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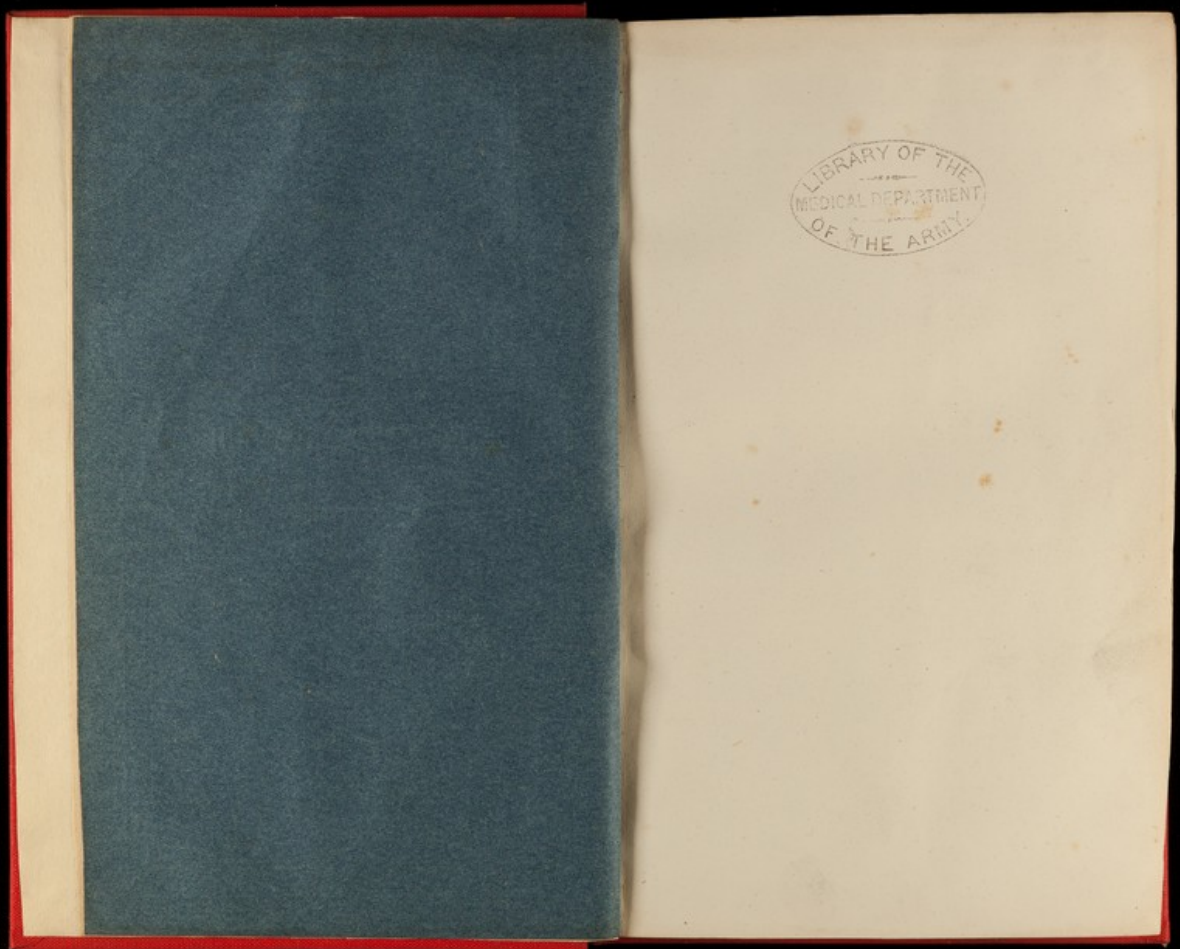
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ON THE  
ANDAMANS AND ANDAMANES.

BY  
G. E. DOBSON, B.A., M.B., F.L.S.







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On the ANDAMANS and ANDAMANES. By G. E. DOBSON, B.A.,  
M.B., F.L.S., &c. [With Plates xxxi., xxxii., and xxxiii.]

From the JOURNAL of the ANTHROPOLOGICAL INSTITUTE.

THE Andamans may be shortly described as a chain of narrow islands, nowhere exceeding twenty miles in breadth, forming the middle portion of a series of smaller islands and shoals lying between Cape Negrais, in Burma, on the north, and Acheen Point, in Sumatra, on the south. From evidence to be adduced hereafter, it will be seen that these islands and shoals were certainly for some time, perhaps for a short period only, connected with the main land to the north and east, most probably at a very recent geological epoch, when, as pointed out by Mr. Wallace,\* the continent of Asia extended far southward beyond its present limits, including the islands of Sumatra, Java, and Borneo. At that epoch this series of islands and shoals now lying between Sumatra and Burma probably formed part of the eastern boundary of the Bay of Bengal, while that portion of the present Asiatic continent known as the Malay Peninsula formed a long ridge of elevated land far to the eastward of a great alluvial plain, through which a mighty river flowed, the (?) Irrawady of the past.

Investigation of the zoology of the islands shows—1st. That the islands were *last* connected with the Asiatic continent, most probably with that part known as Burma and the Malay Peninsula. 2ndly. That they probably formed portions of a large island placed in the delta of a great river. 3rdly. That they have not been at any time completely submerged since their separation from the continent.

The zoological facts on which these inferences are based are: 1. The absolute identity of almost every species of animal inhabiting the islands with species common also to India and Burma especially. 2. The presence of fresh-water fishes in the islands, of which almost every species (one species—query variety—only excepted) is found in the fresh waters of Burma.† 3. The

\* "The Malay Archipelago," Part I.

† Mr. Francis Day is my authority for this statement.

great paucity of mammals, especially of all large mammals. Hitherto the only large mammal found in the islands is a pig (*Sus Andamanensis*), which has been shown to be a hybrid between two species from neighbouring countries, and has probably been introduced by design, or by having escaped from shipwrecks.\* The other small mammals, about six species (not including bats†), consisting of rats and mice and a species of *Paradoxurus*, may have been introduced in the same manner. Most of these, if not all, are found in Burma. Although the islands are densely covered with lofty trees yielding an abundance of fruit, not a single monkey‡ or squirrel has been discovered. This absence of mammals can only be accounted for by supposing that when forming part of the Asiatic continent, the land now known as the Andamans lay between the mouths of a great river falling into the Bay of Bengal.

Mr. Bates and Mr. Wallace have shown how great rivers like the Amazon affect the distribution of species. Such great rivers present barriers as effectual as an arm of the sea, to which they may be likened. Hence the absence of monkeys, squirrels, and other small mammals, abundant in the adjacent countries, but not found in the Andamans, may be explained. In the same manner the presence of fresh-water fishes common to the Andamans and Burma may be understood.§

It is also evident that the islands have not been submerged since they ceased to form part of the continent of Asia, for this would have been attended with immediate destruction of the fresh-water fishes.

I have prefaced my remarks on the Andamanese with these notes on the zoology of the islands, and the evidence afforded therefrom of the changes that have probably taken place in their geographical relations during recent geological periods,

\* Compare Lyell, "Principles of Geology," pp. 358, 359.

† Of the very few species of bats as yet known to inhabit the Andamans, three are peculiar to these islands, or, at least, not yet recorded from other localities. One, *Pteropus Nicobaricus*, is common to the Andamans and Nicobars; and probably the bats of both these series of islands will, hereafter, be found to be nearly identical. The additional power of aerial locomotion possessed by bats renders them in a very much less degree subject to the operation of certain causes which effectually limit the distribution of other mammals.

‡ It is stated that the Andamans that many skulls of convicts have been sent away as those of the aborigines, whilst a *large monkey*, received from India and given to the crew of a passing man-of-war, has lately received a new specific name in London as being indigenous on these islands.—"Observations on the Andamanese." By Surgeon Francis Day, "Proc. As. Soc. Beng., June, 1870," p. 153.

§ Dr. Günther remarks:—"The fresh-water forms being limited to the river—or lake—systems which they inhabit, and being less exposed to the disturbances affecting the terrestrial animals, are singularly adapted for the elucidation of the original geographical distribution of the animals of the present creation."—Catalogue of Fishes in the British Museum, vol. viii., Pref. p. 9.

in consequence of their importance in discussing some of the theories which have been advanced to account for the colonisation of the Andamans by their present peculiar inhabitants. These theories may be shortly summed up as follows:—

The present inhabitants of the Andamans are—

I. The descendants of shipwrecked negroes, escaped either from some Arab slave-ship carried out of its course by adverse winds, or from a slave-ship wrecked on the Andamans on its way to the Portuguese settlement in Pegu (Syme's "Embassy to Ava;" Calcutta *Monthly Register*, 1790).

II. Aborigines, not connected on any anatomical grounds with the people of any existing continent (Owen\*).

III. Negrito-negroes (Huxley†).

IV. Negritos, or Samangs, from the Malay Peninsula (Wallace‡).

V. Mincopie branch of the Negrito division of an original negro stock.§

I have arranged these theories of the origin of the Andamanese according to their date. The presence of a race of negroes (for such every one with a mind unbiassed by preconceived ideas of their origin will consider the Andamanese) in a chain of small islands surrounded by countries inhabited by races very different from them in every respect had, more than one hundred years ago, excited the wonder of travellers. Among the theories put forth to account for the origin of this people, the most generally accepted appears to have been that of Syme ("Embassy to Ava"), who considered them the descendants of negroes escaped from some wrecked Arab slave-ship carried out of its course by adverse winds; or that recorded in the Calcutta *Monthly Register* for 1790 (quoted by Professor Owen||), which supposes that they are descended from "African negroes imported by the Portuguese for slave labour in their settlement at Pegu, and which had been wrecked on the Andamans."

This hypothesis, that they are the descendants of shipwrecked African negroes, is dismissed by Professor Owen as untenable, first, on osteological grounds; and second, because "it is to be presumed that the Portuguese would import from the Guinea coast, or other mart of negro slaves, individuals of the usual stature, and it is incredible that their descendants, enjoying freedom in a tropical locality affording such a sufficiency, and

\* "On the Physical and Mental Characters of the Mincopie," &c.; "Report of Brit. Assoc., 1861," p. 241.

