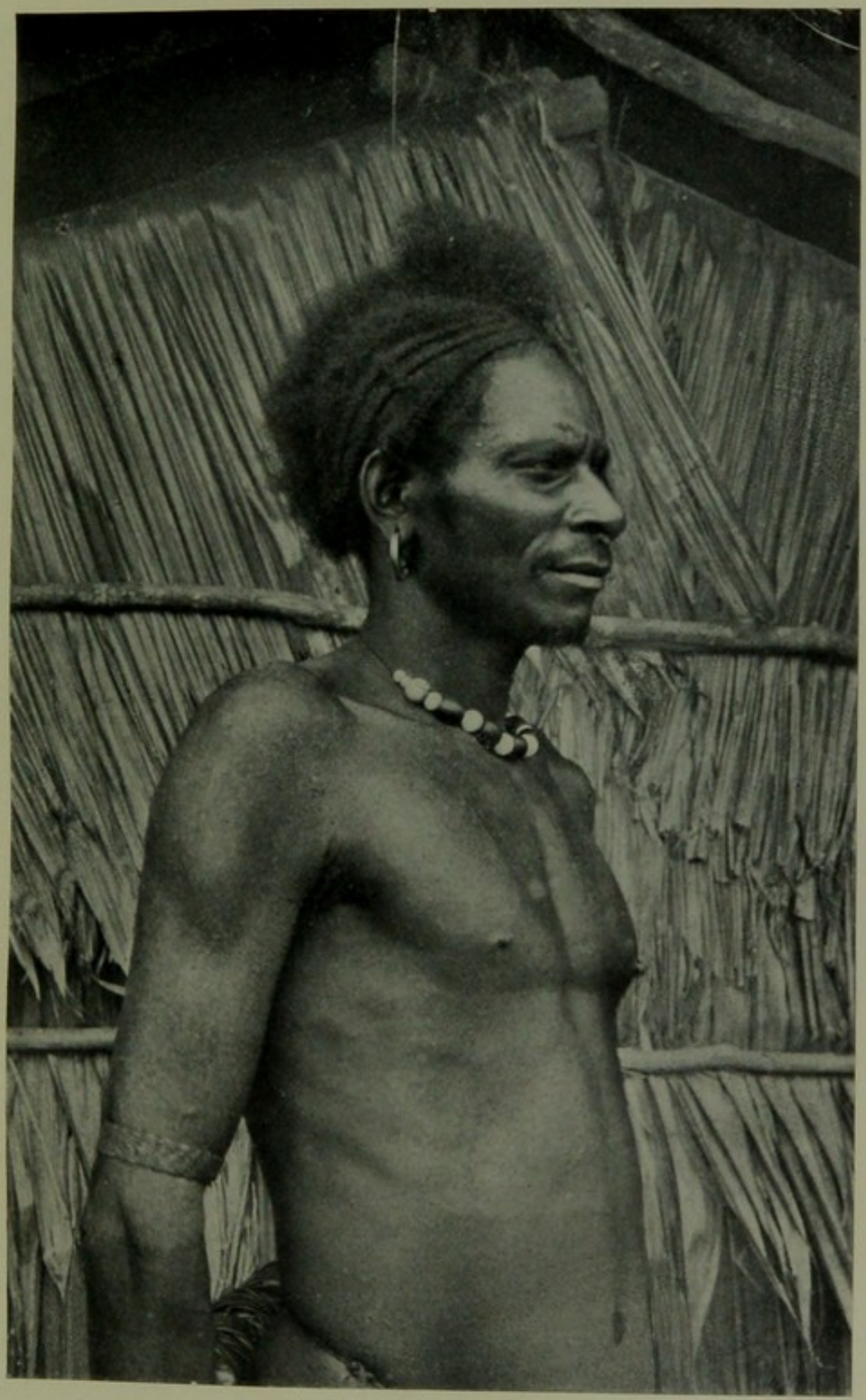
If there is one thing in heaven or earth to which it may be said that the Papuans pay some sort of respect it is the pig. They hunt and kill a good many wild pigs in the jungle and eat their flesh, but the lower jaw of each animal is carefully cleaned and hung up on a sort of rack in front of the houses; on one of these racks I counted no fewer than thirty-two pigs' jaws. The grass and leaves in which the animal is wrapped and the ropes used for tying it up when it is carried home from the jungle, are not thrown away but are hung up on a similar sort of rack in a conspicuous place in the village.

In every village there may generally be seen two or three pigs running about freely; they are probably not bred in the village, but are caught in the jungle, when they are young. They very soon become quite tame and accompany the people on their migrations from one place to another until they are full grown, when they provide food for a festival. The only elaborate popular ceremony that took place while we were in the country happened early in May at Parimau, and the principal feature of it was the slaughter of pigs. Unfortunately for me I was at the base-camp at the time and did not see the festival, so I will make extracts from Marshall's graphic account.*

* *Standard*, 4, 8, 1910.

"Yesterday the natives gave us an excellent show. "For some days previously natives had been arriving "from distant parts until the small village of 40 huts "contained 400 people, and it was evident from the "tomtomming and other signs that something of im- "portance was about to take place. On the night of "the 3rd inst. they lit a big bonfire, and all night long "they were howling and yelling as if to drive away evil "spirits. Soon after daybreak they came over to fetch "us, and, expecting something unusual, I slipped a film "into my cinematograph camera and went over. They "gave me every opportunity of obtaining a good "picture, keeping an open space for me in the best "positions. First of all the women, draped in leaves, "slowly walked down the beach, driving two full- "grown boars in front of them, and then disappeared "in the jungle. About 150 men with faces painted "and heads and spears decorated with feathers, formed "up in three sides of a square, one end of which was "occupied by a band of tomtoms. A slow advance "on the village then commenced, the men shouting "in chorus and the women dancing on the outskirts. "The centre of the square was occupied by single "individuals, who, following each other in quick "succession, gave a warlike display, finally shooting "arrows far over the trees.

"The next scene took place around a large sloping "erection which we soon found was an altar, on which "the two boars were about to be sacrificed. The "women and boars who had disappeared into the "forest now marched from the jungle at the far end of



A PAPUAN OF MIMIKA.

"the village. The boars were seized, and a struggle "with the animals ensued, but the two huge brutes "were bound up with rattan, chalk meanwhile being "rubbed into their eyes, apparently in order to blind "them. The women set up a tremendous wailing, "and appeared on the scene plastered in wet mud from "head to foot. The two boars, on each of which a man "sat astride, were now hoisted up and carried to the "altar, on which the animals were tightly lashed. Then "amid much shouting, tomtomming, and fanatical "displays, the boars were clubbed to death. As soon "as life was extinct, the women cut the carcases free, "and, pulling them to the ground, threw themselves "on the dead bodies, wailing loudly, and plastering "themselves with wet mud in ecstasies of grief. This "continued for some ten minutes, when the men, many "of whom were covered with mud and uttered strange "dirges, picked up the bodies, and the whole assembly "following suit marched into the river, where a much-"needed washing took place. Just previous to this "a three-year-old child, painted red and crying loudly, "had been roughly seized and dragged towards the "dais, and for a moment we thought something more "serious than a boar sacrifice was about to take place. "But we were much relieved to see that it was only "having its ears pierced. The whole performance "lasted about an hour and a half.

"The afternoon was given over to innocent play, "the women and girls—many of them quite pretty— "chasing the men up to the river side and into the "water. This is one of the few ceremonies when the

"women are allowed to beat the men, the latter not "being permitted to retaliate. The damsels finally "became so bold that they stormed the camp."

Of ceremonies connected with birth, if any take place, we saw nothing at all. The only marriage ceremony that took place during our stay in the country has been referred to on a preceding page.

Deaths were unfortunately more frequent, and if they were not accompanied by any elaborate ceremonial they were, at all events, widely advertised, sometimes indeed even before the event itself. A wretched man became very ill at Parimau in August, and it was soon evident that his days were numbered. Members of his family carried him out of the house and laid him in the sunlight for a time, and then took him back into the house again at least half a dozen times a day. Now and again, when he dozed, they set up the dreadful wail that is customary when a person dies, and he had to wake up and assure them of his continued life. At night his hut was crowded with sympathetic watchers, and with the smoke of the fire and much tobacco the atmosphere must have been nearly insupportable. As our own house was distant only about forty yards across the river we could plainly hear his laboured breathing, and when it grew softer they wailed again until the wonder was that he did not die. On the third day they dug a grave for him, but still he lingered on, and it was not until the fifth night, when a tremendous flood came down and swept away the village so that all the people had to take refuge in their canoes, that he died.

When a death occurs the people in the hut at once begin to wail, then the people in the neighbouring huts join in and soon the whole village is wailing. It is a very peculiar and very striking chorus. Each individual wails on one note, and as there are perhaps five notes ranging from a very high pitch to a deep murmured bass being sung at once, the effect is most mournful. The occasional beat of a drum adds not a little to the general effect of lamentation. It must be admitted, however, that the wailing is not always a musical performance. Sometimes the mourning man behaves in the way that a child does when it is described as "roaring"; he puckers up his face in the most extraordinary contortions, "roars" at the top of his voice with occasional heart-breaking sobs, while the tears course down his face, and the complete picture is ludicrous in the extreme.

The disposal of the dead nearly always takes place just before dawn, but the method of it is not always the same. The most common practice is to bury the body in a shallow grave dug in the nearest convenient spot, sometimes within a few yards of the huts. The body is wrapped in mats and laid flat in the grave, which is then filled up, and its place is perhaps marked by a stick, but in a day or two it is forgotten and people trample on it without heed.

We observed one instance of a more elaborate kind of burial. The corpse, wrapped in leaves and mats, was taken out into the jungle and placed on a platform about four feet high, which had been put up for the purpose. After placing the body on the platform the

men who had carried it walked down to the river, shouted once in unison, and then, having received an answering shout from the men in the village, one of them threw a small triangular piece of wood out into the stream. In the meantime the family of the dead man disappeared into the jungle, from which they soon emerged quite naked, plastered all over with mud and decorated with wisps of climbing plants. The next two days were spent in digging a grave and making a coffin shaped like a small canoe; this however was found to be too small and was not used. On the third day the body was placed in the grave, and an ornamental post placed in the ground at each end, but contrary to our hopes (for the state of that man was becoming very offensive) they did not fill in the grave. They merely covered the body with leaves and turned it over every day. At intervals the widow, quite naked, save for a plastering of mud, crawled on hands and knees from her hut, which was less than five yards distant, and visited the grave. In a few days a providential flood came and filled up the grave and put an end to what had become for us an almost intolerable nuisance.

Both at Wakatimi and at Parimau our camp commanded a good view of the native village, and a death always provided us with the mild excitement of wondering in what new way they would celebrate the event. On one occasion when a woman died, the bereaved husband and another man walked slowly down to the river and waded out into about three feet of water. There the widower submitted to being washed all over by the other man and finally to being held under water by

DISPOSAL OF THE DEAD. A COFFIN ON TRESTLES.

him for half a minute or more, after which they walked solemnly back to the village.

Early in the morning of the day after the death of the *natoo* of Wakatimi all the women and girls of the village, to the number of sixty or seventy, came down to the river, all of them without a vestige of clothing, and in the shallow water a foot or two deep they swam and crawled and wriggled up the river for a hundred yards or more, wailing loudly all the time. Sometimes they came out on to the bank and rolled in the mud, and finally they all went out of the water and stood wailing in front of the dead man's house.

Another method of disposing of the dead, which is very frequently adopted, is to place the body wrapped in mats in a rude coffin, which is usually constructed from pieces of broken canoes. The coffin containing the body is supported on a trestle of crossed sticks about four feet from the ground (see illustration opposite), and there it remains until decomposition is complete. As these coffins are often placed within a yard or two of the houses, it can be imagined that a Papuan village is not always a pleasant place to visit.

At the village of Nimé we saw two or three pathetic little bundles containing the remains of infants exposed on racks within a few feet of the houses, from which they doubtless came.

When decomposition is complete no account is taken of the bones, excepting the skull, which is taken and preserved in the house. Sometimes it is buried in the sand of the floor of the house, and sometimes it is tied up in a sort of open basket-work of rattan and hung

up in the roof, where it becomes brown with smoke and polished by frequent handling.

Though the people take the trouble to bring the skulls into their houses, they show no real respect for them, and they are eager enough to part with them if a chance occurs. Two of us went one day to Obota, a village a few miles from Wakatimi, in the hopes of buying some bananas. In one of the huts we saw a skull and offered to buy it, not at all expecting that the owner would be willing to sell, but the offer of (I think) a piece of cloth was gladly accepted and the skull was ours. In a few minutes, when it became known that we had given good cloth for a common skull, everybody was anxious to sell his family remains, and outside every doorway were placed one or two or even three grinning skulls. They do not treat the skulls very carefully, and a good many were damaged, so we only bought about half a dozen that were perfect.

One day a man walked into our camp at Wakatimi carrying a skull under his arm. He stood outside our house for some time, grinning and saying nothing, then he gave us unmistakably to understand that it was the skull of his wife, who, as we knew for a fact, had only died a short time previously. The skull was indeed so fresh that we declined the offer.

CHAPTER XI

Papuans' Love of Music—Their Concerts—A Dancing House—Carving—Papuans as Artists—Cat's Cradle—Village Squabbles—The Part of the Women—Wooden and Stone Clubs—Shell Knives and Stone Axes—Bows and Arrows—Papuan Marksmen—Spears—A most Primitive People—Disease—Prospects of their Civilisation.

THE most pleasing characteristic of the Papuans is their love of music. When a number of them are gathered together and when they have eaten well, or are for any other reason happy, they have a concert. Sometimes the concerts take place in the afternoon and continue till nightfall, but more often they begin after dark and go on almost through the night. The orchestra is simple and consists of two or three men who beat drums and sit before a small fire in the middle. Round them are grouped the chorus all sitting on the ground. The drums are hollowed cylinders of wood, which are often elaborately carved; one end is open, the other is closed by a piece of lizard's or snake's skin (see illustration p. 142). When this skin becomes slack, as it very quickly does, the drummer holds it towards the fire until it regains its pitch. It is not the custom to tune up both drums, when there are more than one, to the same pitch, usually an interval of about half a tone is left between them. The leader of the orchestra sometimes wears a remarkable head-dress made of plaited fibre and ornamented with bunches of plumes of the Bird of Paradise

(see illustration p. 78). The effect of these plumes waving backwards and forwards as the man moves his head to mark the phrases of the song is exceedingly striking, and it must be admitted that if there is anybody, who can becomingly wear those gorgeous plumes, it is the naked black man.

The most usual kind of song begins with a slow tapping of the drums, then these are beaten quicker and the singer (one of the drummers) begins a sort of recitative song, to which the chorus contributes a low humming accompaniment. Then the drums are beaten very loudly and rapidly, all the men in chorus sing, or rather growl, a deep guttural note, followed by a prolonged musical note at about the middle of the register of a normal man's voice, and the song ends with one or more short sharp barks, "Wah! wah! wah!" with a loud drum accompaniment. The song, or probably different verses of it, is repeated very many times. The final shouts of the song, which for want of a better word I have called "barks," are uttered by all the men in unison and recall, as was pointed out by Mr. Goodfellow, the harsh croaking call of the Greater Bird of Paradise, which is heard almost daily in the jungle. It is possible that the song is in some way connected with the bird and that there is an intentional imitation of its note.

The scheme of all these songs is the same, viz., a recitative with drums and a humming accompaniment, but some of them have really rollicking choruses, and we used to listen to them at night with extreme pleasure as they came, somewhat softened by distance, over the water to our camp at Wakatimi. The voices of the men

1

2

3

4

5

6

7

1. Stone Axe.
2. 3. 4. Head-rests for sleeping.
5. 6. 7. Drums.

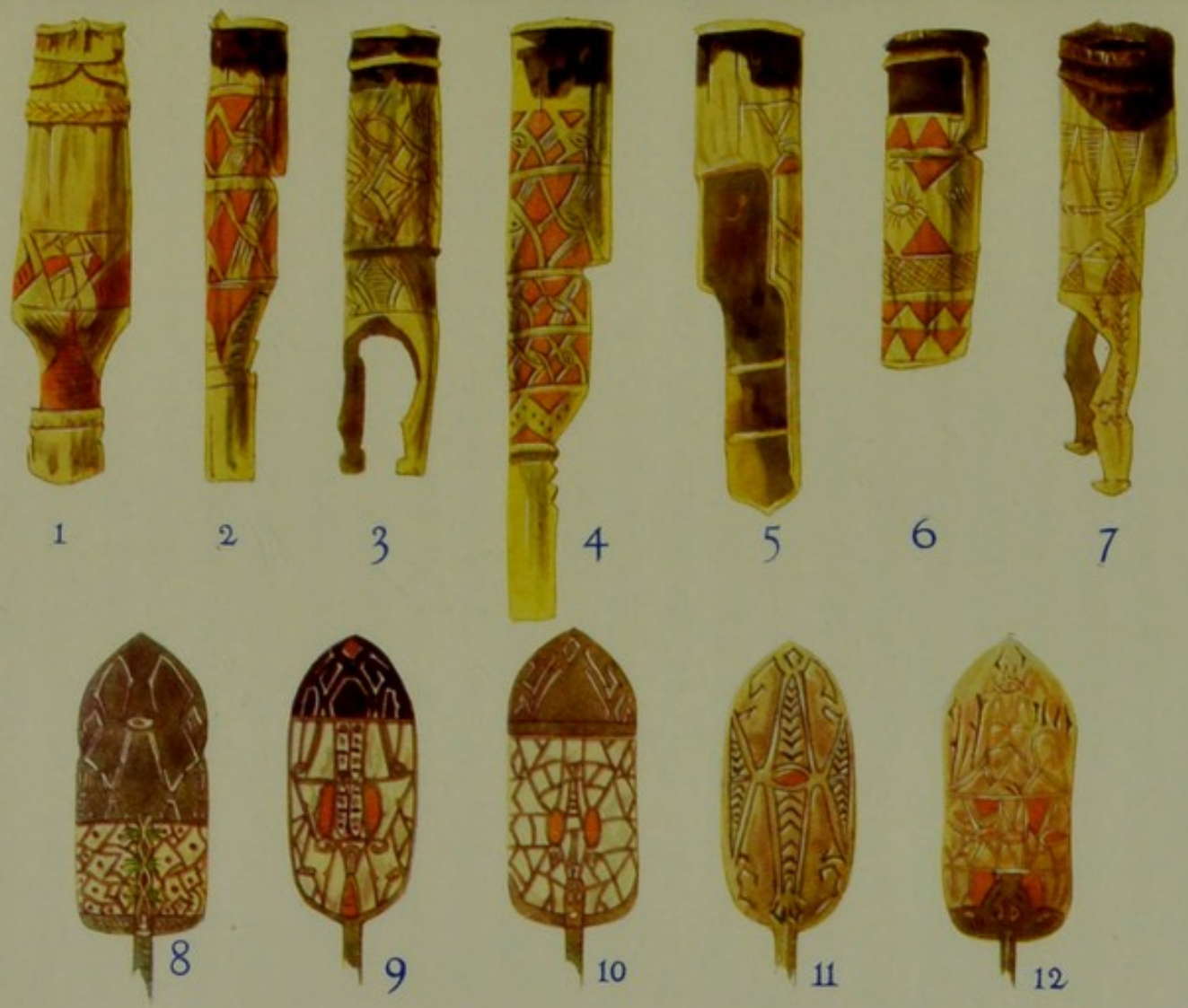
are often rich, and they have a true musical ear. Their intervals are very similar to ours and not at all like those of the Malays and many other Eastern singers, who recognize perhaps five notes where we have only two. Beside the drum the only instrument of music they have is a straight trumpet made from a short piece of bamboo. This produces only a single booming note and is not used at the concerts.

As an amusement of the Papuans even more important than singing is dancing, of which they often talked, but though we saw some of their dancing halls (see illustration p. 48), we never had the good fortune to witness a performance. At the coast village of Nimé, a few miles to the East of the Mimika River, there was a very elaborate dancing house, which must have cost an immense amount of labour to build. The length of the house from front to back was about 100 feet, the width about 25 feet, and it rested on poles which were about 8 feet high in front, rising up to about 14 feet high at the back. The side walls and the back were of "atap" as was also the roof, which sloped from a long ridge-pole running the whole length of the house. The ridge-pole was remarkable as being made from a single tree trunk (*Casuarina*) shaved down very smoothly to a uniform thickness of about 10 inches; the ends of it, which projected about 8 feet both at the front and back of the house, were carved in very lifelike representations of the head of a crocodile and were painted red. The weight of the beam must have been immense and one wondered how it had been hoisted into position. Between the ridge of the roof and the eaves there projected

both in front and at the back six other smaller poles grotesquely carved to represent fish and reptiles and hideous human heads. The front of the house was open, and when you had climbed up the supporting poles and had stepped over a low fence you found yourself in a spacious hall with a floor well made of sheets of bark, which sloped up gradually from front to back. Along either side at regular intervals on the floor were sand fireplaces and above these were wooden racks, from which it was evident that something was hung to be cooked. Round the walls on all sides was a strip of carved and painted wood, and exactly in the middle of the hall, fixed to the floor and the roof were two posts about 3 feet apart and tied between them, at about half the height of a man, was an elaborately carved and painted board about twelve inches wide. In the middle of this board was carved the eye, which is a familiar feature of the ornamental carving on the canoes and drums, and it appeared that this eye is the centre of the ceremonies which take place in the house.

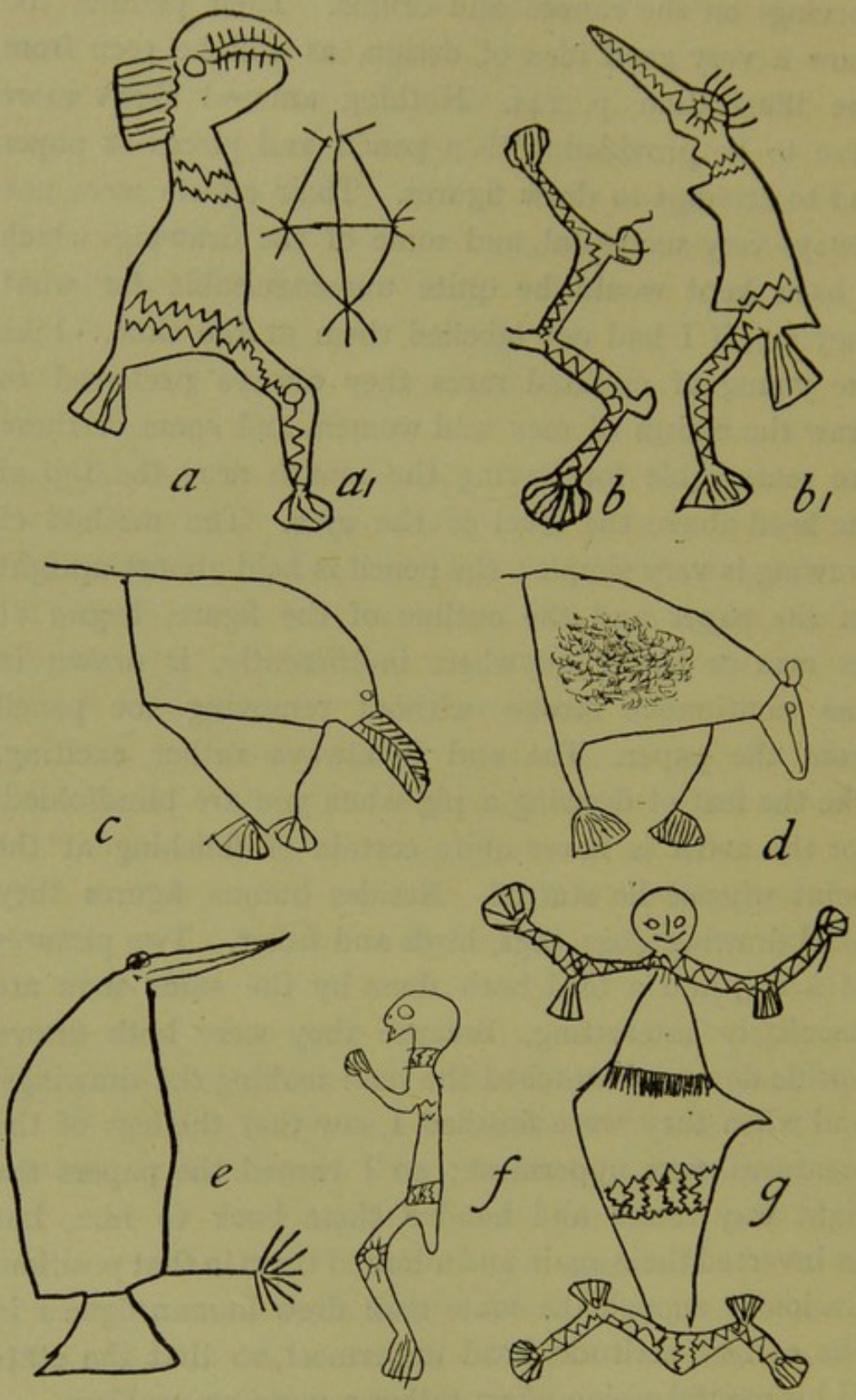
So far as I could understand from the description of the natives who accompanied me in my visit to the house, the people, both men and women, who take part in the ceremony, dance slowly upwards from the front of the house singing as they go, and when they reach the carved board each one in turn touches the eye, while all the people shout together. But what the object of the whole performance is and what the people cook and eat, are questions to which I was unable to find an answer.

I have had occasion above to mention the artistic



1-7. Bamboo Penis-cases. 8-12. Carved Blades of Paddles.

carvings on the canoes and drums. Their paddles too show a very good idea of design, as will be seen from the illustration p. 144. Nothing amused them more than to be provided with a pencil and pieces of paper and to attempt to draw figures. Their efforts were not always very successful, and some of the drawings which I have kept would be quite unrecognisable for what they are, if I had not labelled them at the time. Like the young of civilised races they always preferred to draw the figures of men and women, and some of these are remarkable for having the mouth near the top of the head above the level of the eyes. The method of drawing is very simple; the pencil is held almost upright on the paper and the outline of the figure, begun at an arm or leg or anywhere indifferently, is drawn in one continuous stroke without removing the pencil from the paper. The end is always rather exciting, like the feat of drawing a pig when you are blindfolded, for the artist is never quite certain of finishing at the point whence he started. Besides human figures they liked drawing dogs, pigs, birds and fishes. Two pictures of a dog and a bird both done by the same man are peculiarly interesting, because they were both drawn upside down. I watched the man making the drawings, and when they were finished I saw that the legs of the creatures were uppermost; so I turned the papers the right way round and handed them back to him, but he inverted them again and admired them in that position. Curiously enough the same man drew human figures in the correct attitude, head uppermost, so that the state of his mental vision offers rather a puzzling problem.



a. Cockatoo. *a*, *b*, Designs for scarification. *b*. Hornbill.
c. Pig. *d*. Dog. *e*. Bird. *f*. Man. *g*. Woman.

Most of them had a keen appreciation of pictures and they were surprisingly quick in identifying photographs of themselves; in this respect they showed a good deal more intelligence than some of our Gurkhas, who held a photograph sideways or upside down and gazed at it blankly, as if they had not the faintest idea of what it portrayed. The illustrated papers were a source of endless delight to them, and the portraits of beautiful ladies, who they felt sure were our wives, were greatly admired. Horses, sheep, cattle and all other animals were declared to be dogs.

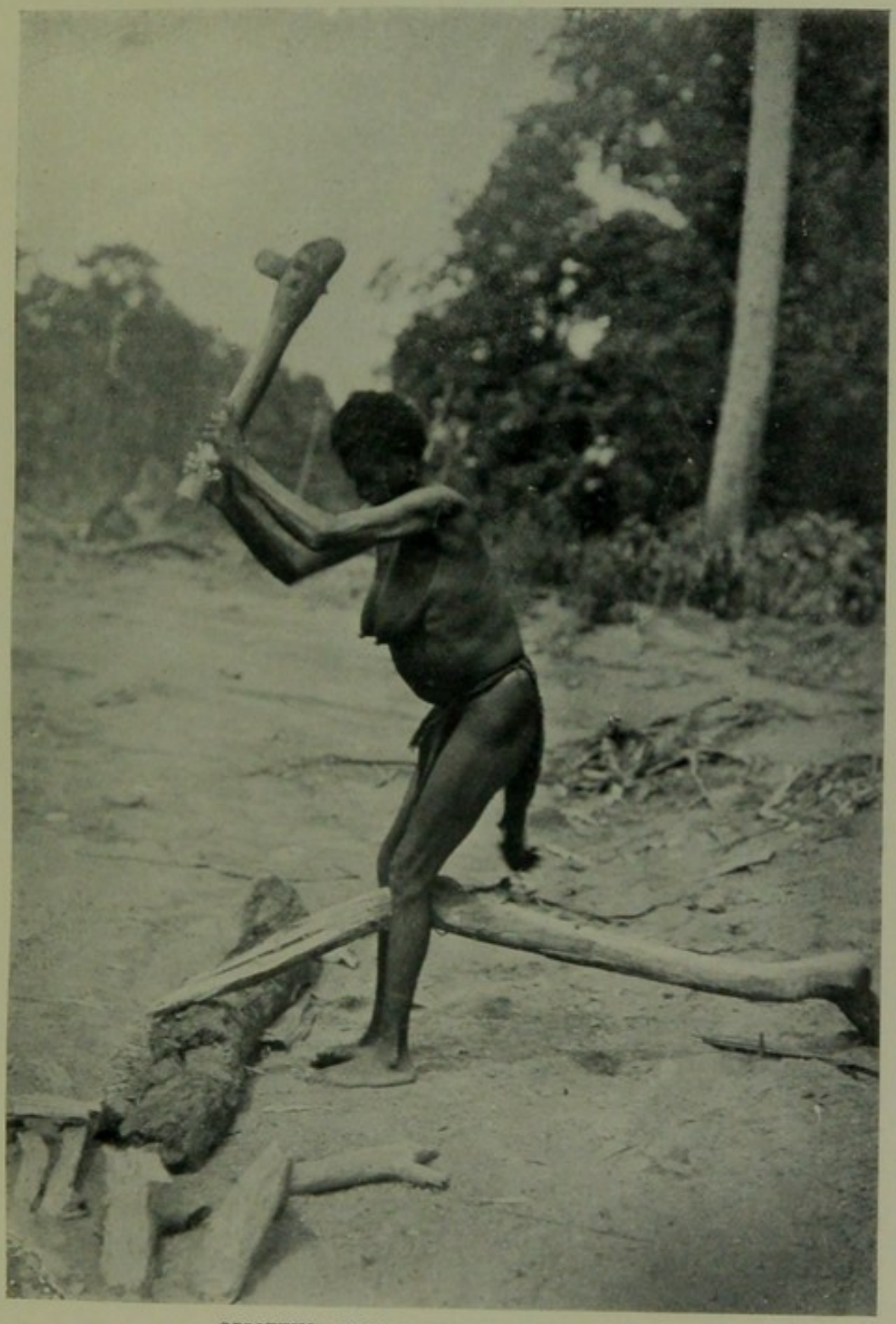
Another amusement—it can hardly be called an art—of the Papuans is the game of cat's cradle, at which many of them are extraordinarily proficient. It is not, as with us, a game played by two persons; with them the part of the second person is performed by the player's teeth, and he contrives to produce some wonderfully intricate figures, none of which, I regret to say, we had patience or skill enough to learn. The most elaborate figure I saw was supposed to represent a bird, and when the features of it had been pointed out some resemblance was certainly apparent.

But it must be admitted that their amusements are not always so innocent as drawing pictures and playing cat's cradle. I have referred above to the gang of drunkards, who used to create such turmoil at Wakatimi. The people of Parimau, who had no means of getting intoxicated, were just as quarrelsome as the Wakatimi people, and fights were of frequent, almost daily occurrence. Some one does something, it matters not what, to offend some other person, and in an instant

the village is in an uproar. Spears fly through the air—we never saw anybody touched by one—and stone clubs are brandished furiously, the combatants all shout horrible threats at the tops of their voices, while a few people look on stolidly or hardly take any notice at all. There seems to be a certain etiquette about the use of clubs, for the person about to be hit generally presents a soft part of his person, the back or shoulders, to the clubber, and we never saw a man intentionally hit another on the head, a blow which might easily be fatal; but blood flowed in plenty from the flesh wounds.

The part of the women in these village squabbles is always to scream loudly and generally to begin by banging the houses with sticks or spears and to end with pulling them to pieces. In a fight at Wakatimi we saw a party of infuriated women absolutely demolish three or four houses. The fights end almost as suddenly as they begin and in a short time the village settles down to its usual tranquillity. Neither the sight nor the sound of these village quarrels is very agreeable, but they have no regularly organised games and, at the worst, not a very great amount of damage is done.

The clubs used in these village fights and doubtless also in their tribal wars—but of those we know nothing—are of two kinds, wooden and stone-headed. The wooden clubs are about four feet long and consist of a plain shaft, of which the last foot or rather more is carved into a saw-like cutting edge; some of these are made of a very heavy wood and they are exceedingly formidable weapons. A more simple type of wooden club is a plain wooden shaft rather thinner at the handle end than at



SPLITTING WOOD WITH A STONE AXE.

the other, round which is fixed a piece of shark's skin or the prickly skin from the back of the Sting Ray and often with it is tied the saw of a small Saw fish; such a club appears to be capable of inflicting a very nasty wound.

There is a great variety of stone-headed clubs, but they are all alike in being furnished with a wooden shaft, which is usually a plain piece of wood, but occasionally carved near the club end. The stone head is pierced in the middle by a round hole about an inch in diameter, through which the shaft is passed and fixed firmly by wedges. Most of the heads are made of a rather soft limestone, but where the people obtain it we do not know, for there is no stone of any kind near the coast. The simplest type is merely a round water-worn pebble with a hole bored through it. More commonly they are worked and the labour of producing them must have been considerable. Some are flat discs with sharp cutting edges or blunt and roughly milled edges, and some are cut into the form of five or six or more pointed stars; rarely they are triangular. Others again are round or oval and are cut into more or less deep teeth, or they have small bosses left projecting here and there, but no two of them are exactly alike. The weight of the club head is usually two or three pounds. The most savage-looking club we saw was simply a rough lump of coral, not trimmed in any way. It was pierced and mounted on a finely carved shaft of extremely heavy wood, and the whole thing must have weighed fifteen or twenty pounds.

Not a little credit is due to the Papuans for their

industry in making these elaborate weapons, for it must be remembered that until we visited the country they had no metal tools whatever, with the exception of two or three scraps of soft iron, and all their work was done with shell knives and stone axes. The knives are simply the shells of a common freshwater bivalve (*Cyrena* sp.); when these are rubbed down on a stone, they take on an exceedingly sharp edge and are used by the natives for carving the canoes and drums and sharpening their spears and arrows.

The stone axes used in the Mimika district are all of the same type, though they vary greatly in size from about four inches to large ones of nearly twelve inches in length. The stone of which they are made is always the same, a quartzite. The shaft is about two feet long and is invariably made of the butt end of a bamboo. A hole is bored and burnt in the lower end of the bamboo, that is to say in the solid part of the wood below the first joint, and the pointed end of the stone is jammed into the hole. The stone is always fixed axe-fashion, *i.e.* with its broad surface and cutting edge in the same plane with the long axis of the handle, and not adze-fashion, as is the custom in some other parts of New Guinea (see illustration p. 142). The axes quickly become blunt with use and they are sharpened by being rubbed upon another stone. At Wakatimi stones are very rare and one man appeared to be the stone-smith of the village. I remember seeing him one day sitting outside his hut sharpening an axe, with three or four others lying beside him waiting to be done, while a few yards away a woman was splitting a log of wood with a stone axe. It struck

1. Bow.
2. 7. Wooden fish spears.
3. Plain Wood-pointed Arrow.
4. Notched Wood-pointed Arrow.
5. Arrow tipped with Cassowary claw.
6. Bamboo-pointed Arrow.
8. Hunting Spear, pointed with sharp bone.
9. 10. Wooden Spear used at ceremonies.

me as being one of the most primitive scenes I had ever witnessed, really a glimpse of the Stone Age.

The bows of the Mimika natives are about five feet long and are made of a simple straight piece of a very hard wood (usually a species of *pandanus*), tapering towards the ends, which are sometimes ornamented with the claw of a cassowary or a tuft of feathers and shells or the claw of a crab. The "string" is a piece of rattan and it requires a strong arm to bend the bow. The arrows are of various types (see illustration p. 150); they are all made of reed stems, and none are ever feathered nor have they nocks. They vary only in their points, which are sometimes merely the sharpened end of the reeds themselves and sometimes a plain sharpened tip of hard wood or bamboo. Some are tipped with the sharpened claw of a cassowary or with the spine that lies along the back of the Sting Ray, and the arrows used for shooting fish have often three points of sharp bamboo.

Most people have the idea that the savage man performs prodigies of skill with his bow and arrows, but whenever I saw the Papuans shooting, they made astonishingly bad practice. I remember seeing two Papuans trying to kill an iguana in a tree not more than twenty feet above the ground; they shot arrow after arrow at it, but the creature, which was as long and almost as thick as a man's arm, climbed slowly up from branch to branch until it was lost to view.

The hunting spears are of two kinds, a plain straight shaft of heavy wood, very sharp and hardened by fire at the tip; and a straight shaft of a lighter wood, to the end of which is fixed part of a straight bone (generally the

tibia) of a pig, sharpened to a fine point. There is another kind of spear made of a soft wood, finely pointed and with a wide blade carved in a sort of open-work fashion (see illustration p. 150); the blade and the point are painted red with clay and the shaft is generally decorated with feathers or plaited fibre. Spears of this sort are of no use in hunting but are employed at dances and other ceremonial functions.

Two more pieces of furniture, the head-rest and the sago bowl, complete the list of articles made by the Papuans. The head-rests, which were seen only in the villages of Obota and Nimé, are made of a strip of elaborately carved wood four or five inches wide and between two and three feet in length, and are supported at each end by a stout wooden prop, which raises the head-rest about four inches above the ground. The longer head-rests are supposed to support the heads of two sleeping persons.

Fire is nearly always taken by the Papuans wherever they go; in almost every canoe a fire is kept burning, and when they travel through the jungle the men carry a smouldering stick. There must be occasions when all these fires are extinguished, but how they produce them we were unable to learn; the Papuans of Parimau could not make fire with the friction stick and rattan used by their neighbours, the Tapiro Pygmies.

From the description of them which has been given in this and the two preceding chapters it will be seen that the conditions of life of the Papuans are as primitive as those of any people now living in the world. There are very few other places, where you can find a people who

neither make nor possess any metal and who have no knowledge of pottery. The only vessels that they have for holding water are scraped-out coconuts and simple pieces of bamboo. Water boiling they had never seen before we came among them. Their implements and weapons are, as I have shown, of the most primitive kind, and their ornaments are of the rudest possible description.

Cultivation of the soil is only practised by the people of one or two villages, and even then it produces but a very small proportion of their food, so it follows that most of their time and energies are devoted to procuring the necessaries of life.

The struggle for existence is keen enough, the birth-rate is low and the rate of infant mortality is, I believe, very high. Nor do diseases spare them; syphilis is exceedingly prevalent, and was probably introduced by Chinese and Malay traders to the West end of the island, whence it has spread along the coast. Tuberculosis is happily absent, but two natives of Wakatimi were suffering from what appeared to be certainly leprosy. Skin diseases, notably *tinea imbricata*, are very common; and almost every person appears to suffer occasionally from fever of one sort or another.

But in spite of all these drawbacks the Papuans of the Mimika are not such a very miserable people. They are strong, those of them that survive the ordeals of infancy and sickness; they have food in plenty to eat, if they choose to exert themselves sufficiently to obtain it; they have their amusements, songs and dances; and the manner of their lives is suited to the conditions of the country

in which they live. It is this last consideration which ought ultimately to determine their fate: they live in a wretchedly poor country which is constantly liable to devastating floods, and their habit of wandering from one place to another, where food may be obtained, is the only way of life suitable to the physical and climatic conditions of the country.

Any attempt to "civilise" them must inevitably destroy their primitive independence, and if it succeeded in establishing the people in settled communities it would reduce them at many seasons to absolute starvation. We were visited once by the Director of the Sacred Heart Mission at Toeal, which has done admirable work amongst the natives of the Ké Islands and at one or two places in New Guinea itself. When he had seen the people and the nature of the country and had been told something of their habits, he decided that the Mimika was not, at present at all events, a proper field for missionary enterprise. Setting aside all other considerations, one dares to hope that such an interesting people may for a long time be left undisturbed; they do no harm to their neighbours and the effects on them of civilising influences would be at the best uncertain.

CHAPTER XII

The Camp at Parimau—A Plague of Beetles—First Discovery of the Tapiro Pygmies—Papuans as Carriers—We visit the Clearing of the Tapiro—Remarkable Clothing of Tapiro—Our Relations with the Natives—System of Payment—Their Confidence in Us—Occasional Thefts—A Customary Peace-offering—Papuans as Naturalists.

WHILE it was the business of some of us during the early months of the expedition to stop at the base-camp and despatch canoes laden with stores up the river, others remained at Parimau to establish there a second permanent camp and to find, if possible, a way of approaching the higher mountains. It should be said that Parimau is some distance from the mountains—the high point nearest to it, Mount Tapiro (7660 ft.) is some twelve miles to the North, but it was no longer possible to travel in the direction of the mountains by way of the Mimika River, which had dwindled to a very small size at Parimau, therefore it was necessary to find a new route from there onward.

The first camp at Parimau was made on the shallow sandy side of the river close to the native village; the Papuans generally place their villages on gently sloping rather than on steep banks for convenience in hauling up their canoes. The coolies, such as there were of them, were occupied on the river, the natives for the

first few months were of little or no assistance in building, and the work was done almost entirely by half a dozen of the Gurkhas. Their greatest achievement was the construction of a log-house in the best Himalayan style, probably by far the solidest building that was ever put up in Dutch New Guinea. The floor was raised about three feet above the ground and it was well that the workmanship was good, for it had not been finished many weeks before a flood swept over the camp and everyone took refuge in the house, the floor of which was just awash. Afterwards the camp was moved to the high bank across the river and the subsequent floods swamped the house and carried it away piecemeal, but two of the uprights survived and were still standing a year later.

We were a good deal annoyed at Parimau by the *larvæ* of a small red and black beetle, which infested the wood of which the frames of our huts were made. These *larvæ*, which look like small hairy caterpillars, were continually dropping from the roof and when they were killed, or even touched, they emitted the most disagreeable musky smell. They sometimes dropped upon you during the night and the smell of them would wake you from your sleep. The beetle itself too, if crushed or irritated, has the same disgusting peculiarity.

It has been mentioned above (Chapter V.) that Captain Rawling in exploring to the N.W. of Parimau came to the big river Kapare, which we unsuccessfully tried to navigate in canoes from below to the point where he had met it. While he was walking up the river bed one day, the Papuans who were with him

caught after an exciting chase two small men, whose build and dress and appearance proclaimed them to belong to another race than the Papuan. A day or two later two more were captured, while they were crossing the river; they were kindly treated and presents were given to them, but they showed no inclination to conduct strangers to their home, a large clearing in the jungle on the hill side, which could be plainly seen from the Kapare River. We learnt from the Papuans that these little people were called Tapiro.*

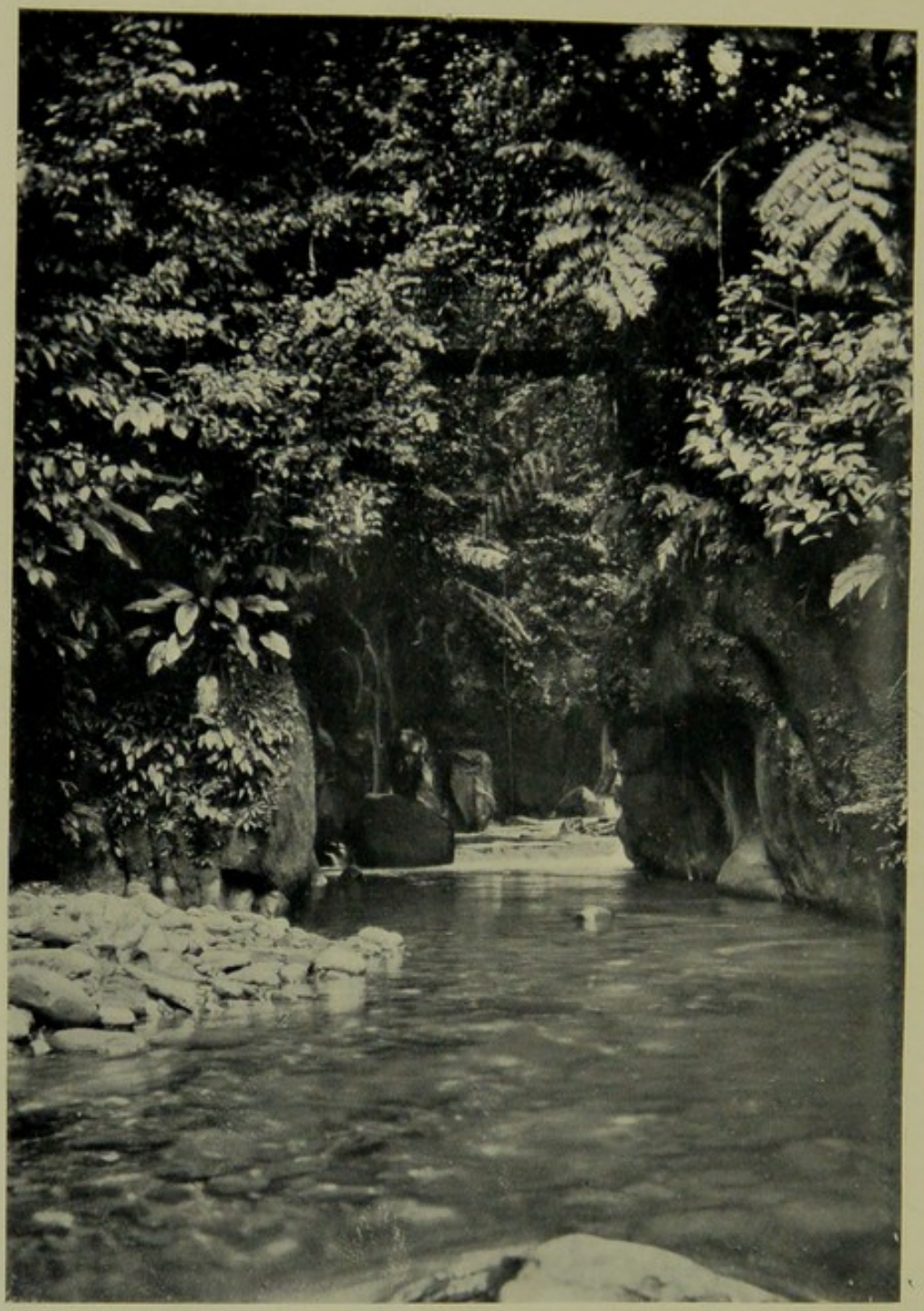
At the beginning of March I accompanied one of the food-transports up the Mimika and went with Rawling out to the Kapare, where he had made a camp and was occupied with some of the Gurkhas in cutting a track through the jungle. By that time we had no coolies available for land transport; in six weeks our fifty coolies had diminished to ten, who were all wanted for the canoes, so we were entirely dependent on native assistance for land journeys. There was not much difficulty in persuading people to carry loads for us from Parimau to the nearest point of the Kapare River, for they were accustomed to go over there to fish. But it was a different business on the second day, when we wanted to push the camp a few miles further up the river so as to be in a better position for reaching the clearing of the Tapiro. At first they resolutely refused to start at all and retired to the shelters they had made at a little distance from the camp. From there they had to be led back by the hand one by one and then be severally introduced to their loads, but even so a number

* The accent is placed on the first syllable—Tápĭro.

of them ran away again, and it was hours before we moved from the camp.

When once they were started they went steadily enough for about a mile and then they all put down their loads and refused to go on, but as they had stopped in the middle of the bed of the river it was impossible to remain there, so with promises of cloth and beads we urged them on a little further. The same performance was repeated a dozen times at intervals, which became shorter and shorter until our coaxing and cajoling availed no longer and there was nothing for it but to stop and make a camp. It had taken us more than four hours to cover less than three miles, most of which was easy going over sand and stones in the bed of the river. We should have been awkwardly situated if they had all gone away and left us to carry the loads, as they did a few weeks later to Marshall, who was deserted by them and forced to leave some of his baggage behind him. Needless to say, these misfortunes would not have occurred if our Malay coolies had been suited to their work. As it was, there were considerable periods when we had either to make use of what help the natives consented to give us, or else be content to do nothing at all.

When it suits them to do so, the Mimika Papuans can carry very heavy loads and they manage to cover the ground at a very respectable pace. They wrap up the load in the mat made of *pandanus* leaves, which every man always carries with him to serve both as a sleeping mat and as a shelter from the rain. The mat is securely tied by ropes of rattan or any of the other innumerable creepers of the jungle, and two strong loops



A TRIBUTARY STREAM OF THE KAPARE RIVER.

are made to pass over the shoulders so that the load may be carried on the back, ruck-sack fashion. The women carry loads as well as the men and sometimes also the children, when the whole family is making a journey.

From our upper camp on the Kapare River Rawling and I made two attempts to reach the forest clearing of the Tapiro, which could be easily seen from the camp at a distance of about three miles in a straight line; but though careful bearings of its direction were taken, it turned out to be a most puzzling place to reach. Not more than a mile above the camp the Kapare emerges from a deep and narrow gorge in the foot hills—or rather the spurs of the mountains, they are too steep to call foot hills—which descend very abruptly to the almost level country below. Just after it emerges from the gorge, the river is joined by a stream of the clearest water I have ever seen, which we afterwards came to call the White Water (see illustration opposite).