† *Portuguese Review*, 1865, p. 268.

‡ "Malay Archipelago," vol. ii. p. 452 (1868).

§ Quatrefages, in "Revue d'Anthropologie," 1872.

|| *loc. cit.*



even abundance of food as the Andamans are testified to supply,\* should have degenerated in stature, in the course of two or three centuries, to the characteristic dwarfishness of the otherwise well-made, well-nourished, strong, and active natives of the Andaman Islands."† The argument that they are not negroes, founded on an examination of the form of their heads, which, as Mr. Busk has pointed out, present the rare combination of brachycephaly with woolly hair,‡ is much lessened in value by recent observations.

Mr. E. T. Hamy, in a short paper published in the "*Comptes Rendus*,"§ points out the existence of brachycephalic negroes on the West Coast of Africa, and remarks that these people are to the other African negroes what the Negrito Mincopies, Aitas, &c., are to the Oceanic negroes.

I believe that a much better proof that they are not descendants of shipwrecked African negroes may be derived from an examination of their habits and customs. These agree in no respect with those of any known African tribe. It is inconceivable that adult negroes, transferred to a distant land, would not have carried with them and handed down to their children the habits and customs of their ancestors. The negroes in the West Indies and America to this day preserve the fetish rites so common among the African tribes, and the acquisition of a new religion, and residence among strangers for more than 200 years, have not sufficed to lessen their belief in them.¶

The results of Professor Owen's examination of the psychical and physical characters of the Andamanese are contained in the following short remarks:—"I conclude, therefore, that they are aborigines, and merely resemble negroes in blackness, or,

\* This assertion needs further proof.

† Owen, *l. c.*, p. 246.

‡ Referred to by Huxley, *l. c.*

§ "L'existence de nègres brachycephales sur la côte occidentale d'Afrique," Feb. 1872, p. 379.

¶ Though it follows that Symes' theory is not admissible in accounting for the colonisation of the Andamans, yet such instances of colonisation are not wanting; and, great as the distance is from Africa to the Andamans, it is not impossible, though very improbable, that a ship laden with African negroes and a supply of food might go so far out of its course as to come within the influence of the south-west monsoon, and be by it carried up the Bay of Bengal, some of the crew surviving and escaping to land. Dr. J. D. MacDonald has informed me, that during Captain Erskine's cruise in H.M.S. *Havannah*, a party of natives passed from the King's Mill group to the Navigators' Islands, a distance of about 2,000 miles. He also mentions that a party, consisting of men, women, and children, left Fotuna, an island 50 miles north of the Fiji group, in an open boat provided with food, and never were heard of again by their friends on the islands. But Dr. MacDonald found in the New Hebrides, in an island known as "Erronan" to Europeans, a people in all respects agreeing with the inhabitants of Fotuna, near the Fiji, who used the same numerals, and called their island, not "Erronan," but Fotuna, after the parent island.

rather, sootiness of the integumentary pigment, which might be due to constant exposure during many generations of this rude and primitive race. . . . I am not cognisant of any anatomical grounds for deriving the Andaman people from any existing continent; but in making these remarks I would offer no encouragement to the belief that they originated in the locality to which they are now confined. . . . The Andamanese are, perhaps, the most primitive, or lowest in the scale of civilisation, of the human race. They have no tradition, and, as has been before remarked, apparently no notion of their own origin.\*

Mr. Wallace appears to hit upon the true relations of this curious people, in connecting them with the woolly-haired Samangs of the Malay Peninsula and Negritos of the Philippine Islands, and the same view is expressed by M. de Quatrefages in two exhaustive papers "On the Mincopies and Negrito Race generally."† M. de Quatrefages' investigations with regard to the Mincopies may be briefly stated as follows:—

1. That their position on an island to which nothing attracted strangers, has resulted in the preservation of a very great, if not absolute, purity of blood, so that the Mincopies of the Andamans may be taken as the type of the race to which they belong.
2. That they belong to an original negro stock (*truncus nigrus*), of which the Negritos may be considered one of the branches (*branche*), and the Mincopies a branchlet (*rameau*) of the latter.
3. That the Mincopie branchlet is found in the Andamans, Nicobars, and in the Philippines, and is still represented on the continent in the Samangs of Malacca, and most probably primitively occupied all or part of India.
4. That the Mincopie branchlet has furnished the negro element of a portion, at least, of the Dravidian peoples. Further, to judge from characters afforded from the examination of skulls, some Pariahs are almost pure Mincopies.‡

It is impossible to account for the presence of the wild tribes of Southern India—among which the dwellers in trees certainly occupy a lower place in the scale of civilisation than even the Andamanese—or of the peculiar Samangs of the interior of the Malay Peninsula, surrounded by races with which they have no connection whatever, except on the hypothesis that they are the few surviving descendants of a woolly-haired people which

\* Owen, *l. c.*

† "*Revue d'Anthropologie*," 1872.

‡ This is very doubtful. I agree with Mr. F. Day, that the chief of Rutland Island is probably a native of India. The women and children of crews shipwrecked on the coasts of countries inhabited by savages are often saved when all the male adults are murdered.

§ Quatrefages, *l. c.*



in ages past occupied lands south of the Himalayas, when the continent of Asia included within its southern limits the Andamans, Nicobars, Sumatra, Java, Borneo, and the Philippine Islands, and that the present inhabitants of the Andamans and the Negritos of the Philippines are also the remnants of those ancient Negrito inhabitants of Southern Asia which have almost disappeared before the invading Aryan and Mongolian races.

The Negritos most probably belong to the very same original stock\* as the African negroes, occupying, at a very distant period, a great continent in the Indian Ocean, the "Lemuria" of Dr. Salter, which seems to have once extended from Africa or Madagascar to the Malay Archipelago. At that period the southern coast of Asia was probably formed by the Himalayas, and the high lands of the peninsula of India were islands in the Indian Ocean inhabited by people belonging to the same race as that occupying the great continent southward of them, and whose descendants are still to be found in the homes of their forefathers. Though this great equatorial continent has almost wholly disappeared beneath the waters of the Indian Ocean, the animals which once inhabited it are represented by some surviving descendants, which, though long and widely separated, in countries once forming its extreme limits, still preserve most of the characters of their ancestors.†

In April, 1872, I visited the Andamans for the purpose of collecting zoological specimens. I was accompanied by Mr. Wood-Mason, of the Indian Museum, Calcutta, and we made Ross Island, Port Blair, our head-quarters. In order to make the most use of our time, we divided our labours, Mr. Wood-Mason undertaking to collect invertebrates, while the vertebrate portion of the collection was in my charge.

Although I traversed the forest for miles in every direction round Port Blair, almost every day for the succeeding month, I never met a single native. On the 4th May, however, an excursion to one of the "Andamanese Homes" was planned. My friend Dr. T. R. Lewis, who happened to visit Port Blair at the same time, accompanied me, and gave me most valuable assistance in taking the photographs which illustrate this paper. We proceeded about seven miles up Brigade Creek, the tidal estuary of a small stream running almost directly southwards to Port Blair, between two parallel ridges, clothed with probably the densest and loftiest forest in the world. The creek runs through a narrow alluvial flat at the base of these ridges, covered with mangrove trees, the deadness and dreariness of which are only relieved occasionally by the appearance of the lovely little

\* Tronc nègre of Quatrefages, l. c.

† See Wallace, l. c.

azure kingfisher (*Alcedo Asiatica*), sitting on one of the slimy mangrove roots, or flying along the margin of the water, looking like a flash of many-coloured light against the dark oozy banks of the creek. Sometimes the slaty heron (*Herodias color*), a more fitting denizen of these shades, would be seen sitting motionless among the mangrove roots, watching for the appearance of some unlucky fish, but they were the only feathered inhabitants of these silent swamps. Higher up, as we left the alluvial flat, the stream narrowed very considerably, the mangroves disappeared, and were replaced by lofty forest trees, growing on the solid banks, or lying across them so as to seriously threaten our progress forwards. Many kinds of birds flew about, conspicuous among them the long-tailed paradise crow (*Dissemurus affinis*) and the lovely *Pericrocotus speciosus*, its brilliant scarlet breast looking like a clear flame among the dark leaves, while occasionally in the deep forest the drumming of the large, black, crimson-crested woodpecker might be heard.

The appearance of a large "dug-out" canoe, containing two perfectly naked natives, announced that we were near the "home," and soon, on rounding a curve of the stream, a large number of canoes appeared moored along a kind of landing-place. We were received by the wife of the chief, who had hastily donned a frock provided by the Government to receive visitors in, but very soon afterwards, perceiving that no ladies were in our boat, she got rid of that unnecessary encumbrance, and presented herself in nature's garb, adorned by a single leaf, a garter tied below one knee, and a necklace composed of the finger- and toe-bones of her ancestors (see Plate xxxi.). At a short distance from the landing-place we found two long sheds—"the home"—built by the Government of Port Blair. The larger shed was filled with 110 Andamanese of all ages—men, women, and children. Some were engaged in cooking fish, others in mending their bows, and although the appearance of Europeans among them was a rare event, they scarcely noticed our arrival, very few leaving the shed to see what we were about. Outside the shed, reclining in the ashes of a cooking-place, we found the king, or chief of the tribe, half asleep. He gave us to understand he did not feel quite well, and relapsed into a doze.

Very soon after arrival I commenced to erect my photographic tent; but although this is a very remarkable object when erected, the natives scarcely took the trouble to look at it, and none expressed any surprise. Although none of the tribe exceeded 64 inches in height, so that on first seeing them we thought the shed contained none but boys and girls, I was especially struck by the remarkable contrast between the size of the males

and females. The chief and his wife afforded a very average example of this (see Plate xxxi.). The central figure in Plate xxxii. is that of a girl brought up from infancy at the Andamanese Orphan School, in Ross Island. This girl I had seen almost every day, sitting in front of the school-house, and on Sunday at church, neatly dressed in white, and her head covered with a fair quantity of black, woolly hair. Four days previous to our visit to the "home" she had asked and obtained permission to rejoin her people, and she was now destitute of clothes, shaved, and greased with a mixture of olive-coloured mud and fat, and married, wanting but the finger- and toe-bone decorations to complete her toilet. This is the girl who, on seeing Mr. Wood-Mason, on his second visit to the islands in the following year, immediately recognised him, and, pointing to her greatly enlarged person, said with much pride, "buecha hai!" The orphan children brought up at the school on Ross Island are taught Hindustani, which they impart to their people on returning to the woods, so that many of the tribes living in the vicinity of Port Blair now speak a curious mixture of Hindustani and Andamanese.