In our first attempt to reach the clearing we wandered in the jungle for ten hours and came nowhere near to it. But the day was not altogether wasted, for we climbed up the hillside to about fifteen hundred feet and by cutting down some trees we obtained a wonderful view across the plain of the jungle to the distant sea. The air of the jungle was heavy with the scent of the wild Vanilla, and all around us were calling (but we could not see them) Greater Birds of Paradise; sometimes we were within sound of as many as six at one time. On that day too I first saw the Rifle Bird (*Ptilorhis intercedens*), one of the most beautiful though the least gaudy of the

birds of Paradise, whose long-drawn whistle can never be mistaken or forgotten.

In our second attempt we profited by some of the mistakes made on the former, but even so the irregularity of the ground and the complexity of the watercourses nearly succeeded in baffling us. "Rawling and I left "camp early with two Gurkhas. A mile and a half up "the left bank of the river we struck off N.E. from the "path we followed the other day. Cut a new path "through the jungle for about a mile until we came to a "faint native track, which we followed for another mile "or so, chiefly along fallen tree trunks overhung by a "network of rattan and other creepers, a fearful struggle "to get through. Then for a mile or more up the bed "of a stony stream encumbered with the same obstruc-"tions, dead trees and rattans, until we came to a deep "gorge with a torrent about three hundred feet below "us and on the opposite side the steep slope of another "great spur of the mountain, on which the clearing "presumably lay. We slithered and scrambled down to "the river, which was full of water and only just fordable. "Then up the other slope, not knowing at all accurately "the direction of the clearing. Very steep and the jungle "very dense with rattan and tree-ferns, so the leading "Gurkha was kept busily occupied in cutting with his "*kukri* and progress was slow.

"About one o'clock, when we had been going for "nearly six hours, the clouds came down and it began to "rain and we were ready to turn back. Luckily the "Gurkhas were convinced that the clearing was not far "ahead and when we found a pig-trap, a noose of rattan

"set in a faint track, it seemed that they might perhaps
"be right. So we went on and in a few minutes we came
"out of the forest into the clearing. About thirty yards
"from us was a hut with three men standing outside it.
"We called out to them and they waited until we came
"up. A minute or two later two more men came out
"from the forest behind us, no doubt they had been
"following us unseen. The hut was a most primitive
"structure of sticks roofed with leaves, leaning up
"against the hillside. There was a fire in the hut and
"beside it was sitting an old man covered with most
"horrible sores. We went on up the hill for a couple of
"hundred yards to a place (about 1900 feet above the
"sea) where we had a fine view. Rawling put up the
"plane-table and got angles on to several points for the
"map.

"During the hour or more that we stayed there, eight
"men came to see us. Excepting one rather masterful
"little man, who had no fear of us, they were too shy to
"approach us closely and remained about ten yards
"distant, but even so it was plainly evident from their
"small stature alone, that they were of a different race
"from the people of the low country.

"The most remarkable thing about them is the case
"that each man wears, his only article of clothing; it is
"made of a long yellow gourd, about two inches in
"diameter at the base and tapering to about half an inch
"at the pointed end. It is worn with the pointed end
"upwards and is kept in position by a string round the
"waist. As the length of the case—some of them
"measure more than fifteen inches—is more than a

"quarter of the height of the man himself, it gives him "a most extraordinary appearance. Every man carries "a bow and arrows in his hand and a plaited fibre bag of "quite elaborate design slung on his back. Two men "wore necklaces of very rough scraps of shell and one "had a strip of fur round his head. Two others wore on "their heads curious helmet-like hats of grass ornamented "with feathers.

"One man had a diminutive axe made of a piece of "soft iron about three inches long, set in a handle like "those of the stone axes. They must have some bigger "axes, as they have cut down some very large trees and "the marks on the stumps look as if they had been made "with fairly sharp instruments. The clearing altogether "is very considerable, probably fifty acres or more. "The ground is covered with the sweet-potato plant, and "in many places 'taro' has been carefully picked out. "They have a few coarse-looking bananas, some of which "they offered to us.

"Their voices are rather high-pitched and one of "them, who met us first and called several of the others "to come and see us, ended his calls with a very curious "shrill jodelling note. When we came away we offered "them cloth and beads to come with us and show us a "better way, but they were either too frightened or too "lazy to do so. We got back to camp after ten hours' "hard going, drenched with rain and covered with "leeches, but well-pleased with the success of the day." *

That was the last that we saw for a long time of the Tapiro pygmies, for it was evident that the Kapare River

* Extract from diary, 12th March 1910. A.F.R.W.

was useless as a means of approach to the Snow Mountains and we had to turn our attention to the country to the N.E. of the Mimika. Moreover, it was impossible to keep the camp there supplied with provisions, as we were at that time entirely dependent for transport on the good-will of the Papuans.

Generally speaking we always remained on excellent terms with the natives and very rarely had any trouble with them. Except that we bought from them the "atap" for our houses, we got little or no help from the people of Wakatimi, but the people of Parimau assisted us in a number of ways. At first, as I have shewn, we had considerable difficulty in persuading them to work for us as carriers; but when they found that they really did receive the payment they were promised, they were willing and sometimes even anxious to carry loads for us, though we often had to wait a few days until it suited their convenience to start. It was a pity that they were never willing to travel further than about three days' march from their village, but as there were long periods when we were entirely dependent on them for land transport, we counted ourselves lucky in their agreeing to work at all.

Chiefly owing to the help of the natives we were able to make and keep supplied for several months another camp on the Wataikwa River, three days' march north-east from Parimau. When they went out there first, they were accustomed to receive their pay, cloth and beads or a small knife at the end of the journey; but later, when wages rose, as they inevitably did with every successive journey, it seemed to be absurd to waste

perhaps half a load by carrying axes and knives to be given in payment at the end of the march. So a plan was adopted of giving them at the Wataikwa camp a paper authorising them to demand payment on their return to Parimau, and it was a gratifying tribute to the confidence that they had in us that they readily fell in with the scheme. Before starting they were shewn the knife or axe or whatever it was that they would receive for their labour, and at the end they raced back with their scraps of paper to Parimau, covering in a few hours the distance that had taken them three days on the outward journey. Some of the less energetic people in the village, when they saw that their friends received a knife or an axe by merely presenting a small piece of paper to the man in charge of the camp at Parimau, thought that they might easily earn the same reward, and they were rather astonished to find that the small scraps of paper, which they handed in, produced nothing at all or only a serious physical rebuff. But they were so childlike in their misdemeanours that one could not be seriously angry with them.

They shewed their confidence in our honesty in another very flattering way. During the period of the most frequent floods at Parimau, when they were liable to be washed away at any moment, the people took most of their movable possessions out of their houses and hid them in safe places in the jungle. But many of them merely brought their goods across to our side of the river and deposited them without any attempt at concealment within a few yards of our camp, apparently knowing that there they would be perfectly secure from theft.

They are by nature unconscionable thieves and a chance of stealing is to them merely a chance of acquiring property in the easiest way. On one occasion, when a party of our coolies were returning alone from Parimau to Wakatimi, they were waylaid at a narrow place in the river by some Papuans, who relieved them of their baggage and disappeared into the jungle; most of the stolen goods were subsequently returned, when the natives were threatened with punishment. The same thing happened another time when the coolies were accompanied by armed Javanese soldiers, who apparently forgot the use of their rifles until the thieves had got away. But they had a proper respect for a white man and whenever one of us, armed or not, was with the canoes, the natives never tried to molest us. They occasionally stole from the camps a knife or an axe, but though they were constantly about our houses and often inside them for hours at a time, we never lost anything of value.

A temptation, which often proved too strong for them, was our fleet of canoes. At Wakatimi the canoes were moored in front of the camp at the place where the natives, who came to visit us, were accustomed to land. They came mostly in the late afternoon and stayed till sunset, and it happened several times that when they went away they contrived to put two or three men into one of our canoes and slip away with it unnoticed in the dusk. But when on the following day we made a fuss, the canoe was generally brought back with a long story of its having been found floating down the river towards the sea.

An opportunity of looting, which was not to be resisted, occurred one day when a party of discharged coolies were leaving the country. The boat, in which they were being taken off to the ship, capsized as it came alongside the steamer and thirty coolies and all their belongings were upset into the sea. The captain of the ship was only anxious to save his boat and the coolies hastened to escape from the sharks. In the meantime a crowd of natives, who had come down in their canoes to visit the ship, lost no time in picking up the floating boxes and bundles of clothing, and before anybody was aware of their action they were fast paddling away to their villages.

On such occasions and at other times when we had reason to be angry with them, the people of Wakatimi observed a curious custom. There was in the village a coloured china plate and a piece of bent silver wire, which was sometimes used by the owner as an ear-ring. On the morning following their misdemeanour two men came over from the village bringing the ear-ring on the plate, which they gave to us, shook hands and departed. Later in the day they returned and we gave them back their gifts ; this happened several times.

At one time there was a serious epidemic of drunkenness among the people of Wakatimi and they shewed their ill-manners by shooting arrows into the camp. This was of no consequence when only one person misbehaved himself. But when one day a number of men waded half-way across the river and began to send arrows into the camp, it had to be stopped. The Dutch sergeant, who was alone in charge of the place at the

time, held up his rifle, a weapon the use of which they very well understood, and signalled to them that unless they went away he would fire. As they took no notice of his warning he fired, aiming at the legs of the ring-leader, but unfortunately he hit him in the groin. Shortly afterwards, so little animosity did they show and so complete was their confidence in us, they brought the wretched man over to our camp, but nothing could be done for him and in a few hours he died.

They were very appreciative of medical treatment and at different times we were able to do a good deal for them. One man actually went so far as to pay a fee of half a dozen coconuts for the saving of his little daughter's ulcerated foot, which was rapidly going from bad to worse under native treatment. They often cut themselves severely with our axes and knives before they learnt their sharpness, and their wounds healed astonishingly quickly with ordinary clean methods; the only trouble was that they liked to take off the bandages and use them for personal adornment.

As well as acting as carriers for us, the people at Parimau did a considerable amount of work for us about the camp in cutting down trees, an occupation which they always enjoyed, and in helping to build some of the houses. They were even more useful to us as naturalists and, thanks mainly to them, we made a very complete collection of the reptiles of the district. They were particularly adept at catching snakes and often five or six men in a day would stroll into the camp carrying a deadly poisonous snake wrapped up in leaves. One day Goodfellow was walking through

the jungle with some natives and the man in front of him stooped down and picked up a poisonous viper without even pausing in his stride.

We always encouraged the natives to bring us snakes in the hope of getting new species, and when we did not want those that they brought, they were quite content to take them away and eat them. They seemed to have a peculiar knack of catching poisonous things, for besides snakes they often brought scorpions and centipedes in their parcels of leaves. With the more delicate creatures such as lizards they were less successful and among the hundreds that they brought us there were very few which they had not damaged. They always assumed an air of importance and somewhat of mystery, when they brought some animal for sale, and you always knew that when you had bought, or refused, as the case might be, the creature that was offered, the man would instantly produce something else, but the puzzle was always to know whence he produced it, for his scanty costume does not admit of pockets.

CHAPTER XIII

Visit of Mr. Lorentz—Arrival of Steam Launch—A Sailor Drowned—Our Second Batch of Coolies—Health of the Gurkhas—Dayaks the best Coolies—Sickness—Arrival of Motor Boat—Camp under Water—Expedition moves to Parimau—Explorations beyond the Mimika—Leeches—Floods on the Tuaba River—Overflowing Rivers—The Wataikwa—Cutting a Track.

A PLEASANT interlude in the monotony of the early part of the expedition occurred one day towards the end of March, when the natives of Wakatimi signalled in the usual way the approach of a boat and presently a steam launch appeared with Europeans on board. They turned out to be the Dutch explorer, Mr. H. A. Lorentz, who was on his way back from his second and successful expedition to Mount Wilhelmina by way of the Noord River, with his companions Captain J. W. van Nouhuys and Lieutenant Habbema, and the Captain of the Government steamer *Java*, which had anchored off the mouth of the Mimika. Mr. Lorentz looked like a man hardly returned from the dead, as indeed he well might, for after climbing to the snows of Mount Wilhelmina he had fallen down a cliff on his return, with a result of two broken ribs and serious concussion of the brain, and he had endured untold sufferings on his way back to the foot of the mountain. But he had achieved the principal object of his expedition, and his spirits were in better condition than his body. They stayed for the

night with us and at dinner, though I was in a minority of one to six, with characteristic courtesy they all spoke English; the entertainment, assisted by luxuries brought from the *Java*, lasted until the small hours, and it was the pleasantest evening I spent in New Guinea.

The *Java* brought for us the long-expected steam launch, and its career began, as it ended, with disaster. Before dawn one of the men of the boat wished to fetch something that he had left on the launch, which was moored in the river about fifteen yards from the bank. The sentry on duty did his best to prevent him, because it was a rule of the camp that no man was allowed to bathe before sunrise, but he insisted on swimming out to the launch. In a few yards he found that the current was stronger than he had expected, he called for help, and in a few moments a canoe set out in the gloom to look for him, but no more was seen of him until his body was recovered by the natives at the mouth of the Mimika a few days later. Shortly after the accident happened our guests left us on their way back to Europe, and we watched their departure with somewhat envious eyes.

The history of the middle period of the expedition, that is to say, from April to December, is chiefly a history of floods and sickness and disappointment. In the middle of April Goodfellow, who had gone away early in March, returned with a fresh batch of forty-eight coolies, whom he had recruited in Banda and Amboina. About a half of these men were natives of the island of Buton, and the rest were Ambonese, and though they were the best men that could be found at such short notice, and

were greatly superior to our first batch of coolies, they were really not fit for the work they had to do, and the majority of them soon became useless to us.

The steam launch towed the canoes for a short distance up the river once or twice, but it very soon broke down and thenceforward until the middle of June all the transport between Wakatimi and Parimau was done by the coolies themselves. For them it was literally a killing work; in the first few weeks two men died, one of pneumonia, the other of dysentery, both causes resulting from the circumstances of their work, while several others developed the first signs of beri-beri and had to be sent away at the earliest opportunity.

About the same time one of the Gurkhas died; he was from the beginning a very unhealthy man, who ought not to have been engaged for the expedition. Of the other nine Gurkhas three were invalided home before the end of the year and the remaining six stayed with us until we left the country. Although they came from the highlands of Darjeeling—or perhaps for that very reason—our Gurkhas, who were by no means a carefully selected lot, withstood the trials and the climate of the country better than any of the other "native" people in the expedition and, if expense were no drawback, it is probable that an expedition to New Guinea would have the best chance of success if coolies were taken from Northern India.

That is, however, rather a counsel of perfection, and an expedition to New Guinea must make use of natives of the Malay Archipelago. The Ambonese and the Butonese have been tried and have been found wanting,

so also have the Ké Islanders and the Sundanese from the mountains of central Java. Possibly the wild hill-men of Timor, if enough of them could be engaged, would work well, but the only people who have hitherto worked successfully as coolies in Dutch New Guinea are the hill-Dayaks of Borneo. Mr. Lorentz, who took with him eighty Dayaks, most of them from the Mendalen River, on his expedition to Mount Wilhelmina, spoke with enthusiasm of the admirable behaviour of his men, and if Indian or other Asiatic coolies are not available, it may be said that an expedition to the mountainous districts of Dutch New Guinea can only be properly conducted with Dayaks.

Our coolies were not the only people in the expedition who began to feel the ill effects of the climate; the Javanese soldiers and convicts quickly filled the hospital which had been put up at Wakatimi, and in May and June there were many mornings when I saw more than forty sick men. Most of them suffered from fever and a more or less severe form of dysentery, and a good many cases of beri-beri occurred. Unfortunately sickness was not confined to our native followers only; the Europeans began also to suffer from the very adverse conditions in which they found themselves. One or two of the Dutch non-commissioned officers became seriously ill; Goodfellow, who returned with the second batch of coolies from Banda about the middle of April, was never free from fever for more than a few days from that time until he left the country in October; and Shortridge became such a wreck from almost continuous fever, which began about the

beginning of March, that by the end of May he had to be sent away for three months' change of air to Australia. Soon after his return in August he succumbed again to the evil climate, and though he pluckily pretended that there was nothing the matter with him, he went from bad to worse, and I am fully persuaded that his almost forcible deportation at the end of November saved his life.

At the end of May, Goodfellow and Rawling went over to Dobo, and after about eight days returned with the motor boat, which had been bought from the pearl-fishers. Like most things of which a great deal is expected the motor boat turned out to be a disappointment, and it eventually led us into serious difficulty, but for a short time it did good service in towing boats up the river, and it considerably shortened the voyage from Wakatimi to Parimau.

The day of the arrival of the motor boat was memorable for being the occasion of the first of the really serious floods that beset us. Late in the evening a party of our coolies on their way back from Parimau, who were not due to arrive until the following day, reached the camp at Wakatimi, most of which was by that time under water. The journey down the river usually occupied two days, but they had found all the usual camping places, some of which were high above the ordinary river bed, under water, and they had been unable to find any safe resting-place.

The three following days were among the most unpleasant that I had ever spent, though worse were to follow later. On the morning of the first day the water

fell a little and we spent laborious hours in piling up our stores and movable gear on to the top of empty boxes, and when those were all used on posts driven into the ground. All through the afternoon the water rose, the coolies' and soldiers' houses were quickly flooded, and our own house, which was on the highest part of the camp, was nearly a foot under water. On the two succeeding days the conditions were much more serious, and we had two feet of water in our house. The river took a short cut over the neck of land formed by a wide bend of the river on which the camp was placed and flowed straight through the camp. Our beds were raised up on empty kerosene-tin boxes, and when these were submerged there was a mild excitement in guessing how far up the frame-work of the bed the water would rise. Fires were put out and cooking was impossible, so the coolies and soldiers, who depended on their boiled rice, had rather a hungry time. Our own food consisted of biscuits and cold tinned stuff, which is not very exhilarating when you have been in water all day long. An unprejudiced observer looking in upon us from the outside in the evening might well have wondered what kind of lunatics we were to come to New Guinea. Goodfellow was lying in bed very sick with fever, while Rawling and I, up to our knees in water, were making a poor pretence at having dinner. The only humour that we managed to extract from the situation was in the novel experience of being able, without moving from our seats, to wash our plates between the first course of biscuits and sardines and the second course of biscuits and marmalade; the Mimika river was flowing under our chairs

and we had only to lower our plates into it to clean them.

On the fourth day the water fell, and the camp was not flooded again for several weeks, but there was left everywhere a thick deposit of mud, which kept the houses sodden for a long time afterwards. In spite of all our precautions, a quantity of stores were irreparably spoilt and, worse still, the flood left behind it an increased amount of sickness, and indeed the wonder was that the prolonged soaking had not ill effects on every one of us.

At the beginning of July Cramer and I arrived at Parimau, bringing with us the last loads of provisions to complete the store, which we had been working hard for three months with our second batch of coolies to accumulate at that place. It was hoped that that store would be sufficient to enable us to use Parimau as a second base camp for making a prolonged expedition into the mountains without wasting any more time on transports up the river; but in that we had reckoned without the vagaries of the New Guinea climate and the consequent diminution of the effective strength of our coolies, who were already too few for our purpose.

In the meantime Rawling and Marshall had been making excursions to the North-east of Parimau, in the direction of the high mountains. About five miles from Parimau they had come to the Tuaba River and about the same distance further on they had come to the Kamura River, a few miles above its junction with the Tuaba. Continuing in the same direction they came to another river, bigger than either of the others, the Wataikwa, which was so often impassable that it seemed

likely to prevent any further progress. But a short excursion up the valley of the Wataikwa showed the impossibility of reaching the highest mountains by that route, and a camp was accordingly established on the Wataikwa with a view to crossing that river when an opportunity should occur.

These excursions were all made with the assistance of natives, without whose assistance no advance beyond Parimau would have been possible, so long as all the coolies were occupied in the work on the river. Very little reliance could be placed on the natives, when they were working as carriers alone without coolies, and most of us at one time or another had the disagreeable experience of being deserted by them and left unable to move either backwards or forwards. It was in circumstances such as these that the Gurkhas, some of whom always accompanied us in journeys through the jungle, shewed to the best advantage.

When the store of provisions at Parimau was completed, the next step was to establish a further depôt of provisions at the Wataikwa camp. Though the distance between the two places was less than fifteen miles in a straight line, it was a three days' march for a loaded coolie and two camping places were made on the way, one on an island in the Tuaba River, the other on the bank of the Kamura. The first day's march from Parimau began by crossing and recrossing the Mimika several times and here and there wading up the river itself. About three miles up the river we struck off Eastwards through the jungle along a hardly visible native track used by the people going to the village of

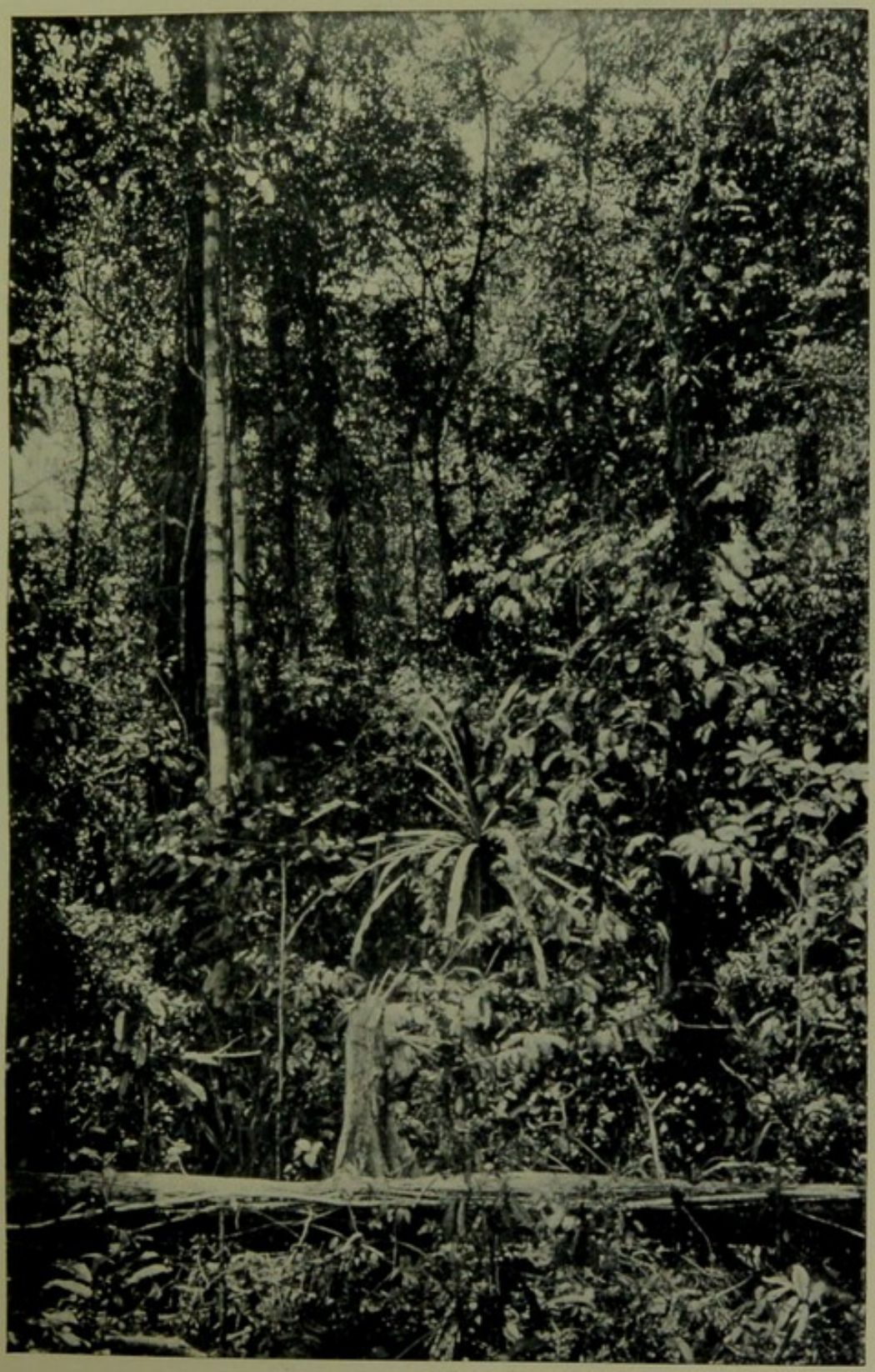
Ibo; this was the only regular native track we used, and these few miles across from the Mimika to the Tuaba were the only place where we had not to cut our own path. The mud in that part of the jungle was quite exceptionally bad, even for New Guinea; in the comparatively dry weather it was like walking through porridge, and in the wet weather you were continually struggling through liquid slime almost up to your knees.

We were very much annoyed there, though not more in that than in other parts of the jungle, by the leeches which swarmed everywhere. These hateful little creatures sit on the leaves or twigs stretched out to their fullest length and expectant of the passer-by. It is not necessary to believe, as some people do, that they jump or even that they fall upon you as you pass beneath them; there are so many that as you brush through the jungle you must inevitably touch many outstretched heads and as soon as they are touched they attach themselves immediately to you. They are extremely rapid in their movements, and their touch is so delicate that you do not feel their presence until they have nearly gorged themselves with blood. Your legs, unless they are well protected with putties, are most liable to their attacks, but you find leeches on all parts of your body, and I have found them in my eyes and in my mouth and once just captured one as it was preparing to enter one of my nostrils. They are able to consume an astonishingly large quantity of blood, and when, as often happens, they open a small vein, the bleeding continues after they have dropped from their feeding place. It is not advisable to pull a leech from your body; it often results in

the creature leaving behind a part of its clasper, which may give rise to a serious sore. Pigs do not appear to be attacked by leeches, but the soft parts of the heads of some of the cassowaries that were shot were found to be covered with them. Cassowaries are few and far between, and there must be millions of leeches that go through life without once tasting blood. Some of the leeches are prettily marked with stripes of yellow and brown, but none that we saw in the jungle were of large size; the longest were perhaps two inches in length.

Besides leeches there was not much to distract or to amuse us in passing through that stage of the march—certainly there were always plenty of the Greater Birds of Paradise to be heard calling, but they were very seldom to be seen—and we were chiefly anxious to struggle to the end of it ourselves and to push the coolies along until we heard the welcome sound of heavy water and light showed through the trees ahead. The Tuaba, at the place where we were accustomed to cross it, is a wide river flowing in about half a dozen channels, which extend over half a mile or more of ground. All of these channels are considerable torrents even in the most favourable conditions and it is by no means easy to cross them, but in the very frequent times of flood they are absolutely impassable. The camping place was made on an island across the first channel, as the river bank proper was covered with very dense jungle, and at low water the island was surrounded by a stretch of dry sand and shingle, which afforded us a pleasant drying ground after struggling through the sweltering jungle.

But it was not always a place of calm; it could be



TYPICAL JUNGLE, MIMIKA RIVER.

quite a dangerous place, and I had a very unpleasant experience the first time I camped there. I was on my way out to the Wataikwa river with a Gurkha, four coolies and about twenty natives of Parimau laden with tins of rice. The river was comparatively low when we pitched our camp, but it began to rain in the afternoon, and the almost continuous thunder and the black clouds in that direction showed us that it was raining heavily in the mountains. By nightfall the rising flood had completely covered the sandbank in front of the camp, and before midnight the river was flowing right through the camp. The coolies were taking refuge like birds in the trees, and the water had just covered my piece of ground, which was an inch or two higher than any other spot. The Gurkha came and helped me to secure the stores from the water, which was still rising fast. We arranged all the rice tins upright, and on them we placed my bed; on the bed we placed all the other stores and baggage, and finally I took refuge there myself. The water rose above the top of the rice tins and about half way up the framework of my bed and then happily it began to fall rapidly, and in an hour or two the camp was land again. Shoes of mine and odd garments of the coolies were washed away, but we had been in no danger of being swept away, for the current was not rapid enough over the comparatively shallow water of the island; the only risk was from the large logs and trees which came sweeping down on the flood. The Papuans, who were encamped on another island a short distance below ours, had kept up all night a constant and most melancholy wailing, which did not at all add to the humour of the situation.

For three more days we stayed on that sandbank, while the rain poured down and the river swept past us on both sides, unable either to proceed or to retreat. I made two attempts to cross the river, but found it impossible to struggle across the flood. In the meantime the natives, who were well able to swim naked across the first channel, threatened all the time to return to Parimau. A few of them did leave me, but the rest by constant cajoling and by liberal gifts of rice, for which they had acquired a great liking, I persuaded to stay with me until after four days we were able to get away.

From the Tuaba to the Kamura river, a distance of about four miles, a track had been cut by Marshall and the Gurkhas. It was a curious piece of country, almost level and covered with not very dense jungle, but remarkable for the number of streams flowing through it. Between the two rivers we crossed eighteen streams of various sizes; some were rivulets, and others swift and strong so that one was glad of a supporting Papuan on either hand. The Kamura river is of less size than the Tuaba, but it is still a large river and subject to heavy and sudden floods. It flows in a bed of sand and shingle two or three hundred yards from bank to bank, though, except at times of flood, it only occupies a narrow channel. Mostly it runs swiftly over the stones, but here and there are long stretches of still water like the pool of a salmon river; unluckily there are no big fish in it, or New Guinea would be a pleasanter place than it is.

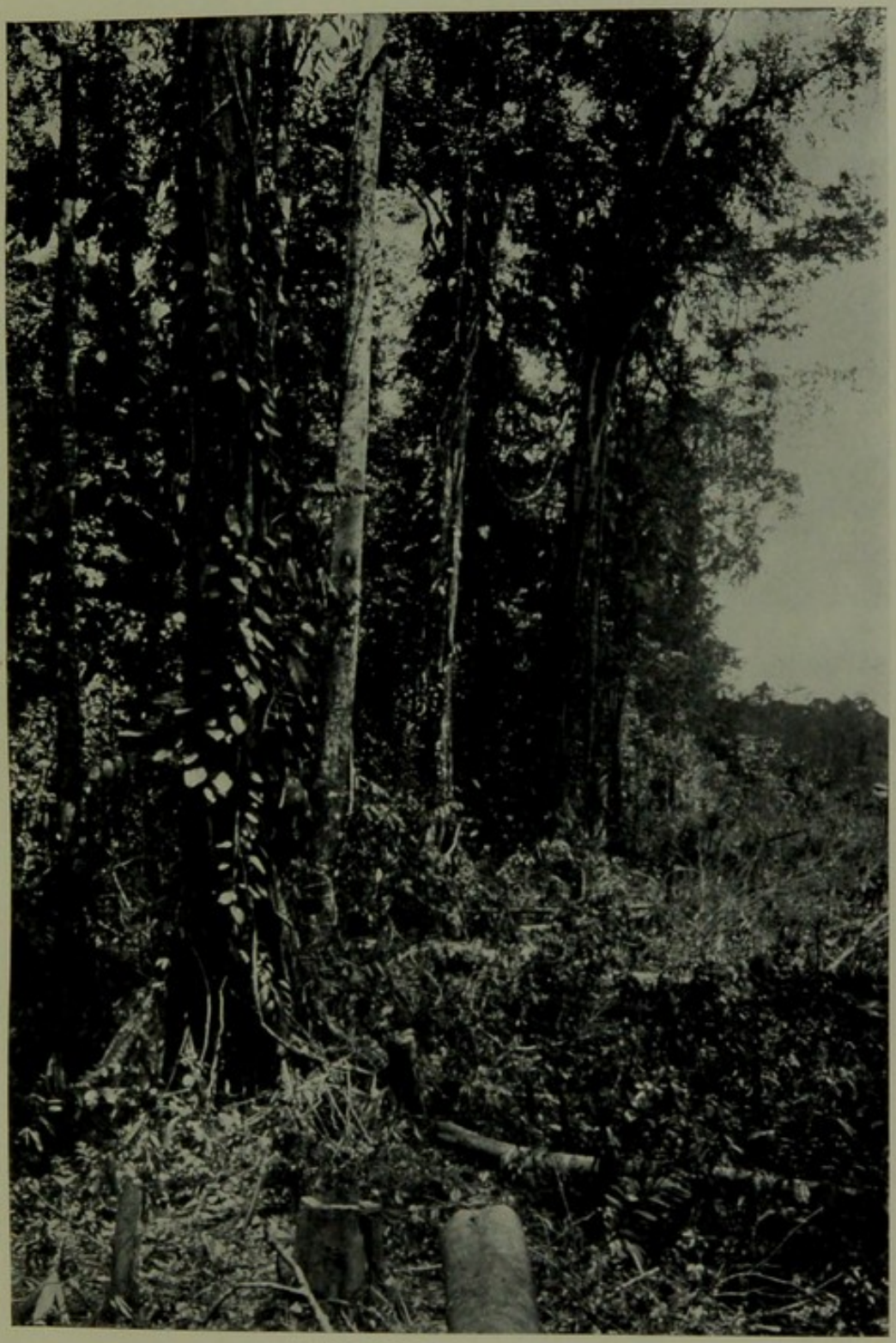
It was an agreeable change to come out on to the

bank of the Kamura, for from there we had our first wide view of the mountains that we hoped to reach. The foothills, if mountains eight or nine thousand feet high may be so described, sloped down to within a few miles of us to the North, and behind them and stretching far to East and West rose range beyond range of steep and precipitous ridges, culminating in the snowy top of Mount Carstensz, thirty miles to the North-east. Our route took us for several miles along the course of the Kamura; it was certainly not comfortable walking over the big and often slippery stones and wading waist-deep across the river three or four times to cut off big bends, but it was pleasant indeed to have a wide free space about us after having been for so long hemmed in by trees, and anything was preferable to the mud and leeches of the jungle.

A few miles up the Kamura we left the main river and turned off up the bed of a smaller river, which joins it from the East. This is actually a branch of the Wataikwa connecting the two rivers, and down it comes a great volume of water when the Wataikwa is full, while at other times it becomes almost dry. The rivers of this district of New Guinea are somewhat peculiar in this respect; they are very numerous, and they flow out from the mountains in a North to South direction, with not many miles intervening between one river and the next. As soon as they emerge from the mountains they find themselves on quite low ground and with forty or more miles to run to the sea. There are no outlying hills or depressions to guide them in any particular course, thus it happens that they overflow in convenient

directions, and connections are established between one river and another. As well as in the case of the Wataikwa this was observed on the Utakwa river, close to the foot of the mountains, and I believe the same thing happens on the Kapare river. Further on in their courses, when they approach the mangrove swamps near the sea, the rivers again break up into an extraordinary network of branches. Judging from the appearance of the country and from the considerable changes, which we observed in the case of the Wataikwa during a period of only a few months, it is probable that these great rivers change their courses very often.

Whilst parties of coolies, rapidly diminishing in numbers, were occupied at lengthening intervals in transporting stores from Parimau to the camp on the Wataikwa river, Rawling and Marshall had found a way of crossing that river. It is true that there were a great many days when it was quite impossible to cross it, and there was always a certain amount of risk of being swept away, not to mention the discomfort of beginning your day's work by getting wet up to your chest; but it was absolutely necessary to continue cutting the track, wet or dry. On the other side of the river, they had tried to continue in the North-east direction and had come to broken lumpy ground covered with the densest jungle that we met with in any part of the country. The trees were not so very big, indeed most of them were quite small, but they were of a peculiarly hard wood, which quickly blunted the *kukris* of the Gurkhas and they grew so close together that it was quite impossible to push your way between them.



AT THE EDGE OF THE JUNGLE.

Eventually a track was cut to the Iwaka River, five miles to the east of the Wataikwa.

Some idea of the difficulty of cutting this track may be learnt, when it is said that Rawling and Marshall with three Gurkhas and five natives were occupied for three weeks in cutting five thousand yards of the way, and the whole distance of five miles was cut in five weeks. Unfortunately it was labour in vain, the path when finished was too difficult for men to traverse with loads. We cut another track, which avoided the hilly ground and brought us to the Iwaka close to the point reached by the first; by the new track, which was cut in a week, we were able to reach the Iwaka in three hours' walk from the Wataikwa.

CHAPTER XIV

The Camp at the Wataikwa River—Malay Coolies—"Amok"—A Double Murder—A View of the Snow Mountains—Felling Trees—Floods—Village washed Away—The Wettest Season—The Effects of Floods—Beri-beri—Arrival of C. Grant—Departure of W. Goodfellow.

IF I were to write a true and complete account of the expedition, I should fill many pages with repeated stories of rain and floods, sickness among the coolies and our consequent inaction; but that would be as wearisome to the reader as it was trying to our own patience. During July and a part of August we sent out parties of coolies to the Wataikwa camp, where a considerable depôt of food was formed, but about the middle of the latter month the number of our coolies was reduced to twenty, of whom not more than half were capable of any hard work, and it became quite evident that any further progress in the direction of the mountains was out of the question until we should get a fresh supply of men.

As the number of coolies grew fewer we sent natives with them to carry stores out to the Wataikwa, but the supply of willing natives was very uncertain and it became a matter of some difficulty to keep up a regular communication with that camp. Two Gurkhas and two Javanese soldiers remained always at the Wataikwa and one or other of us went out there and stopped to make natural history collections or to superintend the cutting

CAMP OF THE EXPEDITION AT PARIMAU.

of the road on the other side of the river for a few weeks at a time, while the others were at Parimau or at Wakatimi. We managed to continue this arrangement until the end of October, when it became no longer possible to keep an European supplied out there; thenceforward until the beginning of January the camp at the Wataikwa was occupied only by the guard of Gurkhas and Javanese, who in the meantime consumed nearly all the stores that had been so laboriously accumulated there.

We often said hard things to and of our Malay coolies, but the poor wretches were not to blame for being such incompetent carriers. At their proper occupations of carrying cargo to and from the ships at Macassar, or working on the boats of the pearl-fishers, or doing odd jobs in their native places, no doubt they excelled; but at struggling through the New Guinea jungle with even the lightest of loads they were hopeless failures and the wonder was that they survived as long as they did. Taking them all round, the majority of them worked as well as they could, and some of them even became quite attached to us.

To a large number of people the name of Malay immediately suggests a savage person who runs *amok*, but you may live for years in a Malay country and never see a single *amok*. Fortunately our Malays never behaved in this dangerous fashion, though one day a man who was suffering from fever went suddenly mad and inflicted a serious knife-wound on the body of another coolie; the wounded man was successfully treated by Marshall, who was happily but seldom required in this way to exercise his vocation as surgeon. Malays are

indeed rather too handy with their knives and a more serious encounter took place one day between two of Cramer's convicts. These two men, a *mandoer* (head man) and another, quarrelled one morning about some trifle connected with their food, and before anybody knew what was amiss, knives were out and one was chasing the other through the camp. By a clever backward thrust the pursued man dealt the pursuer a deep wound under the heart, but he was unable to escape before the pursuer had given him too a mortal wound. One died in a few minutes and the other during the course of the day, fortunately perhaps for both of them.

But ordinarily our Malays were most quiet and peaceable fellows. Certainly they were liars and thieves when it suited their convenience to be so, but these two faults are almost universal in the East. They were enthusiastic fishermen (a sure sign of grace) and spent many hours of their leisure time in angling for small fish, which they very seldom caught. Another of their virtues, though it sometimes became a little wearisome, was their love of singing, in which they indulged on fine evenings. The Ambonese used to sing, accompanied by a soloist on a sort of penny whistle, some really pretty songs, possibly of Portuguese origin, to which one could listen with real pleasure. But the singing of the Javanese, usually in a high falsetto voice, was a burden hardly to be borne.

In dealing with people like the Malays it is essential to keep them constantly occupied in order to prevent them from brooding too much over their untoward circumstances and becoming, as they easily do,

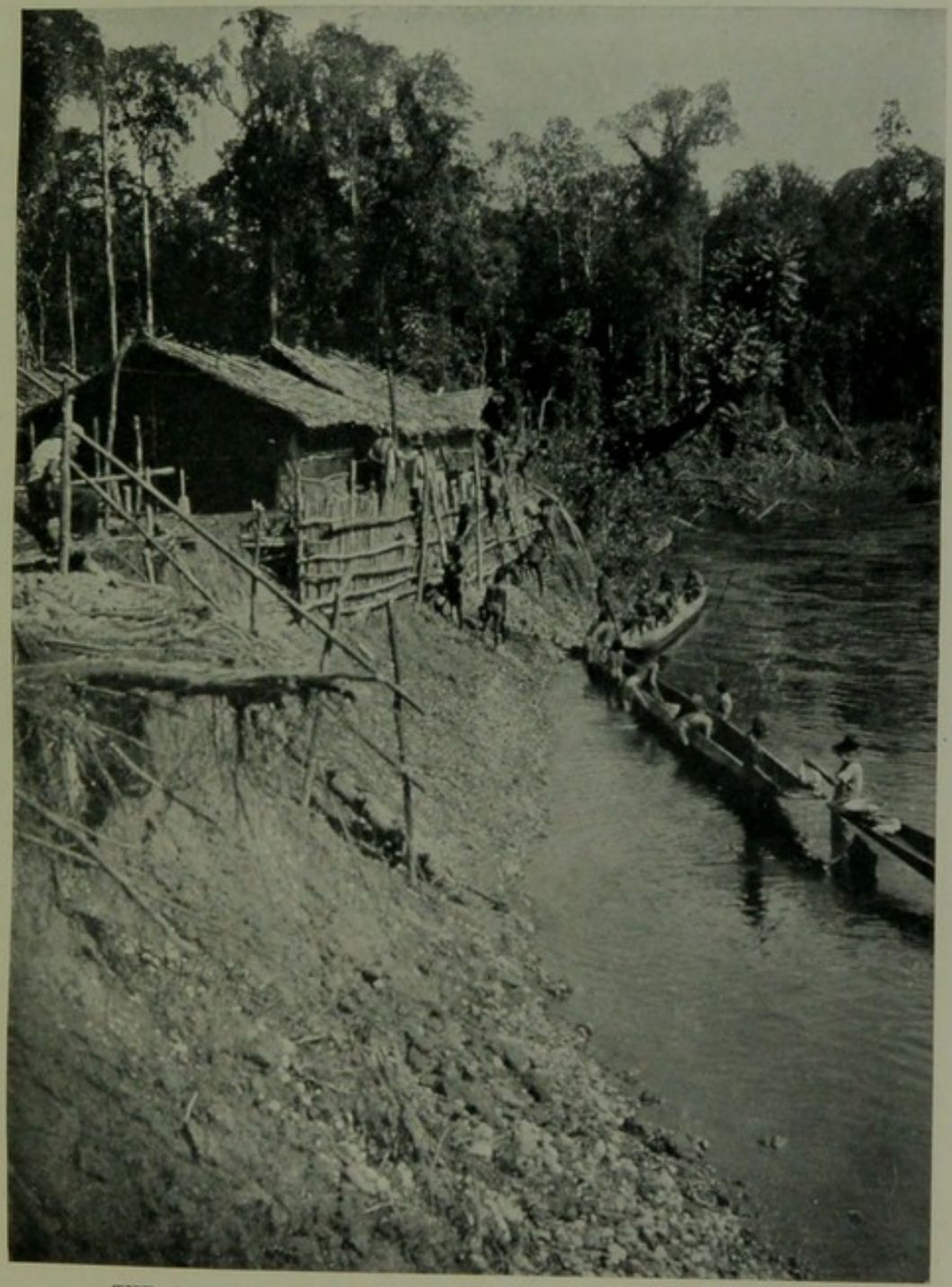
physically ill. Accordingly, during the times when for one reason or another they were not carrying out loads to the Wataikwa camp, we set them to clearing the jungle about the camp at Parimau, and in the course of time some ten or twelve acres were cleared. Apart from the object of drying and letting light into the camp, this clearing was made with the purpose of obtaining from Parimau a view of the Snow Mountains. This latter object was ultimately attained and proved of great service to the surveyors, who were enabled to fix more definitely the various points of the range seen from a place of which they had already determined the position by astronomical observations. To the non-surveyor too the view of the mountains was a boon, though rather a tantalising one, and I used to spend many hours in the mornings, before the mists had hidden them, in scanning the snows of Idenburg and Carstensz and planning routes by which they might be reached.

Cutting down trees in the New Guinea jungle differs from cutting down trees here in that the tree does not always fall, even when the trunk is cut completely through. Amongst the tops of the trees grows an extraordinary network of rattans and other creepers of sufficient strength to support a tree, even if it is inclined to fall. We spent some time one day in firing shots with a rifle at a single creeper, thicker than a man's arm, which was holding up a tree without any other support; though I believe we sometimes pierced the creeper with bullets, it held on and only gave way some hours later. As a rule we did not take the trouble to

cut the creepers, but if a tree did not fall we cut down those about it until they all fell together in one splendid crash. On sloping ground the best method of felling trees is to cut their trunks only half way through and leave them, and then to cut completely through a big tree above them in such a way that it will fall down hill and complete the felling of those below it.

Some of the trees that we cut down in our clearing fell in the most unexpected directions, but though there were some narrow escapes, there were no accidents. The most unpleasant was a tree which fell midway between two houses, one full of coolies and the other full of stores, and shaved off the projecting roof of both; it might easily have killed half-a-dozen sleeping men, but the only harm it did was to fill the camp with a swarm of large and furiously biting ants, which had had a nest in its topmost branches. The natives, who never tired of using our steel axes, helped a good deal in felling the trees and in this way some of them earned large quantities of coloured beads.

Another occupation for the coolies in their idle moments, and at the same time a very necessary work, was the business of keeping the camp in a state of repair. When the high river bank opposite the village of Parimau was chosen for a camping ground, it was thought that floods at all events could do no harm. The houses nearest to the river were built five or six yards back from the edge of the bank, which was there about fifteen feet above the usual level of the water, and it seemed quite out of the question that the river could ever invade the camp. It was necessary, in order to prevent it from becoming



THE CAMP AT PARIMAU. A PRECAUTION AGAINST FLOODS.

the dumping ground of camp-refuse, to clear away the rank vegetation that grew on the bank down to the water's edge, and this was the beginning of what almost ended in our downfall. After the tangle of creepers had been removed, the first rains began to wash the bank away, and when the river rose three or four feet, as it speedily did after a few hours' downpour, it undermined the lower part of the bank and large landslips took place from above.

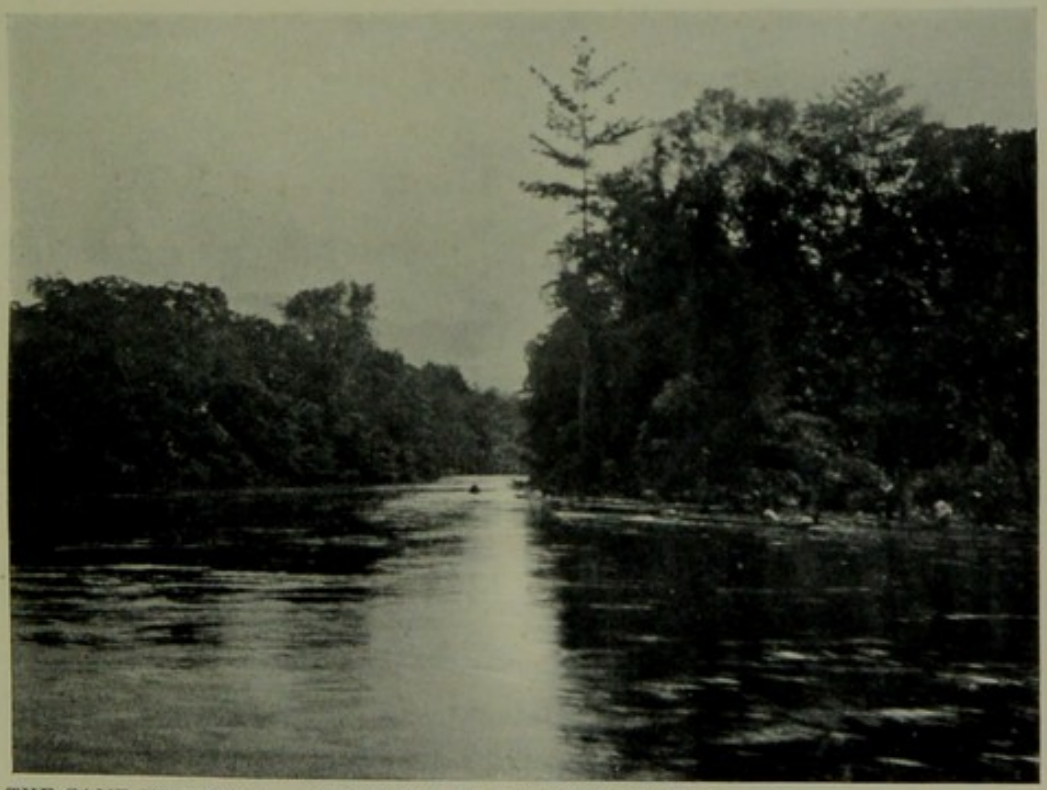
In the course of a few weeks several yards of land disappeared, and the safety of our houses, which had come to be almost overhanging the river, was seriously imperilled. To save them we erected a strong palisade of long poles thrust deeply into the bottom of the bank and secured them by rattan ropes, which passed through our house and were attached to posts at the back. The interval between the palisade and the bank was laboriously filled up with shingle from the river bed, and this provided a never-ending occupation, because the stones were always trickling through the palisade and required to be renewed. The natives were of great assistance to us in this work, and on one occasion—it was the only time that we ever persuaded them to come into our camp, although we lived within a few yards of their village—the women and children came and helped in the work and thoroughly enjoyed themselves.

It was well that we took these precautions, for as the weather grew steadily wetter and wetter (though that seemed hardly possible) through July and August, so the river rose higher and higher and each succeeding flood was greater than the last. The night of the 18–19th of

August was one that I shall never forget: it had been raining steadily for some days and the river was fairly full, but about sunset on the 18th the rain really began to come down solidly, as it does in the Tropics. About midnight a terrific thunderstorm began, which continued with almost incessant thunder and lightning until dawn, but long before this the river had risen many feet and was already threatening the village. As soon as the waters began to rise the natives appeared at the edge of the river with blazing torches, while canoes were baled out and brought nearer to the shore. When the flood, rising visibly by that time, reached the lowest house, a most extraordinary Bedlam broke loose and it sounded as if all the people in the village were being drowned. The men all shouted at once, the women and children screamed and the dogs whined and howled. By the light of the flashes of lightning we could see them scurrying hither and thither, bundling all their belongings into the canoes and trying to save the roofs and matting walls of their huts by throwing them among the branches of the trees at the back of the village. In a very short time all the houses were swamped and the people were in their canoes, about twenty in all, moored to the branches of the trees along the edge of the jungle, where they kept up an unceasing turmoil until daylight.

In the meantime our own position was not very secure. The river was swirling down at ten or twelve miles an hour and bringing with it huge tree-trunks, which carried away our fleet of canoes and threatened to destroy our protecting palisade. If that had gone nothing could have prevented our houses from falling

THE MIMIKA AT PARIMAU. LOW WATER.



THE SAME IN FLOOD. THE VILLAGE HAS DISAPPEARED AND THE PEOPLE ARE IN CANOES.

into the river, but happily it held well. The whole of the jungle on our side of the river was under water and all sorts of creatures sought the shelter of our houses, which occupied the highest position. When even these were flooded, armies of ants and beetles and other insects climbed up our beds and other furniture to escape from drowning, moths washed out of their resting places fluttered aimlessly about, and a family of rats, which inhabited my hut, ran about squeaking in terror.

Beyond the loss of our canoes, some of which were afterwards recovered, no great damage was done, and the flood fell almost as quickly as it had risen. Soon after daybreak the ground, on which the village had been, began to appear above the falling water, and it was seen that not one stick of the huts was standing. But the natives were anxious to get out of their canoes, and by mid-day half the huts in the village were re-built with the fragments that they had crammed into the canoes or had put up into the trees. During the next two or three days they brought back quantities of housing materials, which had been carried for miles down the river, and very soon the village resumed its normal appearance.

On two subsequent occasions in the following month the village was completely swept away by floods, and it was a matter of surprise to us that they did not adopt the custom of their neighbours the Tapiro pygmies and build their houses on piles. The third great flood swept away the sandbank on which the village stood, and they were accordingly compelled to build their houses on the top of a high bank further down the river. Such a place

as that necessitated cutting down a number of big trees, but now that a great many of them have the steel axes, which we gave them, it is to be hoped that they have learnt to place their dwellings in safer positions, even though it costs them a little extra labour.

The wet season, which we hoped had reached its maximum of wetness in July, when sometimes for days together the rain hardly ceased, continued in a series of greater or less floods through the months of August and September. Often it was impossible to move a yard from the camp, and without books life would have been almost insupportable. On one of the wettest of those days I came across the following passage, which seemed to describe the situation exactly :—

> "With five . . . what we call qualities of bad,
> Worse, worst, and yet worse still, and still worse yet."

It need hardly be said that this very disagreeable season produced ill effects on all the members of the expedition. The Europeans became depressed, and if we were not sick of life itself, we were certainly sick of New Guinea, while in the case of the coolies and soldiers, who were accustomed to sunnier climates, and who had no interest or goal to look forward to in the country, the results were disastrous indeed. Hardly a man escaped fever of greater or less severity and chills brought on by the unceasing rain and the consequent impossibility of securing a change of dry clothing. Several men suffered too from dysentery of a very intractable type, which completely incapacitated them from any further service.

But worse than either fever or dysentery was the

beri-beri, which made its appearance after we had been in the country for a few months. This is not the place to give a scientific account of beri-beri; it will suffice to say that it is a disease, of which the most important feature is a degeneration of the nervous system. The results of this are seen in the curious and characteristic walk, loss of sensation in various parts of the body, interference with the circulation and swelling of the body and particularly of the face and limbs, and in very many cases sudden heart failure. It is almost conclusively proved now that the cause of the disease is an error of diet, and it appears to be certain that the fine milling and polishing of the rice, which forms the staple food of the natives of so many countries in the East, deprives the rice of a very necessary constituent as a food. Those people, who grind their own rice and do not mill or polish it finely, but leave a small portion of the husk still adhering to the grain, are free from beri-beri. The disease varies in severity from time to time and from place to place, but at its best it is a very deadly scourge and it causes a very large number of deaths. Occasionally it occurs in an epidemic form, but fortunately that did not happen to our expedition.

In the six months from the beginning of June to the end of November, thirty-nine men shewed definite symptoms of beri-beri, and seven deaths were directly attributable to this cause. Our coolies, who came from the Eastern islands of the Archipelago, were much less susceptible to the disease than were the convicts and soldiers, most of whom came from Java and Sumatra; these latter contracted the disease in a much more

serious form and most of the fatal cases took place among them. It was a curious circumstance that at Parimau, which was in most respects by far the healthier place, many more cases of beri-beri occurred than at Wakatimi, where it is doubtful if any cases originated.

Still more remarkable was the case of the camp on the Wataikwa River, which ought to have been the healthiest place we occupied anywhere in the country. For several months a guard of two Javanese and two Gurkhas was kept there to look after the store of food, and though they were very frequently changed and replaced by others, several of the Javanese developed beri-beri and two of them died. The Gurkhas, perhaps because they led more active lives than the Javanese, remained free of the disease until one of them, Havildar Mahesur, a most useful man, had the misfortune to damage one of his eyes; it was necessary for him to remain in the darkness of his tent for some days and within a fortnight he developed all the signs of beri-beri so that he had to be sent away from the country.

A welcome interruption in those dreary months was caused by the arrival at Parimau on August 26 of canoes bringing Mr. C. H. B. Grant, who had come out from England as naturalist to the expedition in the place of W. Stalker. He brought with him two Dayak collectors * and a quantity of various and excellent stores, and a large mail, the first we had received since the end of May. Shortridge had arrived in the country by the same ship

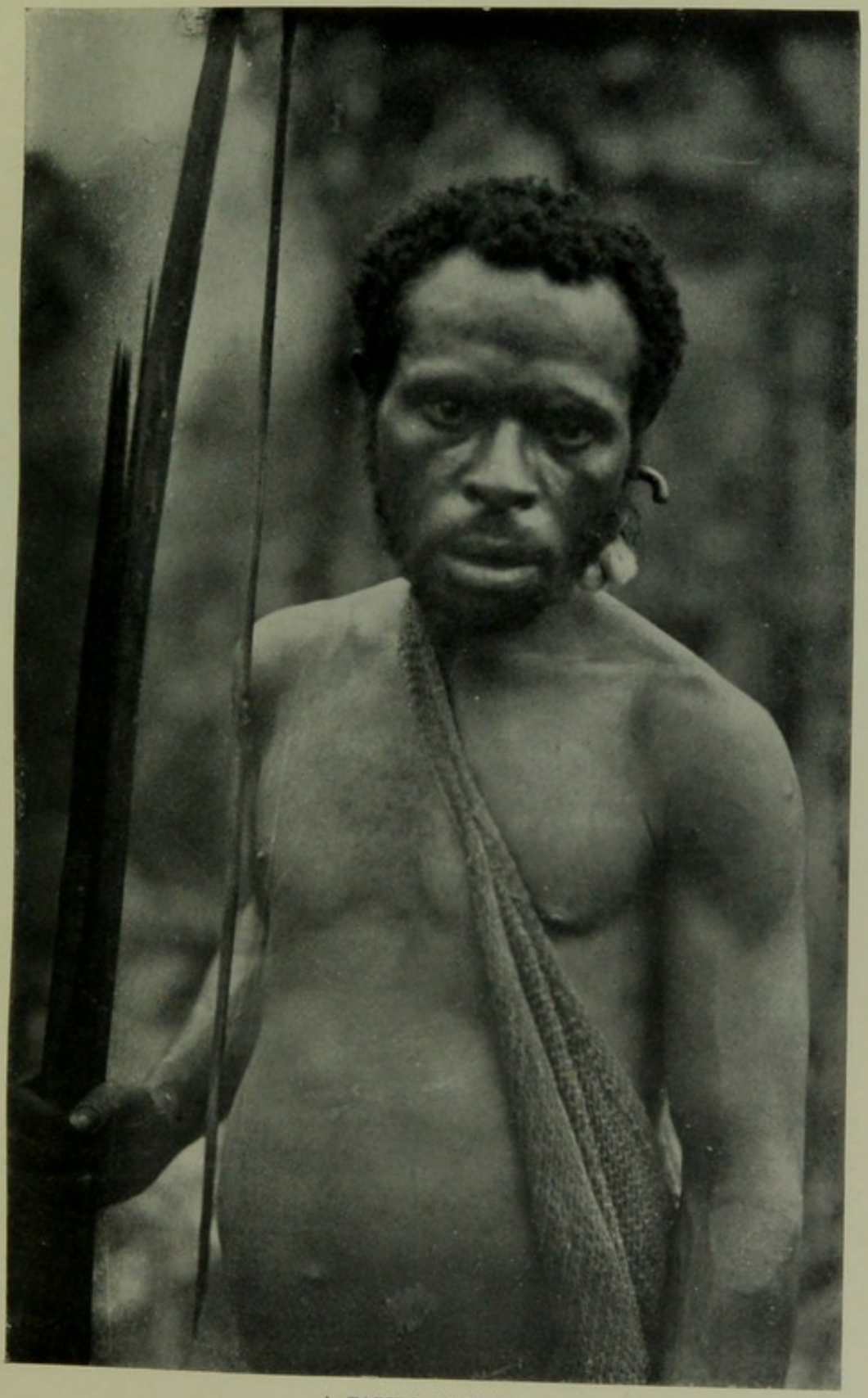
* The services of these two men were secured to the expedition through the generosity of Mr. H. C. Robinson, Director of the Museums of the Federated Malay States

on his return from Australia, but his change of air had not completely cured him and he was compelled to leave the country at the end of November. Goodfellow, whose fever continued almost without interruption, became so weak that he also was obliged to leave the country early in October. From that time we had only a dozen men and no forward movement was possible until the arrival of our third batch of coolies on the 22nd December. By the same boat that brought the new coolies in December came instructions to Captain Rawling to take over the command of the expedition.

CHAPTER XV

Pygmies visit Parimau—Description of Tapiro Pygmies—Colour—Hair—Clothing—Ornaments—Netted Bags—Flint Knives—Bone Daggers—Sleeping Mats—Fire Stick—Method of making Fire—Cultivation of Tobacco—Manner of Smoking—Bows and Arrows—Village of the Pygmies—Terraced Ground—Houses on Piles—Village Headman—Our Efforts to see the Women—Language and Voices—Their Intelligence—Counting—Their Geographical Distribution.

THE Pygmy people—or Tapiro as they are called by the Papuans—whom we saw in March, visited us occasionally in small parties of three or four at Parimau and later we went to one of their villages in the hills, to which they were reluctantly persuaded to show us the way. When they come down to Parimau they were warmly welcomed by the Papuans, with whom they seemed to be on very friendly terms, and stayed in their houses for two or three days. They appeared to be particularly attractive to the women, one of whom we saw affectionately embrace a Tapiro on his arrival; it was said that she kissed him, but if that was so it was the only occasion on which that form of endearment was seen practised by the Papuans. It was noticeable that when they arrived at Parimau they had not their bows and arrows, which they always carry elsewhere; probably they had left them hidden in the jungle before they came to the village. Similarly, when we went up to visit the Tapiro, the Papuans who



A TAPIRO PYGMY.

were with us left their spears behind them at the last camp before we reached their village.

Their visits were always very welcome because they brought with them from the hills quantities of tobacco to exchange with the natives of Parimau, who grow none themselves. At first they were very shy of crossing the river, but by the offer of gifts we persuaded them to come into our camp, where we had better opportunities of observing them than in the crowded village.

At one time or another we took measurements of 40 adult men, most of them men in the prime of life, and their average height was found to be 144·9 cm. (4 ft. 9 in.). It is possible that one or two rather tall men of 150 cm. and upwards, whose appearance led us to suspect that they were Tapiro-Papuan half-breeds, may have been included among those measured, but the correction of that error will not appreciably reduce the true average height. The height of the smallest man measured was 132·6 cm. By contrast with the Papuans they looked extremely small and, what was rather a curious thing, though many of our Malay coolies were no taller than they, the coolies looked merely under-sized and somewhat stunted men, while the Tapiro looked emphatically *little* men. They are cleanly-built, active-looking little fellows, rather big in the buttocks as mountain people are apt to be, and their well-made calves are noticeable in contrast with the long, straight legs of the Papuans. They walk with an easy swinging gait, the knees a little bent and the body slightly leaning forwards.

The colour of their skin is paler than that of the Papuans—some of them indeed are almost yellow—but they are so indescribably dirty that it is not easy to know what is their true colour; they have also an ugly habit of smearing their faces with a black oily mixture. Neither tattooing nor cicatrization appears to be practised by them. The *septum* of the nose is always pierced and in it they occasionally wear a curved boar's tusk planed down to a thin slip, or a short piece of straight bone; the *alae nasi* are not pierced. The nose is straight and very wide at the nostrils. The upper lip of many of the men is long and curiously convex.

The hair is short and woolly and black; many of the men give a lighter shade to the hair with lime or mud, and in two or three cases it seemed to be of a brown colour without any artificial treatment. They appear to begin to grow bald at a comparatively early age. The younger men grow whiskers and the older have short bushy black beards. There is a good deal of short downy black hair scattered about the body. Their eyes are noticeably larger and rounder than those of the Papuans, and there is in them something sleepy and dog-like which gives a pathetic expression to their faces.*

When we first saw them one or two men wore curious helmet-like caps of plaited fibres and another had a strip of fur round his head; otherwise they are completely naked except for the remarkable gourd case described above (p. 161). Strangely enough they are extremely modest and unwilling to expose themselves; when with some difficulty we had persuaded

* For their cranial measurements see *Appendix*.

a man to part with his case, he would not remove it then and there, but always disappeared into the jungle and returned after an interval decently covered with leaves.

Their ornaments are few and simple; a number of men wear arm-bands and leg-bands of plaited fibre similar to those worn by the Papuans, and several of them wear necklaces of seeds, short pieces of bamboo, scraps of broken shell, teeth of wallabies and (in one instance) the bones of a small mammal. The lobes of both ears are pierced and a few men wear in one ear an ornament made of a small piece of gourd to which are attached seeds, scraps of fur, claws of birds and other ornamental odds and ends. One young man, with more originality than the rest, thrust through his front hair a piece of sharpened bone, which projected downwards over his face and gave him a most distinguished appearance (see Frontispiece).

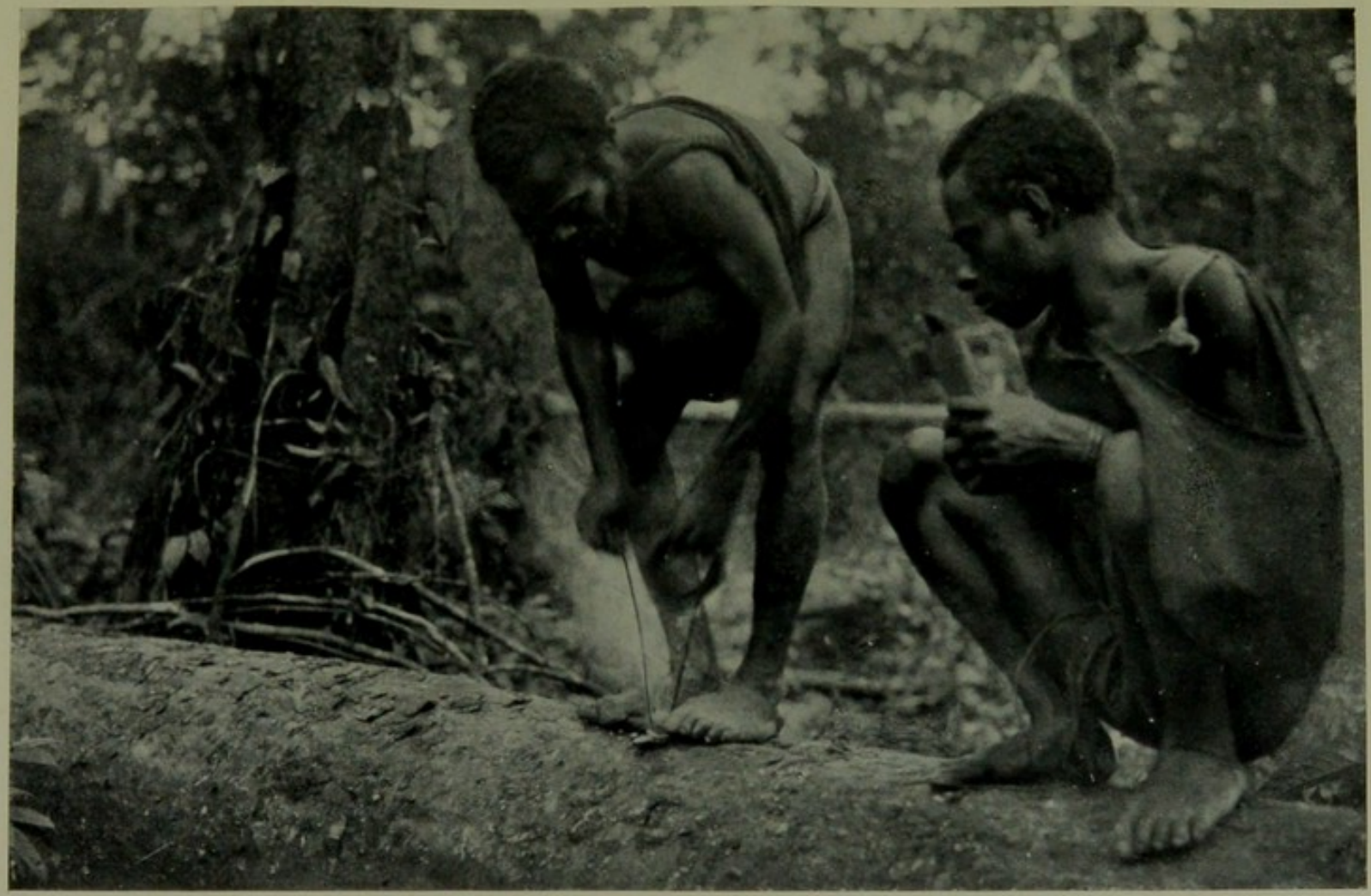
The most elaborate and ornamental of their possessions are the bags, which every man carries. Most of them carry two, a large bag like a haversack slung across the shoulders and usually hanging down the back, and a small bag only a few inches square slung round his neck and hanging down on the chest. They are made of fine fibres of different colours, cleverly netted* in ornamental patterns, and they show the best attempt at decorative art that we saw in the country. In these bags the Pygmy man keeps all his portable property. The small wallet round the neck contains his bone and

* The stitch used is a "figure of eight." An exactly similar pattern is used by the natives near Humboldt Bay, North Dutch New Guinea, in making caps. See Van der Sande, *Nova Guinea*, Vol. III. Illustration, p. 37.

shell ornaments when they are not in use, and his knives; these latter are sharp flakes of a flint-like stone shaped exactly like the flint-knives and scrapers that are found in this country; they are used for scraping down the wood of their bows and for pointing and ornamenting their arrows as well as for other cutting purposes, and it is profoundly interesting in these days of steel to see people still using the implements of prehistoric man. One or two men also carried in their wallets a short dagger made of a pointed cassowary's bone, and they explained to us by graphic gestures how they were accustomed to shoot a cassowary with their arrows and then after a long chase to stab it with the dagger.

The contents of the larger bag usually are the sleeping mat, the fire-stick and rattan, and tobacco. The sleeping mat is a fabric of *pandanus* leaves, which can be used either as a mat to lie upon or as a shelter from the rain; it measures usually about six by three feet and is neatly folded to be carried in the bag. The manufacture of these mats is always the work of the women and is a very ingenious process. The long ribbon-like leaves of the *pandanus* are split horizontally into two strips; the shiny upper one alone is used and the lower is thrown away. Strips of two leaves are placed with their split surfaces together and their shiny surfaces outwards, and then numbers of these pairs of split leaves are sown together, edge to edge, until the mat is of the required size. Thus the mat is made entirely of the outer surfaces of the leaves; it is very strong and is quite impervious to rain.

By far the most interesting of the possessions of these



MAKING FIRE: (I) BY THE FRICTION OF WOOD AND RATTAN.

people is the apparatus for making fire, which consists of three different parts, the split stick, the rattan, and the tinder. The split stick is a short stick of wood an inch or so in diameter, which is split at one end and is held open by a small pebble placed between the split halves. The rattan is a long piece of split rattan wound upon itself into a neatly coiled ring (see illustration p. 202), and the tinder is usually a lump of the fibrous sheath of a palm shoot and sometimes a piece of dried moss.

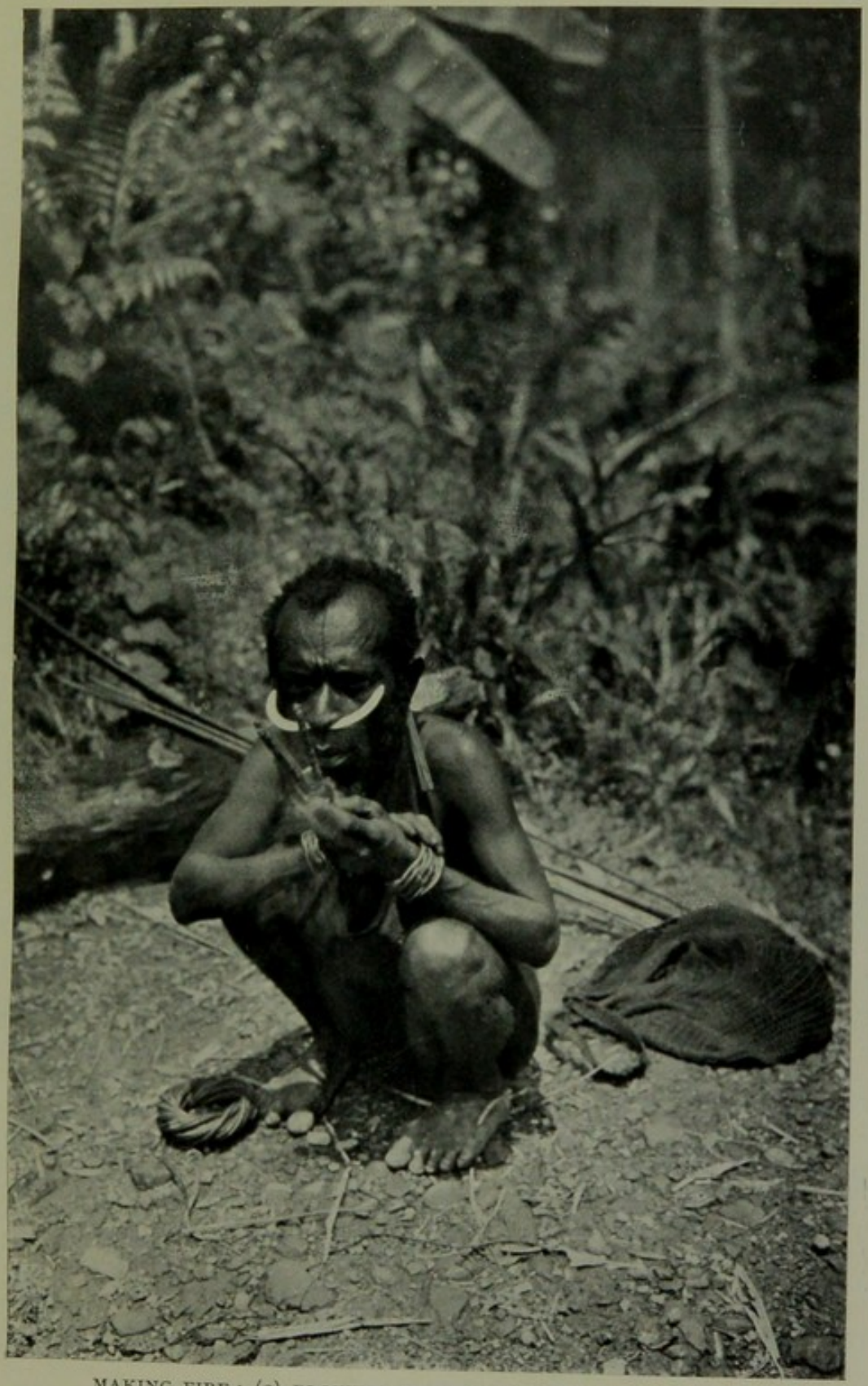
The method of making fire is as follows : In the split of the stick, between the stone which holds the split ends apart and the solid stick, is placed a small fragment of tinder. The operator—if one may use so modern a word in describing so ancient a practice—places the stick upon the ground and secures the solid, *i.e.* the unsplit end with his foot. Then, having unwound about a yard of the rattan, he holds the coil in one hand and the free end in the other and looping the middle of it underneath the stick at the point where the tinder is placed he proceeds to saw it backwards and forwards with extreme rapidity. In a short space of time, varying from ten to thirty seconds, the rattan snaps and he picks up the stick with the tinder, which has probably by this time begun to smoulder, and blows it into flame. At the point where the rattan rubs on the stick a deep cut is made on the stick, and at each successive use the stick is split a little further down and the rattan is rubbed a little further back, so that a well-used fire-stick is marked with a number of dark burnt rings. It was only with the greatest difficulty and after many attempts that we succeeded in producing fire in this manner, but the

Tapiro do it with the utmost ease and they scorned our boxes of matches, which we offered them in exchange for their apparatus, and showed no signs of surprise at a suddenly kindled match. *

The most frequent use of the fire-stick is in lighting the tobacco, of which nearly every man carries a supply in his larger bag. These people cultivate tobacco in sufficient quantities to be able to supply the Papuans of the low country. The leaves are dried and neatly rolled up into long bundles weighing three or four pounds; the flavour is strong and rather bitter, but it is not unpleasant to smoke. The Tapiro smoke tobacco chiefly as cigarettes, using for the wrapper a thin slip of dry *pandanus* leaf. When, as is often the case, the wrapper is very narrow and the tobacco is inclined to escape, the man smokes his cigarette in a peculiar manner; he holds the unlighted end in his fingers and with his mouth draws out the smoke from between the edges of the wrapper in the middle of the cigarette, this he continues to do until the cigarette is about half consumed when he puts the end in his mouth in the ordinary way.

The Tapiro also smoke tobacco in a pipe in a fashion of their own. The pipe is a simple cylinder of bamboo about an inch in diameter and a few inches in length. A small plug of tobacco is rolled up and pushed down to about the middle of the pipe, and the smoker holding it upright between his lips draws out the smoke from below.

* I am informed by Mr. H. Balfour, of the Pitt Rivers Museum, Oxford, that a similar method of making fire is employed by people in Assam, the Chittagong Hills, at certain places in the Malay Peninsula, in Borneo, at numerous places in different parts of New Guinea, and at one place in West Africa.



MAKING FIRE : (2) BLOWING ON THE SMOULDERING TINDER.

The Tapiro never make large cigars like those of the Papuans of the Mimika, and the Papuans never smoke pipes, nor did they take readily to those that we gave them.

Besides the bone daggers mentioned above the only weapon of the Tapiro are the bow and arrows, which they always carry. The bows are a very little shorter than those of the Papuans, but otherwise they are very similar, viz.: straight tapered strips of hard wood "strung" with a slip of rattan. The arrows are shorter and lighter and of finer workmanship than those of the Mimika Papuans, but like those they have neither feathers nor nocks. The best, which they were not at all anxious to sell to us, are ornamented with simple carvings and are tipped with a very sharp point of black wood. An arrow which ended in a curious blunt lump of wood was used, so we understood, for shooting birds.

The Tapiro have no spears and neither they nor the Mimika Papuans know the use of the sling. They set quantities of little nooses for small animals, and we once found a rattan noose fixed to a root of a tree and evidently set with the purpose of catching a pig.

Many of them carry in their bags a small Jew's harp, made of a thin piece of bamboo, from which they extract faint music that is pleasing to their ears. Two men possessed instruments of a more original design: these were made of pieces of polished bone fitting together in such a way that when one was turned round over the other it produced peculiarly discordant squeaks, which were highly appreciated by the player.

Wamberi Merbiri or Wamberimi, the village of the

Tapiro which was visited by different members of our party on three separate occasions, is situated on the lower slopes of Mount Tapiro, the mountain nearest to Parimau, at about 1800 feet above the sea. It is in fact within a stone's throw of that large clearing which Rawling and I had reached with so much difficulty, but when approached by the track used by the people themselves it is an easy walk of two or three hours from the Kapare River.

The track climbs by a steep almost knife-edged ridge densely covered with forest to the rounded shoulder of the hill where the village lies. The first sign of the village is a flimsy fence of tall poles, which bars the track and extends for a short distance on either side of it. Passing through a narrow opening in the fence you come to a cleared space occupied by three or four houses. A couple of hundred yards beyond these and separated from them by a small gully, which is bridged by an enormous fallen tree, is a second group of six houses, constituting the village of Wamberi Merbiri.

The houses are scattered about over three or four acres of steeply sloping ground, from which most of the trees have been cleared. Between the houses the ground has been levelled in three places to form almost level terraces, measuring about fifteen by five yards, completely cleared of vegetation and covered with small stones. These terraces are held up on the lower side by logs and stumps of trees, and the labour of making them by people whose only tools are stone axes and pieces of wood is difficult to imagine; they are used, so far as we could understand, for dances and other ceremonies.

WAMBERI-MERBIRI, THE VILLAGE OF THE TAPIRO PYGMIES.

The houses are greatly superior to those of the Mimika Papuans, from which they differ in every respect. They are built on piles, which raise the floor of the house from four to ten feet above the ground according to the steepness of the slope underneath. The walls are made of long laths of split wood with big sheets of bark fastened on to the outside. The roof is a fairly steep pitched angular structure of split wood covered with over-lapping leaves of the Fan-palm. The floor is made like the walls and covered with large sheets of bark; in the middle of the floor is a square sunken box filled with sand or earth in which a fire is kept burning, and over the fire hanging from the roof is a simple rack, on which wood is placed to dry. The house consists of one nearly square compartment, measuring about ten feet in each direction. The way of entering is by a steep ladder made of two posts tied closely together, which leads to a narrow platform or balcony in front of the front wall of the house. There are no notches on the posts, but the lashings of rattan, which tie them together, answer the purpose of steps or rungs for the feet. As well as in the excellence of their houses, the Tapiro show another point of superiority over the neighbouring Papuans in their habit of using a common retiring place at the edge of a small stream.

There was an old man in the village, bald and white-bearded, and horribly disfigured by disease,* who appeared to be unquestionably the headman of the place. He sat in one of the huts all day and shouted shrilly to the other men who were constantly going in and out to

* I saw three men who showed unmistakable signs of syphilis.

speak to him, and I think it was due to him that we were never allowed to see the women. We were particularly anxious to see some of the women of the tribe, and we offered them large rewards of knives and axes merely for the sight of them. The other men were willing enough to produce the women, and several times they were on the point of fetching them, but were always prevented by the old man. Finally we had a personal interview with him, and held out three bright axes, which made his one eye glisten with greed, but he still remained obdurate.

Though we never saw the women I have no doubt that they saw us; at night we saw their camp fires up on the hillside opposite the village, and when we departed we heard their shrill voices quite close to us before we had gone a quarter of a mile from the place. They had no reason to distrust us when we assured them that our only wish was to see their women, and I think the reason for their keeping them hidden was the presence of the Papuans who accompanied us from Parimau. The supply of Papuan women is very scanty, and it is likely enough that the men would seize any chance of abducting a Tapiro woman, as indeed they boasted of having done.

The language of these Tapiro pygmy people is certainly different from that of the Papuans, but I regret to say that we were unable to make even the smallest vocabulary of it. Their voices are rather high-pitched and nasal, and many of their words contain curious throat sounds, which I was not able to spell much less to imitate. In talking they have a curious habit of

HOUSE OF THE TAPIRO.

protruding the lips, which recalls in a striking manner a familiar grimace of the anthropoid apes.

They appeared to understand a good deal that the Papuans said to them, but I doubt if the latter understood them when they were talking amongst themselves. When we were trying to persuade the headman to allow the women to be produced, it was a strange experience to be using the Papuans, of whose language we knew only the rudiments, as interpreters to an even less known people.

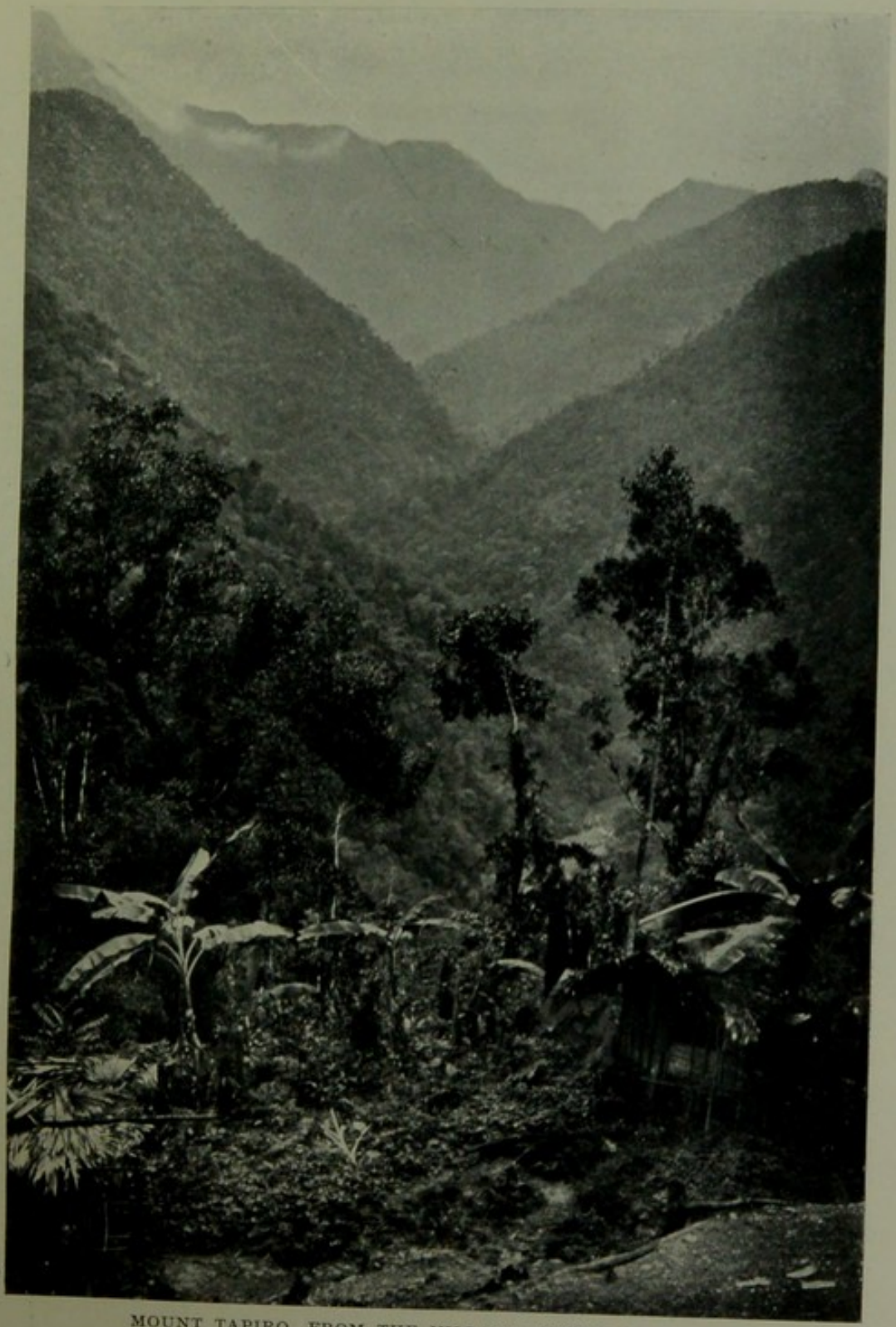
In consequence of our entire lack of knowledge of their language we were not able to form a very reasonable estimate of their intelligence. When they were seen in company with the Papuans, the latter, who usually looked dull and expressionless, appeared by contrast to be full of life and animation. The Tapiro, as a rule, looks blank and rather sad, and when a smile does appear upon his face, it dawns slowly and reluctantly.

A rough test of an uncivilised man's intelligence is the extent to which he is able to count, but in the case of the Tapiro there is an unfortunate difference of evidence in this respect. Capt. Rawling (*Geograph. Journal*, Vol. xxxviii., page 246) affirms that they are able to count up to ten. If this is so, it is a very interesting and remarkable fact. On several occasions I tried to make these people count, with a view to learning their numeral words, and I found that like the Papuans they only had words for one and two, and that those two words were the same as the Papuan words; but it appeared that, unlike the Papuans, they had not the custom of using their fingers and toes for the higher numbers.

On the credit side of their intelligence must be placed their admirably constructed houses, their decorated arrows and ingeniously woven bags, and their cultivation.

As well as the village and clearing of Wambiri Merbiri we saw other small patches of cleared ground on the spurs of Mount Tapiro, and on the slopes of Mount Tuaba we saw from a distance another large clearing which we were never able to reach. Further to the East we saw no sign of them and we were informed by the Papuans that there were no more in that direction. That is probably true, for the mountains are so excessively steep to the East of Mount Tuaba that there appears to be no country suitable for them. It seems likely that we were fortunate enough to meet these people at the Eastern limit of their range and that more of them would be found living in the hills N.W. from the Kapare River towards the Charles Louis Mountains, where the slopes are less steep than in the Nassau Range. The thick-coated dog, which was brought down to Parimau by the Tapiro (see p. 126), might suggest that they have dealings with other natives living high up in the mountains, but so far we have no definite knowledge of the existence of such a people.

This account of our observations, which were necessarily very superficial, will suffice to show that there is a most promising field for some future investigator, who has opportunity and time to spend among these most interesting people.



MOUNT TAPIRO, FROM THE VILLAGE OF THE PYGMIES.

CHAPTER XVI

Communication with Amboina and Merauke—Sail in the "Valk" to the Utakwa River—Removal of the Dutch Expedition—View of Mount Carstensz—Dugongs—Crowded Ship—Dayaks and Live Stock—Sea-Snakes—Excitable Convicts—The Island River—Its Great Size—Another Dutch Expedition—Their Achievements—Houses in the Trees—Large Village—Barn-like Houses—Naked People—Shooting Lime—Their Skill in Paddling—Through the Marianne Straits—An Extract from Carstensz—Merauke—Trade in Copra—Botanic Station—The Mission—The Ké Island Boat-builders—The Natives of Merauke described—Arrival of our Third Batch of Coolies—The Feast of St. Nicholas—Return to Mimika.

It has been mentioned in the preceding chapters that after the expedition landed in New Guinea, a more or less regular communication was kept up between the Mimika and Amboina. The South-west coast of New Guinea as far East as the Utanata River is in the administrative district of Amboina, and beyond that, as far as the boundary of British New Guinea, the country is nominally under the control of the station of Merauke. Thus the Mimika is actually within the Merauke district, but it was for many reasons found more convenient for the Government to communicate with the expedition directly from Amboina rather than by way of Merauke; accordingly the soldiers forming our escort were attached as an outpost to the garrison of Amboina and communications were established with that place.

For several months a steamer came from Amboina

to the Mimika, bringing men and stores and letters and taking away invalids; usually it came every six or eight weeks, and the longest interval that occurred was twelve weeks, during which for one reason or another it was found impossible to send a ship to the Mimika. In October an alteration was made, and it was decided that the Merauke steamer, which was in regular communication with the Dutch expeditions on the Utakwa and Island rivers, should visit the Mimika also. It was in consequence of this new arrangement on the part of the Government that I was enabled to make the journey described below, and although these places do not fall strictly within the sphere of our expedition, yet they are so little known that I shall make no apology for giving a short description of them here.

Towards the end of November, the Government steamer *Valk* called at the Mimika on its way to the Utakwa and Island rivers to take away our sick men, who had accumulated in some numbers during the last two months. Our work was practically at a standstill, and nothing more could be done until our next batch of coolies arrived, so it was agreed that I should go down to Merauke in company with Shortridge, who was going home an invalid, and bring back our new coolies who were due to arrive there by the next boat early in December.

A few hours' steaming from the Mimika brought us to the mouth of the Utakwa, where we lay outside the bar all night waiting for daylight to find our way into the channel. When we had entered the river it was evident that the Utakwa was something very different

from the Mimika, which is a mere ditch in comparison with it; it is indeed to the Mimika as the Severn is to the Wye. It was tantalising to remember that this was the river by which we had originally intended to enter the country, and one could not help regretfully wondering what would have been the result if we had followed out that plan; but it was at the best an unprofitable speculation, and one had to rest content (or as content as possible) with the course we had taken. In any case it was certain that even if we had taken the Utakwa as our point of entering into the country, we could not possibly have reached any considerable height in the Snow Mountains with the means, i.e. the men, at our disposal.

Near its mouth and for some miles inland the Utakwa is about half a mile wide and bounded by low banks of Mangrove and Nipa-palm. The *Valk* was a ship of about five hundred tons drawing twelve feet of water. We steamed up the river for about seventeen miles and there anchored, not from lack of water, but on account of the risk of turning the ship round against a strong current in the somewhat narrowing channel. From the anchorage a steam launch and boats were sent on to the base camp of the Government expedition, which had been established rather more than thirty miles further up the river.

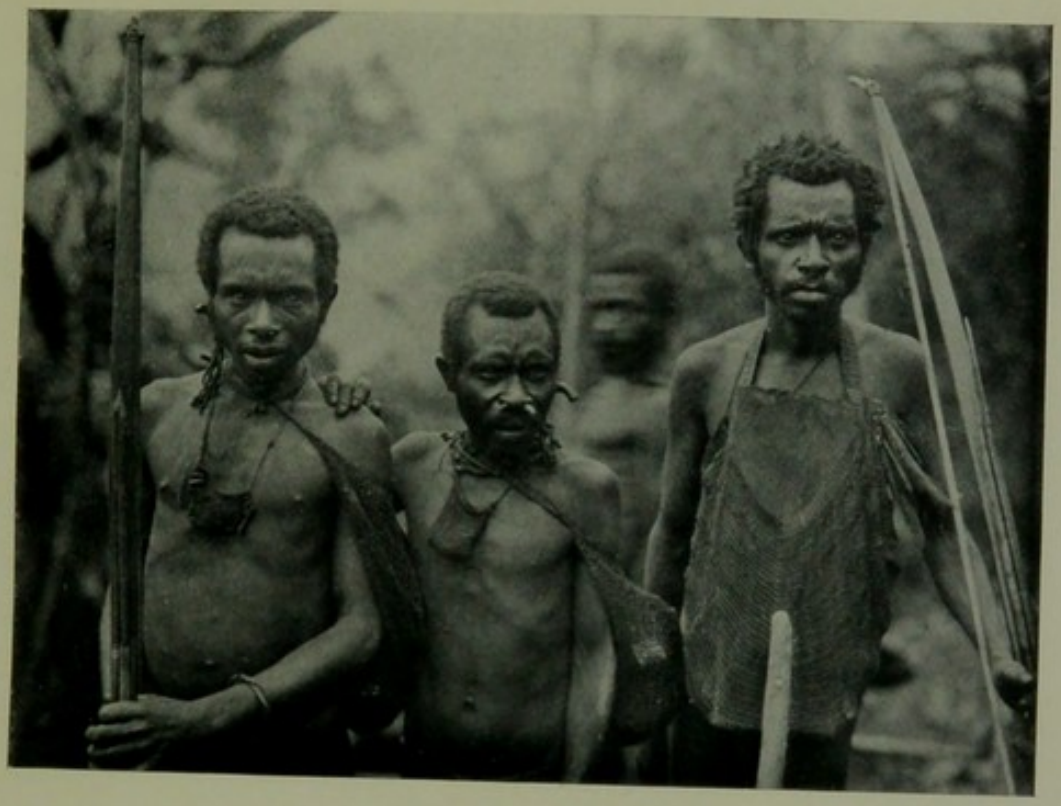
We waited for three days while that expedition was being brought away, and after the first day the *Valk* went down to the mouth of the river on account of the mosquitoes at the anchorage; they were a small black species, and they came out of the swamps by day as well

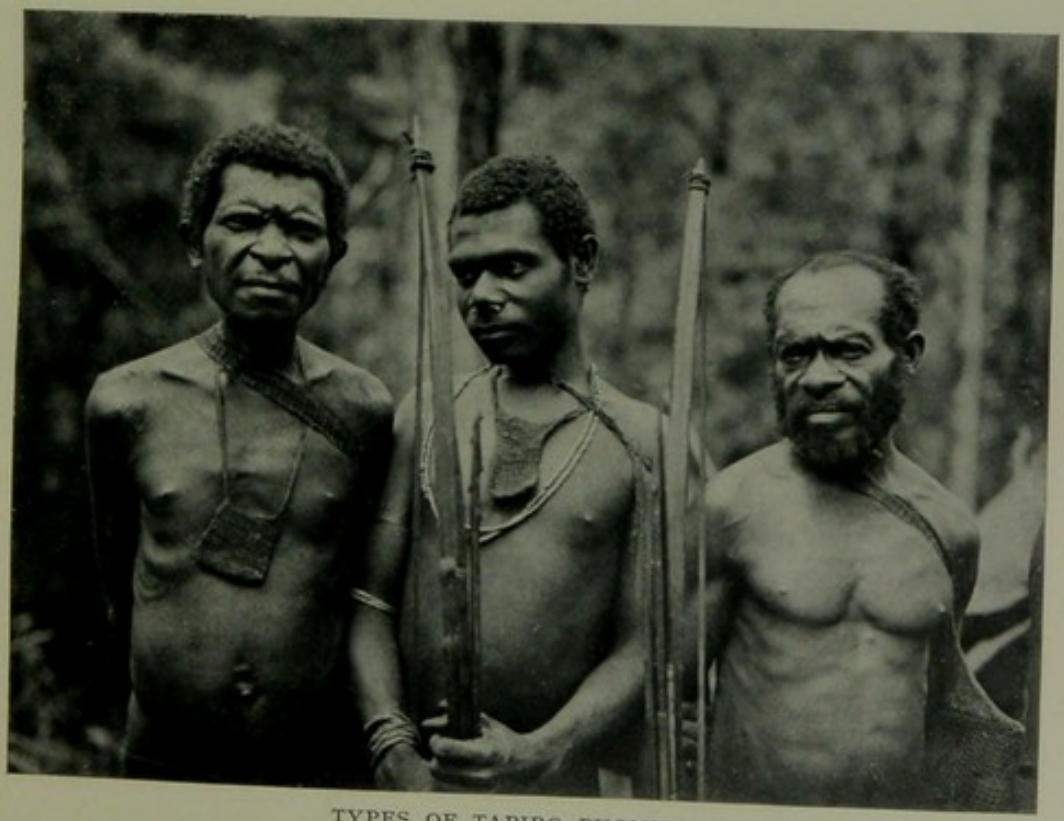
as by night in swarms, and attacked everybody on board so furiously that life became quite intolerable. Before we left the anchorage up the river we saw a magnificent view of the snows of Mount Carstensz towering up over the morning mists. From there the Snow Mountains, making as it were a steep wall across the view to the North, appear far more imposing than they do in the rather sidelong view from the Mimika; and the different aspect of the precipices as seen from the Utakwa was most instructive.

Whilst we were waiting at the mouth of the river we were visited by several parties of natives in canoes, who came, they informed us, from a large village on the Kupera Pukwa, the next river to the west of the Utakwa. They appeared to use the same, or almost the same, language as the people of Mimika, and they were very anxious that we should go and visit their village, but unfortunately we had no means of doing so.

An interesting sight at the mouth of the Utakwa were the Dugongs (*Halicore australis*), which were seen feeding on the weeds in the shallow water and occasionally rose up and stared at us in a curiously human manner. They are about eight feet long and are perfectly inoffensive creatures, but they have been "fished" for with nets and almost exterminated in many places on account of their valuable oil.

The Dutch expedition came down to us in detachments during the three days that we waited at the mouth of the river. There were Captain Van der Bie, in command; Mr. J. M. Dumas, surveyor and naturalist; three white sergeants, about fifty native soldiers and





TYPES OF TAPIRO PYGMIES.

convicts, and twenty Dayaks of Dutch Borneo, who came down the river in the long canoes they had built themselves. There was also an Australian collector, Mr. Meek and two assistants, who had been attached to the Dutch expedition to make collections of birds and butterflies for a private museum in England. With Mr. Meek were ten natives of Port Moresby in British New Guinea, little brown, fuzzy-headed fellows full of life and merriment; they were in every way so different from the sombre and unemotional Papuans that it was difficult to realise that they were both natives of the same island.

The Utakwa expedition had been in the country for seven months and had traversed a considerable extent of country, but those months coincided with the period of the worst weather—one cannot talk of wet and dry seasons in that region—and like us they had suffered from the shortcomings of their coolies; the Dayaks had reached them too late to be of much service to the expedition. From their base camp at the head of steam-launch navigation they had gone two days further up the river in canoes, and then had gone a distance of seven marches towards Mount Carstensz. The furthest point they reached was at an altitude of about 3000 feet, and was less than twenty miles distant from the snow, but the views of the country that they saw were not sufficient to show whether that was the best route to the highest mountains. One of the principal objects of the Government in despatching that expedition to the Utakwa was to discover a convenient way of crossing New Guinea, and when it was found that the Utakwa led apparently to the highest mountain in the island, it was

decided to withdraw the expedition, and to concentrate all the exploring energies on the Island River, which seemed to offer a better prospect of accomplishing that purpose.