In the centre of the large group (Plate xxxiii.) a woman may be observed sitting, having a round object on one shoulder. This is the skull of her late husband, which, adorned with red paint and fringes made from wood fibres, is carried about by the disconsolate widow till she obtains another partner. In the foreground two elderly women are seated—the king and queen-mother respectively.\* The former wears a necklace of finger-bones; the latter, one made of the bones of the foot and pieces of ribs combined. The peculiar tattoo of the Andamans, described by Mr. Francis Day,† is here well seen.‡ Many of these markings seemed to me to have been produced by simply drawing the finger across the surface when freshly painted with a thick coating of the usual mixture of swine's fat and olive mud or red earth. The individual on the left of the same picture, holding an arrow in his hand, known as "Jumbo" to Europeans, rendered himself notorious some years ago by shooting a sailor through the heart who attempted to take liberties with one of the young Andamanese females. That he was also notorious among his people was evident when, on showing the finished negative to some of the young women, they immediately recognised the likeness, and pointed him out among the figures in the group, crying out, "Jumbo, Jumbo," and laughing immoderately.

\* One of these figures is unavoidably omitted in the Heliotype.

† Proc. Asiatic Soc. Bengal, June, 1870, p. 159.

‡ With the figures in this and other plates, contrast the ancient Egyptian types of countenance represented in the plates accompanying Prof. Owen's paper, at pp. 224 and 228 of this Journal.

One of the young men, who was evidently the dandy of the tribe, was strutting about in full dress, evidently very proud of his personal appearance. His full dress consisted in a coat of fresh olive-coloured mud paint on one side, and bright red paint on the other. Half his face was red, the other half olive, and the red paint on his body terminated in a festooned border along the middle of the chest and abdomen; the arms and legs were similarly adorned, the festooned border running down the outer side of the legs like the gold stripe in military trousers. This festooned margin is well shown on the chest of the young girl in Plate xxxii. The wife of the chief of Rutland Island was photographed at Ross Island about a week subsequent to our visit to the "home," but the photograph does not accompany this paper. She is the largest and fattest Andamanese female living in the vicinity of Port Blair; but even in her, no appearance of the fatty deposits in the buttocks, so characteristic of the Hottentot women, can be seen. I mention this, as some have stated that the Andamanese females resemble Hottentots in this respect.

We brought a large shark with us as one of our presents for them. It was interesting to observe how they removed the entrails, separating the gall-bladder with much care; they then broiled large pieces on a wood fire.

The Andamanese, at least the inhabitants of the Southern Island, erect no kind of house whatever. They are fond of a sandy beach, with high cliffs, which shelter them from the wind. When walking along the beach in the vicinity of Port Mout, I have often come across one of their temporary habitations, which consists of a hole scooped out in the sand, beneath an overhanging rock, large enough to contain a single person. They rarely occupy the same sleeping places two nights in succession.

The inhabitants of the Little Andaman erect enormous beehive-like huts, with the roofs coming close to the ground. They have, probably, learned to construct them from observing the huts of the Nicobarese in the not far distant island of Car-Nicobar during some of their forays, or have been taught to construct them by their Nicobarese prisoners.

The construction of their peculiar arrows and fish spears with moveable heads exhibits much ingenuity, and the use of no small reasoning power in adapting means to an end. The arrow-head (made of iron obtained from ships wrecked on the coast) consists of a triangular piece of flattened iron, fastened to the end of a small stick about four inches in length. At the base of the head, from one to three iron barbs are also fastened to the stick. The end of this short stick fits into a socket provided for it in the extremity of the shaft of the arrow. The con-



nection between the head and shaft is also maintained by a flattened thong (made from wood fibres) about eight inches in length, which is attached by one end to the distal extremity of the shaft, and by the other to the stick supporting the head.

When a pig is struck by this arrow, the head is retained in the flesh of the animal by the barbs; but the end of the short stick supporting the head is soon knocked out of its socket, and the shaft, still connected with it by the thong, is carried along almost at right angles, and quickly becoming entangled in some roots or other obstacles, detains the animal till the hunters come up. Without such an instrument it would be impossible to overtake a wounded pig in the dense forest which covers all parts of the islands.

The fish spears are provided similarly with moveable heads, but with a much longer thong, which allows the shaft to float, and so indicate the course of the wounded fish.

I shall not enter upon any further account of the manners and customs of the Andamanese, as these have been well described in Mr. Francis Day's paper, 'Observations on the Andamanese,' published in the June number of the "Proceedings of the Asiatic Society of Bengal," 1870. Dr. Mouat's interesting book is well known, and Colonel Tickell\* and Mr. de Roepstorff† have published short vocabularies of the language. A paper on 'Andamanese Kjökken-möddings,' by the late Dr. F. Stoliczka, and 'Notes on a Trip to the Andamans,' by Mr. V. Ball, will also be found in the "Journal and Proceedings of the Asiatic Society of Bengal."

It would be most desirable that some one would endeavour to collect, as far as possible, a complete vocabulary of Andamanese words. The results of an examination of their language would probably afford a much surer clue to their origin than any hitherto adduced.

#### EXPLANATION OF PLATES XXXI., XXXII., AND XXXIII.

Plate XXXI.—Chief of a tribe of Andamanese (Southern Island) and his wife, showing contrast of size.

Plate XXXII.—Group of Andamanese young women, southern tribe (Southern Island).

Plate XXXIII.—Group of Andamanese of the Southern Island.

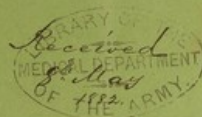
All the plates are from photographs taken by the author, May, 1872.

\* "Journ. Asiat. Soc. Beng.," 1864. † "Proc. Asiat. Soc. Beng.," 1870.

## DESCRIPTION

OF

## ANDAMANES BONE NECKLACES.



BY

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V. P. ANTHROPOLOGICAL INSTITUTE.

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DESCRIPTION of ANDAMANESE BONE NECKLACES.

By Dr. ALLEN THOMSON, F.R.S., V.P. Anthropol. Inst.

THE use of necklaces and waist-belts made of human and other bones by the Andamanese, and the general nature of these as ornaments and memorials, are generally well known to all those who have visited or resided in the islands, and are referred to in most of the descriptions of the customs of their inhabitants; but I have nowhere found a detailed account of the materials of which the objects in question are composed, except it be partially in the descriptive labels affixed to the specimens presented by Mr. Man in General Pitt Rivers' Anthropological collection, as also in the interesting printed catalogue of its Andamanese and Nicobarese specimens.

The circumstance of my having obtained some years ago a number of the bone necklaces along with other objects illustrating the physical characters and customs of the Andamanese by their presentation through me to the Hunterian Museum of Glasgow University by my friend and former pupil Dr. James Reid, who has resided for a number of years at Port Blair, in the South Andaman Island, first called my attention to these necklaces; and I have been led to think that it might be of some use to endeavour to determine and to describe somewhat more in detail than has yet been done the osseous components of the necklaces and belts which I now exhibit to the Institute. Among these specimens, amounting in all to 48 in number, I am happy to be able to include, through the kindness of General Pitt Rivers and the authorities of the South Kensington Museum, a number of Mr. Man's specimens from that collection.

With one exception, that of a human lower jaw afterwards referred to, all the specimens are of a like kind, being formed of pieces of bone or other substituted material strung together on cord for suspension round the neck or other part of the body; one only being of such a size as to serve as a waist-belt. Of the whole number 28 are specimens sent to me in January, 1875, by Dr. Reid, and 20 belong to the Pitt Rivers collection, nearly a half of the last being from specimens recently brought to this country by Mr. Man.

It is to be observed, however, that all these objects are not constructed of bones; but a fourth of them are made up of other materials, such as slips of cane, palm-wood and so-called red coral, and they vary also according as they are simple or more or less adorned with various appendages consisting of small shells, most frequently strings of the tubes of a Dentalium. But in all these the form and arrangement are so obviously

similar to and in imitation of those which are constructed of bones, that the latter must be regarded as the fundamental or original form of the Andamanese necklace, and the others as substitutes for bones when these could not be procured. Indeed, in several instances, we find necklaces which are mainly formed of bones filled in or completed with one or more pieces of cane either in a regular or irregular manner. These spurious or non-osseous necklaces I have separated from those which are wholly or partially composed of bones. Among the latter I have also distinguished those which are obviously made of human bones from those in which the bones of animals have been used, and I have distributed the whole series, with some reference to this distinction and the nature of the bones, in a descriptive tabular form, with consecutive numbers, and under the following general divisions, viz:

I. Human bones; probably chiefly memorial.

1st. Mostly determined.

2nd. Fragments. Some undetermined; some may be of animals.

II. Bones of animals.

1st. Metacarpals, Metatarsals, and Digitals.

2nd. Vertebrae and Ribs.

III. Imitations in Wood, Coral (?), &c.

In the tabular description which follows, details will be given for each specimen, and at this place I will direct the attention of the Institute to the most prominent feature of the more remarkable specimens, and their signification and relation to the habits of the people.

The first ten specimens enumerated in the descriptive table are undoubtedly formed, chiefly or with very few exceptions, of human bones, and are probably of a memorial character, that is, containing bones which have belonged to deceased relatives or friends, and, according to the statement of Mr. Man and others, worn in remembrance of them, and sometimes also as charms against pains, sickness, and other evils.

I have placed first two specimens (Nos. 1 and 2) of the "finger bone" necklaces, as they seem to illustrate better than any others the general nature of these ornaments. The greater number of the bones in these two specimens are from the hands of adults, and among these the most favourite bones are those of the first finger joints, or proximal phalanges. Of these there are seven in No. 1, and five in No. 2. The other hand bones are metacarpal, chiefly the first or thumb one, and the fifth, probably on account of their size; and in both specimens these hand-bones are supplemented by others of a different kind,—in the case of No. 1, with four pieces of human rib, of nearly the same

length as the digital bones; and in No. 2, with four digital bones of a turtle. The difficulty of recovering all the more suitable bones from the remains of the dead bodies, a task which Mr. Man informs us falls to be performed by the women, seems in many instances to have led to the adoption of expedients for supplementing them by means of other bones, and even, as will appear afterwards, by the substitution of other materials.

No. 1 may be taken as a fair example of the average length of the necklace, and the number and size of its component pieces.

The third specimen I have introduced into the series as an illustration of the custom which the Andamanese share with some other savage nations of wearing suspended to their necks the lower jaw or skull of a deceased friend,—as, for example, the skull of a deceased husband by the widow.

In the jaw shown from Mr. Man's specimens the knotted band is of the dimensions suited to serve for suspension round the neck of the wearer, and there is besides a profusion of ornament appended, formed of strings, 5 to 7 inches in length, of broken or entire shell tubes of dentalium (perhaps *D. ontogonum*).

The custom of carrying about the dried skull prevails among some of the Australian tribes; but there it is generally reduced to the cranium alone by the removal of the facial part, and it is often employed to hold objects, or as a drinking vessel, uses which, according to Mr. Man's statement, the skull is never put to with the Andamanese.<sup>1</sup>

It would appear that among other tribes as well as the Andamanese, the lower jaw is also worn on the person. Of this we have an example among the inhabitants of Huon Gulf, New Guinea, in the lower jaw (Christy Collection, No. 9808), probably that of a woman, fitted to be worn as a bracelet with a worked band passing across between the condyles, and ornamented with suspended shell (*Cypraea*) and seed capsules.<sup>2</sup>

In the Christy Collection there is also another very interesting specimen of the same kind, brought from New Guinea by Professor Huxley, and stated to have been worn as a bracelet. This specimen is remarkable as having been that of an old person entirely toothless, but with the alveolar process of good breadth, and well covered over with smooth hard bone, indicating that during the life of the person it had still been in effective use. In this instance the arch of the jaw was closed by

<sup>1</sup> It is not my intention to consider here the various curious ways in which the skull is preserved in a more or less ornamented fashion by different nations, as in most instances of this kind the skull is not worn on the person of the living, but preserved in temples, houses, &c.

<sup>2</sup> For the opportunity of examining this and other specimens in the Christy Collection and British Museum, I am indebted to the kindness of Mr. Read, the Assistant Curator.

two clavicles lying different ways between the condyles and bound to them; and these clavicles appeared to be those of a female.

It may also be mentioned here that the lower jaw of a native dog (Christy Collection, No. 6947) is stated to be worn as a charm by the Australians of Cape York; while in the Admiralty Islands the painted skulls of turtles are hung up in the temples, and in the Louisiade Archipelago, the inhabitants of Bruner Island suspend round their necks a pair of the skulls with the bony part of the beaks of the wreathed toucan (Christy Coll.). Of this we have no similar examples among the Andamanians.

The next specimens, Nos. 4, 5, 6, and 7 of the descriptive table, have especial interest as being almost certainly of a memorial character. The three first are all composed of bones or portions of bones which have belonged to children at or about the time of birth,—and which therefore are not completely ossified. No. 4 consists of several bones from the base of the child's skull, such as the basioccipital, the two exoccipitals, one petrosal, a basisphenoid, and probably a part of one alisphenoid, with a few less definite fragments, and seventeen nodules from the bodies of the vertebrae, all strung together in a certain order. In No. 5 there is one basioccipital bone of an infant similar to that in No. 4, and one left ischial bone; but all the remaining pieces are vertebral (42 in number) consisting of the half or ununited vertebral arches of one or other side, and eleven others which are nodules of the vertebral bodies. No. 6, again, is entirely composed of half vertebral arches from another child, apparently somewhat younger than those of Nos. 4 and 5. Of these half-arches there are 41.

No. 7 is also vertebral, but the pieces of bone are from an adult, and these seem all to consist of angular sections of the human vertebral bodies (cervical, dorsal, and lumbar) presenting at the two ends parts of the upper and lower articular surfaces of these vertebrae, and split surfaces along the sides where they are tied to the retaining cord.

The remaining three specimens of the first division, Nos. 8, 9, and 10, are composed of portions of ribs having the general appearance of those of men, and some of them in which the articular heads are present, undoubtedly human. And in these, as they must have been arbitrarily chosen, it may be right to notice that the number of the pieces varies from 10 to 13, and their length from about  $1\frac{1}{2}$  to  $2\frac{1}{4}$  inches. In No. 10, however, only seven of the pieces are formed of ribs, and these are combined with six irregularly shaped slips of other broken bones.

The nine specimens which are brought under the second section of the first division, Nos. 11 to 19, are perhaps of less interest than those previously referred to, as being formed of

broken fragments of bones in which it is difficult to determine exactly the source from which they have been derived. To the use of this form of component of the necklace the manufacturers have probably been reduced by the dearth of the more suitable entire bones. The shape of these pieces, made with the very imperfect tools of the Andamanese, is necessarily irregular and various, but they are all more or less elongated, and approach somewhat to the form of the pieces of rib. They are, however, frequently angular at the extremities. Most of them are formed of dense or compact bone, presenting the natural or outer surface of the bone on the remote side from the connecting cord, while the hollow or medullary side is next the cord. They are of such a form and thickness as to indicate their having been derived from such bones as the femur, humerus, or tibia. Others of the fragments seem to have been taken from smaller bones, such as the radius, ulna, or fibula, but all of them from the more dense shaft portion, though it would be difficult to determine their exact source, or whether all were really human.

Under the second division are brought those necklaces of which the bones are mainly if not wholly those of animals. In the first section are those composed chiefly of the bones of the fore or hind foot, and of these seven specimens, Nos. 20 to 26, six are principally or entirely from the turtle, and one only from a mammal. That specimen, No. 20, is of some interest from its consisting of the metacarpal and phalangeal bones of a hog—an animal whose bones, according to the statement of Mr. Man, and others well acquainted with the Andamanese customs, are not used in the manufacture of the necklaces. There can be no doubt, however, that these bones, consisting of the metacarpal and some digitals, belong to an animal of the hog kind. They are from a young animal, and the epiphyses (distal) are absent; but it is impossible, from there being only one specimen, to say whether this example is to be regarded as exceptional or not.

Of the necklaces formed of turtles' digital bones, some, as Nos. 21, 23, and 25, are entirely of this nature. Others, as Nos. 22 and 24, are turtles' digital bones supplemented by other bones, such as caudal vertebrae of a mammal or split fragments, and one, No. 26, containing eleven turtles' digital bones, is supplemented with eight pieces of cane placed symmetrically four on each side. Two also of this set, Nos. 23 and 24, are ornamented with strings of dentalium shells, while the rest are entirely simple or without any such addition.

I have not been able to find that any other tribes of people have the custom of wearing bone necklaces, and especially those formed of digital bones in the same manner as the Andamanese.



The nearest approach to such a custom is that which is indicated by a specimen in the British Museum, dating from 1821, which is that of strings of digital bones, probably of the Polar bear, said to be worn as hair ornaments by the Esquimaux of Savage Island. The same people also wear small models of birds made of bone and strung together. The North American Indians wear strings of bears' claws having the last phalanges in them. And in the Christy Collection there is a remarkable specimen, No. 6127, consisting of a string of six astragalus bones with three intermediate pieces of hoof, and a long strip of polished bone drilled with six circular depressions, which is said to be used among the Basutos for divination, and is described in the Journal of the Anthropological Institute by Dr. or Mr. Sanderson.

There is also in the same collection a long string (4 feet 3 inches) of the cylindrical parts of birds' bones (probably radius and ulna) about 2 inches long, worn as a necklace at the Friendly Islands.

In the second section of this Division are brought together eight examples of necklaces formed mainly of the vertebrae and ribs of animals, or portions of them (Nos. 27 to 34). Several of these were stated to be made of bones from the wild cat or *Paradoxurus Andamanensis*; but they appear to me to be for the most part of a larger size than the corresponding bones of any skeleton of that animal which I have seen, and to approach more nearly, indeed to quite equal, the size of those of a fox or moderately sized dog. The caudal vertebrae are frequently employed in the construction of these necklaces, and from the number of bones of nearly a like size in one specimen it seems probable that they have been obtained from several animals. The portions of ribs are sometimes the vertebral part with the articular surfaces entire, and at other times the sternal part. And in two specimens, Nos. 32 and 33, there are several metacarpal and metatarsal bones of *Paradoxurus*, or similar animal, combined in the same necklace with the ribs.

No. 30 stands alone as an example of a necklace formed of the caudal vertebrae of the iguana. From its shortness (12 inches) it may have been intended to be worn by a young person.

We are not altogether without parallel examples among other tribes of the employment of animal vertebrae for personal decoration; as I find in the British Museum two examples of necklaces or some such ornament formed of animals' vertebrae. One of these is from New Caledonia, and consists of about 80 serpents' vertebrae, each nearly half an inch long, and strung together through the spinal canal.

The other consists of a string of the biconically hollowed discs which form the bodies of sharks' vertebrae, artificially perforated, and about 63 in number, brought from the Solomon Islands.

In the third division of the enumeration are placed those specimens of Andamanese necklaces, which being formed of different material from the bone ones, may be regarded as imitations of or substitutes for them. They are of two kinds, viz., of wood, which is either cane or palm, and of a kind of coral; but as might be supposed from their imitative nature, they are on the whole very uniform in their construction. This remark applies especially to those formed of cane and palm wood, and they require very little remark. To secure the hollow form of the pieces on one side with the due curvature and thickness, young plants seem to be selected for the manufacture of these pieces, and occasionally two slips are placed together when greater thickness was required. Most of these wood necklaces are simple; but in two examples, Nos. 41 and 42, four shells (*Veritina gigas*?) are appended by knotted cords; and in another instance, No. 45, a few strings of Dentalium have been added.