When all these people had been taken on board the *Valk*, the decks of the little ship were crowded to overflowing with gear and men and wild animals. They had brought some young wild pigs, a number of crowned and other kinds of pigeons, and several young cassowaries. Mr. Dumas brought on board three eggs, from which were hatched pretty little cassowary chicks during the next few days. We were particularly struck by the appearance of the Dayaks, any one of whom looked more than a match for three of our Malay coolies. Apart from their apparent strength, they differed noticeably from the Malays, who like to spend their days in sleeping between meals, in their unceasing industry; they had brought on board quantities of bamboo, from which they at once started making bird cages, and pieces of hard wood, out of which they carved handles for their knives and other ornamental objects.

The ship was so heavily laden that it was impossible to take on board all the boats that had been used by the Utakwa expedition, and three or four were towed in a long string astern. Fortunately the sea was exceptionally smooth, but even so one of these, an almost new "long-boat," broke adrift, and we lost a day in searching for it unsuccessfully.

Whilst we were cruising about looking for the lost boat, one of our passengers, a fever-stricken soldier from the Mimika, caused some excitement by stabbing with

his knife another man and then jumping hastily into the sea. The sudden plunge cooled his fever and the appearance of a sea-snake swimming not far from him made him as anxious to return to the ship as he had been to leave it.

During the voyage down the coast we saw a number of sea-snakes, sometimes as far as thirty or forty miles from land, but there was no opportunity of catching one; they appeared to be yellowish with dark markings and were about three or four feet in length. I was told that they sometimes travel in large numbers together and will climb up the sides of ships at anchor, but I cannot vouch for the correctness of this statement.

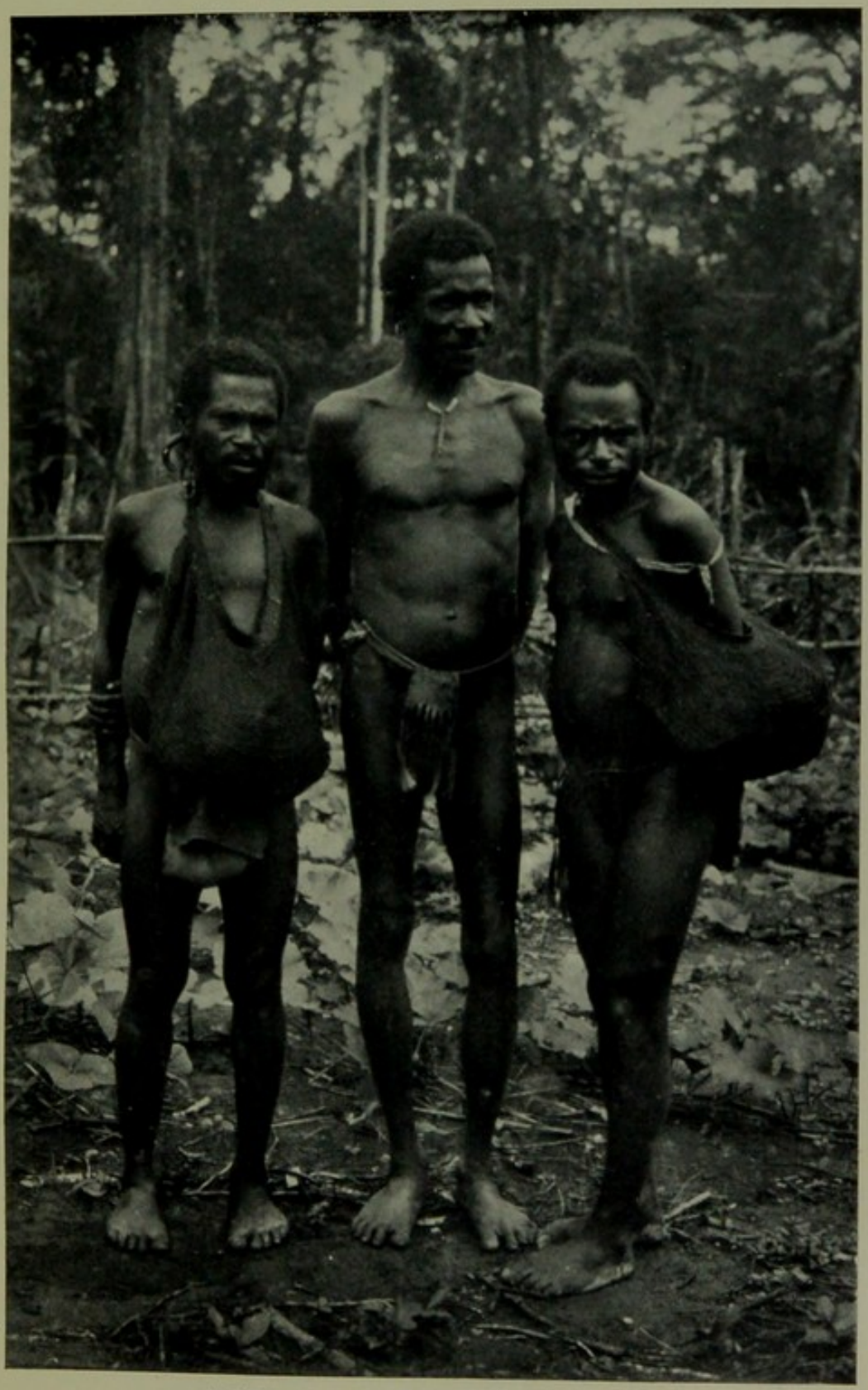
Another episode, which enlivened the voyage down to Merauke, was caused by the strange behaviour of one of the convicts, who was being taken away from the Mimika. This man had suffered from the common form of delusion that everybody was against him, and after he had run away from the camp at Wakatimi and had spent thirty-six hours in the jungle without food I certified that he was of unsound mind and recommended that he should be sent back to Java. He was found prowling about the ship with an exceedingly sharp knife, with which (so he said) he intended to murder me, so he was promptly secured in chains. We made friends in a day or two and he was set at liberty again before we reached Merauke, but I confess I was not sorry when we were no longer together in the same ship.

On the second day after leaving the Utakwa we entered the Island River by one of its many mouths,

and after we had gone up it a few miles we realised that in the matter of size it is to the Utakwa as that river is to the Mimika. The banks are low and swampy and mostly covered with mangroves for several miles from the coast. Further on the banks are a few feet above the level of high water and we saw many trees that looked like good timber trees and others of considerable beauty, notably a wide-spreading acacia-like tree (*Albizia moluccana*), and a very graceful palm (*Oncosperma filamentosum*) like a Betel-nut palm growing in clumps by the waterside. We noticed also a number of Bread-fruit trees (*Artocarpus* sp.) bigger than any I have seen elsewhere, but none of them appeared to bear fruit.

We steamed up the river for one hundred and twelve nautical miles to the *Swallow*, the depôt ship and base camp of the Dutch exploring expedition. The river at that point is about three hundred yards wide, but the current is swift and there are many shallow sand banks, which make further navigation impossible for a ship as large as the *Valk*.

The Dutch expedition had been established for several months in the country and had made very considerable progress towards the North. From the *Swallow* they had proceeded up the river two days' journey by steam launch and six days beyond that by canoes as far as the river was navigable, a distance of more than one hundred miles. Thence they had gone North, and in nine marches they had reached a height of ten thousand feet at a point which appeared to be on the watershed of the main mountain range of the island. One of the principal



A PAPUAN WITH TWO TAPIRO PYGMIES.

objects of the expedition was to cross New Guinea from South to North, and it was hoped that from the furthest point they had reached they would soon arrive at one of the upper tributaries of the Kaiserin Augusta, the large river which enters the sea in German territory. They were at that time busily occupied in transporting supplies up to their furthest camp with a view to continuing the journey, but shortly afterwards the expedition was crippled by sickness and the project was abandoned. We spent two days alongside of the *Swallow* transferring to her the stores and many of the men that we had brought from the Utakwa and taking away the sick and time-expired members of the Island River expedition, amongst them being Lieut. Van der Wenn of the Netherlands Navy, who was attached to the expedition as surveyor.

On our way down the Island River we saw many things which we had missed on the way up, because we had entered the river and steamed up through several hours of darkness. First we came to isolated houses by the river bank of the same type as the Mimika houses, but larger and better built; near them we saw a few natives, who appeared to be very shy and retreated hastily into the jungle when the steamer approached.

Lower down, when we were within about thirty miles of the sea, we came to a large village of fifty or sixty houses, some of which were raised on piles near the edge of the river and the others were built in the trees, where they presented a most astonishing appearance. They are square and apparently well-made houses with ridge-pole roof and walls of "atap," the entrance is by a hole

in the floor which is reached by a vertical ladder of bamboo from the ground. One house was at a height of certainly not less than sixty feet above the ground in a very slender tree, and the position of the inhabitants, when the wind blew, must have been far from enviable. Unfortunately the sun was low and directly behind the village so that I was unable to obtain photographs of the tree-dwellings. The people there showed no fear of us, but stood on the bank and shouted and waved their spears.

A few miles further down the river we came to another large village of yet a different character. The houses there were all built on piles, but while a few of them were of the usual small size, the majority were quite unlike anything else we had seen in that part of New Guinea. They were huge barn-like structures raised on piles ten or more feet above the ground, and the length of some of them must have been from one hundred and fifty to two hundred feet. It was quite evident that these were communal dwellings, indicating a social system entirely different from that of the surrounding districts, and it was very tantalising to pass them within a few yards and not to be able to visit them. The village extended for about a mile along the East bank and the natives that we saw must have numbered at least a thousand. The men were all entirely naked and the women were only dressed in the scantiest strip of bark-cloth. In other respects they appeared, as far as one could tell from such a rapid survey of them, to be very similar to the Mimika Papuans in their features and their short hair and their absence of adornments.

Crowds of people lined the river bank and some of them, holding short bamboos in their hands, jerked them in our direction and from the end came out a white cloud of powdered lime, which looked like smoke. This custom was noticed by Rawling when he first visited the village of Nimé, and it was recorded by some of the early voyagers,* but the meaning of it has not yet been explained. The suggestion that it is a means of imitating the appearance of fire-arms is ingenious, but it can hardly be seriously considered.

While most of the people stood on the bank to see us pass, a number of men jumped into their canoes and came racing after us. The current of the river was about two, and the speed of the *Valk* was seven knots, so they had to move quickly, but they easily overtook us and followed us for some distance down the river. Their canoes are simple "dug-outs," but they differ from those of the Mimika in coming to a fine point at both ends. The bow is roughly notched on the upper side, which gives it somewhat the appearance of a bird's beak. They seem also to be considerably lighter than the Mimika craft, and so narrow that a man could hardly sit down in them. The usual number of a crew is nine or ten men, who all stand up and all paddle on the same side of the canoe. The regular swing of their bodies and the perfect precision of the paddling was a sight prettier than any "eight" I have ever seen. They called to us and waved bundles of arrows, evidently anxious to trade with us, but the captain of the *Valk* was unable to stop, so we

* "Capt. Cook, H.M.S. *Endeavour*, 1770." "Kolff's Voyages in Dutch Brig of War *Dourga*, 1825-6."

threw overboard for them empty tins and bottles, and it was marvellous to see how they raced up to these things, and with a sudden backward stroke of their paddles brought the canoes to a standstill, while they recovered the prize, and then raced on again.

From the mouth of the Island River, as we went out to sea, we saw through a break in the clouds to the far North the snow on Mount Wilhelmina, which was reached by Mr. H. A. Lorentz in November, 1909. Steaming in a south-easterly direction we kept some way out from the land, which is so low as to be invisible at a distance of a few miles. When we were opposite the Digoel, the greatest (excepting the Fly) of all the South New Guinea rivers, we found the sea strewn with logs and trees, in some places so many together as to form floating islands, on which crowds of gulls and terns were seen to settle at nightfall.

The tide favouring us, we chose the Marianne Strait between the mainland and Prince Frederick Henry Island. Sometimes, when the south-east monsoon has been blowing regularly for a few days, it is quite impossible for a ship of only moderate power to steam through it against the current. The Strait is a winding channel about ninety miles long and has an average width of about two miles, and it is not surprising that early voyagers, even as late as Kolff, in the Dutch brig-of-war, *Dourga*, in 1826, mistook it for a river. The banks are low and forest-covered, and we only saw two small clusters of houses. From one of these some men put off in a canoe to intercept us and followed us for some distance, calling "*Kaya-Kaya*"

(friend).* They were tall and powerful-looking men, entirely naked except for a small shell attached to a string about the middle, and their great mats of hair extending down to the shoulders and beyond showed most clearly that we had come to yet another tribe quite distinct from the people of the Island River.

Jan Carstensz, who visited this coast in 1623, gives a good description of the land and the people:† "It "is impossible to land here with boats or pinnaces "owing to the clayey and muddy bottom into which "a man will sink up to the waist, the depth of the "water being no more than three or four fathoms at "three or four miles distant from the land. The land "is low-lying and half submerged, being quite under "water at high tide; it is covered with wild trees, "those on the beach resembling the fir-trees of our "country, and seemingly bear no fruit. The natives "are coal black like the Kaffirs and they go about "stark naked. They have two holes in the midst of "the nose, with fangs of hogs or sword-fishes through "them, protruding at least three fingers' breadth on "either side, so that in appearance they are more like "monsters than human beings, they seem to be evil-"natured and malignant. The lands which we have "up to now skirted and touched at not only are barren "and inhabited by savages, but also the sea in these "parts yields no other fish than sharks, sword-fishes,

* This is the usual friendly greeting of the people in the Merauke district. The word is now used by the Dutch as a slang name for the natives of any part of New Guinea.

† Voyage of the ships *Pera* and *Arnhem*, under command of Jan Carstenszoon or Carstensz, 1623.

"and the like unnatural monsters, while the birds too "are as wild and shy as the men." Further to the East he found the people "cunning and suspicious, and no "stratagem on our part availed to draw them near "enough to us to enable us to catch one or two with "nooses which we had prepared for the purpose." Suspicion of the unknown is in the nature of savage people, and when we read that "in order to frighten "them the corporal fired a musket, which hit them "both, so that they died on the spot," we no longer wonder that they appeared to Jan Carstensz to be "evil-natured and malignant." But times have changed and the Dutch navigator of to-day is not less humane than any other.

After coming out of the Marianne Straits we noticed a change in the appearance of the land; the smoke of villages appeared at frequent intervals and the shore was seen to be fringed by a continuous belt of coco-palms in place of the mangrove to which we had become accustomed. In a few hours from the Marianne Straits we came to the mouth of the Merau River and after steaming up it for about four miles we dropped anchor opposite the Dutch station of Merauke, where we left the ship and went ashore.

The Dutch people have an inborn preference for low-lying land on which to place their stations, but not the most enthusiastic fenman would have voluntarily chosen Merauke as a place for a settlement. The reason of its existence is a political one. Formerly the natives of the district, the Tugeri, a very fierce and warlike people, used to have the habit of making raids to the Eastward

1. Arm-band of Fibres, ornamented with Cowry shells.
2. Part of Waist-band, ornamented with shells and seeds.
3. Arm-band of Fibre.
4. Basket of plaited strips of leaves.
5. Bamboo ornament worn on the neck.
6. Collar made of Fibre and Cassowary Feathers.
7. Bamboo tobacco-pipe, used by the Tapiro Pygmies.
8. Basket of Fibre.
9. Part of the bill of a Hornbill, worn in the Nose.

into British territory, whence they brought slaves and the heads of their fallen enemies. This became such a nuisance that the Australian Government addressed protests to the Dutch about the lawless behaviour of their subjects, and in 1902 the Dutch made the station of Merauke, and established there a small garrison of about one hundred men. The place was chosen partly because it was in the centre of the district of the Tugeri, and partly because on that shallow coast the Merau River alone offered a safe harbour for ships. It is a dreary enough place on the muddy bank of the river and surrounded on the other sides by swamps, but the Dutch have made the best of a bad job, and by laborious ditching and dyking they have made the place fairly secure from floods; in spite of all their draining, however, there are more mosquitoes there than in any other inhabited place I have ever visited.

Like other Dutch settlements Merauke is laid out on a regular and spacious plan, plenty of room being left between the houses of the officials and the quarter occupied by the shops of the Chinese, of which there are about a dozen. There are (or were in 1910) sixteen Europeans * in the place, all of them in the employment of the Government except two, the representatives of an European trading firm. The principal trade of the place is in copra obtained from the hundreds of thousands of coco-palms, which line the neighbouring sea-shore. These palms are the property of the natives, who are too lazy to take advantage of the wealth that lies (or rather

* Here, as elsewhere in the Dutch colonies, half-castes in official positions are reckoned as Europeans.

hangs) at their doors, and they do not encourage other people to come and make use of it.

There is a small force of native police under a Dutch officer, and a few convicts are employed in keeping the station in order. It may not be out of place to remark here that the nearest Dutch settlement is at Fak-fak on the S.W. corner of the MacCluer Gulf, seven hundred miles in a straight line from Merauke. Besides these two places the only other Dutch garrison is at Manokwari (Dorei Bay) on the north coast, where there has been a mission station for more than fifty years. Apart from civilian and military officials, missionaries and two or three agents of a commercial firm there are no settlers in the huge territory of Dutch New Guinea.

A former Resident of Merauke, who had somewhat inflated ideas of the future of the country, established an experimental botanic garden on the only patch of dry ground near Merauke. Attached to the garden is a large building containing rooms for three Europeans, laboratories, a dark room and so on, which (it was hoped) would attract scientific agriculturists and botanists from other countries to come and study the local *flora*. But no sane person wishes to study the *flora* of New Guinea in the middle of a swamp, and already the scanty soil was showing signs of exhaustion at the roots of the experimental bananas, and the practically-minded Resident was considering the removal of the house to Dobo or elsewhere as a dwelling for himself, when the contemplated abandonment of Merauke as a "Residency" should take place.

Another interesting building at Merauke is the house

of the Mission of the Sacred Heart, an offshoot from the mission at Toeal. It must, I am afraid, be admitted that Merauke is not a favourable field for missionary enterprise, and the most notable achievements of the good fathers there are the admirable house they have built, and the herd of cattle which they contrive to keep. They teach a very small class of the native children, but nearly all of them relapse again very soon into savagery, and the adults, who have remained faithful to the mission, are very few, and they are not the best specimens of their race.

Recently the ubiquitous Chinese have discovered that the sea in the neighbourhood of Merauke is a most profitable fishing ground, and the results of their labours are spread abroad to dry in the sun, so that there are times when the air is almost too strong to be breathed. The fishery has attracted some men from the Ké Islands, who are the best boat builders in the Eastern Archipelago, and I spent many hours watching them at their work. Their tools consist only of an axe, an adze and an auger, and no nails or metal are used in the construction of a boat. The planks are about three inches thick and are made each from a single tree hewn to the required shape. Holes are bored at intervals along the edge of the plank, and into these are fixed pegs of wood which fit into corresponding holes in the edge of the succeeding plank. When the shell of the boat is completed, the ribs, each made from a single piece of bent wood, are fitted to the inside. The fitting of the planks is so accurate that the boats require little or no caulking, and they are ready to take the water as soon as they are built.

But by far the most interesting feature of Merauke are the natives of the place, whose independent mien and conservative customs fill the observer with admiration if not with approval. It is now nearly ten years since the Dutch settled at Merauke, but in all that time, apart from curbing somewhat their head-hunting propensities, they have made very little impression on the natives, who still cling (if one may use somewhat of an Irishism) to their scanty costume of nothing at all, and refuse absolutely the beads and cloth and other "trade-goods" of the invading white man. They stroll about the place in a most lordly manner, and they like to visit the houses of the Europeans, where they spend hours disdainfully watching other people at their work.

In appearance they differ from the Papuans of the Mimika in their somewhat paler skin and in their features, which are markedly of the (so-called) "Semitic" type with prominent eyes and long, curving, fleshy nose. They are very fond of personal adornment and paint their faces with white, red, and yellow colours; a fashionable but very unsightly decoration is to paint the eyelids and eyelashes white. Through the *septum* of the nose is thrust a long piece of white bone or shell, and in the *alae nasi*, which are also pierced, are often worn the claws of a large eagle which project forwards, and give the man a most ferocious aspect (see illustration opposite.

Some of the more dandyfied individuals are loaded with necklaces of shells or teeth of dogs, sharks and crocodiles, and bands or belts of the same things are

A NATIVE OF MERAUKE.
(*Wearing the claws of an eagle in the nose.*)

NATIVES OF MERAUKE.

crossed on the chest. Rings of boars' tusks and plaited fibres almost cover the upper arms, and in the ears are worn bunches of large rings of tortoiseshell and bamboo. The hair is long and is plaited with a mixture of mud and grass and feathers into a solid bunch, which hangs down beyond the level of the shoulders. In some of these head-dresses I saw plumes of the Greater, the Red and the King birds of Paradise; it appears that when once they are made these head-dresses may be added to, but they can never be undone, and they are accordingly indescribably dirty. These people are characterised by a pungent and most disagreeable odour, quite different from the sickly sweet smell of the sago-eating Mimika people.

Another curious custom of the Merauke natives is their habit of wearing round the waist a belt of pig-skin, which cannot be removed, and is so tight that it constricts the man to an (apparently) most painful degree; the women of the tribe do not indulge in this practice.

Two days after our arrival the monthly mail-steamer came bringing our forty-eight new coolies from Macassar, and on the following day it sailed again, taking Short-ridge on his way back to England. For a week longer I received the most kind hospitality from the Resident, Mr. E. Kalff, until we returned to the Mimika. During that week of waiting our new coolies, who had heard terrible stories of the Mimika, declared that they would never go there, and they attacked with knives the guards who were placed to keep them in order. When I told them that if they had no liking for the Mimika

they were perfectly at liberty to go and live near Merauke, the stories they heard of the habits of the Tugeri put an immediate end to the strike, and they came contentedly enough to the Mimika. They were more fortunate than some of their predecessors, and all returned to their homes at the end of the expedition.

The Dutch have a pleasant sentiment with regard to the customs of their native land, and at Merauke, the most remote outpost of Holland, the feast of S. Nicholas was celebrated with due ceremony. All the Europeans in the place, as well as the Javanese sergeants and clerks and their children, assembled to meet the Saint, a huge Dutchman disguised out of all recognition, and all of us, brown and white alike, received at his hands a present or a mock flogging according to our deserts.

After spending ten very agreeable days at Merauke we sailed on December 18th and going by way of the Island River, where we landed fresh men for that expedition, we arrived again at the Mimika on the 22nd December.

CHAPTER XVII

Difficulty of Cross-country Travel — Expedition moves towards the Mountains—Arrival at the Iwaka River—Changing Scenery—The Impassable Iwaka—A Plucky Gurkha—Building a Bridge—We start into the Mountains—Fording Rivers—Flowers—Lack of Water on Hillside—Curious Vegetation—Our highest Point—A wide View—Rare Birds—Coal—Uninhabitable Country—Dreary Jungle —Rarely any Beauty—Remarkable Trees—Occasional Compensations.

WHEN our third and last batch of forty-eight coolies reached the Mimika towards the end of December, it was at once evident from their appearance that the majority of them would not last very long, and as we had ourselves been already for a year in the country, it was agreed that we should make a final effort to penetrate as far as possible towards the mountains, and that when our means of transport came to an end we should take our departure from New Guinea.

We had long realised the impossibility of reaching the Snow Mountains from our present base. If we had possessed an efficient steam-launch or motor boat, the Mimika was still too small a river and too frequently unnavigable to be useful as a route for water transport. Another consideration even more important than this was the fact that had the Mimika been ten times the size it was, it would still have taken us in a direction many miles to the West of the mountains we hoped

to reach. The result of these two circumstances was that we travelled by water with great labour to a place (Parimau), which was still in low and often flooded country, and from there we had to travel across country for many miles before we came to the first rising ground.

It is difficult enough in New Guinea to make a way up a river valley, but you always have the comforting reflection that the river itself leads you back to your base, when stores are exhausted and it is time to return. But when you attempt to make a cross-country journey, not only is the trouble of cutting a track much greater than it is in a river bed, but there is the difficult and often somewhat dangerous business of crossing the rivers; added to this is the risk, which increases with every river you cross, of being cut off for a longer or shorter period from your base camp and supplies by a sudden flood in those same rivers. For this reason, when coolies were sent back from an advanced camp to the base, they had to be supplied with an extra allowance of food in the event of their being stopped by floods on the way; such a proceeding meant diminishing to some extent the store of food they had carried out and a consequent waste of labour. It is essential, therefore, in trying to make a long journey in such a country, to discover beforehand the river valley which will take you nearest to your goal and thus avoid the risks of a long cross-country journey.

No time was lost in sending a fleet of canoes heavily laden with stores up the river from Wakatimi, and early in January the whole expedition was assembled

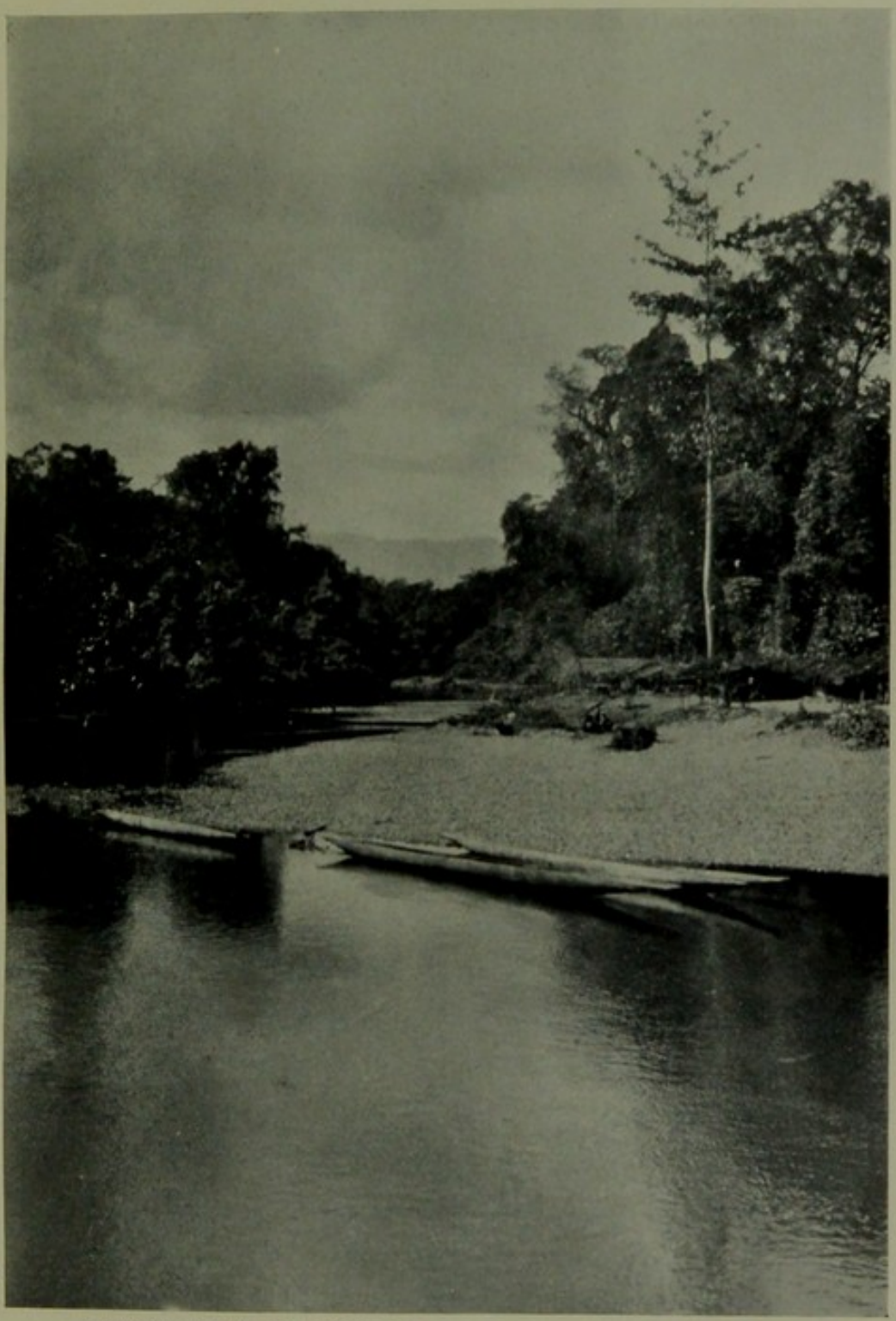
at Parimau with supplies sufficient for three months. On the 14th January Marshall and Grant with two Dayak collectors, forty-six coolies, thirty-one Papuans, and about forty soldiers and convicts, by far the largest number of men we had ever sent off at one time, set out for the Wataikwa river. A few of them went on with the Europeans to the Iwaka, where a track was cut for two marches up the valley of that river, while the rest, after leaving their loads at the Wataikwa depôt, returned to Parimau to fetch more loads of stores. From the Wataikwa the coolies carried on the stores to the upper camp on the Iwaka river, a three days' march, and at the beginning of February Cramer and I went up there with the last party. About a hundred and fifty loads of one kind or another had been carried up from Parimau in these various excursions, but unhappily the coolies ate up a good many of the loads on the way, and still more unhappily many of the coolies fell sick, so that if we had wished to send back to Parimau for yet another transport of stores, it would probably have ended in our having no coolies to carry them any further.

The nett result of all this carrying was that when we arrived with the last loads at the Iwaka depôt we found that we had only twelve days' provisions for our party of three Europeans, two Dayaks and the twenty-two coolies who survived from the forty-eight of a month earlier. Cramer had food for about the same number of days for his party of soldiers and convicts. Such a meagre supply of provisions as that obviously made it out of the question for us to

penetrate far into the mountains; but you must in New Guinea, as elsewhere, cut your coat according to your cloth.

The Iwaka at the place where we first came to it is a tremendous torrent flowing in rather a narrow stony bed. A little way further down it spreads out into a wider channel like that of the Wataikwa, but it is much larger than that river and though we searched down stream for three or four miles, we found no place where it was possible to cross.

As we went up the river we very soon found that the river banks became steeper, and it was soon evident that we were at last among the hills. There was a peculiar satisfaction in bending one's legs to go up hill after having been for so many months on almost level ground. The track was not at all easy, for it appeared that in many places large slices of the hillside had slipped down, bringing with them a chaos of dead and living trees over which we had to pick a precarious way. In some places we crept along the edge of the torrent, and in others we climbed high up the hillside to avoid a precipice where the river ran through a narrow gorge; but it was all a pleasant change from the monotonous jungle of the plains. There was more variety in the vegetation too as we went on; creepers arranged themselves prettily on the rocky river bank, and Fan-palms, which we had not seen before, grew in groups in the more level places. There was a tree growing in many places whose lower branches were covered at that season with small pink flowers, which lent a grateful splash of colour to the usually gloomy



LOOKING UP THE MIMIKA RIVER FROM THE CAMP AT PARIMAU.

green of the jungle. There was an invigorating air of mountains in the river as it came thundering over the huge boulders in its bed, and now and again we even got a glimpse through the trees of the mountains themselves, apparently not so very far distant from us.

Two days' scrambling up the valley brought us to the rest of the party at the depôt camp, and there we learnt the very unwelcome news of a discovery, which seemed likely to put an immediate end to our explorations. The advanced party had climbed up a spur to the west of the river and had seen that the Iwaka, instead of flowing (as we imagined) from the North-east by an apparently wide valley, actually flowed from the North through a deep, and in some places precipitous gorge, which we could not possibly attempt to traverse with our feeble coolies in the short time that remained to us.

If we were to advance at all, it was necessary for us to go in a North-easterly direction, but there we seemed to be completely cut off by the torrent of the Iwaka River. Attempts were made both upstream and downstream to wade across, but nobody succeeded in doing it, and no better luck attended those who tried to make a bridge by felling a tree across the river, the bridge was at once swept away. As a last expedient a large reward of money was offered to the first man who should find a way across the river, and again they all set out full of hope and armed with axes. The luck fell to two of the Gurkhas, who cleverly felled a large tree straight across the river. Had it fallen a few feet

to one side or the other it would not have been long enough to reach the other bank, and if it had bent a little more in the middle, the water would have snatched it up like a straw and carried it away in a moment. But it kept just clear above the water and made a safe temporary bridge by which they could cross, and before nightfall a single rope of rattan was securely tied across the narrowest part of the river.

During the night the river rose and carried away the tree, and it seemed that with only one strand of rattan across the river the prospect of our reaching the other side was not very good. Nobody seemed inclined to risk the passage, even with the promise of a large reward, until one of the Gurkhas, Jangbir by name, said he would go. "There was only one way to go "over—hand over hand, with a rattan round his "waist held by us in case the bridge strand broke, a "very likely thing, for it was extremely flimsy. Again "the rope to hold him had to be very thin, or the "weight would tear him from his hold. He got across "finely, being dragged out straight by the torrent, "until nearly over, when he could make no more "headway. The rope tied to his waist was paid out "fast, but was caught by the current, and then it was "touch and go. Thus he hung for half a minute, "dragged out in a horizontal position. If both rattans "gave, it meant certain death; if he let go, the great "strain would snap the rope round him with a like "result. The rope was pulled in as quickly as possible, "and then the lucky thing occurred. The strain was "too great, and the rope we were pulling on snapped.

BRIDGE MADE BY THE EXPEDITION ACROSS THE IWAKA RIVER.

"This freed him, and he pulled himself up further and "gained the bank." *

When once a man was on the other side, it was simple to throw over another rattan, and so to pull over many more which he tied to the trees on his bank. On our side of the river was a large boulder with a hole conveniently bored through it, into which stout posts were jammed Y-fashion, and over them the rattans were strained and fastened to the trees behind. When more men were able to cross the river, a similar structure was erected on the other bank.

The plan of the bridge was very simple, two hand-rails made of a number of twisted rattans, and a foot piece made of a long thin tree, which was secured to the hand-rails by loops of rattan. The span of the bridge was about one hundred feet, and there must have been several hundred yards of rattan used in its construction. The credit of the idea and of most of the work in making the bridge is due to the Gurkhas, without whose help we should never have crossed the Iwaka.

But all this work had occupied valuable time, and when the bridge was finished we found that we had provisions left for only eight days longer. On February 8th Rawling, Marshall and I, with three Gurkhas and nineteen coolies, and Cramer with a small party of convicts, crossed the Iwaka and made a way Eastwards. After crossing a moderately steep ridge we came down to a stream of marvellously clear water, which brought us in a short time to another large river flowing out of the mountains in a Southerly direction.

* Capt. C. G. Rawling. *Country Life.* 20 May, 1911.

So many rivers are there in this region that this was in some places separated by less than two miles from the Iwaka ; it was eventually found that this was a branch of the Wania, a large river which enters the sea in a common mouth with the Kamura, of which the Iwaka is a tributary. It was evident that this river came from the slopes of Mount Godman (9,500 ft.) a huge mass immediately to the North of us, and it was our intention to climb up on to the ridge of that mountain in the hopes of obtaining a view of the country to the North of it, and of the Snow Mountains.

Going up the valley we found ourselves in the midst of really beautiful scenery. The mountains soon closed in about us, and the river, though not running through an actual gorge, was walled by precipices of white limestone rock, now on one side and now on the other. This necessitated our frequently crossing the river, a task by no means easy even when the water is low, as it happened to be at that time. The best way of crossing those rapid rivers is not to fight your way upwards and across the stream, but to go rather with the stream in a sloping direction towards the other bank, and to go as quickly as may be. The bottom is made of very slippery stones, and a false step means disaster, as we all found at different times, but in that way you cross with far less exertion than by breasting the stream.

In this valley, for the first time since we came to New Guinea, we found several flowering plants ; among the rocks by the river grew clumps of a large pink Balsam, and on the moss at the foot of the tree trunks was a beautiful scarlet *Begonia* with a remarkably hairy leaf.

There was a curious green-flowered aroid with a large blotched leaf, and growing everywhere over the cliffs and the tree trunks were Pitcher plants (*Nepenthes*) of two species.

On the second day we camped on a sort of shelf on the hillside, two or three hundred feet above the river, and as our progress up the valley had been so slow, it was certain that we should not be able to reach the summit ridge before we were obliged to turn back by lack of food. So it was decided to go straight up the spur on which we then were in the hope that from the top we might see a view of the surrounding country. On the following day we climbed up about two thousand feet; the hillside was exceedingly steep, and the men had to haul themselves up by the roots of the trees above them.

At our camp on the hillside—there was not a square yard of level ground—we were troubled for the first time in New Guinea by a lack of water. No rain had fallen for two days, and the ground was so steep that all the water had run off, and it was a long time before the Gurkhas found a trickle of water in a gully some distance away, whence a supply was laboriously fetched to the camp.

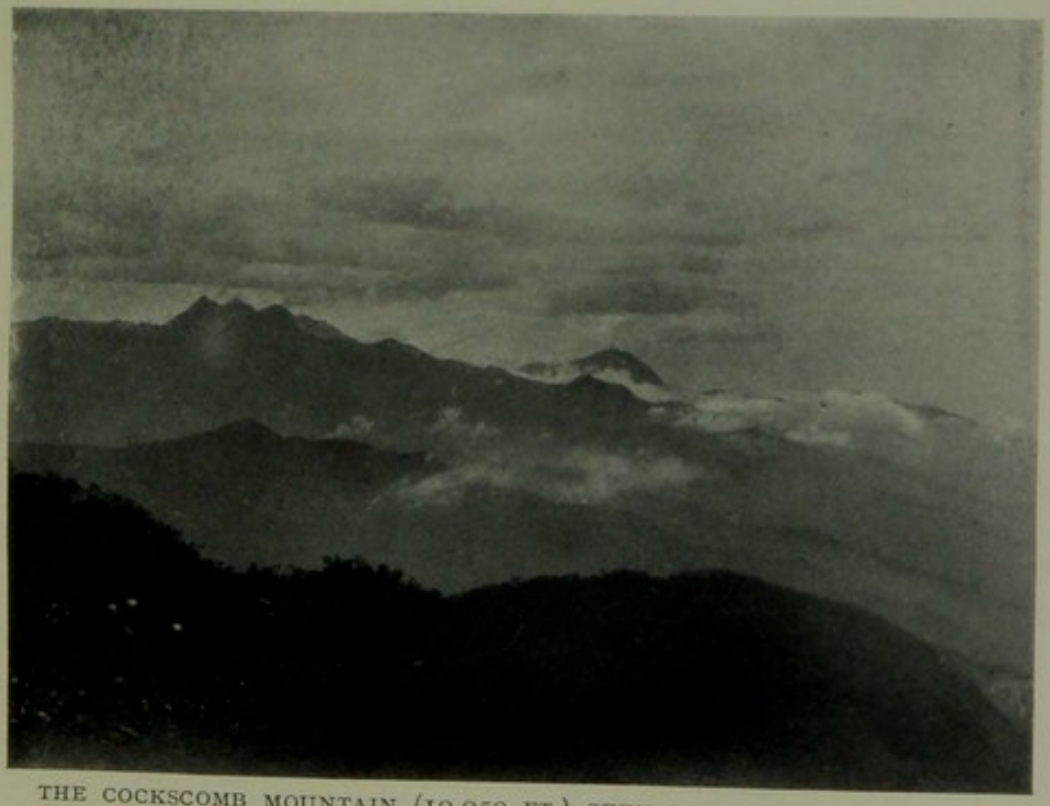
On the fourth day we climbed up about two thousand feet further, but with a great deal more difficulty. The trees became smaller as we went up, but infinitely denser, and for a great part of the way we scrambled up, not along the ground, but over a fantastic network of roots and trunks of dead and living trees, all of them covered with mosses and festooned

with a wonderful variety of creepers. In some places we were clambering over the topmost branches of the tangle of vegetation, and in others we were burrowing into mossy caves and grottoes among the roots. It was a weird and rather uncanny place and, except that it lacked the beauty of colour that is found there, it recalled the forest at ten thousand feet in Ruwenzori more than any other place I have seen.

At 5,000 feet we found ourselves on the ridge, a narrow knife-edged spur of Mount Godman, and there we camped. It was a most unlikely looking spot for a camp, but the ridge beyond was a great deal worse—it took the Gurkhas many hours to cut the narrowest track along it for half a mile—so we had to make the best of the place that we had reached. A number of trees were cut down and the irregularities of the ground were more or less filled up with the branches, and there we pitched our tents and spread our beds. There was a small shrub (a species of *Erica*, I think), which, when burnt, filled the air with a delicious smell of incense, strangely out of keeping with our surroundings.

Though we had been surrounded by dense clouds since we reached the ridge, it obstinately refused to rain for the third day in succession, a thing quite unprecedented in our experience of the country. Happily the mosses, which clothed everything, were full of moisture and we had only to squeeze them like sponges to get water in plenty ; the coolies of course complained of the dirty colour of their rice when it was cooked in mossy water, but we found that it gave to ours an unfamiliar and not unpleasant taste.

LOOKING WESTWARDS FROM ABOVE THE IWAKA RIVER.



THE COCKSCOMB MOUNTAIN (10,050 FT.) SEEN FROM MOUNT GODMAN.

The greater part of the next day was spent in cutting a way along the ridge to a point (5800 ft.) from which it was hoped that a view of the country might be seen. Long before the track was cut the clouds were down upon us, and no view could be seen, so we decided to stay for another day, although we had only one day's food remaining. But the view that we saw on the following day was more than compensation for our rather scanty fare.

Due North of us, and rising from the spur on which we stood, was the great mass of Mount Godman, and to the West of that the even more imposing peak of Wataikwa Mountain (9923 ft.). Between the two could be seen a part of the tremendous cliffs of Mount Leonard Darwin (13,882), the southern face of which appears to show an almost vertical precipice of upwards of ten thousand feet. To the West ridge beyond ridge of forest-covered heights stretched away to the ranges of the Charles Louis Mountains in the far distance. To the East rose the beautiful three-topped mountain called the Cock's Comb (10,050 ft.), behind and to the North of which heavy banks of clouds showed where the snows of Mount Carstensz lay hidden. Five thousand feet below us the mountains ended almost abruptly, and the southern half of the circuit of our view was occupied by the hideous plain of dull green jungle to a hazy line of the sea forty miles away. Here and there the sunlight caught the waters of innumerable rivers, and we could distinctly see those that we had crossed, the Tuaba, Kamura, Wataikwa, and the Iwaka. Further to the East was a still bigger river, the Wania, which we

could trace down to its lagoon-like estuary, and beyond it was the Aiika, and a very distant river, possibly the Newerip.

Nobody who has not spent a year and more in a dreary jungle country, where you are seldom more than a yard or two from the nearest tree, and where the limit of your view is the opposite bank of a stagnant river, can realise the rest, to the mind and to the eye alike, that a wide horizon gives. Although there were points of interest to be seen by the cartographical eye, there was nothing, excepting the outlines of some of the nearer mountains, of beauty in that view; there were no striking features of the land and no gorgeous effects of colour, but one will always treasure a recollection of the physical delight of seeing far and wide to the horizon, and of the feeling of satisfaction in looking down godlike on the world that we had so painfully traversed.

But views, like all other good things, have their ends, and ours was all too soon interrupted by the daily thick blanket of white cloud, which rolled up and enveloped us until nightfall. We groped our way back to the camp where we found our coolies very miserable and shivering with cold—poor wretches, they had never before endured, nor even imagined, a temperature so low as 50° F. To us the coolness was very pleasant, and it provoked a hunger to which we had long been strangers; very small quantities of boiled rice, and *chupatties* made by the Gurkhas of mildewed and weevilly flour, only served to stimulate our appetites for more.

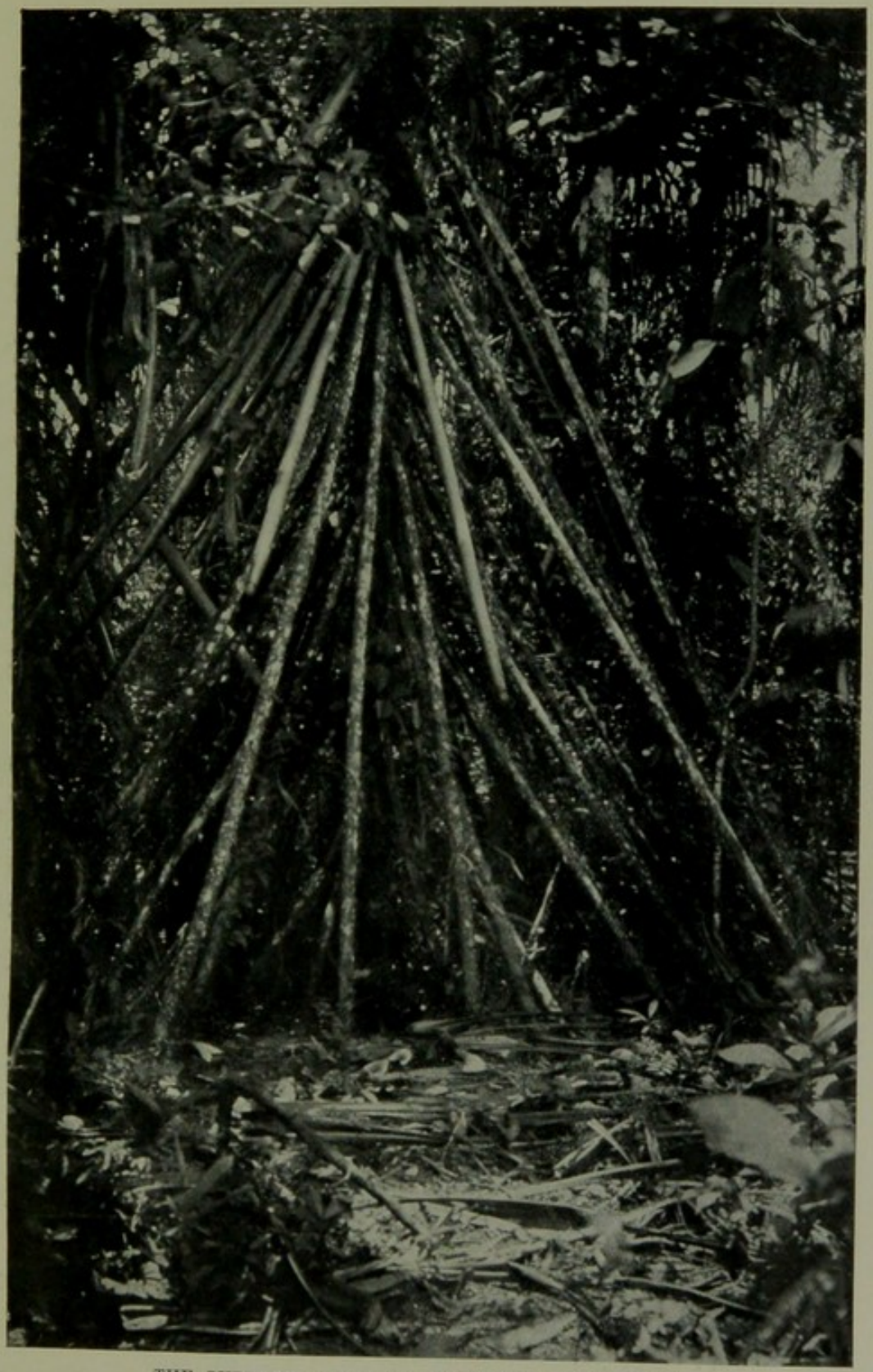
On the following day we retreated hastily downhill by the way we had come, and by forced marches, perhaps a little accelerated by our lack of food, in two days we arrived at the Iwaka camp. In the meantime Grant had been camped with the two Dayak collectors on a hill about three thousand feet high above the Iwaka, where they had made a very fine collection of birds. Among them was a new dwarf species of Cassowary (*Casuarius claudi*) and specimens of the rare Six-plumed Bird of Paradise (*Parotia meeki*). Another bird very characteristic of the Iwaka and neighbouring valleys is the Moustached Swift (*Macropteryx mystacea*), which measures more than two feet across the wings, and is remarkable for its long pointed tail and its tapering white moustache. This bird seldom appears until late in the afternoon, when it is seen sailing majestically with outstretched wings at a height over the river.

Near the Iwaka on a hillside laid bare by a landslip we found two seams of coal a few inches in thickness; it was poor stuff and only burnt with difficulty when put into a fire. Mr. Lorentz found combustible coal in the hills near Mount Wilhelmina, and it is probable that a careful search would reveal the existence of better coal in this region too. Near the same place, as well as in one or two other localities, we found indications of petroleum, but all our searches for gold and other precious metals resulted in nothing except occasional traces of copper.

During the following days, while we were stumbling back to Parimau along the now familiar track, we

wondered whether we should be the last as well as being the first Europeans to penetrate into that forsaken region. It has been mapped now, and our wanderings have shown that it is not the way by which any sane person would go who wished to explore the Snow Mountains. It is a region absolutely without inhabitants, and the Papuans, who live on the upper waters of the Mimika and Kamura rivers, shun it even as a hunting ground. There are no precious metals or other products of the soil to be won, and not until all the other forests in the world are cut down will its timber be of value. So it may safely be supposed that it will long be left untouched; the Birds of Paradise will call by day, the cassowaries will boom by night, and the leeches will stretch themselves anxiously on their leaves, but it will be a long time before another white man comes to disturb them.

Many people have the idea that a tropical forest is full of gorgeous flowers, about which brilliant butterflies are constantly flitting and birds of splendid plumage flash from tree to tree. This idea is no doubt due in a great measure to the habit of gathering together in hothouses the flowering plants of all the Tropics, though they may have come from Central America, from Africa and from Borneo or Java. It is true that there are many splendid birds, but the vegetation is so dense that you seldom, if ever, see them; the brilliant butterflies are mostly out of sight near the topmost branches of the trees; and you may travel for days together without seeing a single flowering plant. Many of the trees are covered with orchids on all their branches, but



THE SUPPORTS OF A PANDANUS (30 FEET HIGH).

they very seldom flower, and the flowers of most of them are so insignificant that they do not attract your attention.

Occasionally you may see high above your head the white flower of a *Dendrobium* or the long spike of the gigantic *Grammatophyllum*, but I have only once (in a small island on the North coast of New Guinea) seen such a mass of flowering orchids as to make a splash of colour in the view. In the Tropics there is nothing comparable in colour with the blue hyacinths, the fields of buttercups, or the gorse and hawthorns of this country.

But if there is little that is beautiful in the jungle vegetation, there is a great deal that is curious and interesting. The ubiquitous Rattans, climbing Palms, are a constant source of wonder for their snake-like meanderings through the jungle until they climb to the top of some tree where they end in a bunch of leaves. We found three species of Screw Pines (*Pandanus*), fantastic trees on stilts, and branching like irregular candelabra. The wood of the *Pandanus* is very tough, and is used by the natives for making bows and spears ; the long ribbon-like leaves are used for mats and the walls of their huts, and the fruits of some are eatable, but exceedingly hard. One species bears a cluster of small red fruit about the size of a banana ; and another bears a huge melon-shaped fruit of a brilliant scarlet colour and weighing as much as thirty pounds and upwards.

Equally remarkable are the trees which stand propped on a number of aerial roots and seem, as Mr.

Wallace noted,* to have started growing in mid air; where several of these trees grow together, it is difficult to say where one ends and another begins. Too rarely you come across a magnificent forest tree (usually, I believe, a species of *Dammara*) supported on huge buttresses, which begin twenty or more feet above the ground and spread out for many yards from the foot of the tree. We had occasion to cut down some of these trees, and found the wood intensely hard; if there were seven or eight buttresses a single one would still hold up the tree after all the rest had been cut. When the tree had been felled, the stump looked like a great starfish sprawling over the ground with a centre not more than a foot across, while the trunk a few feet up had been a yard or more in thickness.

It has happened to me to walk through many hundreds of miles of forest in different parts of the world, but I have never seen any so dreary as that New Guinea jungle with its mud, its leeches, its almost unbroken stillness, and its universal air of death. Happily the mind of man is of a curiously selective habit, and it chooses to retain only the more pleasant things; you forget the long wet weeks of rain and mud, the hunger and the nasty food, and remember rather those glorious moments when you came out of the twilit jungle into an open river bed and saw the distant mountains, or those rare sunny afternoons when the "implacable cicala" creaked in the treetops above your tent.

There are indeed a thousand things to interest one

* *Malay Archipelago.* Chapter V.

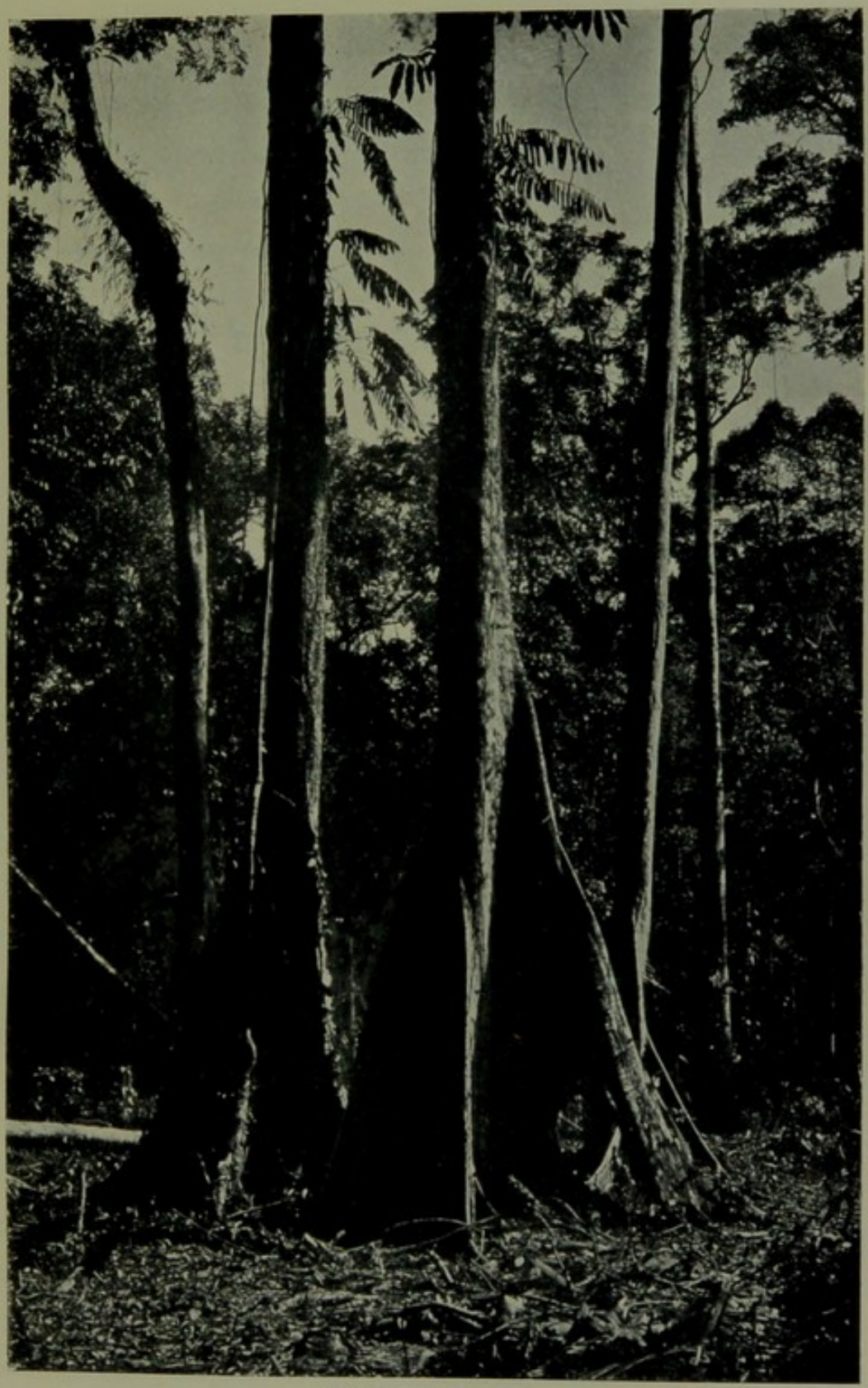
in the jungle, however blank and monotonous it may seem to be. The trouble is that so much of your attention in these places must be devoted to the trivial duties of the day, the eternal question of food, the care of the sick, the precautions against floods, and so on, that but little time is left over for studying the hidden wonders of the world about you. The geographers and the naturalists of the future will live in comfortable ships on the coast, whence they will fly daily into the heart of New Guinea where they will find things undreamt of now. But the time for that is not yet, and in the meantime those who plod on foot do the best they can.

CHAPTER XVIII

Departure from Parimau—Parting Gifts—Mock Lamentation—Rawling explores Kamura River—Start for the Wania—Lose the Propeller—A Perilous Anchorage—Unpleasant Night—Leave the Motor Boat—Village of Nimé—Arrival of "Zwaan" with Dayaks—Their Departure—Waiting for the Ship—Taking Leave of the People of Wakatimi—Sail from New Guinea—Ké Islands—Banda—Hospitality of the Netherlands Government—Lieutenant Cramer—Sumbawa—Bali—Return to Singapore and England—One or Two Reflexions.

AFTER our return to Parimau in February, Rawling and Grant went down to Wakatimi, while Marshall and I spent a week in visiting the village of the Tapiro in a last but vain attempt to see the pygmy women. The first few days of March were occupied in packing up the accumulated odds and ends of our year's occupation and on the 9th of March we were ready to depart. We had told the natives that we were going away and for days before we went they pestered us with questions as to whether we were coming back and what we would give them when we went, and they quickly decided which of our houses they intended to occupy.

On the morning of our departure from Parimau we allowed no natives to come into the camp until all the canoes were loaded up and ready for a start. Then we called out to them to come over and about forty men and boys splashed across the river and came swarming into the camp. We had kept for them a



BUTTRESSED TREES.

number of axe-heads, knives and other pieces of steel and iron, and when the people saw what they were going to be given they became a crowd of madmen. I distributed the things, while Marshall stood by with a big piece of wood and kept them from rushing into the place and seizing everything at once. They shouted and raved and screamed and grew almost pale with excitement, and the various expressions of greed and cunning and anger and delight in their faces were most interesting to watch.

After we had given them their presents we walked towards the canoes, and then they began to set up their horrible wail. A few of them picked up pieces of cloth and matting, through the middle of which they thrust their heads and then began to howl with their hands over their eyes. I took a last look round the houses to see that nothing of value had been left behind and on going to the store-house I met a man, one of our best friends, coming out of it with a tin of rice under his arm. He immediately put down the tin, tore off from a climbing bean that grew by the house a trail of leaves a yard or two long, and wound them about his head and body. Then he burst into tears and the most heartrending sobs, which changed in a moment, when he caught my eye, into a shout of laughter.

When we finally got into the canoes all the men came down to the water's edge and wailed, while some of them sat down in the water and smeared themselves with mud. In the meantime we could see their women going off into the jungle carrying tins full of their possessions to hide there, and it is probable that

after we left there was a good deal of quarrelling and fighting over the spoil. The wailing is a purely perfunctory politeness, but I think there were a few men who were genuinely sorry to lose us. On the following day a strong ebb-tide bore us quickly down to Wakatimi and our navigations of the upper Mimika river were at an end.

In the meantime Rawling had made an interesting exploration of the coast and of the river mouths to the East of the Mimika. The motor boat, which had been badly damaged some months earlier, had been repaired by two Dutch pioneer soldiers and was more or less sea-worthy. In a four days' trip he had entered the Atuka river, or rather the Atuka mouth of the Kamura river, a few miles up which he came to Atuka, a large village of about six hundred huts surrounded by coconut palms and tobacco plantations. Proceeding up the river into the main Kamura river he went on almost to the junction with the Wataikwa river, thus filling in a large gap of unknown river. On his way back he chose the left (East) branch and after passing the village of Kamura, where the inhabitants showed an inclination to plunder the boat, he came to the lake-like estuary of the Kamura and Wania rivers and entered the sea by a deep channel. It is worth noting that the inhabitants of Atuka and Kamura villages, many of whom visited us two or three times at Wakatimi, are of a decidedly lower type (in appearance) than the people of the Mimika district, though the distance that separates them is only a few miles. They have a fiercer and more brutal aspect

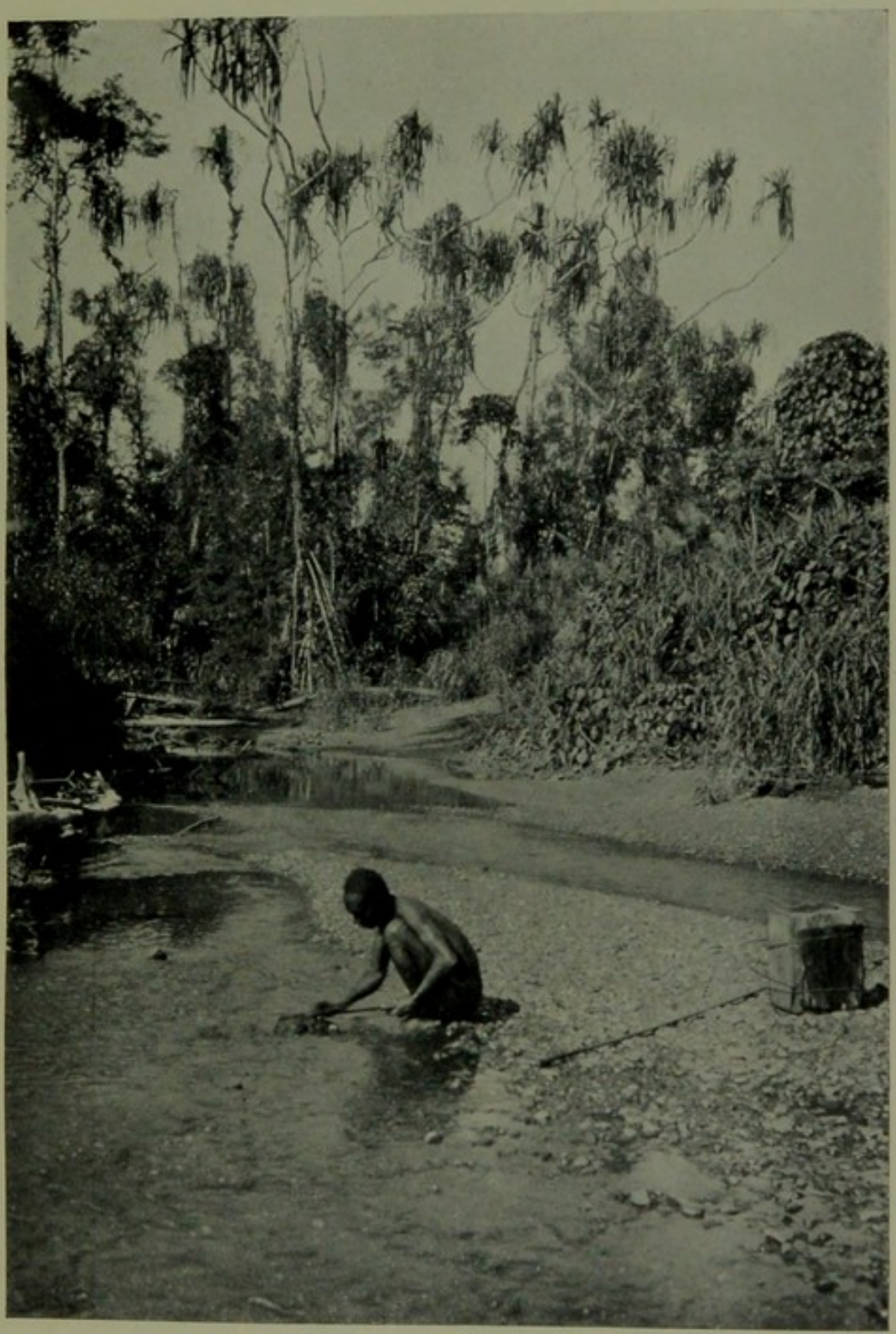
and many of them, both men and women go completely naked, a habit which is never practised by the people of Wakatimi. Scarcity of petrol and an irregularly sparking plug brought that excursion to an untimely end, before the lower waters of the Wania had been investigated.

From our hill-top (see p. 239) the Wania was evidently by far the most considerable of all the rivers of the district, and apart from our desire to see the people of the Wania, of whom the Mimika natives always spoke with great respect, we felt bound to explore that river as far as possible. Accordingly on March 14, Rawling, Marshall and I, with a Dutch pioneer, two Gurkhas and three coolies, set off in the motor boat towing the yawl, a ship's boat about twenty feet long, laden with tents and provisions for a week. In a few hours we arrived at the mouth of the Wania river and found that owing to the low tide there was no way of crossing the sand-bar that lay across the entrance. This circumstance was the more remarkable, because only a few days earlier Rawling had come through this bar by a very deep channel. The frequent changes in the banks make the navigation of this coast and particularly of the river mouths exceedingly difficult.

On this occasion the sea was already rather rough, so that we could not anchor and wait until the tide rose, and as the wind was increasing in force there was nothing for it but to turn back and try to take shelter in one of the rivers between the Wania and the Mimika, if not in the Mimika itself. All went well

for a few miles and then, as happened frequently, the leather band jumped off the driving wheel and the engine was stopped. When it was replaced and the engine was started again, there was no churning of water in the stern and we realized with some consternation that we had lost our propeller. We were about twelve miles from the mouth of the Mimika, in a shallow sea of less than three fathoms, with a strong wind blowing towards the shore where the waves began to break within a few hundred yards of us, and we were ten men with a heavy motor boat and a heavily-laden yawl to get along somehow. We put four men into the yawl to row and they tried to tow, but the current was so strong against them that they made no headway at all, so we had to anchor where we were and hoped for better things. We pitched and rolled and bumped about most horribly and soon most of the party were deadly sea-sick, perhaps luckily for them, because in that condition one cares nothing for the prospect of shipwreck.

Our anchor rope was short and none too strong, and the rope between us and the yawl was thoroughly rotten—it had snapped once earlier in the day—and we expected that every sudden jerk of the lumpy sea would break it again. Had that happened, there might have been a nasty accident, as the men were too sick to row, even if they had known the art, and their chances of swimming ashore through a sea swarming with sharks were not very bright. Our own predicament in the helpless motor boat would have been unpleasant too, if the yawl had gone adrift, but happily the ropes



SCREW PINES (*Pandanus*).

held. Another drawback was that the motor boat leaked like a sieve, so that a man was kept constantly at work baling her out, and we did not know that the strain might not open her old timbers even more. There was a glorious full moon which one would have enjoyed seeing from the smooth deck of a steamer, but there we could only think how uncomfortable it was lying (without having had dinner) on boxes and tins and gear of all sorts huddled in the bottom of the boat.

The wind continued all through the night and the sea did not moderate, so at daylight, after having been for sixteen hours at anchor, we decided to leave the motor boat hoping that it would not be swamped before we were able to come back and fetch it. We all got into the yawl, which we pulled through quite a nasty sea for about three miles to a sand-bank in the estuary of the Timura river, where we camped until the rising tide enabled us to reach the mainland about midnight. On the following day, the sea having become calmer, we rescued the motor boat, which was by that time half full of water, and towed it slowly to the Timura.

But it was a most arduous business and without the help of a party of natives, who fortunately came along the coast in canoes and were prevailed upon to assist us in paddling, we should never have been able to bring back both of the boats. The arrival of the motor boat at the Mimika on the fifth day, propelled by native paddles instead of by its own power, was not a very dignified affair—it resembled rather the formerly familiar sight of the motor-car in tow of a horse from the plough

—but it was a piece of good fortune that it and we returned at all.

We stopped for a night on the way at Nimé, a village at the mouth of the Keaukwa River. This is a very large village—I counted four hundred and thirty huts —but there were hardly a dozen people in the place, the whole population having gone off on one of their periodical migrations to a vegetable diet up the river. It was evident from the immense piles of fishbones and empty shells about the houses that the inhabitants must live largely by fishing, when they are there. The houses are better made than those at Wakatimi, and they are arranged in terraces and crescents along the water's edge. It was there that we saw the elaborate dancing-houses described above (p. 143).

Just as we paddled laboriously into the Mimika estuary we saw far down on the horizon the smoke of a steamer, and in an hour or two a white painted vessel, which turned out to be the Dutch Government ship *Zwaan*, drew inshore and anchored outside the bar. We naturally supposed that this was a ship that had come to take away the expedition, as we had informed the Government some months earlier that we hoped to be ready to leave the country by the end of March. But that communication had taken a long time, as everything does in those regions, in reaching its destination, and the *Zwaan* had come, not to take away the expedition, but to bring the means of prolonging the expedition still further.

It appeared that in the previous December the Committee of the Expedition at home, hearing of our

AT SUMBAWA PESAR.

scarcity of coolies some months earlier, had decided that a further supply of coolies should be sent to us without delay. Though cables work quickly enough between London and Singapore, communications beyond that are matters of days and weeks, and it was not until the 18th of March that the party of Dayak coolies, who had been engaged in Sarawak by the kind permission of H.H. the Raja, arrived at the Mimika. They were in the charge of Mr. C. B. Kloss, Curator of the Government Museum at Kuala Lumpor, who had brought with him six months' provision for himself and the men. Almost at the same time that the Committee in England had taken this step, we in New Guinea had decided that three months more was as long as we were prepared to stay in the country, and a request had been sent to the Dutch Government to take us away at the end of that time.

When the *Zwaan* arrived we were all ready to depart, and Cramer's party, numbering more than a hundred men, were chafing with impatience to get away; it would have been impossible for the Government to keep them there yet another six months. Even if there had been a possibility of our staying on in the country, the number of Dayaks, thirty-eight, was quite insufficient for a long journey into the interior and the prospect of reaching the moderately high ground of Tapiro Mountain, the best that could be hoped for, was not sufficient inducement to tempt any one to paddle again up the Mimika river. Added to this was the further consideration that in a week or two the more rainy season would begin and that for

five or six months very little progress would be possible even with an unlimited supply of the best coolies.

So there was nothing for it but for Mr. Kloss and the Dayaks to go back in the *Zwaan*, which sailed for Amboina on the following day, taking also Marshall, as many sick and useless coolies and soldiers as could be crammed on board, and an urgent request to the authorities to remove us as soon as might be. The Dayak episode was altogether an unfortunate one; had the men reached us six months earlier, we should have made a very good use of them, few though they were; but coming as they did when we were on the point of leaving the country they merely illustrated the uselessness of attempting to conduct an expedition from the other side of the world.

During the next three weeks we waited for the ship with what patience we could. By that time we were all somewhat stale and disinclined for any exertion, and those days of waiting at Wakatimi seemed interminably long. The only pleasant moments were when on fine evenings we could sit outside and watch the sun go down behind the palm trees across the river and hope each time that that would be the last. There were times when for two or three days a strong wind blew and we could hear the surf thundering on the beach, and we knew that even if the ship came it could not approach the shore. Then there were false alarms of whistles having been heard, or of boats seen coming up the river, but our suspense at last came to an end on April 5th, when a steam-launch towing a string of empty boats came puffing up to the camp,

where they were received with immense enthusiasm. They came from the Dutch gunboat *Mataram*, which had been despatched to take away the native escort, and the next day came boats from the *Zwaan*, which had come to transport us and our men and the remaining stores of the expedition to Amboina. There followed two days of busy loading and coming and going of boats, during which our impatience to be off was a little allayed by the forethought of one of the officers of the *Mataram*, who stayed ashore with us and had brought with him that rare luxury, bread, and one or two other welcome delicacies.

Before sunset on April 7th the last boat was loaded and ready to go, and we had an amusing leave-taking with the people of Wakatimi. It was known that we were going to depart and for some days people from other villages had been crowding into Wakatimi. A large number of men were waiting outside the fence of the camp, but when we invited them to come inside they became unaccountably shy and would not venture. So I went outside and took one bolder fellow, a man whom we knew well, and led him by the arm to a hut, where there were a quantity of old mosquito nets; he seized one and bolted as fast as he could run, apparently thinking that there was something suspicious in this unwonted generosity. Then a few more came very warily after him and then fifty or sixty men dashed into the house and out again as soon as they had snatched up something, it mattered not what. Most of them were armed with spears or bows and arrows, and as there were men fighting to get into and out of the

house at the same time it was wonderful that nobody was damaged.

When the people in Wakatimi saw what was going on in the camp they began to yell with excitement, and in a few seconds twenty or more canoes packed with men came paddling madly across the river; they were so excited that some of them upset the canoes, a thing they very seldom do, and they had to swim to the shore. For ten minutes or so the camp was a pandemonium. About two hundred raving lunatics were dashing madly from one house to another and carrying off boxes, sacks, mosquito nets, cases of empty bottles, bits of iron, tables, beds, mats and everything they could possibly move. They howled and raved and fought like wild beasts in a manner horrible to see.

Several women came over and danced and sang in a canoe just in front of the camp, while the crowd of people who had not been able to find a place in the canoes shrieked from the opposite bank. When they could carry no more, they loaded their canoes to the brim with miscellaneous cargoes and went back across the river to the village. There they at once began to squabble over the spoils, and the last we heard of Wakatimi, as darkness came down, were the shrill shrieks of quarrelsome women and the angry shouts of men.

New Guinea treated us kindly in farewell, and we steamed down the river in a glorious starlight, the kind of night which many people think is usual in the tropics, but is in fact most lamentably rare. We left Cramer on board the *Mataram* and went on to the

NEAR BULELING. ISLAND OF BALI.

Zwaan, where we soon were lulled to sleep by the pleasant music of the screw. Early the next morning a dull cloud on the northern horizon was our last view of New Guinea, and before night we had reached civilisation again in the anchorage of Dobo.

Two days later we came to the Ké Islands and went ashore to visit the Catholic Mission at Toeal. There is nothing of great interest to see there except the magnificent "iron wood" timber, which is cut in the forests of the larger island, and is used for boat-building; it is obtained in larger pieces than teak, and it is said to be equally good. The fathers occupy themselves with carpentry and boat-building and with teaching a class of small children. The few people whom we saw appeared to be of a mixed Malay-Papuan race and were dressed in unspeakably dirty clothes.

From Toeal we went on to Banda, where we spent a day of pouring rain, a great pity, for a walk through the nutmeg woods of Banda is one of the pleasantest excursions in the islands, and a day later we dropped anchor in the harbour of Amboina.

It will be fitting to remark here that on the outward journey from Java to New Guinea and on our return from the Mimika to Amboina, the members of the expedition were the guests of the Netherlands Government. The thanks of the Secretary of State for Foreign Affairs have been conveyed to the captains of the ships and to the other officials, who helped the expedition in a hundred different ways.

At Amboina, where we waited a few days for the arrival of a steamer to Singapore, we parted with

Cramer, who was prevented by a sharp attack of fever from coming with us. He was the one other man, beside Rawling, Marshall and myself, who remained with the expedition from the beginning to the end, and it is not paying him an empty compliment to say that few other people would have managed more successfully than he did to live with a party of foreigners in circumstances, which were often exceedingly difficult.

We sailed from Amboina on April 17th in the mail steamer *Van Riebeeck*, and amongst our fellow-passengers we found Captain Van der Bie and Lieut. Van der Wenn (Netherlands Navy), both of whom were returning to Java invalided from the expedition to the Island River in New Guinea. The expedition had penetrated a long way into the interior of the country, but all the Europeans fell ill and the expedition was withdrawn a few months later.

After calling at Macassar we went South past the Postilion Islands to the little known island of Sumbawa, where we went ashore for a few hours at Sumbawa Pesar. It looked a pretty country with well-wooded hills and level cultivated plains. We were much struck by the appearance of the natives, who have a longer type of face and a much fairer skin than any other of the Malay races I have seen. The men all go armed with a *kris*, and they smoke cigars of an incredible length.

From Sumbawa we steamed along the Northern shore of Lombok, from whose Peak (12,000 feet), the clouds rolled off magnificently at sunset, and early the next morning we came into the harbour of Buleling

in the island of Bali. There we took a native carriage (*sado*), and drove a few miles out into the country to see a very interesting Hindu temple, where there are some remarkable good stone carvings, which shew signs of being carefully tended. The Hindu religion still survives, though it cannot be said to flourish, both in this island and in Lombok. The native villages that we saw have quite characteristic features of their own; they are surrounded by a high mud wall with a brick coping and are guarded by a swarm of fiercely barking dogs. Inside the wall, if you are bold enough to enter, you find a neatly swept compound, round the sides of which are well-made dwelling-houses, and in the middle are granaries of rice; both the houses and the granaries are raised on posts several feet above the ground and all are neatly thatched with rice straw. In the corner of the compound is a place set apart for a number of little stone shrines, some of them very elaborately carved, in which votive offerings of flowers and fruit are placed.

The Balinese seem to be a sturdy and industrious people; they have a free and independent appearance, very different from that of their somewhat grovelling neighbours, the Javanese. The roads are picturesquely lined with shady trees, and a very pleasant feature of them is the number of little mouse-coloured ponies, which carry panniers on a high-peaked saddle and are the coolies of Bali; most of them have an elaborate leather harness and many carry a large number of little bells, which make a pretty music along the roads. They appear to be hungry little animals, and they have

the rare and valuable faculty of being able to eat out of a basket tied round their necks as they walk along. The country, what little we saw of it, looks extremely prosperous, and the beauty of the cultivated lands, interrupted here and there by groves of trees and backed by mountains, is beyond dispute.

From Bali to Java is only a few hours' steaming, and from Batavia another ship brought us to Singapore, where we arrived on May 2nd. A month later we landed in England and the English Expedition to Dutch New Guinea, 1910–11, was a thing of the past.

It is not easy to put down in words what were our thoughts on our homeward journey from the Mimika River to Plymouth Sound. Naturally enough there were feelings of pleasant anticipation in returning to the comforts of civilised life, and there were feelings of profound thankfulness that we had left behind us neither our bones nor our health, as too many others less fortunate had done. There was also a sense of (I think pardonable) satisfaction at having accomplished something; the surveyors had made an accurate map of a large tract of quite unknown country; the naturalists had made valuable collections of birds and animals, and some most interesting races of men had been visited and studied.

But beneath these was another feeling of vague disappointment. We had set out full of hope, if not of confidence, of reaching the Snow Mountains, and the disappointment of not having set foot on them was aggravated by the fact that we had been so long in sight of them. It was exasperating beyond words

to see the mountains month after month only forty miles away and not to be able to move a foot in their direction; to study them so that we came to know the changing patches of lower snow and almost the very crevasses in the glaciers, and still to be forced to be content with looking and longing for "the hills and the snow upon the hills."

To look for fifteen months at that great rock precipice, and those long fields of snow untrodden yet by foot of man, to anticipate the delight of attaining to the summits and to wonder what would be seen beyond them on the other side, those were pleasures that kept one's hopes alive through long periods of dull inaction. The aching disappointment of turning back and leaving the mountains as remote and as mysterious as they were before words of mine cannot express; but happily there is always comfort to be found in the reflexion that

"Some falls are means the happier to arise."

APPENDIX A

NOTES ON THE BIRDS COLLECTED BY THE B.O.U. EXPEDITION TO DUTCH NEW GUINEA

By W. R. OGILVIE-GRANT

Our knowledge of the Birds of New Guinea is based mainly on Count T. Salvadori's monumental work *Ornitologia della Papuasia e delle Molluche*, which appeared in three large volumes in 1880–82, and on his *Aggiunte* to the above work published in three parts in 1887–89. Since that date our knowledge of the avi-fauna has vastly increased and a very large number of splendid Birds-of-Paradise and other remarkable new species have been discovered.

A list of the principal works subsequently published, placed in chronological order, will be found at the end of this chapter, the most important papers being no doubt those by the Hon. Walter Rothschild and Dr. E. Hartert, which have appeared from time to time in the Tring Museum periodical *Novitates Zoologicæ*. Mr. Rothschild is to be congratulated on the success which has attended the efforts of his various collectors in New Guinea and on the energy which he has displayed in obtaining birds from unknown districts of the most interesting island in the world.

To give in a single chapter a brief and partly scientific, partly popular, summary of the ornithological work accomplished by our Expedition in Dutch New Guinea is a more difficult task than might be imagined, for there is not only an immense number of species to be dealt

with, but in most instances very little is known about their habits. The jungles of South-western New Guinea are so dense that white men can scarcely traverse them, and most of the collecting had to be done by the trained natives from the Malay Peninsula, kindly supplied by Mr. H. C. Robinson, and by the Gurkhas who accompanied the Expedition.

By dealing with each family in turn, I shall endeavour to refer to all the more important species in the collection in their proper scientific order, briefly describing some of the more beautiful, so that those without any special knowledge of birds may, if they care to do so, form some idea of the marvellous types which have been brought home from the interior of South-western New Guinea.

It is certain that the resources of that wonderful island are not nearly exhausted: on the contrary, every fresh collecting expedition sent to the interior produces remarkable novelties, and large chains of high mountains are still unexplored. The members of our Expedition were fortunate in procuring no less than 2,200 skins of birds in New Guinea, representing about 235 species, of which ten proved to be new to Science. A number of new birds were also obtained by the late Mr. Wilfred Stalker in the mountains of Ceram, which he visited before joining the main Expedition at Amboina. His premature death by drowning, a few days after he landed in New Guinea, was an immense loss to the Expedition, though his place was ably filled by Mr. Claude Grant, who worked with his characteristic zeal and enthusiasm.

It will be noticed that the great bulk of the birds inhabiting New Guinea belong to a comparatively small number of families, but that each of these is represented by a large number of different species, especially in such groups as the Pigeons, Parrots, Flycatchers, and Honey-eaters.

Amongst the Pigeons of which no fewer than twenty-seven different kinds were obtained, it would seem as though, in some instances at least, Nature had almost come to the end of her resources in devising new and wonderful arrangements of colour and markings; for in some of the smaller Fruit-Pigeons, such as *Ptilopus gestroi* and *P. zonurus* we find two perfectly distinct species, occurring side by side, possessing almost exactly the same remarkable scheme of colouration, and only differing in certain minor points to be found in the markings of the wing-coverts. Another very similar instance is to be seen in *Ptilopus coronulatus* and *P. nanus* almost the same colours and pattern being repeated in both.

The collection obtained by our expedition is a very valuable one, and has added many new and interesting forms of bird-life to the incomparable series in the Natural History Museum, to which the bulk of the specimens have been presented by the subscribers. A large proportion of the birds were obtained at low elevations from sea-level to 2,000 feet, only a comparatively small number being procured at from 3000–4000 feet. It is to be regretted that the immense physical difficulties encountered and other causes prevented our collectors from reaching a higher zone between 5000 and 10,000 feet, where no doubt much of interest remains to be discovered by those who are fortunate enough to get there.

TABLE SHOWING THE NUMBER OF SPECIES COLLECTED AND THE FAMILIES TO WHICH THEY BELONG

Family.		No. of species.
Corvidæ	Crows	2
Paradiseidæ	Birds-of-Paradise, Bower-Birds and Manucodes	13
Eulabetidæ	Tree-Starlings	4
Dicruridæ	Drongos	2
Oriolidæ	Orioles	1
Ploceidæ	Weaver-Finches	1
Motacillidæ	Wagtails	2
Meliphagidæ	Honey-eaters	26
Nectariniidæ	Sun-birds	2
Dicæidæ	Flower-peckers	2
Zosteropidæ	White-eyes	1
Laniidæ	Shrikes	8
Prionopidæ	Wood-Shrikes	4
Artamidæ	Swallow-Shrikes	1
Timeliidæ	Babblers	4
Campophagidæ	Cuckoo-Shrikes	11
Muscicapidæ	Flycatchers	30
Hirundinidæ	Swallows	2
Pittidæ	Pittas or Ant-Thrushes	2
Cuculidæ	Cuckoos	11
Cypselidæ	Swifts	4
Caprimulgidæ	Nightjars	2
Podargidæ	Frog-mouths	3
Bucerotidæ	Hornbills	1
Meropidæ	Bee-eaters	1
Coraciidæ	Rollers	2
Alcedinidæ	Kingfishers	11
Psittacidæ, *Loriidæ*	Parrots, Lories or Brush-tongued Parrots	22
Bubonidæ	Horned and Wood-Owls	1
Falconidæ	Eagles and Hawks	7
Phalacrocoracidæ	Cormorants	1
Anatidæ	Ducks	2
Ibididæ	Ibises	1
Ardeidæ	Herons	4
Œdicnemidæ	Stone-Plovers	1
Charadriidæ	Plovers	8
Laridæ	Gulls and Terns	2
Rallidæ	Rails	1
Columbidæ	Pigeons	26
Megapodiidæ	Megapodes or Mound-builders	3
Casuariidæ	Cassowaries	3
	Total	235

From the above table it will be seen that out of 235 species procured, 150 are included in eight of the Families; *viz.* Birds-of-Paradise 13; Honey-eaters 26; Cuckoo-Shrikes 11; Flycatchers 30; Cuckoos, 11; Kingfishers 11; Parrots, 22; Pigeons, 26.

FAMILY *CORVIDÆ*—CROWS.

Though the true Crows are never brightly coloured birds, many are extremely handsome, but this epithet cannot be applied to the Bare-faced Crow (*Gymnocorax senex*) which is common on the Mimika River and distributed over New Guinea generally.

The adult is brownish-black with a slight purplish or bluish gloss on the wings, but is generally in worn and shabby plumage. Even when freshly moulted it is rather a disreputable looking bird, its naked pink face, pale watery blue eyes, slate-coloured bill and livid feet adding to its dissipated appearance. Young birds in their first year's plumage are even plainer than their parents, being dull drab-brown inclining to brownish-white on the head and neck, and appear to be clad in sackcloth and ashes. They have a weak uncrow-like call pitched in a high key and their flight is feeble and seldom sustained.

In addition to this Crow of unprepossessing appearance, there is a handsome Raven (*Corvus orru*), much like our familiar bird but smaller, which was met with in pairs on the coast.

FAMILY *PARADISEIDÆ*—BIRDS-OF-PARADISE AND BOWER-BIRDS.

Closely allied to the well-known Greater Bird-of-Paradise (*Paradisea apoda*) from the Aru Islands is the New Guinea form *P. novæ-guineæ*, the males being distinguished by their smaller size and by having the long ornamental side-plumes of a much richer orange-yellow. Though the call of this bird was frequently heard on the upper parts of the Mimika, it was rarely seen; but on the Wataikwa quite a number were procured in all stages of plumage. The species was, however, nowhere plentiful and confined to the foot-hills.

The Pygmies often brought plumes of the Lesser Bird-of-Paradise (*P. minor*) to Parimau and traded them with the natives, but the species was not found on the Mimika, the Charles Louis mountains probably forming its southern boundary.

My account of the display of that species, as witnessed in the Zoological Gardens, Regent's Park, will be found in the *Ibis*, 1905, p. 429, accompanied by various drawings and a coloured plate by Mr. G. E. Lodge. The display resembles that of the Greater Bird-of-Paradise (*P. apoda*) and the Red Bird-of-Paradise (*P. raggiana*) and no doubt also that of *P. novæ-guineæ*. It is a wonderful and beautiful sight to see these birds erect their splendid side-plumes in an arch over the back, which is concealed in a shivering cascade of colour, orange and white, or red according to the species.

Numbers of the beautiful little King Bird-of-Paradise (*Cicinnurus regius*) were brought home in all stages of plumage from the young to the fully adult male, with its scarlet head, shading into glittering carmine on the back and wings and into purplish-carmine on the throat, which is bordered below by a rich dark green band. The sides of the chest are ornamented with fan-like arrangements of grey feathers tipped with glittering golden green; the breast and the rest of the under-parts are of the purest white: the outer tail-feathers are earthy-brown edged with orange-red, while the middle pair, which cross one another, have the bare shafts enormously lengthened, and terminate in a tightly curled disc, golden green above and reddish-brown beneath.

These beautiful ornaments are seen to the greatest advantage when the King is displaying, the green-tipped fan-like feathers on the sides and the white feathers of the breast being spread out to form a circular shield in front of the bird, while the green

metallic discs of the long middle tail-feathers are erected and waved overhead. An interesting description of the display of this species is given by Sir William Ingram in the *Ibis*, 1907, p. 225, with a coloured plate and figures drawn by Mr. G. E. Lodge from a living specimen.

Mr. Walter Goodfellow made an interesting observation on the habits of this species. While watching some Pigeons on the opposite bank of the river through his glasses he saw a small bird rise from the top of a tree and soar into the air like a Sky-Lark. After it had risen about 30 feet, it suddenly seemed to collapse and dropped back into the tree as though it had been shot. It proved to be a King Bird-of-Paradise and probably this soaring habit is a part of the display not indulged in by captive birds confined in comparatively small cages.

A Rifle-Bird (*Ptilorhis magnifica*) was fairly common both on the coast and near the mountains and its call consisting of two long-drawn notes, one ascending, the other descending, might be heard at all hours of the day. Its plumage is mostly velvety black on the head and upper-parts, but the crown, middle of the throat and chest, as well as the middle pair of tail-feathers, are metallic blue and a bronze-green band separates the chest from the deep purplish-maroon under-parts. The outer flight feathers are curiously pointed and strongly falcate and some of the side-feathers terminate in long, narrow decomposed plumes. The long curved bill and the legs are black, while the inside of the mouth is pale apple-green as is the case in several other species of Paradise-Birds.

Though a well-known species, we must not omit to mention the splendid Twelve-wired Bird-of-Paradise (*Seleucides niger*). The plumage of the male is like dark brown plush shot with bronze-green on the back and

deep violet on the wings, while the long dark breast-feathers are edged with rich metallic emerald-green. The long ornamental side-plumes and the rest of the under-parts are beautiful bright cinnamon-yellow when freshly moulted, but this colour is so volatile that it soon fades to nearly white in skins which have been kept for a few years. The shafts of six of the long side-plumes on either side extend far beyond the vane of the feather and look like twelve recurved wires, hence the bird's popular name. The eye is crimson, the bill black, the gape bright apple-green, and the legs and toes yellowish flesh-colour.

The Expedition procured three examples of a new form of *Parotia* or Six-plumed Paradise-Bird on the Iwaka River, but unfortunately did not succeed in shooting a fully adult male. Simultaneously A. S. Meek, who was collecting for Mr. Rothschild, procured specimens of the same bird on the Oetakwa River a few miles to the east, but he likewise did not secure the fully adult male. The species has been named *Parotia carolæ meeki* by Mr. Rothschild.

The plumage of this bird is like brownish-black plush and equally soft to the touch. The head is ornamented very wonderfully; on either side behind the eye there are three long racket-like plumes on long bare shafts, (a character common to all the members of this remarkable genus of Paradise-Birds): the middle of the crown is of a beautiful "old" gold colour in a setting of silvery white and golden brown: on the occiput there is a marvellous patch of stiff metal-like feathers, golden-green bordered with deep violet; the sides of the head before and behind the eye are golden-brown, the chin and upper part of the throat deep brown, and the lower part whitish, spotted with rufous. A lovely metallic breast-plate of bronze-green and violet feathers with dark middles covers the chest and the long flank-feathers are

white. The two outer flight feathers are curiously attenuated near the extremity and terminate in a sharp point, the shaft bearing only a very narrow web. No doubt all these ornaments are displayed in a similar manner to those of *P. lawesi* from British New Guinea, males of which have been living for some years in the Zoological Gardens, Regent's Park.

Another very handsome species is the Golden-winged *Diphyllodes chrysoptera*. The male has the bill and a bare space behind the eye bluish-white, the inside of the mouth apple-green and the feet Prussian blue. The head is clad in short velvety reddish-brown feathers with two metallic green spots between the eyes; the nape bears a frill of lengthened brown-tipped plumes; the mantle is light golden-yellow like spun glass and forms a lengthened tippet; the inner secondary quills and shoulder-feathers are orange-yellow, and the back carmine and dull orange shading into sooty black on the upper tail-coverts. The throat is deep velvety brown, the neck and breast rich dark green bordered below with metallic bluish-green, and with a row of metallic green bars like steps down the middle of the neck and chest; the rest of the under-parts are black. The short outer tail-feathers are sooty brown, while the middle pair which cross one another are very long and narrow and of a metallic bluish-green. The female is very soberly clad, dull brown above and narrowly barred with brown and buff below.

The Bower-Birds have received their name from their peculiar habit of constructing bowers or runs where the males meet to play or pay their court to the females. The bowers are built long before the birds begin to build their nests which are placed in trees.

One of the most noteworthy species procured by the Expedition was the gorgeously coloured Bower-Bird, *Xanthomelus ardens*. The male has the eye yellow and

the head, sides of the neck and mantle orange-scarlet, the feathers of the latter being very long and loose and forming a dense cape; the rest of the plumage is orange-yellow above and golden-yellow below: the ends of the quills and the tail-feathers, being black.

The female has the iris brown and is more sombrely clad, the head and upper-parts, including the wings and tail, being earthy-brown, while the under-parts, under wing-coverts and wing-lining, are yellow, like those of the male, but less bright.

This beautiful species was originally described from an imperfect native-made skin obtained by the Italian naturalist, D'Albertis, on the Fly River. Subsequently, Dr. H. A. Lorentz shot two adult males on the Noord River, which were described and figured by Dr. Van Oort. Our expedition was fortunate enough to secure not only adult males, but also the immature male and adult female, these latter being hitherto unknown.

The display of the male bird must be a very beautiful sight, his scarlet cape being no doubt erected, and forming a great hood over the head.

Among the Bower-Birds, one of the most interesting was a remarkable female example of a species of *Chlamydodera* procured on the Kamura River. Unlike any of the allied forms, it has the under-surface washed with yellow, and appears to be the female of *C. lauterbachi*, of which the brilliantly coloured male was described by Dr. Reichenow from an example procured in German New Guinea.

The male has the crown and sides of the face golden-orange, the upper-parts olive-brown, edged with yellowish, and the under-parts bright yellow. It is a very striking bird and much the most brightly coloured member of the genus.

Though the two specimens were obtained in localities so far apart, there seems to be no reason why they should

not be male and female of the same species. The female obtained by the Expedition possesses many characteristics in common with the male type of *C. lauterbachi* and the differences in plumage are just what one would expect to find in the female of that species.

The beautiful Cat-bird (*Ælurœdus stonei*) was fairly plentiful, and is remarkable on account of its peculiar colouring. The cap is brown, the back grass-green, and the neck and under-parts buff, spotted with black or green on the longer flank-feathers. The eye is hazel and the bill and legs slate-blue. The sexes are alike in plumage. It derives its popular name from its peculiar hissing alarm note, not unlike the sound made by an angry cat.

Of the Manucodes, four different kinds were met with. They are all crow-like birds with brilliant metallic black plumage glossed with purple, green or blue, and form a link between the Paradise-Birds and the true Crows. The Purple-and-Violet Manucode (*Phonygama jamesi*) is distinguished by possessing tufts of long, narrow metallic green plumes behind the eye, and by having the neck-feathers similarly lengthened; while the other three belonging to the genus *Manucodia* have the head and neck covered with short curly feathers. These curly-headed species are much alike in general appearance, but *M. orientalis* has the short curly feathers on the chest and breast glittering golden-green, while in *M. jobiensis* and *M. altera* the same parts are dark steel-blue. *Inter se* the two latter kinds differ considerably, both structurally and in colour. *M. jobiensis* is smaller and has the feathers of the throat rounded and crinkled, and the upper-parts glossed with a strong shade of violet; while *M. altera* is larger and has the throat-feathers short but rather pointed, and the general colour above purplish-blue or steel-blue.

In most of the Manucodes the trachea is very long

and convoluted, that of the Purple-and-Violet species possessing no fewer than twelve coils which lie between the skin and the pectoral muscles. In spite of this marvellous instrument its cries are not nearly so loud as those of the Birds-of-Paradise of the genus *Paradisea*.

Mr. Claude Grant discovered a nest of *M. altera* with two eggs at Parimau, an interesting find, as no properly authenticated eggs of that species had hitherto been obtained.

FAMILY *EULABETIDÆ*—TREE-STARLINGS.

Among the smaller Glossy Starlings we must specially mention a new species, *Calornis mystacea*, discovered by the Expedition. It has the plumage purplish-bronze and is especially remarkable in having long semi-erect plumes on the forehead as well as long neck-hackles. Three specimens were obtained flying in company with large flocks of *C. metallica*, a rather widely distributed species, which ranges to North Australia, the Moluccas and the Solomon Islands.

The Grackles or Talking Starlings are represented by two lovely species, the first being the well-known Dumont's Grackle (*Mino dumonti*) a dark glossy greenish-black bird with a yellow belly and white under tail-coverts. It has a brown eye surrounded by a large naked orange patch partially covered with short stiff filaments. The second species Robertson's Golden Grackle (*Melanopyrrhus robertsoni*) is an equally handsome, but much rarer bird, and the fine series of adults obtained by the Expedition proves that it is a species quite distinct from *M. orientalis*, the form found in British New Guinea which has a large black patch on the occiput.

Robertson's Grackle has the cheeks and upper part of the throat, as well as the back, wings and breast, black glossed with green; the rest of the head, neck and chest,

as well as the lower back, rump, upper tail-coverts and belly, are orange-yellow. In the adult there is no trace of a black patch on the occiput, but the quite young bird has the entire crown black and specimens which have not assumed the fully adult plumage and still retain some black feathers on the occiput might be mistaken for *M. orientalis*. That they have been is proved by the fact that Count Salvadori and many others have regarded *M. robertsoni*, Sharpe, as a synonym of *M. orientalis*, Schlegel, but they are really quite distinct.

A few very high trees left standing near the huts at Wakatimi were the resort, morning and evening, of these Starlings and various other species of birds. For a long time during the hot mid-day hours Mr. Goodfellow had observed that some bird, possessing a remarkably sweet Thrush-like song, rested there, and, after many days of watching, he found it to be Robertson's Golden Grackle. He says that the notes of this Starling would not pass unnoticed, even in countries where the birds, as a rule, have sweeter voices than those inhabiting New Guinea.

FAMILY *DICRURIDÆ*—DRONGOS.

The Drongos, small Crow-like Flycatchers with pugnacious habits, are represented in the collection by two species—*Chibia carbonaria* and *Chætorhynchus papuensis*.

FAMILY *ORIOLIDÆ*—ORIOLES.

The Orioles are represented by one species only, *Mimeta striata*, belonging to the dull coloured brown-backed group with heavily streaked under-parts and the sexes alike in plumage. It was commonest in the mangrove swamps near the coast.

FAMILY *PLOCEIDÆ*—WEAVER-BIRDS.

This widely distributed group of Weaver-Finches is not very numerous in New Guinea and the only representative met with was a small species, *Munia tristissima*, which was common in the clearing round the camp at Wakatimi.

FAMILY *MOTACILLIDÆ*—WAGTAILS.

The Grey Wagtail (*Motacilla melanope*) and the Blue-headed Wagtail (*M. flava*) were both met with on the Mimika and other rivers. It is interesting to note that both species are included in the British List, the former being a regular breeding-species in our islands. The birds wintering in far-off New Guinea, no doubt formed part of the eastern colonies of these species which nest in Siberia and visit the Indo-Malayan Islands in winter.

FAMILY *MELIPHAGIDÆ*—HONEY-EATERS.