Of the necklaces formed of pieces of so-called red coral, in which numerous small pieces of the material are strung together on the same general plan as in the bone necklaces previously described, two at least, Nos. 46 and 48 (and probably also the remaining one No. 47), consists of portions of the stalks of a jointed Gorgonia, of which I have not ascertained the specific name, but which is very similar to some specimens in the British Museum. One of these is under the name of orange coloured branched coral from the Hainan coast, 1868. With this the structure, as seen both on the surface and in broken sections of the necklace, pieces exactly corresponds, and they are altogether different from the red coral (*Corallium rubrum*) of the Mediterranean. In the smaller specimen No. 46, parts of the joints are retained, while in No. 48 the pieces of which are taken from a considerably thicker stem, only the intermediate portions are present. It is curious thus to find portions of a natural object in itself not unlike strung vertebrae taken to imitate a collection of such vertebrae.

There appear to be some other tribes of people besides the Andamanese who make use of strings of portions of cane as necklaces, but all those I have seen have been formed of complete tubes loosely strung by a cord passed through the canal, and not fragments tied on the connecting cord after the Andamanese fashion.

In the foregoing fragmentary notice of necklaces or other

such ornaments formed of bone among other tribes than the Andamanese, I might, if time had permitted it, have made some reference to the employment of teeth for a similar purpose; but however interesting this might be, and closely allied to the subject of the present communication, I believe it would open up much too extensive a field of inquiry. All ethnological museums, indeed, present numerous examples of the most various and elaborate applications of teeth of all kinds of animals to the adornment of the person as well as to more useful purposes. The only remark which I shall make in regard to this is that in all the examples of necklaces made of strings of teeth which have come under my notice, with one single exception, the teeth are invariably perforated for the passage of the connecting cord, generally near the end of the root, and are not therefore tied on to a cord as the Andaman bones are. The exception to which I refer is that of a string or necklace made of the lower incisor teeth of a large ruminant from Australia contained in the collection of the British Museum.

Without a more intimate knowledge of the customs of the Andamanese people and the nature of the products of their country than I possess I could not venture upon any detailed account of the mode of construction of their necklaces. I must limit myself therefore to some general remarks on this part of the subject. As already stated there is a remarkable simplicity and uniformity in the plan upon which the necklaces are constructed, and a still more marked absence of any artistic skill or refinement, both of execution and design. In no case is any perforation of the material attempted; but the shape of the pieces or joints, whether natural or artificially produced, is relied on for securing the fastening by means of the finer string which is coiled round them and the connecting cord. Thus the bone pieces which are elongated and somewhat thinner, or which at least do not bulge in the middle, are best suited for the purpose of fastening. Those objects also which present more or less of a convexity on one side, and a hollow on the other are well adapted for the arrangement, as we have seen in the half cylindrical form of the finger bones, in the portions of ribs and in the caudal vertebrae.

With regard to other bones, such as those of the child's skull and vertebral bodies, which are not naturally adapted by their shape to be fastened to the connecting cord, we can only suppose that the great desire to preserve them as memorials according to a traditional custom has led those who collected them to disregard the difficulties opposed by their form.

In employing other materials than bone for the construction of the necklaces in imitation of those of bone, it is obvious

that objects would be chosen which, while they could be readily procured, had a general resemblance to the more approved forms, or could be easily fashioned into them. Hence the choice of the slips of the hollow cylinders of bamboo cane or of young palms and of the joints of the *Gorgonia* before mentioned.

In the binding of the bone pieces, &c., upon the connecting cord, there is generally interposed longitudinally between them slips of a bright yellow-coloured straw, which gives some variety of colouring to the specimens which are freed from the red clay with which most of them are smeared; but the use of such attempts at variation of colour it is difficult to understand when all differences of colour are completely obscured by the red clay or oxide of iron.

The small string used for binding the separate pieces to the connecting cord is of very uniform appearance and thickness, and does not differ greatly from the small twine of this country. The connecting cord varies considerably both in length and thickness as well as in the material of which it is composed. In most instances a portion of the cord of from six to eight inches in length is left free at each end beyond the bone pieces for the purpose of tying, and the ends are generally knotted. In other instances, and especially in those to which shells are appended, the ends are fixed together close to the bones, and some length is left beyond the fastening in a subdivided form for the attachment of shells or other objects. The cord is in general made of twisted vegetable fibre from leaves or bark, but occasionally for want of the usual material various substances are employed, among which even woven cotton cloth may be found twisted into the form of cords. Sometimes also British cord seems to be employed.

With respect to the dimensions of the necklaces and their component parts, as well as the numbers of the latter, while there are occasional variations, it will be seen from the Descriptive Table that there is on the whole great uniformity.

The whole length of the necklaces within the limits of the bony parts comes in 42 out of 48 described between 17 and 23 inches, giving thus a variation of 6 inches, corresponding to a difference of 2 inches in the diameter of the circles formed by them taken as from  $5\frac{1}{2}$  to  $7\frac{3}{4}$  inches.

The length of the separate pieces of bone or other materials is also on the whole very uniform. This might have been expected with the imitations in cane and the broken pieces of bone, the greater number of which are from  $1\frac{1}{4}$  to 2 inches or occasionally  $2\frac{1}{2}$  inches. In one case only where a small fibula was used has it reached  $2\frac{1}{2}$  inches. And the size of the natural bones chosen does not in the main depart greatly from those now stated. But where vertebrae of small animals are employed, and in the



peculiar instances of the vertebral pieces of the child, very great differences are observed; and the same remark applies to the so-called coral imitations of these smaller bones.

It does not appear that there is any regularity in the number of the pieces, nor that any importance can be attached to their variations. Nearly three-fourths of the whole necklaces described have a number of pieces varying from 11 to 16. The smallest number in any case is 9. There is only one having a number between 20 and 29 pieces, viz., one having 23 pieces, there are six having between 29 and 44 pieces, and two only above the latter number, viz., one having 55 and another 80 pieces,—a circumstance which contrasts remarkably with what is found in the greater number of teeth necklaces, and still more in those composed of shells, ostrich shells, and manufactured materials in which the number of pieces is usually very great.

It may be further mentioned that the strings of bones I have described under the general title of necklaces are sometimes also worn as chaplets or head ornaments, and that some, such as No. 19, are adapted by their size for waist belts, and are actually worn as such: but these last, or ornamental girdles, are to be distinguished from the more common girdles or waistbands, made of dried leaves, bound together, and fitted with a bunch of cords or "bustle" hanging down from them behind, which constitute an essential part of the "dress or clothes" of the Andaman female (Dobson).

The difference among the necklaces and belts in respect of appended ornaments is also worthy of notice. In Nos. 3, 19, 23, and 24, brought by Mr. Man, there is a large quantity of strings of Dentalium shells; while in Nos. 41 and 42, obtained from Dr. Reid, four shells of Neritina are appended, and in one only of Dr. Reid's specimens are a few strings of the Dentalium tubes added.

It seems probable that these and other differences may be connected with a variation of the tribes to whom the objects have belonged, with regard to which differences, however, we are as yet imperfectly informed, but may expect fuller and more minute details from Mr. Man upon his return to the East. With respect to these necklaces it is also to be remarked that, as in the case of most objects of a like kind, they may now be manufactured by the natives for the European collector.

In conclusion, I have to return to Mr. Man in particular, and to Dr. Reid, Dr. Dobson, General Pitt Rivers, and others, my best thanks for valuable assistance and information connected with the objects shown to the Institute.

# SHORT DESCRIPTION OF FORTY-EIGHT BONE AND IMITATION NECKLACES WORN BY THE ANDAMANES.

## I.—HUMAN BONES, PROBABLY MEMORIAL.

1st. *Mostly Determined.*

| Specimen. | Number of Bones. | Material.                                                                                                                                      | Number of Bones in each Necklace. | Length of Necklaces within the limits. | Size of the pieces in each necklace. | Remarks of the cord on which the bones, &c., are strung. |
|-----------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------|--------------------------------------|----------------------------------------------------------|
| 1         | 1                | Ten white human metacarpal and digital bones, with four pieces of red human femur (from first digital phalanx) and four pieces of human tibia. | 14                                | 21 in.                                 | 1 to 1 1/2 in.                       | Strong cord made of twisted lard or bark.                |
| 2         | 2                | Seven white human femora (from first digital phalanx) and four pieces of human tibia.                                                          | 11                                | 17                                     | 1 1/2 to 2 in.                       | Strong cord made of twisted lard or bark.                |
| 3         | 3                | Four white human femora (from first digital phalanx) and four pieces of human tibia.                                                           | 1                                 | band 22                                | 4 in. diam.                          | Metad cord.                                              |
| 4         | 4                | Partially ossified bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.      | 29                                | 17                                     | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |
| 5         | 5                | Human bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.                   | 25                                | 19                                     | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |
| 6         | 6                | Human bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.                   | 41                                | 18                                     | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |
| 7         | 7                | Human bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.                   | 23                                | 20 1/2                                 | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |
| 8         | 8                | Human bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.                   | 19                                | 19                                     | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |
| 9         | 9                | Human bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.                   | 11                                | 17 1/2                                 | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |
| 10        | 10               | Human bones from the base of the skull (4), and bones of the vertebrae (17), and others doubtful (6), from a child at birth.                   | 13                                | 22 1/2                                 | 1 to 1 1/2 in.                       | Cord of twisted vegetable fibre.                         |



## I.—HUMAN BONES. PROBABLY MEMORIAL—(continued).

2nd. *Fragments of Human Bones, some determined.*  
Others not so; may be of animals.

| Running Number of Specimen. | —                                                                                   | Museum Reference. | Number in each Necklace. | Length of Specimen within the line. | Size of the piece within the necklace. | Nature of the cord on which the bones, &c., are strung. |
|-----------------------------|-------------------------------------------------------------------------------------|-------------------|--------------------------|-------------------------------------|----------------------------------------|---------------------------------------------------------|
| 11                          | Large angular piece of compact and thick bone shafts, such as those of humerus, &c. | M. 102a           | 9                        | 17½ in.                             | 14 to 21 in.                           | Moderately thick cord.                                  |
| 12                          | Two of same ribs, &c.                                                               | R. 7              | 10                       | 14                                  | 11 to 21                               | Thick cord.                                             |
| 13                          | Two of same, also varying much in length and breadth.                               | R. 8              | 11                       | 20                                  | 11 to 21                               | Thick cord.                                             |
| 14                          | The same, also varying much in length and breadth.                                  | R. 9              | 12                       | 14                                  | 11 to 21                               | Thick cord.                                             |
| 15                          | Angular broken piece with some pieces of ribs.                                      | M. 10             | 15                       | 21                                  | 11 to 21                               | Thin cord.                                              |
| 16                          | Two of same, also varying much in length and breadth.                               | R. 10             | 15                       | 21                                  | 11 to 21                               | Thin cord.                                              |
| 17                          | The same, also varying much in length and breadth.                                  | R. 11             | 13                       | 14                                  | 11 to 21                               | Thin cord.                                              |
| 18                          | A waisted, curved piece of compact bone, probably of humerus, &c.                   | R. 12             | 29                       | 20 + 10                             | 11 to 21                               | Thick cord.                                             |
| 19                          | ornamented with strings of Dentalium shells                                         | M. 102            | 29                       | 20 + 10                             | 11 to 21                               | Strong cord.                                            |

## II.—BONES OF ANIMALS.

1st. *Metacarpals or Metatarsals and Digitals.*

| Running Number of Specimen. | —                                                                                                                     | Museum Reference. | Number of pieces. | Whole length of the piece, or of the bone. | Size of the piece within the necklace. | Nature of the cord on which the bones, &c., are strung. |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------------------------------|----------------------------------------|---------------------------------------------------------|
| 20                          | Metacarpal and digital, &c., of young pig without the distal epiphysis and digital of the turtle, &c.                 | R. 13             | 15                | 19½ in.                                    | 14 to 21                               | Cord made of wire cotton cloth, twisted.                |
| 21                          | Metatarsal and digital of the turtle, &c.                                                                             | M. 134            | 13                | 22                                         | 14 to 21                               | English-looking cord.                                   |
| 22                          | Digit, with two others, probably caudal vertebra of a carabid, &c.                                                    | R. 14             | 18                | 21                                         | 14 to 21                               | English-looking cord.                                   |
| 23                          | Two of same, also varying much in length and breadth.                                                                 | P.R. 28           | 15                | 24                                         | 14 to 21                               | English-looking cord.                                   |
| 24                          | Four of same, also varying much in length and breadth.                                                                | P.R. 46 bis.      | 12                | 18                                         | 14 to 21                               | English-looking cord.                                   |
| 25                          | Eleven digitals of turtle (Chelonia chelonia) with eight irregular pieces of bone, ornamented with Dentalium strings. | P.R. 25 bis.      | 17                | 20                                         | 14 to 21                               | English-looking cord.                                   |
| 26                          | Eleven digitals of turtle, short, probably of foot, with eight pieces of bone, four on each side symmetrically.       | R. 15             | 19                | 22                                         | 14 to 21                               | English-looking cord.                                   |





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Royal Institution of Great Britain.

WEEKLY EVENING MEETING,

Friday, May 31, 1878.

GEORGE BUSE, Esq. F.R.S. Treasurer and Vice-President,  
in the Chair.

WILLIAM HENRY FLOWER, F.R.S.

HUTCHINSON PROFESSOR OF COMPARATIVE ANATOMY AND CONSERVATOR OF THE MUSEUM OF THE  
ROYAL COLLEGE OF SURGEONS OF ENGLAND.

*The Native Races of the Pacific Ocean.*

THE region of the world treated of in the present lecture is that known to geographers as OCEANIA, or OCEANICA, consisting of a vast number of islands of various sizes, from Australia downwards, scattered throughout the great ocean tract bounded east and west by the continents of America and Asia.

The inhabitants of these islands offer many advantages for the commencement of a study of physical anthropology, and for an exposition of the principles of the science. We shall find that they present great diversity; some of the widest contrasts to be met with in the human species are to be found among them. We shall also find in this area some of the lowest existing types of mankind, affording material for studying the most extreme deviation known from the highest race, as exemplified in the European. Lastly, the comparative isolation in which the greater number of these islands have remained for countless generations, lying hidden in their ocean solitudes, far away from the track of commerce and civilization, has caused their inhabitants to develop and retain distinctive characteristics more sharply defined than those of other regions of the world, where constant inter-communication has resulted in infinite and intricate blendings of primitive races, and but partial and imperfect evolutions of new ones.

The people of these islands will be treated of here mainly from an anatomical point of view, and in great measure from observations made upon such portions of their bodily frame (chiefly crania) as are preserved in the collection under my charge. But it must be observed *in limine*, that this collection, as with all others yet formed, large as it may appear to the uninitiated in the difficulties of craniology, is wholly insufficient for the purpose of constructing a classification of mankind, founded on physical structure. It can

only afford certain indications, valuable as far as they go, from which a provisional or approximative system may be built up. Very many, indeed the majority, of the islands are totally unrepresented in it; others are illustrated by only one or two individuals. Far larger collections, and far more systematic and minute observations, than have yet been made, are required before the natural history of man in this region can be worked out in any detail. The results obtained at present are however sufficient to encourage us to persevere, and to vindicate the study of anatomical characters, especially those of the skull, as a basis for a natural classification, from the disrespect into which it has fallen, on account of the failure of tentative systems of craniology, founded on far too imperfect materials, and too imperfect use of those materials.

I will begin by speaking of the great continental island, as it may be called, of Australia, which when discovered by Europeans was inhabited throughout by a race, distinct in the totality of its characters from any known to exist in any other part of the world. It will be convenient to consider this race first, partly because the materials at my disposal for its investigation are more abundant and more complete than in the case of any other of the races of the Oceanic area, and partly because a comparison of its characters with those of the best known race (that to which we ourselves belong, and which is commonly taken as the standard in works on human anatomy) will afford a good idea both of the kind and the degree of variation to be met with between one of the lowest and one of the highest groups of mankind, and we shall at the same time be able to appreciate whether, and if so, to what extent, any approximation is made by the former towards any still lower types of animal organization.

Although the northern coast of Australia had previously been seen by Spanish and Portuguese navigators (as by Torres in 1606), the first rencontre of any European with the native inhabitants appears to have been that of Abel Tasman, the celebrated Dutch seaman, who in 1644 was sent out by Van Dieman, governor of the possessions of Holland in the East Indies, on his second voyage of discovery. The part which he visited (and to which he gave the name of New Holland) was the north-west coast, and he describes the natives as naked, black, and curly-haired.

The earliest description of the aborigines of Australia by any Englishman is that of Dampier, who in his first adventurous voyage round the world stayed on the north-west coast, not very far from the spot visited by Tasman, from January 4th to March 12th, 1688. He has left us a tolerably full account of the inhabitants, which, although presenting some discrepancies from those of more modern travellers, is valuable, and probably on the whole trustworthy. "The inhabitants of the country," he says, "are the miserablest people in the

\* 'A New Voyage round the World,' by Captain William Dampier. Sixth edition, 1717, vol. i. p. 464.

world. The *Hodmadods* [Hottentots] of *Monomatapa*, though a nasty people, yet for wealth are gentlemen to those; who have no houses and skin garments, sheep, poultry, and fruits of the earth, ostrich eggs, &c., as the *Hodmadods* have. And setting aside their humane shape, they differ but little from brutes. They are tall, strait-bodied, and thin, with small, long limbs. They have great heads, round foreheads, and great brows. They have great bottle noses, pretty full lips, and wide mouths. The two fore-teeth of their upper-jaw are wanting in all of them, men and women, old and young; whether they draw them out I know not. Neither have they any beards. They are long-vizaged, and of a very unpleasing aspect, having no one graceful feature in their faces. Their hair is black, short, and curly'd, like that of the Negroes; and not long and lank, like the common *Indians*. The colour of their skins, both of their faces and the rest of their body, is black, like that of the Negroes of *Guinea*. They have no sort of cloaths, but a piece of the rind of a tree ty'd like a girdle about their waists, and a handful of long grass, or three or four small green boughs full of leaves, thrust under their girdle to cover their nakedness. They have no houses, but lie in the open air, without any covering; the earth being their bed, and the heavens their canopy. Their only food is a small sort of fish, which they get by making wares of stone across little coves, or branches of the sea. In other places they seek for cockles, mussels, periwinkles, &c. He describes their weapons as wooden swords and lances. "The sword is a piece of wood shaped somewhat like a cutlass," probably a boomerang. It is satisfactory to note that the relations of Dampier and his companions with the natives, both on this and his second visit to Australia at Shark's Bay, eleven years later, were perfectly amicable, or at all events unattended by any serious disagreement or casualty on either side, a sudden and vigorous beating of the drum being sufficient to scare them away on one occasion when they had become troublesome and even threatening.

The next visit of an Englishman to Australia was one which led to far more memorable consequences. It was that of Captain Cook, who, on his first voyage round the world, after sailing westward from New Zealand, reached the coast of "New South Wales," as he named it, near Cape Howe, on the 19th of April, 1770, and sailing northwards, explored the whole east coast to Cape York in Torres Straits. His first sight of the natives, on April 27th, is described at page 489, and his first landing, on the following day, at page 492 of the great navigator's deeply interesting narrative. Read by the light of subsequent events, the gallant though unsuccessful defence of their native land by two naked savages against a boat's crew of forty armed men must excite our sympathy. Certainly no more critical event has ever occurred in the history of any nation, nor combat ever fought attended with such momentous consequences, to one at least of the races engaged, as that which took place in Botany Bay on April 28th,



1770. On that day the fate of the Australian race, which had been for untold ages in undisturbed possession of their native soil, was sealed. Cook's discovery led to the settlement of the country by the English. The settlement of the country by the English means the inevitable annihilation of the aboriginal race.

Cook afterwards saw more of the natives of the northern part of Australia (now Queensland) during his enforced stay in "Endeavour Bay," and has left us a detailed account of their physical characters, condition, and customs,\* which, as in the case of all other descriptions given by the illustrious navigator, subsequent observation has fully corroborated, and which will be incorporated with what I shall have to say on these subjects presently.