The Honey-eaters are very numerously represented in South-western New Guinea and no fewer than twenty-seven species were met with by our Expedition.

The family is divided in two sections, the first including the comparatively brightly coloured genus *Myzomela* the members of which resemble true Sun-birds (*Nectariniidæ*) in general appearance. Seven species were met with; the most brilliantly coloured being *M. cruentata* which has the plumage of the body scarlet and the wings washed with the same colour, another species *M. obscura* has the entire plumage smoky-grey, and four forms are intermediate between these two types of colouration, being partly scarlet and partly grey. The seventh is a very small and very rare species (*Œdistoma pygmæum*), which was described by Count Salvadori from the Arfak Peninsula.

The other section contains a number of larger species, mostly with dull greenish or brownish plumage and nearly all with a yellow tuft or patch on the ear-coverts. Though rather uninteresting-looking birds several are really of great scientific value, being new to the National Collection, and one, *Ptilotis mimikæ* proved to be new to Science. The largest form is the curious Friar-bird (*Philemon novæ-guineæ*) with the bare sides of the face and neck black and a swollen knob on the base of the bill. It was generally met with in pairs and inhabited the tops of the tallest forest trees whence its peculiar cry might constantly be heard.

FAMILY *NECTARINIIDÆ*—SUN-BIRDS.

The Sun-birds are represented by two species *Cinnyris aspasiæ* and *C. frenata*. The male of the former is deep black with a dark metallic green cap, shoulders and lower back, and purple throat, while the female is olive above, and dull yellow below, with a grey head and throat. The latter species is dull yellow above, brilliant yellow below, with a purple throat in the male, which is absent in the female.

Mr. Goodfellow tells us that among the riot of parasitic plants which covered the trees a few Sun-birds and Honey-eaters might always be seen. The nests of the former, suspended from fallen and partially submerged dead trees, were continuously swinging from side to side, the strong current in the river keeping the trees in perpetual motion. These nests might easily be mistaken for a handful of drift left there by the river.

FAMILY *DICÆIDÆ*—FLOWER-PECKERS.

Dicæum diversum and *Melanocharis chloroptera*, a dull-looking greenish-grey species described by Count

Salvadori, were the only Flower-peckers met with. They are small Tit-like birds allied to the Sun-birds, but with a short bill serrated along the edges of the mandibles. Both species were very common everywhere except on the coast and were extremely tame.

FAMILY *ZOSTEROPIDÆ*—WHITE-EYES.

Zosterops chrysolæma, a beautiful little species with the upper-parts golden-olive, the throat and under tail-coverts yellow, and the breast and belly pure white, was the only species met with of this most numerous and widely distributed group. The popular name White-eye is derived from the ring of tiny white plumes which encircles the eye in all. They resemble Titmice both in their mode of life and notes. The only pair observed were met with on the Iwaka River, and the species is probably more numerous in the higher parts of the mountains.

FAMILY *LANIIDÆ*—SHRIKES.

The large Shrike-like birds with powerful hooked bills known as the Piping-Crows are represented by two members of the genus *Cracticus*; *C. cassicus*, a black and white species, and *C. quoyi*, with uniform black plumage. Both are much like their well-known Australian representatives, but smaller. *C. cassicus* was much the commoner bird and was generally observed feeding on berries and fruits in high trees, its actions being very Crow-like.

The Pachycephaline group of birds allied to the true Shrikes is represented by half-a-dozen species, two of which proved to be undescribed: a grey form with a white throat *Pachycephala approximans* and a black species with a white breast and belly, *P. dorsalis*. Brilliantly coloured orange-yellow and black, or orange-

yellow and grey species were represented by *Pachycephala aurea* and *Pachychare flavogrisea*.

FAMILY *PRIONOPIDÆ*—WOOD-SHRIKES.

This group is represented by *Rhectes cristatus* and *R. ferrugineus* in which both sexes are rufous and by *R. nigripectus* with the sexes different, the male being partly black and partly chestnut. *Pinarolestes megarhynchus*, an allied species with the sexes alike, is brown above and dull rufous below. Some of these Wood-Shrikes lay peculiar looking eggs of a long oval shape and large for the size of the bird. The ground-colour is purplish- or pinkish-grey with scattered spots or small blotches of dark purplish-brown or maroon-brown, often blurred at the edges and running into the ground-colour. These eggs have on several occasions been palmed off on travellers in British New Guinea as eggs of the Red Bird-of-Paradise, which they do not in any way resemble.

FAMILY *ARTAMIDÆ*—SWALLOW-SHRIKES.

These birds which closely resemble Swallows in their mode of life are represented by one species only, *Artamus leucopygialis*, a grey bird with the breast and rump white. It was common along the coast, and was generally seen either perched on some dead tree or skimming swiftly over the sands.

FAMILY *TIMELIIDÆ*—BABBLERS.

We now come to the Timeline group of birds: of these we may mention two striking-looking species of *Eupetes*. One, *E. nigricrissus*, with the plumage slate-blue and the throat white, edged with black, was met with on the Mimika; the other, *E. pulcher*, was only

seen further east on the Wataikwa River. It is very similar to the above, but has the crown and back rich-chestnut, instead of slate. Both species are ground-birds and usually found in pairs; they are rather difficult to procure as, when disturbed, they instantly conceal themselves among the trunks of the trees and vegetation. The Scimitar Babblers were represented by the reddish-brown *Pomatorhinus isidori*.

FAMILY *CAMPOPHAGIDÆ*—CUCKOO-SHRIKES.

The Cuckoo-Shrikes are well represented in the collection, no fewer than eleven species having been obtained. They belong to four genera and vary much in colour: the large *Graucalus cæruleogrisea* has the entire plumage bluish-grey, except the axillaries and under wing-coverts which are pale cinnamon and the male has a black patch in front of eye. Another genus *Edoliisoma* is represented by *E. melas* of which the male is entirely black, and the female chestnut and brown. A very attractive and brilliantly coloured species is *Campochæra sloetii*, forming a marked contrast to other members of the group. The greater part of its plumage is orange-yellow, the forehead white, the middle of the crown yellow and the wings black and white; the male has the cheeks, throat and chest black glossed with dull green, while in the female these parts are dull grey. Several examples of this very rare Cuckoo-Shrike were procured on the Mimika River. It is no doubt most nearly allied to the Minivets (*Pericrocotus*) which inhabit the Indo-Chinese countries and islands, the predominant colour of most of the males being scarlet and of the females yellow.

FAMILY *MUSCICAPIDÆ*—FLYCATCHERS.

Flycatchers are very numerously represented and among them two new forms were discovered, a Fan-

tailed Flycatcher (*Rhipidura streptophora*) and a broad-billed species *Myiagra mimikæ*. Among the more notable forms we may mention *Monarcha aruensis*, a brilliant yellow and black species; *Todopsis bonapartei*, the male being vivid ultramarine-blue, purple and black, while the female differs in having the back and sides dark chestnut and the breast mostly white; lastly *Peltops blainvillei*, a black bird with the rump, vent and tail-coverts scarlet, a large white patch on each side of the head and another on the middle of the mantle; the sexes are alike in plumage.

The Fan-tailed Flycatchers were commonly seen on the Mimika River in May and June when numbers were busy hawking the canary-coloured May-flies which swarmed at that time.

The Black-and-white Flycatcher (*Malurus alboscapulatus*) frequented the tall grasses near the camp on the Wataikwa River. It was a delightful little bird, very tame and might constantly be seen crossing the open spaces with an undulating flight.

FAMILY *HIRUNDINIDÆ*—SWALLOWS.

Two species of Swallows were met with *Hirundo javanica* and *H. gutturalis*.

FAMILY *PITTIDÆ*—PITTAS OR ANT-THRUSHES.

Of the Ant-Thrushes or Pittas two species were met with, both brilliantly plumaged birds. *Pitta macklotí* which was far the commoner of the two, has a dark crown, reddish-chestnut nape, and greenish-blue upper-parts; the throat is black, the chest shining greyish-blue and the breast and belly scarlet, divided from the chest by a wide black band.

The other species, *Pitta novæ-guineæ*, which was much

less frequently met with, has the head and neck black and the rest of the plumage dark green washed with bluish on the breast, which is black down the middle. The shoulders are shining silvery-blue and the vent and under tail-coverts scarlet.

These long-legged Thrush-like birds are entirely terrestrial in their habits and frequent the depths of the forests. They can hop with great agility and escape on the slightest alarm, but are easily taken in snares.

FAMILY *CUCULIDÆ*—CUCKOOS.

Among the Cuckoos, the largest is a species of "Crow-pheasant" or "Lark-heeled" Cuckoo, *Centropus menebiki*, a bird of black plumage glossed with dark green, with a large whitish-horn bill and heavy slate-coloured legs and toes.

An allied, but smaller and rarer species, *C. bernsteini*, was met with near the mouth of the Mimika. It is very similar in plumage to the above, but is easily distinguished by its smaller size, black bill and long, nearly straight hind-claw. Both are almost entirely ground-birds of skulking habits. Several other species of Cuckoo were met with, and among these *Cuculus micropterus*, the eastern form of the Common Cuckoo, closely resembling our familiar bird. The rarest species obtained was *Microdynamis parva*, a remarkable little Cuckoo about the size of a Thrush, first described by Count Salvadori in 1875. The origin of the type specimen is uncertain, but it is believed to have been obtained by Beccari in the Moluccas. Subsequently, Dr. H. O. Forbes procured female examples in the Astrolabe Mountains. Mr. Claude Grant obtained an adult male and female which form a valuable addition to the National Collection. The general plumage is brown, but in the male the top of the head and the malar

stripe are black, glossed with steel-blue and the cheeks and throat are cinnamon. In both sexes the bill is short, thick and curved. The male has the eye bright red, while in the female it is hazel.

FAMILY *CYPSELIDÆ*—SWIFTS.

The Swifts, though of especial interest, are not very numerously represented in the collection. The commonest species was that known as the Esculent Swiftlet (*Collocalia fuciphaga*) which produces the best kind of edible nest.

A very interesting discovery was the existence in New Guinea of the large fork-tailed species *Collocalia whiteheadi* originally described by myself from the highlands of Luzon, Philippine Islands.

A remarkable Spine-tailed Swift (*Chætura novæguineæ*) is new to the National Collection. It was fairly common on the Mimika River and originally described by Count Salvadori from specimens procured by D'Albertis on the Fly River.

A pair of the magnificent Moustached Swift (*Macropteryx mystacea*) with a wing expanse of more than two feet were also procured. The plumage of this bird is mostly grey, but the crown, wings, and long deeply-forked tail are black glossed with purplish-blue. The eye-brows and moustache-stripes as well as the scapulars are white, the two former being composed of lengthened, narrow, pointed plumes. The male has a small chestnut spot behind the ear-coverts which is absent in the female. The nesting-habits of this species are very curious, it makes a very small exposed half-saucer-shaped nest of bark and feathers gummed by saliva to a branch or stump barely large enough to contain the single white egg, and ridiculously small in comparison with the size of the bird. When incubating, the greater part of the

bird's body must rest on the branch to which the nest is attached.

FAMILIES *CAPRIMULGIDÆ* AND *PODARGIDÆ*—NIGHTJARS AND FROG-MOUTHS.

The common Nightjar of the country found along the shingly banks of the rivers was *Caprimulgus macrurus*, a widely distributed species. After the ground had been cleared for the base camp at Wakatimi it was visited every evening by a number of Nightjars, which no doubt found such a large open space an admirable hunting-ground and the members of the Expedition derived great pleasure from watching their graceful evolutions. Another very rare Nightjar was *Lyncornis papuensis*, not previously included in the National Collection. Frog-mouths were represented by the larger species *Podargus papuensis* and the smaller, *P. ocellatus*. At some of the stopping places on the river night was made hideous by their mournful cries repeated to distraction on every side, and ending up with a sharp snap.

A single example of the rare Wallace's Owlet-Nightjar (*Ægotheles wallacei*) was collected by Mr. G. C. Shortridge on the Wataikwa River. It has a peculiar uniform blackish upper plumage, without any trace of a distinct nuchal collar. No doubt, like its Australian ally, it roosts in holes in trees during the daytime and captures its prey on the wing at night, like the true Nightjars, though the flight is said to be less tortuous.

FAMILY *BUCEROTIDÆ*—HORNBILLS.

The only representative of the *Bucerotidæ* is the Wreathed Hornbill (*Rhytidoceros plicatus*) a large bird with a casque formed of overlapping plates on the base of the upper mandible. The male is black with the head and neck chestnut and the tail white, while the female

differs in having the head and neck black. It was plentiful everywhere and its flesh was reported to be good eating. It frequented the fruit-bearing trees in company with various species of Pigeons and Mr. Claude Grant on one or two occasions observed pairs at what he took to be their nesting-holes high up in the bare trunks of very tall trees. Their heavy noisy flight and raucous call, continually repeated, renders these birds difficult to overlook.

FAMILY *MEROPIDÆ*—BEE-EATERS.

A species of Bee-eater, *Merops ornata*, was common about the base camp. It ranges to Australia, the Moluccas and westwards to the Lesser Sunda group. Mr. Goodfellow says it swarmed in some places after the month of April; though previous to that date none had been met with.

FAMILY *CORACIIDÆ*—ROLLERS.

Two species of Rollers inhabit the Mimika district *Eurystomus crassirostris*, a greenish-blue species with brilliant ultramarine throat, quills and tail-feathers and vermilion bill and feet; and a smaller species *E. australis* with brownish-green upper-parts, verditer-blue breast and bluish-green bases to the tail-feathers.

Both Bee-eaters and Rollers were common in flocks along the banks of the Mimika during April and May when preying on the canary-coloured May-fly, which swarmed on the waters at that season.

FAMILY *ALCEDINIDÆ*—KINGFISHERS.

Kingfishers were well represented in the Mimika district and Mr. Goodfellow says that the Sacred Kingfisher (*Halcyon sanctus*) was undoubtedly the most

conspicuous bird about the base camp, where its harsh cry could be heard all through the hot hours of the day. The huts and storehouses were infested by myriads of black crickets, which take the place of the cockroaches found in other countries and commit fearful havoc among stores and personal possessions. The constant packing up of goods to send up river drove thousands of these insects to seek shelter in other parts of the camp, and, at such times, Kingfishers became very tame and darted in and out among the buildings, taking advantage of the feast thus afforded. Mr. Claude Grant shot a single specimen of the lovely Kingfisher *H. nigrocyanea* the only one obtained. It has the crown, wings, upper tail-coverts, tail, and breast dark ultramarine blue, the rump cobalt-blue, the throat and a band across the breast pure white, and the remainder of the plumage black. Another species met with at the base camp was *H. macleayi* with purple head, wings and tail, verditer-blue back, white lores, collar and under-parts, and cinnamon flanks. Only one example of this fine bird was procured. Others were the dark purplish-blue and chestnut *Alcyone lessoni*, about the size of our Common Kingfisher and the much smaller *A. pusilla* similarly coloured above, but with the under-parts pure white.

Ceyx solitaria, a closely allied species, with purple spangled upper-parts and cinnamon-yellow under-parts was also found on the Mimika and Mr. Goodfellow was surprised to find this diminutive species which he had believed to be exclusively a fish-eater, greedily devouring a canary-coloured May-fly which swarmed on the waters of the Mimika during April and May.

On the river a few specimens of the large "Jackass" Kingfisher (*Dacelo intermedia*) were obtained, but the species was by no means common. The most conspicuous bird was Gaudichaud's Kingfisher (*Sauromarptis gaudichaudi*) and its loud grating call might be heard in all

directions. The adult is a very handsome bird, the black of the upper-parts being relieved by the electric-blue tips to the wing-coverts and feathers of the lower back and rump, the wings and tail are washed with dull purplish-blue, the throat is white and extends in a buff collar round the neck, the under wing-coverts are buff and the breast and rest of the under-parts deep chestnut. The natives brought numbers of the half-fledged young of this species to the base camp during May and June and many were purchased by the Javanese soldiers and convicts; but as they fed them on boiled rice only, their lives were brief. The great Shoe-billed Kingfisher (*Clytoceyx*) was not met with by the members of our Expedition, but Dr. Van Oort has described a new form which he calls *Clytoceyx rex imperator*, from a specimen procured by Dr. Lorentz on the Noord River. Another large species, *Melidora macrorhinus*, with a curious brown spotted plumage above was not uncommon; it usually frequented the lower branches and undergrowth within a few feet of the ground and when disturbed merely mounted to a more conspicuous perch.

The lovely Racquet-tailed species of the genus *Tanysiptera* were not procured, though Dr. H. A. Lorentz met with a specimen on the Noord River.

FAMILIES *PSITTACIDÆ* AND *LORIIDÆ*—PARROTS AND LORIES.

Another very numerously represented group is the Parrots of which twenty-two different species were procured, varying in size from the Great Black Cockatoo (*Microglossus aterrimus*), which is about the size of a Raven and has an enormously powerful bill, to the tiny Pygmy Parrot (*Nasiterna keiensis*) which is about the size of a Golden-crested Wren. This latter species has recently been described by Mr. Walter Rothschild as new, under the name of *Nasiterna viridipectus* from

specimens obtained by A. S. Meek in the Oetakwa district, but they do not seem to differ from the birds found on the Kei and Aru Islands and also in the neighbourhood of the Fly River. The plumage is green, paler below, the crown dull orange, the shoulders spotted with black, the middle-tail feathers blue and the outer pairs black with yellow and green tips. A few solitary Black Cockatoos might be seen on the lower River, sitting on the tops of the highest trees; their loud whistle always attracted attention and even on their high perches their red faces and erect crests were conspicuous. The Common Cockatoo of the country was *Cacatua triton*, a moderate sized species with a yellow crest which was met with in small numbers throughout the mangrove belt, but it was a shy bird and when approached always flew away, screaming. Lories of different kinds were numerous and included some of the most brilliantly coloured species, *Lorius erythrothorax* combining in its plumage black, crimson, scarlet, purple, blue, green and bright yellow. The adult has the under wing-coverts uniform scarlet in marked contrast to the bright yellow inner webs of the primary quills, but in younger birds the smaller under wing-coverts are mottled with scarlet, blue, black, green and yellow and the long outer series are yellow with greyish-black ends, making a dark band at the base of the quills. In this stage the bird has been described by Dr. A. B. Meyer as *Lorius salvadorii*.

A less brilliantly coloured and more common species in the neighbourhood of the Mimika was *Eos fuscatus* which has the general colour above sooty-black shaded on the middle of the crown, neck, etc. with reddish-orange and the under-parts widely banded with scarlet. A lovely species with a longer tail was *Trichoglossus cyanogrammus* which is green with a blue face and greenish-yellow collar, and has the scarlet chest-feathers edged

with purple, while the belly and flanks are yellow barred with green.

The tiniest Lory is *Loriculus meeki*, a minute species, about the size of a Blue Titmouse, with brilliant green plumage, orange-yellow forehead, and the rump and upper tail-coverts as well as a spot on the throat scarlet. The female differs in having the forehead and cheeks verditer-green.

The genus *Geoffroyus* is represented by two species: the commoner *G. aruensis* with the plumage green, the male having the crown and nape violet-blue and the rest of the head and neck scarlet, while in the female these parts are brown; also the much rarer *G. simplex* which is entirely green with a dull lilac blue ring round the neck. This latter is a very rare bird in collections, but was seen on the higher parts of the mountains above the Iwaka River in flocks of upwards of twenty individuals.

Other small and brilliantly coloured species of Lories are *Charmosynopsis pulchella* and *C. multistriata*, the latter a remarkable new species with green plumage, and the whole of the under-parts streaked with bright yellow. It was recently described by Mr. Rothschild from a male, shot by A. S. Meek on the Oetakwa River; a second specimen, a female, was obtained on the Mimika by Mr. Goodfellow. We must also mention *Chalcopsittacus scintillans*, *Hypocharmosyna placens*, *Charmosyna josephinæ*, the rare *Glossopsittacus goldiei*, and three species of *Cyclopsittacus*, viz. *C. melanogenys*, which is green with a white throat, black cheeks, deep orange breast, and ultramarine wings; *C. diophthalmus;* and *C. godmani*, a new and handsome species with the general colour green, the head and nape orange-scarlet, the upper mantle orange-yellow, the cheeks covered with long, pointed, yellowish feathers, and the chest verditer-blue.

Behind the camp at Wakatimi lay a swamp which

Mr. Goodfellow tells us was every night the roosting-place of thousands of Lories, chiefly *Eos fuscatus*, and there were also smaller flocks of *Trichoglossus cyanogrammus*. Long before sunset and until it was quite dusk flocks of many hundred birds coming from all directions flew over with a deafening noise. Often some weak branch would give way under their weight, causing a panic just as the noise was beginning to subside, and clouds of these birds would again circle around, seeking a fresh roosting place and keeping up a continual din.

One of the most peculiar Parrots, and bearing a marked external resemblance to the Kea of New Zealand, is the Vulturine Parrot (*Dasyptilus pesqueti*) which has the black skin of the face almost entirely bare, the plumage black and scarlet on the wings, rump and belly, the breast feathers having pale sandy margins. Its hoarse, grating call, quite unlike that of any other species, could be heard a long way off, and was continually uttered when on the wing. Mr. Goodfellow says it usually moves about in parties of four or five individuals, and that occasionally as many as seven may be seen together. When not feeding they always select the tallest trees to rest in, preferring dead ones which tower about the general level of the jungle, and in which they remain for hours at a time in rain or sunshine. They do not climb after the usual manner of Parrots, but jump from branch to branch with a jerky movement, like the Lories, and with a rapid flicking movement of the wings. They feed entirely on soft fruits, chiefly wild figs. Apparently the species feeds on the plains and retires to the mountains to roost, for every evening flocks or pairs were observed passing high over the camp at Parimau, and making their way towards the Saddle-peak range.

A handsome new Parroquet of the genus *Aprosmictus* was discovered, and has been named *A. wilhelminæ*, in

honour of the Queen of Holland. The male has the head, neck and under-parts scarlet, the wings green, with a pale yellow green band across the coverts, the mantle and back mostly deep purplish-blue, and the tail black tinged with purplish.

Finally, the Eclectus Parrot (*Eclectus pectoralis*) was common. The remarkable difference in the colouration of the sexes might lead some to believe that they belonged to quite different species, the male being mostly green with scarlet sides and under wing-coverts, while the female is maroon with the head, neck and breast scarlet, and the mantle, belly, sides and under wing-coverts blue.

FAMILIES *BUBONIDÆ* AND *STRIGIDÆ*—WOOD-OWLS AND BARN-OWLS.

The only Owl of which examples were obtained was a small species of Brown Hawk-Owl (*Ninox theomaca*), with the upper-parts, back, wings and tail uniform dark brown, and the under-parts deep chestnut. It was a strictly nocturnal species, and confined to the jungle along the base of the mountains, where its weird double call "yon-yon" might constantly be heard after dark.

A form of the Barn-Owl (*Strix novæ-hollandiæ*), which occurs in the district, was not obtained by the Expedition.

FAMILY *FALCONIDÆ*—EAGLES AND HAWKS.

New Guinea possesses a very remarkable Harpy-Eagle (*Harpyopsis novæ-guineæ*) allied to the Harpy Eagles of America and to the Great Monkey-eating Eagle (*Pithecophaga jefferyi*) which inhabits the forests of the Philippine Islands. The New Guinea bird is like a large Goshawk, having a long tail and comparatively short and rounded wings; the feet are armed with very powerful claws, but in strength and power it is far inferior to its

great Philippine ally or to the still more powerful species inhabiting Central America. Mr. Claude Grant says that this species was seldom met with; it has a rather loud cry and a beautiful soaring flight, often in ascending circles. Besides this large Eagle, two species of Goshawk *Astur etorques* and *A. poliocephalus* were met with, likewise a small chestnut and white Brahminy Kite (*Haliastur girrenera*). A small Sparrow-Hawk was obtained near the mouth of the Mimika River, but being in immature plumage its identification is at present uncertain. Reinwardt's Cuckoo-Falcon (*Baza reinwardti*) with a crested head and banded breast, was rather a rare bird and appears to feed largely on insects.

FAMILY *PHALACROCORACIDÆ*—CORMORANTS.

The small black-backed white-breasted species *Phalacrocorax melanoleucus* is the only representative of this group. Several specimens were shot on the upper waters of the Mimika, at Parimau and at the base camp at Wakatimi.

FAMILY *ANATIDÆ*—DUCKS.

The handsome white-necked Sheld-duck (*Tadorna radjah*) differs from the Australian form in being much darker on the back, the plumage being practically black with indistinct mottlings of dull rufous on the mantle. This dark form, found also in the Moluccas, was common about the mouth of the Mimika River. The more rufous-backed Australian form has been named *T. rufitergum* by Dr. Hartert.

The only other species of duck brought home was an immature male Garganey (*Querquedula discors*) shot on the Kapare River.

FAMILY *IBIDIDÆ*—IBISES.

The Eastern form of the Sacred Ibis (*Ibis stictipennis*) was met with at the mouth of the Mimika. It is easily distinguished from its western ally by having the innermost secondaries mottled with black and white.

FAMILY *ARDEIDÆ*—HERONS.

Several different species of Herons were procured including the Night Heron (*Nycticorax caledonica*); the Yellow-necked Heron (*Dupetor flavicollis*); the White Heron (*Herodias timoriensis*); and a Tiger-Bittern (*Tigrisoma heliosylus*). The last named is a very fine bird with the general colour above black boldly barred with rufous and buff; the under-parts buff barred on the neck and chest with black. The feathers on the neck and chest are very long and broad and no doubt form a most imposing ruff when the bird is displaying.

FAMILIES *ŒDICNEMIDÆ*, *CHARADRIIDÆ* AND *LARIDÆ*—STONE-PLOVERS, PLOVERS, AND GULLS

A number of small wading birds were also procured near the mouth of the river, and two species of Terns, but as all belong to well-known, widely distributed species, there is no special interest attaching to them. I may however mention that the great Australian Curlew (*Numenius cyanopus*), and the large Australian Thicknee (*Esacus magnirostris*) were among the species found at the mouth of the Mimika.

FAMILY *RALLIDÆ*—RAILS.

The only Rail met with was an example of *Rallina tricolor* which has the head, neck and chest bright chestnut, and the rest of the plumage dark brown with white bars on the wing-feathers. It is also met with in some of the Papuan Islands and in North-eastern Australia.

FAMILY *COLUMBIDÆ*—PIGEONS.

Pigeons were very numerously represented, no fewer than twenty-six different species being obtained by the Expedition. Some of the smaller forms are among the most beautifully coloured birds met with in New Guinea. The Crowned Pigeons (Goura) are represented by *G. sclateri* which was fairly common near the base camp and met with in all places visited by the Expedition. In spite of the numbers shot for food during the whole time the Expedition remained in the country, the supply did not appear to diminish. This fine Pigeon and a few others afforded the only fresh meat to be had. On the canoe-journeys up the river Sclater's Goura was frequently met with in the early mornings in parties of two or three searching for aquatic life along the muddy banks. When disturbed they did not immediately take flight, but with raised wings pirouetted around for a few seconds and then flew to the nearest high tree. Mr. Goodfellow found the remains of small crabs in their stomachs and a large percentage of the birds shot were infested by a small red parasite, the same, or similar to that which is known in other parts of New Guinea as "Scrub-itch."

Another very handsome bird is the Ground-Pigeon (*Otidiphaps nobilis*) with the head bluish-black, the nape dull metallic green, the mantle and wings purplish-chestnut and the rest of the plumage deep purple, all being more or less metallic. Its long legs and the upward carriage of its long tail give it much the appearance of a Bantam hen. It was fairly common, but being extremely shy was rarely met with.

Among the larger Fruit-Pigeons we must specially mention *Carpophaga pinon* which has the general appearance of a large Wood-Pigeon. It was met with in large flocks and proved an excellent bird for the table. Another

very striking species, of rather lesser proportions and very much rarer, was Muller's Fruit-Pigeon (*Carpophaga mulleri*) easily distinguished by its white throat, the bold black ring round its neck and its shining chestnut mantle. Among the handsomest was *Carpophaga rufiventris*, a bird with the breast cinnamon and the wings and back metallic green, copper and purple. Lastly a very striking form was the large creamy-white Pigeon (*Myristicivora spilorrhoa*) with the flight feathers, tips of the tail-feathers and under tail-coverts blackish. It appears to be entirely confined to the mangrove swamps and was observed breeding in May along the creeks near the mouth of the river, no less than seven nests being found in one tree.

As already stated among the smaller Fruit-Pigeons many are very beautifully marked and brilliantly coloured, but always with the most harmonious shades. It would seem as though Nature had almost exhausted her scheme of colouration in dealing with some of these birds; for we find two totally different species, *Ptilopus zonurus* and *P. gestroi*, occurring together in which the markings and colours of the plumage are almost identical; on the under-surface the two species are practically alike, both have the chin and throat pale lavender, extending in a ring round the neck, the throat orange, the chest washed with vinous and the remainder of the under-parts green; on the upper-surface, the top of the head and nape are greenish-yellow and the rest of the upper-parts green, but in *P. zonurus* the median wing-coverts are green with a subterminal spot of bright pink, while in *P. gestroi* the least wing-coverts are crimson and the next series grey fringed with greenish-yellow. Another parallel case of close resemblance is found between the small *Ptilopus nanus* and the larger *P. coronulatus*. Though really extremely distinct species the under-parts are very similarly coloured both being green with a bright

magenta patch on the middle of the breast and the belly and under-tail coverts mostly bright yellow: viewed from the upper surface the two birds are, however, very different, *P. coronulatus* having the crown lilac-pink, edged posteriorly with bands of crimson and yellow, while *P. nanus* has the head green, but the ends of the scapulars and secondaries are deep shining bluish-green, tipped with bright yellow. Even more brilliantly coloured species than the above are *Ptilopus pulchellus*, *P. superbus*, *P. aurantiifrons* and *P. bellus*.

Near the camp at Wataikwa large flocks of D'Albertis' Pigeon (*Gymnophaps albertisii*) were observed coming in every evening from their feeding-grounds on the high mountains to roost on the plains below. Mr. Goodfellow tells us that their flight is extremely rapid and that their strange aerial evolutions remind one of the common "Tumbler" Pigeons.

The Long-tailed Cuckoo-Doves were represented by the very large *Reinwardtœnas griseotincta* and the smaller chestnut-plumaged *Macropygia griseinucha*; the former being a large and abnormally long-tailed bird with the head, mantle and under-parts grey, and the back and tail chestnut.

FAMILY *MEGAPODIIDÆ*—MEGAPODES OR MOUND-BUILDERS.

The Game-birds are represented by three species of Mound-builders, two being Brush-Turkeys and the other a true Megapode (*Megapodius freycineti*). The fact that two closely allied species of Brush-Turkeys are found in the same district is of considerable interest. The common species of the country *Talegallus fuscirostris* has a very wide coastal range, being also found in S.E. New Guinea and extending along the north coast to the middle of Geelvinck Bay. The other species *T. cuvieri*

is of western origin being hitherto known from the Arfak Peninsula, and the islands of Salwatti, Mysol and Gilolo. Its occurrence on the Iwaka river was quite unexpected and no doubt the range of the two species overlap in the neighbourhood of the Mimika in the south and in the vicinity of Rubi on Geelvinck Bay in the north. In both the plumage is black, but *T. cuvieri* is a larger bird than *T. fuscirostris* and is easily recognised by having the tibia feathered right down to the tibio-tarsal joint and the bill orange-red instead of sooty-brown.

All these species are of the greatest interest on account of their remarkable nesting habits, and their nesting mounds of decaying vegetable matter were conspicuous objects in the jungle. The eggs, which are very large for the size of the birds, are buried among the débris which the birds rake together into a large heap, the young being hatched, as in an incubator, by the warmth of the decaying leaves. The parent bird, after burying its eggs, takes no further notice of them, but the young on leaving the shell are fully feathered and able to fly and take care of themselves.

FAMILY *CASUARIIDÆ*—CASSOWARIES.

The discovery made by Mr. Walter Goodfellow that two distinct forms of two-wattled Cassowary occur side by side on the Mimika River has greatly modified Mr. Rothschild's views on the classification of the genus, and he now finds that the ten forms possessing two wattles, when placed side by side fall naturally into two groups, one consisting of the Common Cassowary (*Casuarius casuarius*), divisible into six sub-species or races, and the other of *C. bicarunculatus* which may be divided into four sub-species. The large forms found on the Mimika are *C. sclateri*, representing the first group, and *C. intensus* representing the second. Both these birds

have a large elevated casque or helmet and differ chiefly in the pattern and colouration of the bare neck-wattles.

These Cassowaries were seen at various times searching for food in the pools and shallow waters of the river-beds, and during the cross-country marches would sometimes dash across the trail, affording but a momentary glimpse.

The natives have distinct names for the male and female birds and judging from the quantities of feathers in their possession must often succeed in capturing them. Eggs and newly-hatched chicks were brought in during January and February. On one occasion at Parimau some eggs must have been kept by the natives for a few days before they hatched, for young were brought to the camp which had evidently just emerged from the shells.

A very interesting discovery was made by Mr. Claude Grant on the foot-hills, where he met with a new dwarf species of Cassowary, *C. claudii*. It is allied to *C. papuanus*, but has the hind part of the crown and occiput black instead of white. Like that bird it has a low triangular casque and belongs to a different section of the genus from the two larger species already mentioned.

C. claudii has very brilliantly coloured soft parts. The occiput and sides of the head are entirely black; between the gape and the ear is a patch of deep plum-colour; the upper half of the back of the neck is electric-blue, shading into violet-blue on the sides and fore-part of the neck including the throat; the lower half of the back of the neck is orange-chrome, this colour extending down the upper margin of a bare magenta-coloured area situated on each side of the feathered part of the neck. This fine bird is now mounted and on exhibition in the Bird Gallery at the Natural History Museum.

LIST OF THE PRINCIPAL PAPERS RELATING TO THE BIRDS OF NEW GUINEA, INCLUDING THE KEI AND ARU ISLANDS.

1875–88. *Gould.* Birds of New Guinea and the adjacent Papuan Islands. (Completed by R. B. Sharpe) (1875–88).

1880–82 & 1889–91. *Salvadori.* Ornitologia della Papuasia e delle Molluche. Vols. I–III. (1880–82). Aggiunte, pts. I.–III. (1889–91).

1883. *Ramsay.* Proc. Linn. Soc. N.S.W. VIII. pp. 15–29 (1883).

1884. *Sharpe.* Journ. Linn. Soc. Zool. XVII. pp. 405–408 (1884).
Meyer. Zeit. Ges. Orn 1. pp. 269–296, pls. XIV.–XVIII. (1884).

1885. *Finsch and Meyer.* Zeit. ges. Orn. II. pp. 369–391, pls. XV.–XXII. (1885).
Guillemard. P.Z.S. 1885, pp. 615–665, pl. XXXIX.

1886. *Meyer.* Monat. Schutze Vogelw. 1886, pp. 85–88, pl.
Meyer. P.Z.S. 1886, pp. 297–298.
Finsch and Meyer. Zeit. ges. Orn. III. pp. 1–29, pls. I.–VI. (1886).
Meyer. Zeit. ges. Orn. III. pp. 30–38 (1886).
Salvadori. Ibis 1886, pp. 151–155.

1887. *Ramsay.* Proc. Linn. Soc. N.S.W. (2) II. pp. 239–240 (1887).
Bartlett. P.Z.S. 1887, p. 392.
Oustalet. Le Nat. I. pp. 180–182 (1887).

1888. *Meyer.* Reisen in Kaiser Wilhelms-Land und Englisch New-Guinea in dem Jahren 1884 u. 1885 an Bord des Deutschen Damfers "Samoa." Leipsig, 1888.
Cabanis. J.f.O. 1888, p. 119.

1889. *Cabanis.* J.f.O. 1889, p. 62, pls. 1 & 2.
Meyer. J.f.O. 1889, pp. 321–326.
De Vis. Proc. Roy. Soc. Queensland VI. pp. 245–248 (1889).

1890. *De Vis.* British New Guinea. Report of the Administration for the period 4th Sept. 1888 to 30th June, 1889.
App. G. Report on Birds from British New Guinea, pp. 105–116 (1890).
(Reprinted, Ibis 1891, pp. 25–41).
Goodwin. Ibis 1890, pp. 150–156.
Meyer. Ibis 1890, p. 412, pl. XII.
Salvad. Ann. Mus. Civ. Genov. (2) IX. pp. 554–592 (1890).

1891. *Oustalet.* Le Nat. V. pp. 260–261 (1891).
Sclater. Ibis 1891, p. 414, pl. X.
Meyer. Abh. Zool. Mus. Dresden 1891, No. 4, pp. 1–17.

1891–98. *Sharpe.* Monogr. *Paradiseidæ* and *Ptilonorhynchidæ* (1891–98).

1892. *De Vis.* Ann. Queensland Mus. II. pp. 4–11 (1892).
De Vis. Annual Report Brit. New Guinea, 1890–91. App. CC. pp. 93–97, pl. (1892).
Salvad. Ann. Mus Civ. Genov. (2) X. pp. 797–834 (1892).
Meyer. J.f.O. 1892, pp. 254–266.
Crowley. Bull. B.O.C. 1. p. XVI. (1892).

1893. *Meyer.* Abh. Zool. Mus. Dres. 1892–93, No. 3. pp. 1–33, pls. 1 & 2.
Oustalet. Nouv. Archiv. Mus. Paris, (3) IV. pp. 218–220, pl. XV.; V. pp. 295–299, pl. VI.
Sclater. Ibis 1893, pp. 243–246, pl. VII. text fig.
Finsch. Ibis 1893, pp. 463–464.
Meyer. Ibis 1893, pp. 481–483, pl. XIII.

1894. *De Vis.* Annual Report, Brit. New Guinea, 1894, pp. 99–105.
Salvad. Ann. Mus. Civ. Genov. (2) XIV. pp. 150–152 (1894).
Meyer. Bull. B.O.C. IV. pp. VI., VII., XI., XII. (1894).

1894. *Rothschild.* Bull. B.O.C. IV. p. XI. (1894).
Sharpe. Bull. B.O.C. IV. pp. XII.–XV. (1894).
Reichenow. Orn. Monatsb. II. p. 22 (1894).
Meyer. Abh. Zool. Mus. Dres. 1894–95. No. 2. pp. 1–4. pl. (1894).
Büttikofer. Notes Leyden Mus. XVI. pp. 161–165 (1894).
Mead. Amer. Natural. XXVIII. pp. 915–920. pls. XXIX.–XXXI. (1894).
1895. *Meyer.* Bull. B.O.C. IV. p. XVII. (1895).
Meyer. Abh. Zool. Mus. Dres. 1894–95, no. 5. pp. 1–11. pls. 1 & 2. No. 10. pp. 1–2, pl. I. figs. 1–4 (1895).
Rothschild. Nov. Zool. II. pp. 22, 59, 480, pls. III. & V. (1895).
Hartert. Nov. Zool. II. p. 67 (1895).
Rothschild. Bull. B. O. C. IV. pp. XXI., XXVI., XLII. (1895).
Ogilvie-Grant. Bull. B.O.C. V. p. XV. (1895).
Mead. Amer. Natural. XXIX. pp. 1–9, 409–417, 627–636, 1056–1065, pl. VII. (1895).
Sanyal. P.Z.S. 1895, pp. 541–542.
Oustalet. Bull. Mus. Paris. 1895, pp. 47–50.
Sclater. Ibis 1895, pp. 343, 344, pl. VIII.
1896. *Rothschild and Hartert.* Nov. Zool. III., pp. 8, 252, 530, 534, pl. I. (1896).
Rothschild. Nov. Zool. III., pp. 10–19 (1896).
Salvadori. Ann. Mus. Civ. Gen. (2) XVI., pp. 55–120 (1896).
Salvadori. Bull. B.O.C. V. p. XXII. (1896).
Rothschild. Bull. B.O.C. VI. pp. XV.–XVI. (1896).
Oustalet. Nouv. Archiv. Mus. Paris (3) VIII. pp. 263–267, pls. XIV. & XV. (1896).
1897. *Rothschild.* Bull. B.O.C. VI. pp. XV., XVI., XXIV., XXV., XL., XLV., LIV. (1897).
Rothschild. Bull. B.O.C. VII. pp. XXI.–XXII. (1897).
Reichenow. Orn. Monatsb. V. pp. 24–26, 161, 178, 179 (1897).
Kleinschmidt. Orn. Monatsb. V. p. 46 (1897).
Kleinschmidt. J.f.O. 1897, pp. 174–178, text-fig.
Reichenow. J.f.O. 1897, pp. 201–224, pls. V. & VI.
Rothschild. Nov. Zool. IV. p. 169, pl. II. fig. 2 (1897).
Hartert. Nov. Zool. IV. p. 396 (1897).
De Vis. Ibis 1897, pp. 250–252, 371–392, pl. VII.
Madarasz. Termes Füzetek XX. pp. 17–54, pls. 1 & 2 (1897).
Mead. Amer. Natural. XXXI. pp. 204–210 (1897).
1898. *Hartert.* Bull. B.O.C. VIII. pp. VIII. & IX. (1898).
Rothschild. Bull. B.O.C. VIII. p. XIV. (1898).
Rothschild. Das Tierreich *Paradiseidæ*, 52 pp. Berlin, 1898.
De Vis. Annual Report, New Guinea, App. AA. Report on birds for 1896–97, pp. 81–90 (1898).
Finsch. Notes Leyden Mus. XX. pp. 129–136 (1898).
Rothschild. Nov. Zool. V. pp. 84–87, 418, 509, 513, pl. XVIII. (1898).
Reichenow. J.f.O. 1898, pp. 124–128, pl. 1.
Caley-Webster. Through New Guinea and the Cannibal Countries. Appendices on birds by Messrs. Rothschild and Hartert (1898).
1899. *Salvadori.* Ann. Mus. Civ. Genov. (2) XIX. pp. 578–582 (1899).
Rothschild. Nov. Zool. VI. pp. 75 & 218, pls. II. & III. (1899).
Hartert. Nov. Zool. VI. p. 219, pl. IV. (1899).
Madarasz. Termes, Füzetek. XXII. pp. 375–428, pls. XV.–XVII. (1899).
1900. *Finsch.* Notes Leyden Mus. XXII. pp. 49–69 & 70 (1900).
Rothschild. Bull. B.O.C. X. pp. C. CI. (1900).
Rothschild. Bull. B.O.C. XI. pp. 25, 26, 30 (1900).
Madarasz. Orn. Monatsb. VIII. pp. 1–4 (1900).
Renshaw. Nature Notes XI. pp. 164–167 (1900).
Currie. P.U.S. Nat. Mus. XXII. pp. 497–499, pl. XVII. (1900).

1900. *Le Souëf.* Ibis 1900, pp. 612, 617, text-fig. 1.
1901. *Rothschild.* Bull. B.O.C. XII. p. 34 (1901).
Reichenow. Orn. Monatsb. IX. pp. 185–186 (1901).
Madarasz. Termes Füzetek, XXIV. p. 73 (1901).
Hartert. Nov. Zool. VIII. pp. 1, 93 (1901).
Rothschild and Hartert. Nov. Zool. VIII. pp. 53, 102, pls. II.–IV. (1901).
1902. *Weiske.* Ein Beitrag zur Naturgeschichte der Laubenvogel. Monat. Schutze Vogelw. XXVII. pp. 41–45 (1902).
Sclater. Bull. B.O.C. XIII. p. 23 (1902).
1903. *Rothschild.* Bull. B.O.C. XIII. p. 32 (1903).
Finsch. Orn. Monatsb. XI. p. 167 (1903).
Renshaw. Avicult. Mag. (2) II. pp. 26–27, fig. (1903).
Rothschild and Hartert. Nov. Zool. X. pp. 65–89, pl. I. 196–231, 435–480, pls. XIII. & XIV. (1903).
Hartert. Nov. Zool. X. pp. 232–254 (1903).
1904. *Rothschild.* Bull. B.O.C. XIV. pp. 38–40 (1904).
Ogilvie-Grant. Bull. B.O.C. XIV. p. 40 (1904).
1905. *Ogilvie-Grant.* Ibis 1905, pp. 429–440, pl. VIII. text-figs. 22–26.
Pycraft. Ibis 1905, pp. 440–453.
Sharpe. Bull. B.O.C. XV. p. 91 (1905).
Salvadori. Ibis 1905, pp. 401–429, 535–542.
1905–10. *Salvadori.* In Wytsman, Genera Avium. Psittaci, pts. 5, 11, & 12 (1905–1910).
1906. *Salvadori.* Ibis, 1906, pp. 124–131, 326–333; 451–465, 642–659
Rothschild. Bull. B.O.C. XIX. pp. 7–8, 27 (1906).
Foerster and Rothschild. Two new Birds of Paradise Zool. Mus. Tring. 3 pp. Tring. 1st October, 1906.
Van Oort. Notes Leyden Mus. XXVIII. p. 129–130 (1906).
Ogilvie-Grant. Bull. B.O.C. XIX. p. 39 (1906).
North. Vict. Nat. XXII. pp. 147, 156–8, pl. (1906).
1907. *Salvadori.* Ibis 1907, pp. 122–151; 311–322.
Ingram, (Sir W.). Ibis 1907, pp. 225–229, pl. V. text-figs. 8 & 9.
Simpson. Ibis 1907, pp. 380–387, text-figs.
Rothschild and Hartert. Nov. Zool. XIV. pp. 433, 447 (1907).
Rothschild. Nov. Zool. XIV. p. 504, pls. V.–VII. (1907).
Rothschild. Bull. B.O.C. XXI. p. 25 (1907).
Hartert. Bull. B.O.C. XXI. p. 26 (1907).
North. Vict. Nat. XXIV. p. 136 (1907).
Ingram, (C.). Avicult. Mag. (2) V. p. 364, pl. (1907).
Le Souëf. Emu. VI. p. 119–120 (1907).
1908. *Van Oort.* Notes Leyden Mus. XXIX. pp. 170–180, 2 pls. pp. 204–206 1 pl. (1908).
Van Oort. Notes Leyden Mus. XXX. pp. 127–128 (1908).
Rothschild. Nov. Zool. XV. p. 392 (1908).
Sharpe. Bull. B.O.C. XXI. p. 67 (1908).
Rothschild. Bull. B.O.C. XXIII. p. 7 (1908).
Goodfellow. Bull. B.O.C. XXIII. pp. 35–39 (1908).
1909. *Beaufort.* Nova Guinea V. Zoologie Livr. 3, pp. 389–420 (1909).
Van Oort. Nova Guinea IX., Zoologie Livr. 1. Birds from South-western and Southern New Guinea, pp. 51–107, pl. III. (1909).
Van Oort. Notes Leyden Mus. XXX. pp. 225–244 (1909).
Horsbrugh, (C. B.). Ibis, 1909, pp. 197–213.
Sassi. J.f.O. 1909, pp. 365–383.
Nehrkorn. Orn. Monatsb. XVII. p. 44 (1909).
Astley. Avicult. Mag. (2) VII. pp. 156–158 (1909).
1910. *Van Oort.* Notes Leyden Mus. XXXII. pp. 78–82, 211–216 (1910).
Madarasz. Ann. Hist. Nat. Mus. Nat. Hung. Budapest VIII., pp. 172–174, pl. II. (1910).
Goodfellow. Avicult. Mag. (3) 1, pp. 277–286 (1910).

1910. *Ogilvie-Grant.* Bull. B.O.C. XXVII. p. 10 (1910).
Rothschild. Bull. B.O.C. XXVII. pp. 13, 35, 36, 45 (1910).
Hartert. Nov. Zool. XVII. p. 484, pl. X. (eggs) (1910).
1911. *Rothschild.* Ibis 1911, pp. 350–367, pls. V. & VI.
Rothschild and Hartert. Nov. Zool. XVIII. pp. 159–167 (1911).
Ogilvie-Grant. Bull. B.O.C. XXVII. pp. 66, 68, 83, 84 (1911).
1912. *Rothschild.* Ibis 1912, pp. 109–112, pl. II.
Ogilvie-Grant. Ibis 1912, pp. 112–118, pl. III.
Hartert. Nov. Zool. XVIII. p. 604, pls. VII. & VIII. (1912).
Rothschild. Bull. B.O.C. XXIX. pp. 50–52 (1912).

APPENDIX B

THE PYGMY QUESTION

By Dr. A. C. HADDON, F.R.S.

Pygmies, as their name implies, are very short men, and the first question to decide is whether this short stature is normal or merely a dwarfing due to unfavourable environment. Although stature cannot be taken as a trustworthy criterion of race, since it is very variable within certain limits among most races, there are certain peoples who may be described as normally tall, medium, or short. The average human stature appears to be about 1·675 m. (5 ft. 6 ins.). Those peoples who are 1·725 (5 ft. 8 ins.) or more in height are said to be tall, those below 1·625 m. (5 ft. 4 ins.) are short, while those who fall below 1·5 m. (4 ft. 11 ins.) are now usually termed pygmies. One has only to turn to the investigations of the Dordogne district by Collignon and others to see how profoundly *la misère* can affect the stature of a population living under adverse conditions, for example in the canton of Saint Mathieu there are 8·8 per cent. with a stature below 1·5 m. But when one finds within one area, as in the East Indian region, distinct peoples of medium, short and pygmy stature, living under conditions which appear to be very similar, one is inclined to suspect a racial difference between them, and the suspicion becomes confirmed if we find other characters associated with pygmy stature.

Pygmy peoples are widely distributed in Central

Africa, but these Negrillos, as they are often termed, do not concern us now.

Asiatic pygmies have long been known, but it is only comparatively recently that they have been studied seriously, and even now there remains much to be discovered about them. There are two main stocks on the eastern border of the Indian Ocean, who have a very short stature and are respectively characterised by curly or wavy hair and by hair that grows in close small spirals —the so-called woolly hair.