The whole of the habitable part of the great land tract, 2400 miles from east to west, and nearly 2000 from north to south, when first explored by Europeans was found to be occupied, though very sparsely, by people having a remarkable general similarity in physical characters, language, and customs, though whether they are all to be considered as belonging to one race, or whether, as some suppose, they result from the blending of two originally distinct races, it is not easy upon the present evidence to decide. The latter theory certainly has the merit of reconciling the discrepancies between the accounts of different observers. It will be reverted to in speaking of their physical characters.

The geographical position of the country has isolated them in a remarkable manner, probably for long ages, from all the rest of the world; except for a little infusion of Papuan and Malay influence on the north coast, all the civilization they possess is undoubtedly their own. This isolation must be taken into account, in considering their social condition, as an index of their real elevation in the scale of humanity; for as with individuals so with nations, those naturally of inferior endowments may, by the influence of educated and civilized neighbours, appear superior to others who have not had these advantages. Although, as will be shown hereafter, the anatomical structure of the Australian, as compared with that of the European, shows signs of degradation, yet, in some respects, he is not below, but, perhaps, rather above, some African negroes, who may greatly surpass him in knowledge of the arts, in social customs, and other conditions, by which relative superiority of race is usually tested. But then the Africans have been living from time immemorial in contact with more highly educated races.

However this may be, it is certainly true that there is nowhere existing at present any large group of human beings, the inhabitants in fact of a whole continent, so totally removed from what we call civilization, as were the Australians when first discovered; as the following short summary of their condition will show:—

Of clothing the majority had none, being like those described by

\* *Op cit.*, p. 631, et seq.

Cook, absolutely naked, both sexes alike. Some, however, wore a girdle or band of bark, leaves, or skin, and others a short cloak, made of kangaroo skin, thrown over the shoulders. Yet they were not destitute of the idea of personal adornment, daubs of red or yellow ochre mixed with grease on the body, a stick or a bone stuck through the septum of the nose, and feathers in the hair were indispensable to the full dress at least of the men. They had no fixed dwelling-places, but moved about from spot to spot as inclination or necessity compelled, erecting temporary shelters of the most primitive and unstable character, of boughs of trees, or pieces of bark. Some (as those described by Dampier) appear to have made no habitations of any kind. Their bark or log canoes were of the roughest and most simple construction, though in this, as in some other respects, an improvement is observed near Cape York, doubtless under Papuan influence. They had no bows and arrows, their arms being spears, lances, and shields, and two remarkable and ingenious weapons peculiar, or nearly so, to themselves, and almost universally distributed throughout the country, the boomerang or the "wummera," or throwing stick. With the aid of the latter in propelling their lances, "at fifty yards," Captain Cook says, "they were more sure of their mark than we were with a single bullet." They had no metals and no kind of pottery for domestic use. The only vessels that they had for holding water were curved pieces of bark, or, in some districts, the skulls of their deceased relatives. They knew, however, how to manufacture knives of flint and shells, axes of stone, and cord and nets out of native grass. Their cookery was of the rudest kind, as they had no vessels in which they could boil water. Their food consisted of the flesh of kangaroos and other marsupial and rodent mammals, fish, molluscs, crabs, snakes, lizards, wild seeds, roots, and fruits. They made no sort of attempt at cultivation of the ground, and possessed no domestic animal, except the half wild dingo, or native dog. Cannibalism, though occasional, was not so universal a custom as with many other races higher in the social scale, as the New Zealanders and Fiji islanders.

They were divided into numerous small tribes, each composed of a varying number of individuals (from fifteen to three hundred or more), which were constantly at war with each other. They acknowledged no hereditary or formally elected chiefs, but had several curious and complicated social customs, of which those relating to the initiation into manhood, and others designed to prevent the intermarrying of near relations, are the best known. They possessed nothing resembling writing, but native drawings have been discovered, which (as in the case of many others of the least elevated of mankind) show some power of representing graphically the forms of men and animals. Though every tribe spoke its own dialect, all the languages of the continent are said to have possessed closely allied common characters.

It will be seen from this summary that the Australian of the present day is on an immeasurably lower level of civilization than the



Britons were, even as far back as the neolithic period, ages before the invasion of Caesar, as there is fairly good evidence that the country "was then inhabited by a tolerably large population, divided into tribes, and living principally on their flocks and herds, acquainted with agriculture, and supplementing their food by hunting and fishing. They were acquainted with the arts of spinning and making pottery, and with mining, and exchanged their commodities by barter. They were possessed of boats, in which they could make voyages from France to Britain or from Britain to Ireland. They revered their dead by erecting tombs, and they worshipped the Great Unknown in those rude temples which astonish us on the lonely moor, or the swelling chalk down, or within reach of the sound of the waves on the sea-shore."<sup>\*</sup>

I do not propose to enter into the question of the moral and intellectual character of these or of the other people of whom I shall have to speak, as there is no subject upon which it is so difficult to obtain satisfactory evidence or to draw just conclusions. It is hard enough to do so with people about whom we have ample means of judging, but to attempt it with savages, whose language is imperfectly understood, and whose ideas and notions are most difficult to appreciate, would lead me far beyond the scope of the subject I have undertaken; so I will pass at once to the physical characters of the race.

Although there are many general traits common to all Australians, yet, as indicated above, it is by no means certain that they are such a homogeneous people as has been often supposed. Topinard, who has made a careful summary of the descriptions of various travellers,<sup>†</sup> thinks that he can distinguish two races, which, either pure or mixed in various proportions, constitute the various tribes now, or recently, inhabiting the continent.

1. The finer race, taller and lighter coloured (chocolate or coppery), with straight or wavy hair, inhabiting the elevated plains of the whole of the interior, and reaching the coast at Queensland, and to the north. These are the people described by Cook at Endeavour Bay.

2. The lower race, negroid, black, and small, with woolly hair, and more prognathous. They are met with chiefly on the coast at various parts, as on the north-west (Dampier), King George's Sound, and the neighbourhood of Sydney. These, Topinard considers the primitive inhabitants of the land; they are now becoming extinct, by absorption into the other, the invading race, and by the encroachments of the latter and of European settlers. He thinks, moreover, that he can distinguish two types of Australian crania; but these have not been associated hitherto with the other characters, as unfortunately the larger number of osteological specimens in our Museums have

<sup>\*</sup> 'Edinburgh Review,' April 1878, No. 302, p. 448.

<sup>†</sup> 'Étude sur les Races Indigènes de l'Australie.' Paris, 1872.

no indication of the tribe, or of the external appearance of the individual, to which they belonged.

Under these circumstances, it is necessary at present to treat them all as belonging to one race, trusting to future and more careful observations to discriminate between the different branches into which it may have become divided, or perhaps the different roots from which it may have sprung.

With regard to the stature of the Australians, we have really no very precise information; travellers almost always trusting to somewhat vague impressions, instead of actual measurements. Stanbridge, however, gives the average of men of Victoria as 5 feet 5½ inches. As facts contributing to a knowledge of this subject, I may mention that the height of four adult male skeletons now in England are respectively, 1. (Middlesex Hospital) 5 feet; 2. (Cambridge University) 5 feet 4 inches; 3. (Cambridge University) 5 feet; 4. (Barnard Davis collection) 5 feet 1 inch; and four in the Blumenbach collection at Gottingen, are according to Dr. J. W. Spengel, respectively 5 feet 8 inches, 5 feet 5 inches, 5 feet 3 inches, and 5 feet 3 inches, giving an average of 5 feet 3 inches for the eight males. Three female skeletons, two in the museum of the Royal College of Surgeons, and one at Haslar Hospital, are respectively 5 feet 2 inches, 4 feet 11 inches, and 4 feet 11 inches. These numbers are of course quite insufficient to give the true average of the race, but I think that we may infer from them, that the general height is somewhat less than that of Englishmen, whose average, as ascertained by the very careful observations of Dr. Beddoe, is not very far from 5 feet 6½ inches.\*

The colour of the skin presents various shades of darkness, never really black, but more usually of a dark brown or chocolate colour. The hair is always black, though often artificially discoloured by lime or ochre. It is greatly developed upon the scalp, face, breast, shoulders, and arms; the men being nearly always full-bearded. The hair on the head has neither the stiff, lank character of the Mongolian and American races, nor (unless in exceptional cases, as those described by Dampier, indicating mixture of other races) the frizzly or "woolly" character of the negro or Melanesian; but is fine, silky, and slightly curled or wavy. When allowed to grow long, it commonly hangs on the head in tangled, shaggy masses. As in general appearance, so in microscopic section, it is intermediate between the two extreme forms mentioned above, having neither the nearly cylindrical form of the lank-haired races, nor the flattening of the frizzly-haired groups of men. It is, in fact, very similar in size and form to that of many Europeans.

The figure of the Australian is variously described by different travellers; but the limbs, especially the legs, are generally said to be

<sup>\*</sup> 'On the Stature and Bulk of Man in the British Isles.' 'Mem. Anthropol. Soc. Lond.' vol. iii. 1870.

slender, and the head appears disproportionately large. In fact, as will be shown presently, though the cerebral cavity is small, the outline of the bony framework of the head is large and long, and the overhanging brows, profusion of shaggy hair, and luxuriant beard, heighten the effect of size.

Judging from descriptions, and numerous photographs which I have seen, there is a type of countenance common to, and very distinctive of, all Australian natives. In the album of the Anthropological Institute, there are excellent photographs of upwards of fifty natives of both sexes and different ages, which present a remarkable family likeness. It is true that, though from various tribes, these are all from one district, near Melbourne; but others from New South Wales, and from North Australia, show the same common characters, and the general resemblance of the facial portion of the skulls indicates a general prevalence of similar and strongly marked features. These are as follows:—The head is narrow and long behind the ears. The eyes (which are said to be bright and sparkling) are sunk beneath very heavy and prominent brows. The nose is short, not prominent, but very wide, its width at the lower end equalling its height, and being about one-third of the whole width of the face. The upper part of the dorsum is deeply sunk under the projecting forehead, there being no prominence of the "bridge"; the dorsum seen in profile is straight or slightly rounded. The apex is thick and round, the nostrils dilated, their plane directed downwards, outwards, and forwards. The mouth is very wide; the lips thick and projecting, though by no means to the extent observed in most African negroes. The degree of prognathism varies, as will be seen when speaking of the cranium. The chin is usually small.