(i.) The Sakai or Senoi of the southern portion of the Malay Peninsula are typical examples of the former stock, their average stature is slightly above the pygmy limit, but they need not detain us longer as they belong to a different race of mankind from the woolly-haired stock. It may be mentioned however that cymotrichous (curly-haired), dolichocephalic (narrow-headed), dark-skinned peoples of very short stature, racially akin to the Sakai, have been found in East Sumatra and in Celebes (Toala) more or less mixed with alien blood; and quite recently Moszkowski, as will be mentioned later, has suggested that the islands of Geelvink Bay, Netherlands New Guinea, were originally inhabited by the same stock. All these peoples together with the Vedda and some jungle tribes of the Deccan are now regarded as remnants of a once widely distributed race to which the term Pre-Dravidian has been applied; it is also believed by many students that the chief element in the Australians is of similar origin.

(ii.) For a long time it has been known that there are three groups of ulotrichous (woolly-haired), brachy-cephalic (broad-headed), dark-skinned, pygmy peoples inhabiting respectively the Andaman Islands, the Malay Peninsula and the Philippines; to this race the name Negrito is universally applied. We can now include in it a fourth element from New Guinea. The physical

characters of these several groups may be summarised as follows:

1. The ANDAMANESE, who are sometimes erroneously called Mincopies, inhabit the Andaman Islands in the Bay of Bengal. Their head *hair* is extremely frizzly (woolly), fine in texture, lustreless and seldom more than two or three inches long, or five inches when untwisted, its colour varies between black, greyish black, and sooty, the last perhaps predominating. Hair only occasionally grows on the face and then but scantily. There is little or no hair over the surface of the body. The *skin* has several shades of colour between bronze or dark copper, sooty, and black, the predominating colour being a dull leaden hue like that of a black-leaded stove. The average *stature* of 48 males is 1·492 m. (4 ft. 10¾ ins.), the extremes being 1·365 m. (4 ft. 5¾ ins.) and 1·632 m. (5 ft. 4¼ ins.). The *head* is moderately brachycephalic, the average *cranial index* (*i.e.* the ratio of the breadth to the length, the length being taken as 100) in male skulls is 81, thus the *cephalic index* of the living would be about 83. The *features* may be described as: face broad at the cheek-bones; eyes prominent; nose much sunken at the root, straight and small; lips full but not everted; chin small; the jaws do not project.

2. The SEMANG live in the central region of the Malay Peninsula, some of them are known under the names of Udai, Pangan, Hami and Semán. The *hair* of the head is short, universally woolly, and black. Skeat says it is of a brownish black, not a bluish black like that of the Malays, and Martin alludes to a reddish shimmer when light falls on it, but says there is not a brownish shimmer as in the Sakai. Hair is rare and scanty on face and body. Skeat describes the *skin* colour as dark chocolate brown approximating in some Kedah Negritos to glossy black, and Martin says the

skin of the chest is dark brown with reddish tinges, while that of the face is mainly dark brown, the remainder being medium brown, with reddish or pure brown tinges. The data for the *stature* are not very satisfactory, the best are a series of 17 males by Annandale and Robinson, the average being 1·528 m. (5 ft. $0\frac{1}{4}$ in.), with extreme, of 1·372 m. (4 ft. 6 ins.) and 1·604 m. (5 ft. 3 ins.). The average *cephalic index* is about 78 or 79, the extremes ranging from about 74 to about 84. The Semang are thus mesaticephalic on the average. According to Skeat the *face* is round; the forehead rounded, narrow and projecting, or as it were "swollen"; the nose short and flattened, the nostrils much distended, the breadth remarkably great, five adult males having an average nasal index of 101·2, the 20 measured by Annandale and Robinson varied from 81·3 to 108·8 with an average of 97·1, but four men measured by Martin had an average index of 83·5. The cheek-bones are broad; jaws often protrude slightly; lips not as a rule thick, Martin remarks that very characteristic of both the Semang and the Sakai is the great thickening of the integumental part of the upper lip, the whole mouth region projecting from the lower edge of the nose; this convexity occurs in 70 per cent., and is well shown in his photographs.

3. The AETA live in the mountainous districts of the larger islands and in some of the smaller islands of the Philippines. It is convenient to retain this name for the variously named groups of Philippine Negritos, many of whom show admixture with other peoples. The *hair* of the head is universally woolly except when mixture may be suspected or is known; Reed says it is uniformly of a dirty black colour, sometimes sunburnt on the top to reddish brown; Worcester describes it as usually black but it may be reddish brown, and Meyer as a dark seal-brown to black. Reed says that the beard is

very scanty but all adult males have some and that there is very little body hair, but Worcester states that the men often have abundant beards and a thick growth of hair on the arms, chest and legs. The *skin* is described as being of a dark chocolate brown, rather than black, with a yellowish tinge on the exposed parts (Reed), sooty black (Sawyer), or dark, sooty brown (Worcester). The average *stature* of 48 men is 1·463 m. (4 ft. 9½ ins.), ranging from 1·282 m. (4 ft. 2½ ins.) to 1·6 m. (5 ft. 3 ins.), but some of these were not pure breeds (Reed); other observations also show a considerable range in height. The *cephalic index* of 16 males averages 82·2, ranging from 78·8 to 92·3, ten range between 80 and 85 (Reed). *Features:* typically the nose is broad, flat, bridgeless, with prominent arched alæ and nostrils invariably visible from the front. Of 76 persons measured by Reed 4 males and 3 females had nasal indices below 89, 10 and 3 of 90–99, 20 and 13 of 100–109, 7 and 7 of 110–119, 6 and 3 above 120; the median of the males is 102, the extremes being 83·3 and 125, the median of the females is 105, their extremes being 79·5 and 140·7; in other words they are extremely platyrhine. The eyes are round. The lips are moderately thick, but not protruding. A somewhat pronounced convexity is sometimes seen between the upper lip and the nose in the photographs of Meyer's and Folkmar's Albums. Meyer says the projecting jaw gives an ape-like appearance to the face, but Reed says the Aeta have practically no prognathism, a statement which is borne out by his and Folkmar's photographs.

4. The discovery of pygmies in Netherlands New Guinea by the Expedition has drawn public attention to a problem of perennial interest to ethnologists. Nearly twenty-five years ago Sir William Flower stated, "that it (the Negrito race) has contributed considerably to form the population of New Guinea is unquestionable. In

many parts of that great island, small round-headed tribes live more or less distinct from the larger and longer-headed people who make up the bulk of the population." (Lecture at the Royal Institution, April 13, 1888, reprinted in *Essays on Museums*, 1898, p. 302.) No further information is given, nor are his authorities mentioned. Perhaps he was alluding to the following statement by de Quatrefages, "L'extension des Négritos en Mélanésie est bien plus considérable. Ici leurs tribus sont mêlées et juxtaposées à celles des Papouas probablement dans toute la Nouvelle Guinée" (*Rev. d'Ethn.*, 1882, p. 185); subsequently he wrote, "La confusion regrettable (namely the confusion of the brachycephalic Negrito-Papuans with the dolichocephalic Papuans, of which Earl, Wallace, Meyer and others have been guilty) est cause que l'on n'a pas recherché les traits differentiels qui peuvent distinguer les Negritos-Papous des vrais Papouas au point de vue de l'état social, des mœurs, des croyances, des industries." (*Les Pygmées*, 1887, p. 97, English Translation, 1895, p. 62.) Dr. A. B. Meyer, from whose essay these quotations have been taken, adds, "No, the confusion has not been in this case in the heads of the travellers; a Negritic race, side by side with the Papuan race, nobody has been able to discover, just because it does not exist, and it does not exist because the Papuan race, in spite of its variability, is on the one hand a uniform race, and on the other as good as identical with the Negritos." (*The Distribution of the Negritos*, 1899, p. 85.) When reviewing this essay in *Nature* (Sept. 7, 1899, p. 433), I stated that I was inclined to adopt the view that the various types exhibited by the natives of New Guinea "point to a crossing of different elements," and do not "simply reveal the variability of the race," as Dr. Meyer provisionally believed. While agreeing with Dr. Meyer that the "different conditions of existence" (p. 80) in New Guinea probably

have reacted on the physical characters of the natives (about which, however, we have extremely little precise information), we have now sufficient evidence to prove that the indigenous or true Papuan population has been modified in places by intrusions from elsewhere, and of late years data have been accumulating which point to the existence of a pygmy population. Shortly before his death, Dr. Meyer drew my attention to a more recent statement of his views, in which he says, "Although I formerly stated (*Negritos*, p. 87) that the question whether the Papuans, *i.e.* the inhabitants of New Guinea, are a uniform race with a wide range of variation or a mixed race is not yet ripe for pronouncement, I am now more inclined, after Mr. Ray's discovery of the Papuan linguistic family, to look upon them as a mixed race of 'Negritos' and Malays in the wider sense. I am eagerly looking forward to the exploration of the interior of that great island, for may it not be possible there to discover the Negrito element in that old and more constant form in which it persists in the Philippines, Andamans, and in Malakka." (*Globus*, XCIV., 1908, p. 192.) This later view appears to me to be less tenable than his earlier one, as it is difficult to see how a mixture of pygmy, woolly-haired brachycephals with short, straight-haired brachycephals (Malays) could give rise to the taller, woolly-haired dolichocephalic Papuans.

The racial history of New Guinea has proved to be unexpectedly complicated. We are now justified in recognising at least two indigenous elements, the Negrito and Papuan; the effect of the island populations to the east has not yet been determined, but in the south-west two immigrations at least from Melanesia have taken place, which, with Seligmann, we may term Papuo-Melanesian. (*Journ. R. Anth. Inst.*, XXXIX. 1909, pp. 246, 315; and *The Melanesians of Brit. New Guinea*, 1910.) It is, however, almost certain that future

researches will reveal that the problem is not so simple as that just indicated.

Writing in 1902, Dr. Weule states (*Globus*, LXXXII. p. 247) that he has no further doubts as to the existence of pygmies in New Guinea, though it is not yet clear whether they live in definite groups or as scattered remnants among the taller peoples. He points out that information as to the pygmies was of necessity scanty, as expeditions had always followed the course of rivers where encounter with them might least be expected, since they are for the most part mountain people. Through the activity of Sir William MacGregor and others, British New Guinea is "the least unknown" part of the whole island; there is therefore more likelihood of pygmy peoples being discovered in German or Netherlands New Guinea, the latter being entirely a *terra incognita* from the geographical standpoint. Dr. Weule's article contains various references to previous literature on the pygmy question, and three photographs of pygmies from the middle Ramu are reproduced, which show three men well under 142 cm. (4 ft. $8\frac{3}{4}$ ins.) in height.

The later history of the discovery of a pygmy substratum in the population of parts of New Guinea is as follows:—

Dr. M. Krieger had visited the Sattelberg and the neighbourhood of Simbang where he heard reports of dwarfs from natives, but no European had seen them (*Neu Guinea*, 1899, p. 143); subsequently Dr. R. Pöch stayed from December 1904 to February 1905 in the Kai area, which lies inland from Finschhafen in German New Guinea. In the *Mitt. aus den deutschen Schutzgebieten* 1907, he writes (p. 225): "During the first part of the time I remained chiefly on the Sattelberg itself, and observed and measured the various Kai frequenting the Mission Station. In them I became acquainted with a

mountain tribe entirely different from the coast peoples previously visited. In fifty men I found the average height to be 152·5 cm. (5 ft.); the skulls are, as a rule, mesocephalic to brachycephalic. Towards the coast (Jabim) dolichocephaly becomes more usual and the type also changes. Very small people are not infrequently met with among the Kai." Among 300 adult males he found twelve ranging from 133 to 145·6 cm. (4 ft. 4½ ins. to 4 ft. 9¼ ins.). "For the present," he adds, "it cannot be determined whether this is merely a variation in stature or whether we have here survivals of an older smaller race not yet entirely merged in the Kai" (*cf.* also *Sitzungsber. der Anth. Gesellschaft in Wien*, 1905, pp. 40 ff.). In the *Zeitschr. f. Ethnol.* XXXIX., 1907, p. 384, he states that on the north coast of British New Guinea and in Normanby Island he often came across very small people. Dr. O. Reche, in describing a journey up the Kaiserin-Augusta river, says that, "the population consists of three clearly distinguishable types or races, two of which have long, very narrow skulls, and one a short broad skull. Inland from the river bank there seems to be in addition to these a pygmy-like people of small growth; at all events, I found in some of the villages situated on the upper river, among other skulls, some which were remarkably small and of a special type, and which must have been taken from enemies living further inland." (*Globus*, XCVII. 1910, p. 286.)

Neuhauss studied the Sattelberg natives and is very certain that a pygmy element occurs there. He notes the stockiness of certain individuals, who have a long powerful trunk and short limbs, whereas the Papuans are lean and slender; the shortest man measured by him was 1·355 m. (4 ft. 5½ ins.). Again, the *cephalic index* of 260 Papuans averages 76·8, while that of thirty-two short individuals averages 78·8, and on the Sattelberg 79·7, some even ranging from 83–84·6. He also noticed that

the ears were short, wide and without lobe; the hands and feet were unusually small. Von Luschan draws attention to the convexity of the whole upper lip area as in African pygmies. Neuhauss insists that the pygmies are almost merged into the rest of the population, and that their low stature is not due to poor conditions. (*Zs. f. Ethnol.* XLIII., 1911, p. 280.)

Dr. M. Moszkowski found that in Geelvink Bay the hair is not always ulotrichous (woolly), as is usual with Papuans, especially on Biak and Padeido Islands the hair often recalls the cymotrichous (curly) hair of Veddas. Other points of resemblance with wild tribes of Further Asia are:—A very dainty graceful bone-structure, small hands and feet, relatively short limbs compared to the trunk, low stature, few being above 156 cm. and most below 150 cm. (4 ft. 11 ins.), and now and then the characteristic convex upper lip of the wild tribes (*Zs. f. Ethnol.* XLIII. 1911, pp. 317, 318). On these grounds Moszkowski inclines to think that the islands of Geelvink Bay were originally peopled by pre-Malayan wild tribes allied to the Vedda, Sakai, Toala, etc., and thus the present population is the result of crossing between these and immigrant Melanesians; true Malays came later. Moszkowski has not yet published any head measurements of these interesting people, and the evidence is insufficient to decide whether this is a Pre-Dravidian or a Negrito element in the population of these islands, the curly character of the hair may be due as elsewhere in New Guinea to racial mixture; the photograph of a "Vedda-type" from Padeido island is by no means convincing (*l.c.* p. 318).

Finally Guppy, Ribbe and Rascher report the occurrence of very short people in the interior of the larger islands of the Bismarck Archipelago and of the Solomon Islands; recently Thurnwald refers to very small people in the mountainous interior of Bougainville who speak a

non-Melanesian language, one man from Mari mountain had a stature of 1·39 m. (4 ft. 6½ ins.). In the mountains the mixed population consists of types recalling the Solomon Islanders and "representatives of a small short-legged, broad-faced, short-skulled, very hairy, wide-nosed people." (*Zs. f. Ethnol.* XLII. 1910, p. 109.)

Discussing the pygmies of Melanesia von Luschan referred in 1910 (*Zs. f. Ethnol.* XLII., p. 939) to bones brought a century ago from the Admiralty Islands which must have belonged to individuals 1·32–1·35 m. (4 ft. 4 ins.–4 ft. 5 ins.) in stature; it is unlikely that the type persists, though Moseley mentions an unusually short man, a little over 5 ft. (*Journ. Anth. Inst.* 1877, p. 384). In the collection made by the German Marine Expedition there are a number of extremely small skulls from New Ireland, which von Luschan is convinced belong to pygmies. Finsch brought from New Britain over thirty years ago the smallest known skull of a normal adult person; it came from the S.W. coast of Gazelle Peninsula. Like four other extremely small feminine skulls from New Britain this one is dolichocephalic (ceph. index 73). Von Luschan is of opinion that the small people of Melanesia represent an older stratum of population than their tall neighbours.

While other travellers have come across what is now accepted as a pygmy element in the population, the members of this Expedition have for the first time proved the existence of a pygmy people, known as the *Tapiro*, who may be regarded as predominantly Negritos. The *hair* is short, woolly and black, but seemed brown in two or three cases, there is a good deal of hair on the face and of short downy hair scattered about the body. The *skin* is of a lighter colour than that of the neighbouring Papuans, some individuals being almost yellow. The *stature* averages 1·449 m. (4 ft. 9 ins.), ranging from 1·326 m. (4 ft. 4¼ ins.) to 1·529 m. (5 ft. 0¼ in.). The

cephalic index averages 79·5, varying from 66·9 to 85·1. *Features:* The nose is straight and though described as "very wide at the nostrils," the mean of the indices is only 83, the extremes being 65·5 to 94. The eyes are noticeably larger and rounder than those of Papuans. "The upper lip of many of the men is long and curiously convex."

At the same time that the Expedition discovered pygmies in Netherlands New Guinea, Mr. R. W. Williamson was investigating the Mafulu, a mountain people on the upper waters of the Angabunga river in the Mekeo District. He has shown (*The Mafulu Mountain People of British New Guinea*, 1912) that in all probability these and some neighbouring tribes are a mixture of Negritos, Papuans and Papuo-Melanesians. Their invariably woolly *hair* is generally dark brown, often quite dark, approaching to black and sometimes perhaps quite black, but frequently it is lighter and often not what we in Europe should call dark; a beard and moustache are quite unusual. The *skin* is dark sooty-brown. The average stature is 1·551 m. (5 ft. 1 in.) ranging from 1·47 m. (4 ft. 10 ins.) to 1·63 m. (5 ft. 4 ins.). They are fairly strong and muscular, but rather slender and slight in development. The average *cephalic index* is 80 and ranges from 74·7 to 86·8. *Features:* The average nasal index is 84·3, the extremes being 71·4 and 100. The eyes are dark brown and very bright. The lips are fine and delicate.

It is worth noting that Pöch had in 1906 measured two Fergusson Island men with statures 1·403 and 1·425 m. (4 ft. 7¼ ins., 4 ft. 8 ins.), who told him that "all the people in that tribe were as small or smaller." (*Zs. f. Ethnol.* XLII. 1910, p. 941.)

On reading through the brief synopses which I have given it is apparent that, with the possible exception of the Andamanese, each of the Negrito peoples shows

considerable diversity in its physical characters and this is more evident when more detailed accounts and photographs are studied. There appears to be sufficient evidence to show that a very ancient ulotrichous, low brachycephalic, pygmy population once extended over the Malay Peninsula and a great part (at least) of Melanesia and New Guinea, but the existing groups do not appear to be homogeneous judging from the diversity in stature, head index and nasal index. Stature, as has already been stated, is always recognised as subject to considerable variation, but the bulk of the measurements of these peoples fall below 1·5 m., and therefore indicate a predominant very short population. The head indices mainly show low brachycephaly; the occasional very low indices may be due either to a Pre-Dravidian mixture or in New Guinea, at all events, to a Papuan strain. The former existence of a Pre-Dravidian stock in New Guinea is highly probable, nor must it be overlooked that there may have been a hitherto undescribed pygmy or very short dolichocephalic ulotrichous stock in New Guinea and Melanesia. The nasal index of these Negrito peoples is very suggestive of racial complexity. Judging from photographs, in the absence of measurements, the Andamanese have by no means a broad nose, and a mesorhine index is found in all the other groups, some of the Tapiro and Mafulu are even leptorhine. A constantly recurring feature is the convex upper lip, but that also occurs among the Sakai. The problem now is to determine what foreign elements have modified these pygmies, and whether the Negrito stock itself will not have to be subdivided into at least two groups.

The Negritos have certain cultural characters more or less in common, some of which differentiate them from their neighbours. There is very little artificial deformation of the person. The Tapiro and Mafulu alone do not tattoo or scarify the skin; Skeat says that

the Semang "do not appear as a race to tattoo or scarify," and the Aeta scarify only occasionally. The nasal septum is not pierced for a nose-stick by the Andamanese and Aeta nor among the purer Semang tribes, but the Tapiro and Mafulu do so. The Semang women possess numerous bamboo combs which are engraved with curious designs of a magical import, similar combs are possessed by nearly every Aeta man and woman. The Andamanese have no combs.

With regard to clothing, the male Andamanese are nude, the females wear a small apron of leaves or a single leaf, but one tribe, the Jarawa, go nude. The male Semang frequently wear a loin-cloth, or simply leaves retained by a string girdle, sometimes the women wear this too or a fringed girdle made of the long black strings of a fungus, but more usually a waist-cloth. The Aeta men wear a loin-cloth and the women a waist-cloth. The Mafulu men and women wear a perineal band of bark cloth, while the Tapiro men wear a unique gourd penis-sheath. A gourd or calabash is also worn by men on the north coast of New Guinea, but not further west than Cape Bonpland, in this case the hole is in the side and not at the end as among the Tapiro.

The Negritos are collectors and hunters, and never cultivate the soil unless they have been modified by contact with more advanced peoples.

The Andamanese make three kinds of simple huts on the ground and large communal huts are sometimes built. The Semang construct "bee-hive" and long communal huts and weather screens similar to those of the Andamanese. They also erect tree shelters, but direct evidence is very scanty that pure Semang inhabit huts with a flooring raised on piles; they sleep on bamboo platforms. The Aeta usually make very simple huts sometimes with a raised bamboo sleeping platform inside. The pile dwellings of the Tapiro have evidently been

copied from those of other tribes in the interior. The Mafulu build a different kind of pile dwelling which has a peculiar hood-like porch.

All the Negritos have the bow and arrow. The Great Andamanese bow is peculiar while that of the Little Andamanese appears to resemble that of the Semang. The Great Andamanese and the Tapiro have very long bows. Harpoon arrows with iron points are used by the Andamanese and Aeta, the arrows of the Andamanese, Semang and Aeta are nocked, but only those of the two latter are feathered. No nocked or feathered arrows occur in New Guinea. Only the Semang and Aeta are known to poison their arrows, and they may have borrowed the idea from the poisoned darts of the blow-pipe. Some Semang have adopted the blow-pipe.

The Andamanese appear to be one of the very few people who possess fire but do not know how to make it afresh. The Semang usually make fire by "rubbing together short blocks of wood, bamboo or cane. A common method consists in passing a rattan line round the portion of a dried branch, and holding the branch down by the feet whilst the line is rapidly worked to and fro with the hands." Flint and steel are also used. (The Sakai employ similar methods.) (*Skeat and Blagden*, I, pp. 111–114, 119.) Among the Aeta flint and steel have almost replaced the old method of making fire by one piece of split bamboo being sawed rapidly across another piece. Semper collected from Negritos of N.E. Luzon, a split stick, bark fibre and a strip of rattan used in fire-making, these are described and figured by A. B. Meyer (*Publ. der K. Ethn. Mus. zu. Dresden*, IX, *Negritos*, p. 5, pl. II, fig. 7 a-c). It is interesting to find that the Tapiro employ the same method and apparatus (p. 200). Thus there occurs among Negritos in the Philippines and New Guinea the method of making fire by partly splitting a dry stick, keeping the ends

open by inserting a piece of wood or a stone in the cleft, stuffing some tinder into the narrow part of the slit and then drawing rapidly a strip of rattan to and fro across this spot till a spark ignites the tinder. Pöch found it among the Poum, dwelling in the mountains inland from the Kai (*Geog. Jnl.* XXX, 1907, p. 612, and *Mitt. Anth. Ges. in Wien*, XXXVII. 1907, p. 59, fig. 2, 3). Precisely the same method was described by the Rev. Dr. W. G. Lawes who found it among the Koiari of Tabure on Mt. Warirata (*Proc. R. Geog. Soc.* V, 1883, p. 357). Finsch collected the apparatus from the same people (*Ann. des K.K. naturhist. Hofmus. in Wien*, III, 1888, p. 323; Leo Frobenius, *The Childhood of Man*, 1909, fig. 313, but Frobenius is mistaken in representing the rattan as going twice round the stick). Dr. H. O. Forbes had found it at Ubumkara on the Naoro, also in the Central Division (*P.R.G.S.* XII. 1890, p. 562). Mr. C. A. W. Monckton noticed it in 1906 among the Kambisa tribe, in the valley of the Chirima, Mt. Albert Edward (*Ann. Rep. Brit. New Guinea*, 1907). Pöch suggests that N. von Miklucho-Maclay was wrong in thinking that the strip was rubbed in the split of a stick (*l.c.* p. 61); this is the earliest Papuan record (1872).

From the above account it is possible that the split stick and rattan strip method of fire-making may be a criterion of Negrito culture, but it should be noted that the stick is not reported as split among the Semang, and that the unsplit stick is found among the Sakai and the Kayans and Kenyahs of Sarawak who are not Negritos. Also the split stick is found at several spots in the mountainous interior of the south-east peninsula of New Guinea where Negrito influence has not yet been recorded, but Mr. Williamson's observations are very suggestive in this respect. Pöch (*l.c.* p. 62) points out that this method is nearest akin to "fire-sawing with bamboo, both in principle and distribution," of which he gives details. A

somewhat similar method is that described by W. E. Roth. A split hearth-stick is held by the feet, but fire is made by sawing with another piece of wood, a device which appears to be widely spread in Queensland and occurs also on the Lachlan River, N.S.W. (*N. Queensland Ethnogr. Bull.* 7, 1904, sect. 9, pl. II. figs. 17, 18).

So far as is known the social structure of the Negritos is very simple. Among the Andamanese there is no division of the community into two moieties, no clan system nor totemism, neither has a classificatory system of kinship been recorded; the social unit appears to be the family, and the power of the head-man is very limited. Our knowledge concerning the Semang and Aeta is extremely imperfect but they probably resemble the Andamanese in these points. The Andamanese and Semang are strictly monogamous, polygyny is allowed among the Aeta, but monogamy prevails. The only restriction at all on marriage appears to be the prohibition of marriage between near kindred, and divorce is very rare. All bury their dead, but it is considered by the Andamanese more complimentary to place the dead on a platform which is generally built in a large tree, and the more honourable practice of the Semang is to expose the dead in trees. The Mafulu bury ordinary people, but the corpses of chiefs are placed in an open box either on a platform or in the fork of a kind of fig tree. Nothing is known about the social life of the Tapiro, and Williamson says, "The very simple ideas of the Mafulu, as compared with the Papuans and Melanesians, in matters of social organization, implements, arts and crafts, religion and other things may well, I think, be associated with a primitive Negrito origin" (*l.c.* p. 306).

SHORT BIBLIOGRAPHY.

This is not the place to attempt to give a record of the very voluminous bibliography of the Negritos, and most of the works here recorded are those from which the foregoing facts have been collected. Books referred to in the text are, with one or two exceptions, not here repeated.

The General Question.

Danielli, G., "Studi di Antropogeografia generelle." *Memorie Geografiche*, N. 18. Vol. VI. 1912.

Flower, W. H. *The Pygmy Races of Men.* Royal Inst. Lecture, 1888, reprinted in *Essays on Museums*, 1898.

Lapicque, L. "La Race Negrito." *Ann. de Géographie*, 1896, p. 407.

Meyer, A. B. *The Distribution of the Negritos*, 1899; translation with additions from *Publikationen d. K. Ethn. Mus. zu Dresden*, IX. 1893.

Quatrefages, A. de. *The Pygmies*, 1895. (English Translation).

Schmidt, W. *Die Stellung der Pygmäenvölker in der Entwicklungsgeschichte des Menschen*, 1910.

Pater W. Schmidt has gone into the whole pygmy question with great thoroughness. He extends his comparison to the African pygmies (Negrillos), between whom and the Asiatic pygmies he attempts to prove a connection through Southern India. Emphasis is laid on the "infantile" physical characters of both African and Asiatic pygmies and the extremely primitive features of their culture. He is inclined to regard the Pre-Dravidian Vedda, Senoi and Toala as of mixed pygmy origin, finding support for this theory in the proximity of the Senoi to the Semang in the Malay Peninsula. The eastward extension of the pygmies into Melanesia and New Guinea is not dealt with.

Tyson, E. *A Philological Essay concerning the Pygmies of the Ancients*, 1699. Edited by B. C. A. Windle, 1894.

The Andamanese.

Dobson, G. E., "On the Andamans and Andamanese." *Journ. Anth. Inst.* IV. 1875, p. 457.

Flower, W. H., "On the Osteology and Affinities of the Natives of the Andaman Islands," *J.A.I.* IX. 1879, p. 108, *cf.* also X., p. 124, XIV., p. 115, XVIII., p. 73.

Lane Fox, A., "Observations on Mr. Man's Collection of Andamanese and Nicobarese Objects," *J.A.I.*, VII. 1877, p. 434.

Man, E. H., "On the Aboriginal Inhabitants of the Andaman Islands," *J.A.I.* XII. 1882–3, pp. 69, 117, 327, *cf.* also VII. p. 105, XI. p. 268.

Portman, M. V., "Notes on the Andamanese," *J.A.I.*, XXV. 1896, p. 361.

The Semang.

Skeat, W. W., and Blagden, C. O., *Pagan Races of the Malay Peninsula*, 1906.

Martin, R., *Die Inlandstämme der Malayischen Halbinsel*, 1905.

Annandale, N., and Robinson, H. C., *Fasciculi Malayensis*, Anthropology, Part I, 1903, p. 105.

The Aeta.

Folkmar, D., *Album of Philippine Types*, Manila, 1904.

Koeze, G. A., "Crania Ethnica Philippinica," *Publicatiën uit 's rijks ethnographisch Museum*, Serie II. No. 3, Haarlem, 1901–1904.

Meyer, A. B., *Album of Filipino Types*, 1885, Vol. II., 1891, and Vol. III., 1904, with photographs taken by Dr. A. Schadenberg.

Meyer, A. B., "Die Philippinen, II., Negritos," *Publikationen des K. Ethnogr. Mus. zu Dresden*, IX. 1893 (and *cf. J.A.I.*, XXV. p. 172).

Reed, W. A., "Negritos of Zambales," *Department of the Interior, Ethnological Survey Publications*, II. Manila, 1904.

Sawyer, F. H., *The Inhabitants of the Philippines*, 1900.

Worcester, Dean C., "The Non-Christian Tribes of Northern Luzon," *The Philippine Journal of Science*, I. 1906, p. 791.

MEASUREMENTS OF 22 TAPIRO PYGMIES (MALES).

No. of man.	Height of stature.	Girth of chest.	Vertexto tragus.	Head length.	Head breadth.	Face breadth.	Bigonial breadth.	Face length.	Nose length.	Nose breadth.	Interocular breadth.	Indices.		
												Head index.	Face Index.	Nasal Index.
17	152·7	80·5	13·0	18·2	14·1	13·6	12·7	10·7	5·1	3·9	3·4	77·5	78·7	76·5
18	148·0	77·5	12·7	17·7	13·8	13·4	12·7	10·0	4·7	4·1	2·8	78·0	74·6	87·2
19	142·5	71·0	11·2	18·1	13·9	13·1	11·1	11·5	5·5	3·6	3·4	76·8	87·8	65·5
20	142·1	71·5	11·0	17·2	11·5	13·0	12·0	10·3	4·8	4·1	3·1	66·9	79·5	85·4
21	147·9	78·0	12·6	17·4	13·7	12·5	9·3	11·7	6·0	4·5	3·2	78·7	93·6	75·0
22	140·2	74·0	11·2	17·7	14·2	13·0	10·7	10·6	5·2	4·2	3·4	80·2	81·5	80·8
23	145·4	74·5	12·9	17·8	14·3	13·6	12·5	10·6	4·5	3·9	3·3	80·3	77·9	86·7
24	152·9	78·5	12·1	17·7	14·3	12·7	11·1	11·6	5·2	4·4	3·2	80·8	91·3	84·6
25	138·9	74·5	12·6	16·7	14·1	11·8	9·6	10·4	5·0	4·4	2·8	84·4	88·1	88·0
26	149·0	72·7	12·6	17·4	13·6	12·3	11·8	10·7	4·8	3·9	3·2	78·2	87·0	81·3
27	148·2	81·4	11·3	18·5	13·9	12·8	11·0	11·3	5·2	4·4	3·2	75·1	88·3	84·6
28	132·6	72·8	12·8	17·5	14·7	12·8	9·8	11·2	5·1	4·1	3·0	84·0	87·5	80·4
29	150·7	79·5	13·6	17·4	14·8	13·6	12·3	11·1	5·5	4·4	3·4	85·1	81·6	80·0
30	148·8	74·0	13·0	18·1	14·1	12·6	11·0	10·6	4·9	4·4	3·3	77·9	84·1	89·8
31	150·1	79·0	13·5	17·8	14·8	13·1	11·0	12·2	5·5	4·4	3·1	83·2	93·1	80·0
32	139·8	76·5	12·5	17·4	14·7	13·4	10·8	10·4	5·5	4·1	3·1	84·5	77·6	74·6
33	134·3	71·8	12·2	16·2	13·4	13·2	11·7	10·6	4·8	4·1	3·1	82·7	80·3	85·4
34	150·6	78·0	12·8	18·2	14·6	13·8	11·4	11·6	5·9	5·0	3·6	80·2	84·1	84·8
35	144·2	79·0	12·0	17·8	13·7	13·5	12·8	11·2	4·8	4·1	3·1	77·0	83·0	85·4
36	144·8	77·7	11·1	18·1	13·9	13·0	12·2	11·0	5·1	4·8	3·3	76·8	84·6	94·1
37	140·5	71·3	12·2	18·4	14·6	13·0	9·7	12·5	5·5	3·9	3·3	80·7	96·2	70·9
38	142·8	79·0	11·5	18·1	14·2	13·4	11·9	12·1	6·1	4·3	3·0	78·5	90·3	70·5

APPENDIX C

NOTES ON LANGUAGES IN THE EAST OF NETHERLANDS NEW GUINEA

By SIDNEY H. RAY, M.A.

I. INTRODUCTION

In considering the languages of Netherlands New Guinea it is convenient to divide the territory into six geographical divisions. These are:—

1. The North-western Coast and Islands (Waigiu, Salawati, and Misol).
2. The Western shore of Geelvink Bay and the islands adjacent (Mefor, Biak, and Jobi).
3. The Peninsula of Kumava (Orange Nassau) with the islands between Ceram and the Ké group.
4. The Southern and Eastern Shores of Geelvink Bay.
5. The North Coast from Kurudu Islands to Humboldt Bay.
6. The South-eastern Coast from Kamrau Inlet to the Bensbach River on the boundary between Netherlands and British territory.

The present notice only refers to languages in the three last of these divisions.

At the Western end of the South shore of Geelvink Bay is the district of Wandammen, of which the language is fairly well known. For this we have a vocabulary with grammatical examples (9),* and also for Windessi,

* The numerals in brackets refer to the list of authorities prefixed to the comparative vocabulary.

which is the same language, a mission text-book. Eastward from Wandammen the numerals only are recorded (7), but at the Southern point of the Bay, in the district around Jamur Lake we have the collections made by Van der Sande during the Wichmann Expedition of 1903 (8). He gives a vocabulary of Angadi, an island in the Jamur Lake, some words of the Nagramadu dialect on the North-west, and the numerals of Goreda on the South of the lake. The languages of the Western Shore of Geelvink Bay are represented only by numerals (7) but there is more information of the language of Pauwi at the mouth of the Wamberam or Amberno or Mamberamo River, where F. van Braam Morris collected a vocabulary published by Robidé van der Aa in 1885 (6). This was considered faulty by de Clercq.*

Westward along the Northern coast very little linguistic material is available, and the few words recorded show great differences. The places of which the speech is known are, on the mainland: Takar, Tarfia and Tana Merah, and on the islands: Liki (in the Kumamba Group), Moar (called also Wakde), Masimasi and Jamna (4, 5).

For the region about Humboldt Bay we have short vocabularies of Jotafa by various collectors, and a fuller one by G. L. Bink (2), also Sentani lists by P. E. Moolenburg (3) and van der Sande (8). Moolenburg also gives a list from Seka, West of the Bay.

For the Southern shore of Netherlands New Guinea, we have nothing but vocabularies, none of very large extent, the most extensive being that of Merauke in the extreme West (15) which has also been ably discussed by Dr. N. Adriani. †

Commencing at Kamrau Inlet, the languages of the

* *Cf.* Translation by G. G. Batten in "Glimpses of the Eastern Archipelago," 1894.

† Dr. N. Adriani. Eenige opmerkingen over de Mĕraukĕ-Taal naar aanleiding der Woordenlijst van Contr. J. Seijne Kok, in "De Zuidwest Nieuw-Guinea-expeditie van het Kon. Ned. Aardrijkskundig Genootschap, 1904–5."

shore and islands are illustrated by the Kowiai vocabularies of Miklucho-Maclay (13), the papers of G. W. Earl * and the lists of S. Muller (10), the last two being derived from the collections made during the voyage of the *Triton* under Lieut. Modera in 1828. The following languages are named :—

Lobo at Triton Bay (including Namatote, Aiduma, Mawara, and Kaju-Mera).
Wuaussirau, inland on the Kamaka-Wallar Lake.
Mairassis, inland from Lobo.
Lakahia, on Telok Lakahia.
Kiruru, on Telok Kiruru.
Utanata, on the Utanata River.

Westward of the Utanata a vocabulary of the language spoken on the Mimika River people was obtained by Mr. Wollaston in 1910–11. A list of the same language is given also in the account of the South-west New Guinea Expedition of the Royal Netherlands Geographical Association.† The latter work contains a few words of the language used at the mouth of the Kupĕra Pukwa River.

The language of Měraukĕ has been recorded by J. Seijne Kok (15), and by J. C. Montague and E. F. Bik,‡ that of Toro by S. Bik.‡

II. CLASSIFICATION OF THE LANGUAGES.

Of the three languages in the northern part of Eastern Netherlands New Guinea that of the Jotafa of Humboldt Bay has been ably discussed by Dr. Kern,§ who decides that in phonology, construction, numeration and word store it presents many points of agreement with the Mefoor or Nufor of the North-west. But it undoubtedly also contains many words which are of non-

* G. W. Earl, Native Races of the Indian Archipelago, Papuans, 1853, Appendix, and Jour. Roy. Geographical Society, 1837, p. 393–395.

† De Zuidwest Nieuw-Guinea-expeditie van het Kon. Ned. Aardrijkskundig Genootschap, 1904–5. Leiden, 1908.

‡ *Cf.* Internat. Archiv. für Ethnographie, 16, 1905, and Reports of Cambridge Anthropological Expedition, III., p. 387.

§ H. Kern. Over de taal der Jotafa's aan de Humboldtbaai, Bijdragen tot de Taal-, Land, en Volkenkunde van Ned. Indië, 6 Volg. deel VII.

Indonesian origin. The Sentani and Pawi languages seem to have very few or no words similar to the Indonesian, and may probably be found to be Papuan languages. But nothing is known of the grammar. The language of Wandammen presents agreements with the Mefoor (or Nufōr) in vocabulary and also in some points of grammar. It will probably be found to fall into the same class as the Nufōr and Jotafa. The languages of the north coast and islands also show a mixture of Indonesian with other words. So little is known of the structure of the languages in the Kumava Peninsula that their place cannot be determined with certainty. The numerals and much of the vocabulary appear to be Indonesian,* but there are Papuan forms in the Grammar.

The Lobo languages of the Kowiai district on the south coast appear to be Indonesian, but those inland and south of Geelvink Bay have a distinct connection with those on the south coast west of the Kowiai district, and with those at the Utanata River and beyond the Mimika, at least as far as the Kupera Pukwa River. Beyond this point nothing is recorded until Princess Marianne Strait is reached, and here of two words known, one is Měraukĕ.† The latter language extends to the Boundary. All west of the Lobo appear to be Papuan.

Using the scanty means available, the languages of the Eastern part of Netherlands New Guinea may be thus provisionally classified:—

* *Cf.* G. von der Gabelentz und A. B. Muller, Melanesischen Sprachen, 1882, p. 536–541. Also C. J. F. le Cocq d'Armandville in Tijds. v. Taal, etc., 46, 1903.

† P. J. B. C. Robidé van der Aa in Bijdragen tot de Taal etc., 1883, p. 197. The word is *mes*, coconut, the Měraukĕ *mise*.

NORTH COAST AND ISLANDS (INCLUDING EAST AND SOUTH SHORE OF GEELVINK BAY).

Papuan.	Seka	West of Lake Sentani.
	Sentani	Lake Sentani.
	Moki (?)	Hinterland of Tana Mera Bay.
	...	Tana Mera.
	Tarfia (?)	Coast West of Tana Mera Bay.
	Takar	Mainland East of Mamberamo R.
	Wamberan	? Mamberamo R.
	Pauwi	Villages on Lower Mamberamo R.
	Angadi	Island in Jamur Lake.
	Goreda	South of Lake Jamur.
	Nagramadu	North-West of L. Jamur.
	Manikion	North of McCleur Inlet (Telok Berau).
*Indonesian.**	Jotafa	Humboldt Bay.
	Jamna	Island opposite Takar.
	Masimasi	Island West of Jamna.
	Moar	Islands West of Masimasi.
	Kumamba	Islands and Coast West of Moar and Takar.
	Waropin	East shore of Geelvink Bay.
	Mohr	Island opposite Waropin.
	Tandia	Coast South of Waropin.
	Jaur	South-West shore of Geelvink Bay.
	Dasener	West of Jaur.
	Wandammen	North of Dasener.

SOUTH COAST.

Papuan.	Mairassis	Inland from Lobo.
	Wuaussirau	On Kamaka Wallar Lake.
	Lakahia	On Telok Lakahia.
	Kiruru	On Telok Kiruru.
	Utanata	Inland from Utanata River.
	Mimika	Inland from Mimika River.
	Kupera Pukwa	Kupera Pukwa River.
	Měraukě	Coast between the Kumbě River and the British Boundary.
	Toro	Bensbach R.
Indonesian.	Onin	North of Kumava Peninsula.
	Kapauer	North-West of Kumava Peninsula.
	Karufa	South of Kumava Peninsula.
	Lobo	Kowiai Coast and Islands of Namatote, Mawara, Aiduma, and Kaju-mera.

* The term "Indonesian" is used here only to imply that the languages so designated appear to contain some words and constructions which are found commonly in the languages of the Indian Archipelago. The data are too few for definite classification. The term "Papuan" may be taken to mean "non-Indonesian" or "Non-Malayo-Polynesian" with a similar limitation.

III. COMPARATIVE NOTES ON THE ANGADI-MIMIKA GROUP OF LANGUAGES.

This group consists of the Angadi, Nagramadu, Goreda, Utanata, Lakahia, Mimika and Kupera Pukwa dialects, and perhaps also Kiruru.

1. *Sound changes.**

A comparison of vocabularies shows a certain amount of sound change between the dialects. Thus Angadi *m* becomes *b* in Utanata and Mimika and *vice versa.*†

Ex. Angadi *muti*, Mimika and Utanata *buïti*, bamboo.
Angadi *mopere*, Nagramadu *mobere(bu)*, Mimika *bopere*, navel.
Angadi *mirimoi*, Utanata *birimbu*, Mimika *birim*, nose.
Angadi *mau*, Utanata *mouw*, Mimika *bauwe*, foot.
Angadi *tohoma-pare*, Mimika *to-mari*, arm.

The Angadi *m* is represented sometimes by *mb* in Mimika, but is retained in Lakahia and Kiruru. Utanata examples are not found.

Ex. Angadi *mi*, Lakahia *mu*, Kiruru *mi*, Mimika *mbi*, *mbu*, water.
Angadi *metaho*, Mimika *mbatau*, spit.
Angadi *imiri*, Mimika *imbiri*, shin.
Mimika *amuri* is Kupera Pukwa *ambori*.

Angadi in some words loses a *k* or *g* which appears in Mimika and Lakahia.

Ex. Angadi *irča*, Mimika *irčka*, Utanata *eriki*, fish.
Angadi *kauwa*, Mimika *kaukwa*, woman.
Angadi *maare*, Mimika *makarč*, armlet.
Angadi *măe*, Mimika *mbage*, Utanata *make*, cry, weep.
Angadi *hehe*, Lakahia *eika*, finger-nail.
Angadi (*nata*)*pairi*, Mimika *pigeri*, skin.

A few words show an interchange of *r* and *n* between Mimika and Lakahia.

Mimika *marč*, Lakahia *mana*, finger. (Utanata *to-mare*, Angadi *mahare*, hand.)
Mimika *iribu*, Utanata and Angadi *iripu*, Lakahia *ini-fa*, knee.
Mimika *amuri*, Utanata *amure*, Angadi *amore*, Lakahia *amuno*, bow, Kupera Pukwa *ambori*.

2. *Vocabulary.*

The great likeness of the dialects may be illustrated by the following examples:—

* In the Examples following, the vowels should be sounded as in Italian, and the consonants as in English. The Dutch *oe* and *ie* are written *u* and *ï*.

† This interchange is very common in the languages of the Papuan Gulf. *Cf.* Reports of Cambridge Anthropological Expedition, III., pp. 325, 334.

	Angadi.	*Utanata.*	*Mimika.*	
Arm.	*to* (in compounds)	*tō*	*to*	Lakahia *esu-rua* (?)
Arrow.	*ka-tiaro* (in bundle)	*tiăre*	*tiari*	
Boat.	*ku*	*ku*	*ku*	
Chin.	*kepare*	..	*kepare*	
Coconut.	*utiri*	*uteri*	*uteri*	Kupera Pukwa *otiri.*
Dog.	*uwiri*	*wuri*	*wiri*	Lakahia *iwora,* Nagramadu *iwŏra,* Kupera Pukwa *uweri.*
Ear.	*ihani*	*iänī*	*ene*	
Eye	*măme*	*mame*	*mame*	
Fire	*utămai*	*uta*	*uta*	Lakahia *ŭsia,* Kiruru *uta,* Nagramadu *uha.*
Give	*kema*	..	*kema*	
Hair	*rup-ere*	*uirī*	*viri*	Kupera Pukwa, *uīri*
Hand	*mahare*	*tu-mare*	*marĕ*	Lakakia, *mana* (finger).
Head.	*rupau*	*upauw*	*kapa-uĕ*	Lakahia *uwua.*
House.	*kăme*	*kamī*	*kamĕ*	
Iron.	*jau* (pot)	(*puruti*)	*tau*	
Laugh.	*oko*	*oku*	*oko*	
Lip.	*iri*	*iri* (mouth)	*iri*	Kiruru *uru* (mouth).
Moon.	*pură*	*uran*	*pura*	Lakahia *bura.*
Mountain	..	(*pamogo*)	*pukare*	Lakahia *bugura,* Wuaussirau *wara.*
Neck.	*amoiï*	*ema*	*ima*	Lakahia *umia,* Nagramadu *umeke.*
Paddle.	*pă*	*pō*	*poh*	Lakahia *boa.*
Pig.	*ŏhŏ*	*ī*	*u*	Lakahia *u*(*fa*), Nagramadu *ŏhă,* Kupera Pukwa *uwĕ.*
Rain.	*keke*	*komak*	*ke*	Lakahia *ge*(*fa*), Kiruru *kĕ.*
Sago.	*amata*	(*kinani*)	*amota*	Lakahia *ama,* Nagramadu *ĕma,* Kupera Pukwa *aměta.*
Sleep.	*ete*	*ete*	*ete*	Kupera Pukwa *ete.*
Sugar cane.	..	*mone*	*mŏni*	Lakahia *moni*(*fa*).
Sun.	*jăă*	*youw*	*yau*	Lakahia *aya.*
Tongue.	*mere*	*mare*	*malī*	Lakahia *mara.*
Tooth.	*titi*	*titi*	*titi*	Nagramadu *si.*
Wind.	*kimiri*	*lowri*	*kimire*	Kiruru *kemuru.*

3. *Pronouns.* These are given only in Mimika for the singular number, and in Utanata for the first person singular, but the words for "I," Mimika *doro* and Utanata *area* are unlike. In Mimika the possessive is shown by the suffix *-ta,* which is used also with other words. *Dorota,* mine, *oro-ta,* yours, *amare-ta* his, *wehwaída-ta* of another man. *Wehwaída* is compounded apparently of *uwe* (*ri*) man and *awaída* other. In Mairassis "I" is *omona.*

4. *Numerals.* No numerals are given by Müller or Earl for Utanata. "People of Utanata had very little knowledge of counting. When wishing to make known

any number, they made use of the word *aweri* and counted on their fingers and toes." * In Angadi, Nagramadu, Goreda, Lakahia and Mimika, the numbers appear as follows:

	Angadi.	Nagramadu.	Goreda.	Lakahia.	Mimika.
1.	*janăŭwă*	*nadi*	*unakwa*	*onarawa*	*inakwa*
2.	*jaminatia*	*ăbămă*	*jămanini*	*aboma*	*yamani*
3.	*jaminati-janăŭwa*	*ăbămă-nadi*	..	(*torua*)	*yamani-inakwa*
4.	*awaităma-jaminatia*	*abama-bămŏ*	..	(*făt*)	*ama-yamani*
5.	*măhăre-ajăherauri*	*măma-riba*	*maheri-herori*	(*rim*)	..
6.	*măhăre-janăŭwa*	*mariba-nadi*	..	*rim-onarawa*	..
10.	*măhăre-jăminatia*	*măma răbămă*	*tăoru*	..	..

These show a numeration only as far as two. "Three" and "four" are made by additions, 2 + 1 = 3 and 2 + 2 = 4, except in Angadi where *awaităma-jaminatia* means "another two" with which cf. the Mimika *awaĭda*, other. *Măhăre, maheri, mari* in the words for "five" also mean "hand," abbreviated to *mă* in *măma* of Nagramadu. The Goreda *tăoru* given for "ten," is the Angadi *tăöru*, much, Mimika *takiri*, many. In Lakahia the words for "three," "four," "five," "six" have the Ceram numerals which are also used in Lobo and Namatote. The Mairassis and Wuaussirau numerals agree with one another, but differ entirely from those of the Angadi-Mimika group.

	One	Two	Three	Four	Five	Six	Ten
Mairassis	*tangauw*	*amoōi*	*karia*	*āi*	*iworo*	*iwora-mōi*	*werowa-mōi*
Wuaussirau	*anau*	*amōi*	*karia*	*aiwera*	*iworo*	*iwor-tanau*	*iwor-toki-tani*

The low numeration in all these languages may be regarded as an indication of their Papuan character.

5. *Construction.*

A few grammatical forms which appear to be indicated in the vocabularies may be noted here.

a. The possessive with pronouns and pronominal words is indicated by a suffix *-ta*. Mimika, *doro-ta*, of me, mine; *oro-ta*, thine; *amare-ta*, his; *wehwaida-ta*, of

* G. W. Earl in Jour. Royal Geographical Society, 1837, p. 394.

another man. In Angadi several compound words end in *nata*, which thus appears to be a noun, *na* (thing ?), with the possessive suffix; and it seems possible to explain such words as *ută-nata*, firewood; *kara nata*, head of javelin—*i.e.* fire-thing-of, javelin-thing-of. Cf. also *nata pairi* given by v. d. Sande for "skin," with Mimika *pīgīri*, skin, which suggests that *nata pairi* means skin of something.

b. The adjective follows the noun. Utanata *wararí napetike*, water big, river.

c. A noun in the genitive relation precedes its substantive. Mimika *bau mame*, leg's eye, ankle; *iwau makarĕ*, belly's band. Angadi *mahare hehe*, finger nail; *māū hehe*, toe nail; *mirimoi ipa*, nose hole, nostril; *ihaní ipa*, hole in ear lobe; *ămore eme*, bow's rattan, bowstring.

d. The subject precedes the verb. Angadi *jăū hinaumara*, sun rises (?), morning; *jăū emapojemía*, sun sets (?), evening.

e. The object also precedes the verb. Angadi *ihaní aimerí*, ear pierce; *mirímoi aimerí*, nose pierce.

These five points indicate a Papuan structure of the languages.

6. *Comparison with Merauke and the Languages of British New Guinea West of the Fly River.*

The Papuan languages usually show so few agreements in vocabulary that the likeness of words, unless frequent, cannot be held to establish relationship. In the comparative vocabulary, words and numerals are added from the languages on British Territory.* These show a few likenesses, which may, however, be accidental.

* Those quoted are: *Dungerwab* (or *Parb*) on Wai Kasa R., *Bangu*, Morehead River; *Bugi*, Mai Kasa River, *Dabu*, Paho R., *Mowata*, mouth of Binaturi R., *Saibai Is.* in Western Torres Straits, *Miriam*, Murray Is. Torres Straits, *Kunini* and *Jibu* West shore of Fly Delta, *Kiwai Is.* in Fly Delta.

Arm. Mimika *to*, Dungerwab *tond*, Dabu *tang*, Miriam *tag*, Kiwai *tu*
Arrow. Mimika *tiari*, Kiwai *tere*.
Arrow barb. Mimika *imari*, Kiwai *were*.
Basket. Mimika *temone*, Kunini *diba*, Jibu *dimba*, Mimika *eta*, Kiwai *sito*, Mowata *hito*.
Bird. Mimika *pateru*, Bugi *pa* (?), Dabu *papa* (?).
Earth. Mimika *tiri*, Bangu *tiritari*.
Eat. Mimika *namuka*, Bangu *jamukwa*.
Elbow. Mimika *to-mame*, Mowata *tu-pape*.
Fire. Mimika *uta*, Miriam *ur*.
Forehead. Mimika *metar(re)*, Bangu *mithago*, Miriam *mat*.
Head. Mimika *kapane*, Bangu *kambu*.
Iron. Mimika *tau*, Dungerwab *tod*.
Nose. Mimika *birim*, Dabu *murung*, Saibai, Miriam *pit*.
Pig. Mimika *ap*, Meranke *sapi*.
Rat. Mimika *kemako*, Bugi *makata*, Saibai *makas*, Miriam *mokeis*.
Shore. Mimika *tiri*, Dungerwab *tredre*.
Sleep. Mimika *ete*, Bangu *ete-betha*, Dungerwab *eda-bel*, Miriam *ut-eid*.
Tree. Mimika *uti*, Kiwai *ota*.

IV. MALAYAN INFLUENCE ON THE SOUTH COAST OF NETHERLANDS NEW GUINEA.

In a discussion of the languages of the south-eastern shores of Netherlands New Guinea, the extent of Malay influence in that region must be taken into account. Mr. William Churchill has lately put forward a theory that the Polynesian people entered the Pacific not only by coasting along the northern shores of New Guinea to the Solomon Group, but also by a passage through Torres Straits, and thence along the south-eastern coast of British New Guinea to the New Hebrides.* On tracing the languages westward from Polynesia, it is an indisputable fact that many words which are identical with Polynesian are found in use along the shores of British New Guinea, though they are not used in a Polynesian syntax, or in the simplified forms usual in the Eastern tongues. It is also a fact that many of these same words are current also in the western islands of Indonesia. For example, *hua*, fruit; *ina*, mother; *lala*, blood; *lau*, leaf; *au*, I; *ruma*, house; *inu*, drink; *utu*, louse; *tohu*, sugar

* William Churchill, "The Polynesian Wanderings." Washington. 1911. Pp. v., 147.

cane, and many other words are identical in the south-east of British New Guinea and in Ceram. But in British New Guinea the languages which show likeness to Polynesian end abruptly at Cape Possession, and are not found west of that point.* Hence it becomes important to inquire how far the similar tongues of Amboyna and Ceram have influenced the New Guinea languages to the east of them. That there is such an influence is plain from the vocabularies of the languages. Indonesian words, such as the Onin (10) *kayu*, wood; *tanigan*, ear; *nifan*, tooth; *fenu*, turtle; *mani*, bird; *afi*, fire, are of common occurrence in the islands of the Arafura Sea, and on the coast of the mainland. But these words are more common in the west, and gradually disappear towards Torres Straits, and are not found beyond. In Rosenberg's Karufa list (12) we find such characteristically Indonesian words as *ulu*, hair; *mata*, eye; *uhru*, mouth; *taruya*, ear; *nima*, hand; *ora*, sun; *uran*, moon; *niyu*, coconut. Words of this kind are found also in Lobo (10) and Namatote (13), as, for example, *wuran*, moon; *labi*, fire; *nima*, hand; *nena*, mother; *rara*, blood; *metan*, black; *tobu*, sugar cane; *wosa*, paddle; *matoran*, sit; *mariri*, stand. Some of these words seem to have passed into Utanata (10) and Lakahia (13), and apparently, though not so freely, into Wuaussirau (13), Mairassis (10), and Mimika (14). The Kiruru vocabulary of Maclay does not appear to show any words of this kind. The following are examples of Indonesian or Ceram words in the Utanata-Mimika group of languages.

Utanata *uran*, Lakahia *bura*, Mairassis *furan*, Mimika *pura*, Ceram *wulana*, moon. The Angadi has also *pura*.

Lakahia *bugura*, Wuaussirau *wara*, Mimika *pukare*, Ceram *uhara*, mountain. Utanata has *pamogo*.

Utanata *pō*, Lakahia *boa*, Mimika *poh*, Ceram *wosa*, paddle.

Utanata *kai*, Ceram *kai*, wood. For this the Mimika is *uti*.

A word of much interest in this region is *turlka*

* Reports of Cambridge Anthropological Expedition, III., p. 290.

or *turi*. This is given by Muller in his Ceram list as *turika*, knife, in Lobo *turi*, Onin *tuni*. Maclay gives the Ceram (Keffing) as *turito*, Namatote and Wuaussirau *turi*, also for "knife." The word does not appear in Angadi or in the list of Ekris (19). Though not apparently used in Merauke *turik* has travelled eastward as far as Torres Straits and the Fly River, and even to the borders of the Papuan Gulf. Thus Bangu *turik*, Dabu *turikata*, Sisiami (Bamu R.) *turuko*, and Tirio *turuko* mean "knife" (*i.e.* iron knife). In Bugi, Saibai, Mowata and Kiwai, *turika* and in Murray Island *tulik* mean "iron." *

Dr. N. Adriani has pointed out some words adopted from Malay in Merauke and also some apparent agreements between that language and Indonesian languages generally,† but there is no evidence of any language from Ceram having passed through the Torres Straits. Agreements between the Merauke and Papuan languages to the east are also pointed out by Dr. Adriani ‡ but these are no evidence of the passage of a Polynesian fleet, as they are not Polynesian words, and the languages using them have no Polynesian syntax. Mr. Churchill's theory of the Polynesian entry into the Pacific by way of Torres Straits cannot therefore be maintained.

V. A COMPARATIVE VOCABULARY OF LANGUAGES IN THE NORTH EAST AND SOUTH EAST OF NETHERLANDS NEW GUINEA AND OF BRITISH NEW GUINEA WEST OF THE FLY RIVER.

The following vocabulary is arranged strictly in Geographical order. The North Eastern Languages follow from East to West, from Seka to Manikion, and

* The writer was however told by Murray Island natives that "tulik" was the name of the old shell axe.

† Eenige opmerkingen over de Měraukĕ-taal, in "De Zuidwest Nieuw-Guinea-expeditie van het Kon. Ned. Aardrijkskundig Genootschap, 1904–5," p. 661–2.

‡ Op. cit., p. 664–665.

the South Eastern from Onin to the Boundary and thence along the South Coast of British Territory to the Western or Right Bank of the Fly River.

The following authorities have been quoted:— *

1. *Seka.* P. E. Moolenburg. Tijd. v. Indische Taal xlvii. 1904.
2. *Jotafa* [and *Sentani* in ( )]. G. L. Bink in ibid. xlv. 1902.
3 *Sentani.* P. E. Moolenburg. Bijdragen. t.d. Taal. Ned Indië (7) v. 1906.
4. *Tanah Merah, Tarfia, Takar, Jamna, Masimasi, Moar* (i.e. *Wakde*) and *Kumamba.* G. G. Batten. Glimpses of the Eastern Archipelago, 1894.
5. *Arimoa.* A. B. Meyer. Über die Mafoor'sche, 1874.
6. *Pauwi.* P.J.B.C. Robidé v.d. Aa. "Reisen van Braam Morris." Bijd. t.d. Taal. Ned. Indië. (4) x. 1885.
7. *Wamberan, Waropin, Mohr, Tandia, Dasener, Jaur.* Fabritius. Tijd. v. Indische Taal. iv. 1885.
8. *Angadi, Goreda, Nagramadu, Manikion.* G. A. J. v. d. Sande in "Nova Guinea." Vol. III. 1907.
9. *Wandammen.* G. L. Bink. Tijd. v. Indische Taal. xxxiv. 1891.
10. *Onin, Lobo, Mairassis, Utanata.* S. Muller. Reisen, 1857.
11. *Kapaur.* C. J. F. le Cocq d'Armandville. Tijd. v. Indische Taal. xlvi. 1903.
12. *Karufa.* H. v. Rosenberg. Der Malayische Archipel. 1878.

* The number prefixed is that by which these authorities have been referred to in the preceding pages.

13. *Namatote, Wuaussirau, Lakahia, Kiruru.* N. v. Miklucho Maclay. Tijd. v. Indische Taal. xxiii. 1876.
14. *Mimika.* MS. Dr. A. F. R. Wollaston.
15. *Merauke.* J. Seijne Kok. Verhand. v. h. Batav. Genootsch. v. Kunsten lvi. 1906.
16. *Bangu, Bugi, Dabu, Mowata, Kuniní, Jibu, Tagota.* Reports of Cambridge Anthropological Expedition. Vol. III. 1907.
17. *Parb, Saibai, Kiwai,* and *Tirio.* MSS. S. H. Ray.
18. *Nufor.* J. L. v. Hasselt. Hollandsch. Noefoorsch Woordenboek, 1876.
19. *Ceram.* A. v. Ekris. Woordenlijst v. Ambonsche Eilanden. Mededeel. v. h. Ned. Zendings Genoots, viii. 1864–65.
20. *Tuburuasa, Karas.* (*Islands between Ceram and Onin.*) P. J. B. C. Robidé v. d. Aa. Reisen naar Ned. Nieuw-Guinea, 1879.

COMPARATIVE VOCABULARY.

	Man. Man.	Woman. Vrouw.	Head. Hoofd.	Eye. Oog.	Ear. Oor.
Seka	...	...	subi	rutja	re
Jotafa	tante	moi	rabunadu	windu	tĕni
Sentani	doh	mī	farem, (panem	yŏrâ, (yeroh	anggei, (angei
Arimoa	kabun (*white*)	...	dabro	masamana	seroro
Pauwi	maomba	nedba	...	kikia	knĭperemba
Angadi	were	kauwā	rupau	măme	ihani
Nagramadu	...	...	yabimă	...	ehăra
Wandammen	mua	babien	rupai	rĕne	tatelajau
Onin	marara	matapais	onimpatin	matapatin	tanigan
Kapaur	neméhār	tombŏhār	kenda	kendep	per
Karufa	mutangki	maisoida	umuh	mata	taringa
Namatote	murwana	merwine	umu	matatungu	zingangu
Lobo	marowana	mawina	monongo, umun	matalongo	tringango
Mairassis	fatakowa	ewei	nanguwu	nambutu	newirana
Wuaussirau	taturobu	ewei	kotera	obiatu	obiru
Lakahia	odacira	yama	uwua	managa	yawana
Kiruru	...	...	...	...	yawatsha
Utanata	marowana	kuranī	upauw	mameh	ianī
Mimika	uweri	kaukwa, aina	kapane	mame	ene
Merauke	amnangga	bubtī, savĕ, īsus(?) iwogĕ	pa	kīndĕ	kambīt
Bangu	...	...	kambu	ti	taroba, tarup
Parb	ar	temarb	mor	taramb	tongal
Bugi	la	mala	beneqet	kalye	laandra
Dabu	rabu	mure	bunkut	ikapa	ran, ika
Saibai	garakazi	ipŏkazi	kuikŏ	dan, purka	kaura
Mowata	auana	orobo	epuru	damari	hepate, gare
Kunini	binam, ima	magebi, ule	mope	ireu	tablame
Jibu	vientete,rega	konga	mopu	yere	yekrom
Kiwai	dubu	orobo	epuru	damari	sepate, gare
Tirio	amiami	kinasu	yapuru	pariti	pamata
Tagota	...	moream	kana	pari	tuap
Nufŏr	snun	bien	rewuri	mgasi	knasi
Ceram	malona, mandai, makwai, manawal	mahina, bina, leuto, pepina	uru, ulu	mata, maa	tarina, talina
Tuburuasa	maruana	mapata	unīn	matanpuon	taningan
Karas	kianam	paas	nakalun	kangiri	kulokeim

COMPARATIVE VOCABULARY.

	Nose. Neus.	Tongue. Tong.	Tooth. Tand.	Hand. Hand.	Sun. Zon.
Seka	hā	...	...	na (nabērā, *arm*)	...
Jotafa	su	meriki	ñoh	tibimi	tap
Sentani	yoi	fēuw	je, (tje	megeragera, (posadi	su
Arimoa	sirino	mataro	umata	...	...
Pauwi	kimparia	kimsiba	kabrua	kibawia(*arm*)	tebia
Angadi	mirimoi	mere	titi	mahare	yăū
Nagramadu	...	yămănărai	si	...	...
Wandammen	swŏnê	taperê	derĕnesi	waraba	wor
Onin	wirin	eri	nifan	nemien	rera
Kapaur	kănomba, kănunga	gengabu	mĕhien-tāb	tān	kĕmina
Karufa	sikai	...	...	nimang-uta	ohra
Namatote	iyaongu	yaeiyongu	zwiutiongu	siŭsiongu	oro-mata-wuti
Lobo	sikaiongo	kariongo	ruwotongo	nimango-uta	orah
Mairassis	nambi	nenegun	sika	okorwita	onguru
Wuaussirau	ombi	onsabi	oras	uadu	unguru
Lakahia	onoma	mara	ifa	esurua	aya
Kiruru	unuga	...	uru	...	yauburawa
Utanata	birimbu	mare	titi	mareh	dyauw
Mimika	bīrim	malī	titi	marĕ	yau
Merauke	anggīp	unum	manggat	sangga	katŏnī
Bangu	...	thamina	ter	tambia	epotha
Parb	mebele	penji	tol	tond	abiard
Bugi	wede	dangamai	lenge	trang-qab	yabada
Dabu	murung	dogmar	ngui, ngoia	tang-kor	yabada
Saibai	piti	nŏi	dang	get	goiga
Mowata	wodi	watotorope	ibuanara	tu-pata (*palm*)	iwio
Kunini	keke	weta	giriu	imwe	bimu
Jibu	soku	vrate	orkak	yema	loma
Kiwai	wodi	wototorope	iawa	tu-pata (*palm*)	sai
Tirio	norose	ima	sū	tikiri	uainea
Tagota	miu	uo	kam	...	dari
Nufōr	snŏri	kaprēndi	nasi	rwasi	ori
Ceram	hiru, inu, ninu, ili	mei, mē, mā	niki, niri, nityi, nio	rima, lima, barau	rematai, leamatai, leamanyo, deamatae
Tuburuasa	nirīng	kwēri	...	tangan	nera
Karas	bustang	belein	...	taan	īōn

COMPARATIVE VOCABULARY.

	Moon. Maan.	Star. Ster.	Rain. Regen.	Stone. Steen.	Fire. Vuur.
Seka	...	...	...	...	...
Jotafa	sembi	endor	tāb	āt	aijări
Sentani	ara, (aroh	...	(ya	tuga, (duwa	ī
Arimoa	...	...	...	fati	...
Pauwi	...	...	...	...	...
Angadi	pură	...	kehe	...	ută-mai
Nagramadu	...	...	emoya	...	uhă
Wandammen	sembai	siberere	rama	rebuki	adia, adyat
Onin	punono	apatin-no-farere	unano	pāti	api
Kapaur	koba, keba, kabah	mbāb	kĕri	wār	tōm
Karufa	uran	ŏma	kama	langerah	lawi
Namatote	wuran	omoma	omo	...	labi
Lobo	furan	komakoma	komah	...	lawi
Mairassis	furan	waniwani	yamo	...	iworo
Wuaussirau	angane	onburi	yamu	...	iworo
Lakahia	bura	mawena	gefa	...	ŭsia
Kiruru	...	imaru	kē	...	uta
Utanata	uran	...	koma	...	uta
Mimika	pura	mako	ke	omanī	uta
Merauke	mandau	ovom, uvum	heĕ	katarĕ	takavĕ
Bangu	...	...	narunjar	tan	meni
Parb	tugiu	...	nou	...	pend
Bugi	kak	qatai	yugula	dader	iu
Dabu	qar, qak	piro	igurai	dadar	yu, dumbrel
Saibai	mulpal, kizai	titui	ari	kula	mui
Mowata	ganume	zogubo	wiari	nora-api	era
Kunini	mabie	wale	ngupe	magezuli	muie
Jibu	mobi	guje	piro	nora	para
Kiwai	sagana	gugi	mauburo, wisai	kuraere	era
Tirio	korame	apapa	iōuko	kuma	suze
Tagota	mano	durupa	...	tamaga	jau
Nufōr	paik	ătaruwa, samfari	mĕkem, miun	kĕru	fōr
Ceram	huran, ulano, buran	marit, kolomali, kamali, umalio	uran, ulan, kial	hatu, batu	hau, au
Tuburuasa	puna	finma	unang	pati	lawi
Karas	pak	masseer	kekal	jaar	dien

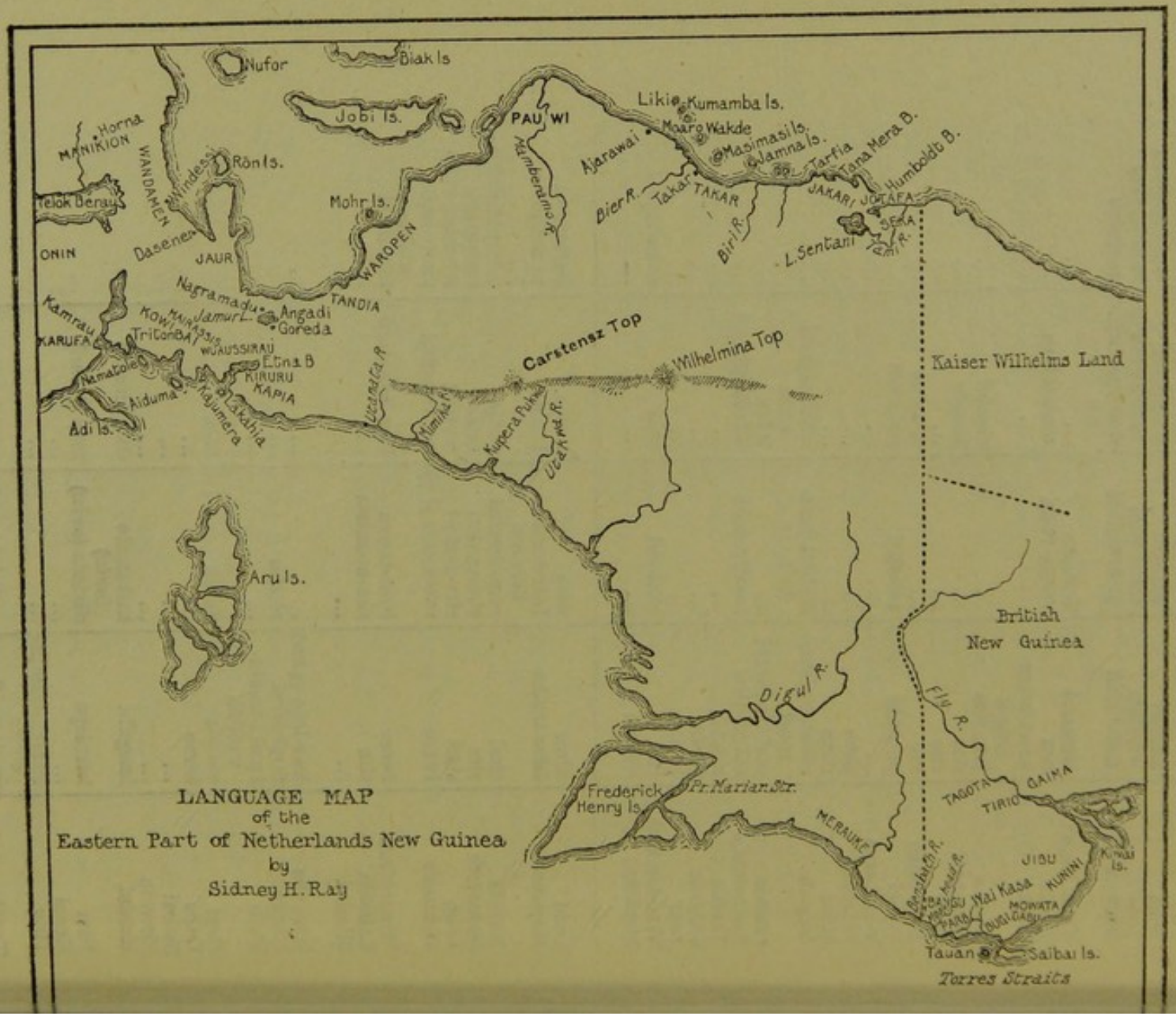
COMPARATIVE VOCABULARY.

	Water. Water.	Pig. Varken.	Fish. Visch.	Coconut. Kokos-noot.	House. Huis.
Seka	...	...	...	...	pā
Jotafa	nanu	por	igeh	nīno	duma
Sentani	bu	(yoku	ka	koh	ime
Arimoa	dano	...	...	niwi	...
Pauwi	memba	...	...	...	hŭsia
Angadi	mi	ŏhŏ	ireă	utiri	kāme
Nagramadu	...	ŏhă	...	măgrabe	ya
Wandammen	kambu	pisai	diya	ankadi	anio
Onin	weari	papio	sairi	ruroh	rumaso
Kapaur	kĕra	ndur, kalapaji, măma	heir	no'ur	wuri
Karufa	ualar	...	dohndi	niyu	tsaring
Namatote	wălar	boi	dondi	niu (?)	sarin
Lobo	walar	bōi	donde	niu	sarin
Mairassis	wata	bemba	kuratu	owah	watara
Wuaussirau	kai	wembe	kuratu	obo	wata
Lakahia	mura	ufa	nema	wuina	yafa
Kiruru	mi	...	...	...	...
Utanata	warari	uh	erika	uteri	kami
Mimika	mbi, mbu	u, api	irĕka	utēri	kamĕ
Merauke	daka	basikĕ	pararĕ, parara	misĕ, onggat, wīmap	sava, aha
Bangu	tauqar	rougu	thaua	nangar	boot, munka
Parb	nou	kimb	angur	argh, kwogh, keu	mongo
Bugi	ngi	simbel	galba	nge	māē
Dabu	ine	mule, chimela, sasa	pudi	ngoi, guvi	ma
Saibai	nguki	burum	wapi	urab	mud
Mowata	obo	boromo	arimina	oi	moto
Kunini	nīe	blome	ibu	ia	mete
Jibu	nia	woroma	waji	u	meta
Kiwai	obo	boromo	irisina	oi	moto
Tirio	opa	sepera	kopoma	sapu-mutira	turie
Tagota	mauka	minao	...	...	...
Nufōr	wār	beyen	iyen	srabon	rum
Ceram	waer, wael, kwael	hahu, apal	ian, iano	niwer, niwel, nimel, nikwel, noolo	ruma, luma
Tuburuasa	wêre	...	se	...	kapalla
Karas	pere	...	soor	...	kawe

COMPARATIVE VOCABULARY, NUMERALS.

	One. Een.	Two. Twee.	Three. Drie.	Four. Vier.
Seka	ahi (ari ?)	hitjun	hetun	nabu
Jotafa	the	ros	for	au
Sentani	imbai	be	name	gŭri
Tana Merah	ogosarai	saibona	ondoafi	soronto
Tarfia	tukse	arho	tor	fauk
Takar	afateni	nawa	nawa-jengki	nawa-nawa
Jamna	tes	ru	tau	fau
Masimasi	kīs	ru	tou	fo
Moar	hibeti	ru	tou	fau
Kumamba	tès	lu	taur	fau
Pauwi	pa-sari	pa-ri	pa-rosi	pa-rasi
Wamberan	tenama	bisa	...	...
Waropin	wo-sio	wo-ruo	wo-ro	wo-ako
Mohr	tata	ruru	oro	ao
Angadi	janăūwă	jăminatia	jaminati-janăūwă	awaitămă-jaminatia
Goreda	unakwa	jămanini	...	...
Nagramadu	nadi	ăbâmă	ăbâmă-nadi	ăbâmŏ-bâmŏ
Tandia	nei	rusi	turusi	attesi
Dasener	joser	suru	toru	ati
Jaur	rebe	redu	reŭ	rea
Wandammen	siri	mondu	tŏru	atê
Manikion	hom	hŏai	homoi	hŏku
Onin	sa	nuwa	teni	fāt
Kapauer	hĕre-wo	hĕre-rīk	hĕre-terī	hère-ngara
Karufa	simoksi	rueiti	tohru	bahdi
Namatote	samosi	rueiti	toru	fāt
Lobo	samosi	rueti	tuwru	fāt
Mairassis	tangauw	amōi	karia	āi
Wuaussirau	anau	amoi	karia	aiwera
Lakahia	onarawa	aboma	torua	fāt
Mimika	inakwa	yamani	yamani-īnakwa	ama-yamani
Merauke	zakod	iena	iena-zakod	iena-iena
Bangu	nambu, nambi	yethombi, kethembi	yetho	asar
Parb	ambiur	tumbi	lambi	tutubiar
Bugi	tarangesa	metakina	gingi-metakina	topea
Dabu	tupi-dibi	kumi-rivi	kumi-reriga	kumi-rivi-kumi-rivi
Saibai	wara, urapon	uka, ukasar	uka-modobigal	uka-uka
Mowata	nau	netoa	...	...
Kunini	iepa	neneni	nesae	neneni-neneni
Jibu	yepa	kuraiepa (*finger*)	kuraiepa	kuraiepa
Kiwai	nau	netewa	netewa-nau	netewa-netewa
Tirio	oroka	miseka	misorako	miseka-miseka
Tagota	uradaga	mitiga	nan	mitiga-mitiga
Nufōr	sai, ŏsēr	dui, suru	kior	fiak
Ceram	isa, sā	rua, lua, dua, roti	teru, telu, tolu, toru	haa, hata, ata, fāt

	Five. Vijf.	Six. Zes.	Ten. Tien.	Twenty. Twintig.
Seka	naplan	naplahi	amplahari	amplanaplan
Jotafa	mimiām	măndŏsīm	ronduminarōs	manisayām
Sentani	mehembai	mehinimbai	mehinmehembai	megohri
Tana Merah	ogosarai	demena	...	...
Tarfia	rim	mana-tuksi	mafarufaru	...
Takar	nawa-nawa-jengki	...	...	...
Jamna	jim, rim	...	sinafui	...
Masimasi	rim	...	sanafu	...
Moar	rim	...	...	...
Kumamba	lim	...	sanafun	...
Pauwi	pa-rinisi	ponensi	putaonsi	...
Wamberan	...	...	...	...
Waropin	rimo	...	...	...
Mohr	rimo	...	...	...
Angadi	măhărè-ajăhe-rauri	măhărè-jană-ūwă	măhăre-jămi-natia	...
Goreda	mahère-hèrori	...	tăóru	...
Nagramadu	măma-riba	mariba-nadi	măma-răbâmă	...
Tandia	marasi	...	...	...
Dasener	rimbi	...	...	...
Jaur	breiare	...	...	...
Wandammen	rīm	rīmi-siri	sura	snun-tupesi
Manikion	sirkem	...	...	...
Onin	nima	nem	pusua	puti-nuwa
Kapauer	hĕre-tembu	here-tembu-here-wo	pra'a	to mdijowo
Karufa	rimi	rom-simoksi	putja	siúmput-rueiti
Namatote	rim	rim-samoti	futsa	ombutueti
Lobo	rimi	rim-samosi	wutsya	sekumat-rueti
Mairassis	iworo	iwora-mōi (? 7)	werowa-moi	yauw-nat-makia
Wuaussirau	iworo	iwor-tanau	iwor-toki-tani	toki-amoi
Lakahia	rim	rim-onarawa	...	...
Mimika	...	...	...	...
Merauke	iena-iena-zakod	...	...	...
Bangu	tambothoi	nimbo	...	...
Parb	tumbi-tumbi-yambia	...	...	...
Bugi	manda	gaben	dala	...
Dabu	tumu	...	...	...
Saibai	...	...	...	...
Mowata	...	...	...	...
Kunini	imegube	matemate (*wrist*)	dare (*breast*)	...
Jibu	kuraiepa	ribenda (*wrist*)	mua (*breast*)	...
Kiwai	...	...	...	...
Tirio	miseka-miseka-oroka	...	...	...
Tagota	uradaga (?)	moti-taba-nan	moti-tatan	...
Nufōr	rīm	onem	samfur	samfur-di-suru
Ceram	rima, lima, dima	nē, nena, nō, onam	husane, husā, utsya	huturua



LANGUAGE MAP
of the
Eastern Part of Netherlands New Guinea
by
Sidney H. Ray

LIST OF WORDS USED BY THE PAPUANS IN THE DISTRICT OF THE MIMIKA RIVER, S. W. DUTCH NEW GUINEA.

Above	Opo
Acid	Tite / Imakemàn
Animal	Iréka (also "fish")
Ankle	Bau-mámĕ
Ant	Wámé
Arm	To-marī / To
Arm-band	Maka-rĕ
Arrive	Mainaumà
Arrow	Tīari
(barb of)	Imari
Atap	Wurī
Axilla	Emmabu
Back (of man)	Ata
Bamboo	Búiti
Banana	Kau
(plantation of)	Kauti
Band (of rattan worn round middle)	Iwau-mákarĕ
Bandicoot	Púruga
Bark (of tree)	Pīkī
Basket	Temme / Eta
Beads	Kamburi
Bean	Kawetī
Beard	Keparise / Kepa bíri / Burídi / Pakúti
Bed (mat)	Kápiri
Bee	Imoho
Beetle	Buruta
Belch	Mbau
Belly	Iwau
Big	Atwa / Iwáko
Bird	Páteru / Páturu
(of Paradise	Yamuku / Yau
Bitter	Tite / Imakemàn
Black	Ikako
Blood	Maréte
Blunt	Yamenà
Boat	Ku
Bodice (of woven fibre)	Paitĕ
Body	Nata
Bottle	Kárepa
Bow	Amúri
Bow-string	Kima
Breast (of woman)	Auwĕ
(of man)	Pītī
Breathe	Túa
Broken	Táka
Butterfly	Wīrī
Buttock	Atabú
Calf (of leg)	Ewambugu
Canoe	Ku
Cap (worn by widows)	Ubauta
Carve (to)	Maramu
Cassowary	Tu
Centipede	Arowī
Coconut	Utēri
Cheek	Awár(re)
Child	Aidru
Chin	Kepáre
Cicada	Wéako
Cloth	Pīkī
Club	Moánne
Clouds	Apu
Cockatoo	Pukī
Cold	Yu
Comb	Ta
Copulate	Ipĕ
Cough	Otah
Crab	Peja / Epor(re) / Bī
Crayfish	Bī
Crocodile	Tīmaku
Cry (weep)	Mbágĕ
Cut (to)	Embe
Cuscus (Phalanger)	Apui
Dance	Dirin-dirin
Deep	Emúku
Dog	Wīrī
Drink	Tomagu
Drum	Emmĕ
Ear	Éne
Ear-ring	Tīrawōnĕ
Earth (sand)	Tīrī
Eat	Namúka
Eel	Mbatarúbia
Egg	Tareté
Elbow	To-mámé
Exchange	Akóra
Eye	Mámé
Eyebrow	Mambīrī

Far	Awakopíre
Fat	Atwa
Feather	Idī
Finger	Márĕ
Finger-nail	Marē
Fire	Utá
(stick)	Utamau
Fish	Irĕka
Flower (orchid)	Idarōnĕ
Fly (insect)	Oboō
Flying-fox	Iéa
Foot	Bauwe
Forehead	Métár(re)
Ghost	Níniki
Give	Kéma
Grass	Umetir(re)
Grasshopper	Atŏkŏ
Green	Otopu
Hair	Vīrī
Hand	Marĕ
He	Amárepa
Head	Kapa-uĕ
Heavy	Ikīti
Heel	Mbautep(e)
His	Amareta
Hiccough	Urri
Hornbill	Kumai
Hornet	Imŏkŏ
House	Kámĕ
I	Doro
Ill	Namúti
Image (carved)	Betoro
Iron	Tau
Knee	Irību
Lance	Uruna
Laugh	Oko
Leaf	E
Leg	Atīrī
Lightning	Marapiti
Lips	Irī
Little	Mĭmiti
Lizard	Inamo
Lizard (frilled)	Wago
Loins	Yaïmi
Man	Uweri
Many	Tákiri
Mat (of pandanus)	Au
Melon	Anĕtĕ
Mine	Dorota
Moon	Pura
Mosquito	Itjī
Mountain	Púkare
Mouth	Ba
Moustache	Mbu-tīrī
Navel	Boporĕ
Neck	Ima
New	Aigu
Nod	Kiparu
Nose	Bīrim
(secretion of)	Bīndī
Old man of village	Natu
One	Inakwa
Orchid	Idarōnĕ
Other	Awaida
Other man	Wehwaida
Other man's	Wehwaidata
Paddle	Poh
Palate	Tībanne
Papaya	Tĕnà
Parrot	Akīma
Pearl	Omab(e)
Penis	Kamárē
(case)	Kamare-po(ko)
Pig	U / Api
Pigeon	Parúa
Pillow (wooden)	Yamate
Pine-apple	Makadĕtĕ
Prawn	Mbi
Pumpkin	Nabru
Python	Pīmī
Rain	Ke
Rainbow	Paraképta
Rapids	Kamáwa
Rat	Kemako
Rattan	Kima
Red	Epĕró
Ribs	Párĕrŏ
Rice	Wátē
Ripe	Pu
River	Iuata
Road (track)	Mako
Rope	Temmà
Sacrum	Wagamau(e)
Sago	Amŏta
(beater)	Wapúri
Sago-bowl	Pámagu
Sap	Namī
Scorpion	Purumbaā
Sea	Takarī
Shallow	Taparī
Sharp	Yánakŏ
Shell	Parau
Shell-fish	Uwo
Shin	Imbīrī
Shore	Tīrī
Shoulder	Ta-rī
Shoulder-blade	To-bābŭ
Skin	Pīgerī

DUTCH NEW GUINEA
RAWLING AND MARSHALL

INDEX

A

Acton, Lord, 2
Albinos, 110
Alcohol, 68
Amberno River, 24
Amboina, 14, 257; communication with, 209; inhabitants of, 17; market at, 17
Ambonese coolies, 50
Ambonese, dress of, 17; names of, 17
Amok, 185
Arafura Sea, 19, 35
Arfak Mountains, 23
Arrows, 151
Aru Islands, 19
Atap, method of making, 60
Atuka River, 248
Atjeh, 92

B

Balfour, H., 202
Bali, 259
Bamboo, throwing lime from, 219
Banana, 17, 88
Banda, 16, 19, 257
Batavia, 3; washing in, 9
Bees, stingless honey-, 76
Beetles, as food, 124; larva of, 156
Beri-beri, 66, 193
Bird of Paradise, 74, 142, 159, 178, 227, 261
Birds, collection of, 241
Boat-builders, 225
Boni, 14
Bonnets of widows, 115
Borneo, 21
Boro-Boder, 11
Botanic station at Merauke, 224
Bougainville, de, 31
Bows, 151
Bridge, building a, 235
British New Guinea, 22
British Ornithologists' Union, 1
Brush Turkey, 76
Buddhist Temples, 11
Buitenzorg garden, 10
Buleling, 258
Butonese, 170
Butterflies, 16

C

Camp, health of, 58; repairing, 188
Cannibalism, 127
Canoes, 219; building of, 53; description of, 53; method of paddling, 36; the price of, 55
Carstensz, Mt., 23, 44, 181, 212
Carstensz, Jan, 28, 221
Cape York, 28, 32
Carteret, Philip, 31
Cassowaries, 200, 214
Cassowary, 125, 241
Casuarina trees, 42
Cat's cradle, 147
Celebes, 14
Celebes Trading Company, 20
Ceram, 14
Ceremonies, 131
Charles Louis Mountains, 23, 35, 44
Chief, 128
Children, games of, 117
Chinese, 17, 223, 225
Christians at Amboina, 17

Cicatrisation, 112
Clothing of Dutch, 9; of natives, 113
Clouds on mountains, 45
Clubs, Dutch, 18; stoneheaded, 149; wooden, 148
Coal, 241
Coast, description of, 42; navigation of, 249
Coconuts, 98, 223
Comet, Halley's, 81
Convicts, 13, 93; madness of, 215
Cook, Captain, 31, 219
Coolies, 15, 170, 227; Ambonese, 50; failure of, 231; feebleness of, 51; sickness of, 184
Corals, 16
Counting, 104
Cramer, H. A., 3, 13, 41, 46, 57, 92, 102, 231, 258
Crickets, a plague of, 59
Crocodiles, 75
Crowned pigeon, 74
Crows, pale, 77
Cultivation, 88; in Java, 5

D

Daggers of bone, 203
d'Albertis, 33
Dampier, Captain, 31, 123
Dancing, 143; houses, 143
Darwin, Mt. Leonard, 239
Dayaks, 172, 194; arrival of, 253; industry of, 214
Dead, disposal of, 137–140
Death, 136
Digoel River, 24
Disease, 205
Djokjakarta, 11
Dobo, 19, 257
Dog, Papuan, 126
Dorei, 22
Drawing, 145
Drowning of sailor, 170
Drums, 141
Ducks, penguin, 11; perching in trees, 86
Dugongs, 212
Dumas, J. M., 212
Dumas, Mr., 44
Dutch, Government, 3, 257; food of, 7; house of, 8; habits of, 9; tree-planting by, 15; hospitality of, 18; rule in New Guinea, 23; explorations of, 28; East India Company, 31; Expeditions, 213, 216

E

Earthquake at Amboina, 15
Effigies, carved, 131
Endeavour, voyage of, 31
Escort, 3, 13
Expedition, members of, 2; leave Java, 13

F

Fak-fak, 224
Families, 129
Festival, 134
Fiji, 24
Fire, 152
Fire-making, 200
Fish, many coloured, 16
Fishing-net, 120
Flies, a plague of, 58; on water, 76
Flint knives, 200
Flood, 132, 156, 173, 178, 189
Flores, 24
Flowers, 206, 242
Fly River, 33, 42
Food of natives, 119, 124
Forbes, H. O., 33
Forest, 242–245
Fortnum and Mason, 68
Frogmouth, 77

G

Garden at Amboina, 16
Garoet, 11
Geographical Society, Royal, 2
German New Guinea, 22

Ghosts, 133
Goa, Raja of, 14
Godman, F. D., 1
Godman, Mt., 239
Goodfellow, W., 2, 142, 167, 170, 172, 195
Grant, C. H. B., 194, 231, 241
Grant, W. R. Ogilvie, 1
Grey, Sir E., 2
Guillemard, 38
Gurkhas, 3, 156, 160, 171, 179, 194, 233

H

Habbema, Lieut., 169
Half-castes, 6, 223
Halley's Comet, 81
Head-rests, 152
Herwerden, Captain, 13
Hindu Temple, 259
Hornbills, 86
Houses of the natives, 96; in trees, 217; communal, 218
Humboldt Bay, 33

I

Ibis, 1
Iguanas, 75
Intoxication of natives, 99
Incense, smell of, 238
Island River, Dutch Expedition, 60; description of, 216
Iwaka River, 231

J

Java, prosperity of, 5; half-castes in, 6
Javanese soldiers, 62
Jew's harp, 203
Jungle, clearing the, 46

K

Kaiserin Augusta River, 24, 28
Kalff, Mr. E., 227
Kamura River, 175, 248
Kapare River, 82
Ké Islands, 15, 51, 257; natives of, 225
Kingfishers, 59
Kloss, C. B., 253
Kolff, 220
Kris, abolition of, 7

L

Language, difficulty of, 103
La Perouse, 32
La Seyne, wreck of, 3
Leeches, 177
Le Maire, Jacques, 28
Lombok, 258
Lorentz, H. A., 2, 13, 33, 34, 169, 172, 241
Lories, 75

M

Macassar, 14
MacCluer Gulf, 42
MacCluer, John, 32
Macgregor, Sir W., 33
Malays, 185; food of, 65; music of, 143
Mangrove, 42
Marianne Strait, 220
Marriage, 116
Marshall, E. S., 2, 80, 82, 133, 175, 185, 231
Medical treatment, 167
Meek, Mr., 213
Megapode, 77
Meneses, Don Torge de, 27
Merauke, 31, 37, 222; communication with, 209; natives of, 226
Mimika, first voyage on, 39; description of, 40, 71; water of, 40; tides on the, 57; obstacles in, 78
Mission at Dorsi, 22
Missions, 154
Mosquitoes, 211, 223
Motor-boat, 52, 173, 248

Murderer, 13, 186
Music, 141

N

Natives, trading with, 61 ; communicating with, 84, 102 ; dislike of rain, 84 ; migrations of, 95 ; drink of, 99 ; language of, 102, Appendix C ; description of, 109 ; height of, 112 ; clothing of, 113 ; age of, 115 ; food of, 119, 120 ; social system of, 128 ; property of, 129 ; music of, 141 ; dancing of, 143 ; as artists, 145 ; mock sorrow of, 247 ; quarrels of, 148 ; as marksmen, 151 ; health of, 153 ; as carriers, 158 ; our relations with, 163 ; as thieves, 165
Naturalists, explorations by, 32
New Guinea, position of, 21 ; size of, 21 ; mountains of, 23 ; natives of, 24 ; discovery of, 26 ; name of, 27 ; recent explorations of, 33 ; first sight of, 35 ; shore of, 36 ; lack of food, 65 ; rivers of, 24, 83, 181 ; departure from, 257
Newton, Professor Alfred, 1
Nias, 13, 35
Nimé, dancing house at, 252
Noord River, 2, 13, 33, 34
Nouhuys, J. W. van, 169
Numerals, 104

O

Obota, 83
Ogilvie-Grant, W. R., 1

P

Palm, coconut, 98
Pandanus, 10, 243
Papua, 22 ; meaning of, 25
Papuans, description of, 25, 109 ; behaviour of, 37 ; dress of, 37, 113 ; apathy of, 38, 45 ; asleep, 39 ; dancing, 41, 143 ; as traders, 45 ; communicating with, 84 ; dislike of rain, 84 ; food of, 91 ; migrations of, 95 ; drink of, 99 ; language of, 102, Appendix C ; height of, 112 ; age of, 115 ; social system of, 128 ; property of, 129 ; music of, 141 ; as artists, 145 ; quarrels of, 148 ; as marksmen, 151 ; health of, 153
Paradise, bird of, 74, 142
Parimau, arrival at, 56, 155 ; departure from, 247
Payment of natives, 163
Peace-offering, 166
Pearls, 20
Pearl-shell, 20
Penguin ducks, 11
Periepia, 85
Petroleum, 241
Pickles, 68
Pig, 125, 133–136
Pigeons, crowned, 31, 74
Pineapples, 101
Plants, 231
Plants at Buitenzorg, 10
Ponies, 259
Pool, Thomas, 30
Port Moresby, natives of, 213
Portuguese, remains of, 17 ; navigators, 27
Precipice, 239
Prince Frederick Henry Island, 220
Propeller, loss of, 250
Provisions, storing of, 66 ; packing of, 68 ; depôt of, 176
Pygmies, discovery of, 157 ; visit to, 159 ; dress of, 161 ; description of, 161, 197 ; voices of, 162 ; visit Parimau, 196 ; measurements of, 197, Appendix B ; ornaments of, 199 ; possessions of, 199 ; methods of smoking, 202 ; village of, 203 ; houses of, 205 ; women of, 206 ; intelligence of, 207 ; distribution of, 208

R

Races, mixture of, 6 ; harmony of, 19
Raffles, Sir Stamford, 5, 10

Rain, 79
Rattan, 243
Rawling, C. G., 2, 82, 156, 174–5, 195, 219, 248
Relationship, 105
Reptiles, 168
Retes, Ynigo Ortiz de, 27
Rice, 65 ; cultivation in Java, 5
Rifle bird, 159
Rijst-tafel, 7
Rivers, branching, 83 ; crossing, 236 ; in New Guinea, 24
Robinson, H. C., 194
Roebuck, voyage of, 31
Ruwenzori, 2, 238

S

Sago, 65, 89–92
St. Nicholas, feast of, 6, 228
Sandpiper, 86
Sarawak, H. H. the Raja of, 253
Sarong, 10
Schouten Islands, 27
Schouten, Willem, 28
Screw-pines, 10, 243
Sea, depth of, 19
Sea-snakes, 215
Seasons, 79 ; wet, 192
Shackleton Expedition, 67
Sharks, fishing for, 46
Shortridge, G. C., 2, 172, 194, 210
Sickness, 171–192
Sindanglaya, 11
Skulls, preservation of, 139
Smith, Staniforth, 90
Snakes, 167
Snow Mountains, 1, 23, 33 ; discovery of, 29 ; first sight of, 35 ; distant view of, 43 ; attempt to reach, 229
Social system, 128
Soldiers, native, 92
Songs, 142
Spanish navigators, 27
Spears, 151
Spices, Dutch monopoly of, 31
Spiders, tameness of, 58
Stalker, W., 2, 14, 51 ; death of, 47 ; funeral of, 49
Steam-launch, 52, 170
Stone Age, 151
Stone implements, 150
Stones, gifts of, 87
Sugar-palm, 99
Sumbawa, 258
Superstitions, 131
Swift, Moustached, 241
Swimming, 117

T

Tapiro (*see* Pygmies)
Tasman, 30
Tattooing, 112
Tears, a welcome of, 41
Temples at Boro-Boder, 11
Ternate, Sultan of, 22 ; traders of, 89
Thunderstorms, 79, 132
Tides of the river, 57
Timura River, 251
Tobacco, 38, 202 ; cultivation of, 88
Torres, Luis Vaz de, 27
Torres Strait, 32
Tosari, 12
Track, used by natives, 176 ; cutting a, 183
Trade goods, 63
Transport, difficulty of, 52
Travelling, difficult, 230
Trees, 216, 243 ; falling at night, 77 ; cutting down, 187 ; houses in, 217
Tuaba River, 175
Tugeri, 23
Tugeri tribe, 222

U

Utakwa, Dutch expedition to, 210
Utakwa River, 4, 33, 210

V

Van der Bie, 212
Vanilla, 159

Vegetation, 237
View, a rare, 240
Volcano, 15
Volcanoes in Java, 5, 12

W

Wailing at death, 137
Wakatimi, arrival at, 40; camp at, 46; description of, 95; departure from, 255
Wallaby, 125
Wallace, A. R., 16, 20, 33, 38, 91, 244
Wamberi Merbiri, 203
Wania, excursion to, 249
Wania River, 236, 239, 249
Wataikwa, 231
Wataikwa River, 175
Water, lack of, 237; squeezed from moss, 238
Water-lilies, 10
Weather, 79
Wilhelmina, Mt., 23, 45, 169, 220
Wives, number of, 116
Women, 148; clothing of, 114; treatment of, 130; dress of Dutch, 9; Pygmies, 206

THE END

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED, LONDON AND BECCLES.