No part of the organization offers such definite characters for description, analysis, and comparison as the skeleton. The bones are nearly imperishable, readily preserved, and easily examined and measured. Of all parts of the skeleton the cranium is the most valuable, as it gives the means of estimating the volume and form of the brain; and the facial characters, by which the races of mankind are so strongly differentiated, have their outlines clearly indicated in its bony framework.

The Museum of the Royal College of Surgeons contains a fine series of crania of native Australians, fifty-four in number—a far larger series than is contained in any one collection elsewhere. Of these, twelve are from North Australia, Cape York, and Port Essington; one from Queensland; six from New South Wales; nineteen from South Australia; four from West Australia; and the remainder from unknown localities. As I have not been able to find any constant characters by which the skulls from different regions of the continent can be distinguished, I have taken them all together in the following summary of their characteristics, irrespective of locality. Five of the skulls have not arrived at full maturity, having the basal suture still open (being, therefore, below the age of twenty), and

are consequently rejected in the average of measurements. Of the remaining forty-nine, twenty-six appear to belong to males and nineteen to females; the remaining four being doubtful. The sexual characters are generally very well marked. Of pathological deformities sufficiently marked to interfere with the normal characters of the cranium, or of variations of form caused by premature synostosis of the sutures, there are none; and not one of the series (or any other Australian which I have examined) shows any signs of having been artificially deformed during infancy. These skulls show that the practice of knocking out some of the front teeth on initiation into manhood is not so frequent as some writers on the customs of the Australians would lead us to believe. In only one case, both central upper incisors have been lost, and the right only in five cases, the left in one, though this latter may have been due to natural decay. Among fifteen Australian skulls in the Army Medical Museum, at Netley, three have lost the right central incisor, none the left.

In order to appreciate the distinctive characters of the Australian crania more fully, I have compared them with a corresponding number of Europeans, and have taken Italians as the only nation of which a sufficient number exist in the Museum to obtain a fair average of both sexes. This is owing to the College having a few years ago purchased the valuable collection of ancient and modern Italian and Greek crania, formed by Professor Nicolucci. From these I have selected forty male and twenty female crania from various parts of Italy, taken at hazard from the modern collection, regard only having been paid to their being adult and of no abnormal form. These were probably all from people of the least cultivated classes, and whose average height would not differ greatly from that of the Australian.

In general size, as estimated by the principal external diameters of the cranium, there is a wonderful similarity between the two races. The average horizontal circumference\* of the Australians of both sexes is exactly 19·7 inches, while that of the Italians is 19·8 inches.† Though the average length, height, and breadth of each differ individually, these three mean dimensions added together come to exactly the same in both races, as the following table shows:—

|                      | Australian. | Italian.     |
|----------------------|-------------|--------------|
| Average length .. .. | 7·2         | 6·9          |
| " breadth .. ..      | 5·1         | 5·5          |
| " height .. ..       | 5·1         | 5·0          |
|                      | 17·4 inches | 17·4 inches. |

\* This is measured by a tape passed round the skull, just above the glabella, and over the most prominent part of the occiput—the line Op O in Fig. 1.

† The average for both sexes, where the number of skulls of each has not been equal, is obtained by adding together the average procured for each sex separately, and dividing the result by two; otherwise a preponderating number either of males or females in the series would have a disturbing effect upon the general average.



Yet the capacity of the interior of the cranial cavity is very different, the average of the Australians of both sexes being 74.7 cubic inches, or 1224 cubic centimetres, and that of the Italians 83.4 cubic inches, or 1367 cubic centimetres, giving an advantage of nearly 9 inches to the latter. This difference is accounted for partly by the greater thickness of the Australian cranium, but chiefly by its angularity, the upper lateral parietes being flattened and sloping from the median line above like the roof of a house, instead of having the round, dome-like form of the European cranium; being, in fact, as Professor Cleland expresses it, "ill-filled."

The average of the twenty-six Australian male skulls is 78.4 inches, or 1285 cubic centimetres; that of nineteen females, 69.7 inches or 1142 cubic centimetres. The highest male is 88.5 inches (1450 cubic centimetres), or less than the average male Italian (89.1 inches = 1460 cubic centimetres). The smallest of the Australian series (a female) is 62.9 inches, or 1030 cubic centimetres. The greatest care was used to ensure accuracy in the measurements, which were taken by the method to which, after many thousand trials, I have now given the preference—i.e. filling the skull with mustard seed and estimating the quantity by means of Busk's chrenometer,\* certain precautions being adopted which it would take too long to describe here. It is perfectly clear, then, that in cranial capacity, which is the most accurate way of estimating volume of brain, the Australian savage is very inferior to the Italian peasant.

The general form of the cranium seen from above (the *norma verticalis* of Blumenbach), is ordinarily estimated by stating the proportion which its greatest breadth in the parietal region (Fig. 3, P P') bears to its extreme length from before backwards (O O'), the latter being reckoned as 100. This gives the index of breadth, or latitudinal index, or, as it is often called, the cranial index.† According to the most convenient system of nomenclature, when the index is below 75 the skull is called *dolichocephalic*, or long-headed; when between 75 and 80, *mesocephalic*; when 80 or above, *brachycephalic*, or short-headed. The average length of the male Australian crania of this collection is 7.31 inches, the length of the female being 7.00. This diameter is taken from the *ophryon* of Broca (Fig. 1, Op) to the most distant part of the occiput (O), and does not include the projection of the glabella (G). The average breadth of the male is 5.18, of the female 5.06. The indices are more interesting than the absolute diameters, as they give an idea of the form of the skull. The average latitudinal index of the twenty-six male skulls is 71.2, of the nineteen females, 72.3; so that as a race, the Australians are strongly *dolichocephalic*. On analyzing the indices of the forty-

\* G. Busk, "Note on a Ready Method of Measuring the Cubic Capacity of Skulls," *Journ. Anthropol. Institute*, vol. iii. p. 200.  
† Obtained thus:  $\frac{\text{breadth} \times 100}{\text{length}} = \text{index}$ .

nine skulls separately, I find that forty-five of them range between 68 and 74, which may thus be called the normal limits of variation. One is exceptionally low, viz. 67, making forty-six out of the forty-nine truly *dolichocephalic*. Three come into the category of *mesocephaly*, one having an index of 75, one of 76, and one the altogether exceptional index of 78. Of the genuineness of this last, I have, however, some doubts, as it presents some other aberrant characters. Excluding this, not one approaches the borders of *brachycephaly*.

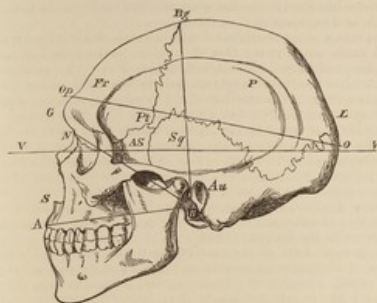


Fig. 1.—Side view of skull of male Australian.\* V V. Horizontal line, corresponding with visual axis. A. Alveolar point. S. Spinal point, or base of nasal spine. N. Nasion, or centre of fronto-nasal suture. G. Glabella. Op. Ophryon, or centre of supra-orbital line. Bg. Bregma, or union of coronal and sagittal sutures. L. Lambda, or union of lambdoid and sagittal sutures. O. Occipital point. Au. Auricular point, or centre of external auditory meatus. B. Basion, or centre of anterior margin of foramen magnum. Pt. Pterion, or point where the frontal (Fr), parietal (P), squamosal (Sq), and alisphenoid (AS) bones meet.

It is interesting to find that other collections of Australian crania give closely similar results. Thus I found the average latitudinal index of ten male Australian skulls in the Army Medical Museum at Netley, to be 72. Broca gives 71.93 as the average of seventeen of both sexes at Paris, and Dr. Barnard Davis 72 as the average of twenty-three in his collection. From all these various data, there can be no doubt that it is a perfectly well-established fact, that the average cranial index of the skull of the Australians is 72, or slightly

\* The figures are all from specimens in the Museum of the Royal College of Surgeons of England. They are drawn geometrically by means of Broca's stereograph, and reduced one-third.



less, and that they are, therefore, to be placed among the most dolichocephalic of races.

The Italians show in this respect far greater variation than the Australians, the extremes ranging between 71 and 91, the average of both sexes being as high as 80, or just within the compass of brachycephaly.

The height of cranium is estimated in various ways by different anthropologists, but the most convenient is the distance from the basion or anterior margin of foramen magnum (B, Fig. 1), to the bregma or junction of the coronal and sagittal sutures (Bg, Fig. 1). This dimension in the Australian skulls of both sexes in the College Museum is practically equal to the breadth. In the males it rather exceeds the latter, but in the females falls short of it. The average altitudinal index (ratio of height to length, the latter being 100) in the male is 72.0, in the female 71.1. The range of variation is greater than that of the breadth, being from 63 to 80. The average altitudinal index of ten skulls of males at Netley is 74, or rather higher than the College series—a circumstance probably due to the latter containing a number of skulls belonging to a peculiar tribe from the neighbourhood of Adelaide, of exceptionally depressed form, of which there are no representatives in the Netley collection.

Every Australian cranium yet examined, of either sex, is what Busk calls *phanozygous*—that is to say, in the *norma verticalis*, when held at arm's length and looked at with one eye, both zygomatic arches are seen at the same time. Of the Italian skulls, out of twenty females, only one is phanozygous, and that very slightly; out of forty males, eighteen present this condition. This depends upon the comparative development of the cranial parietes (Fig. 2, P P) and the zygomatic arch (ZZ), or cerebral versus muscular development. In the Australian crania it rather indicates narrowness of brain cavity, than any great size of the zygomata, for as a general rule the various ridges and processes for the attachment of muscles are not very strongly marked. The mastoid processes are not large, and theinion and occipital curved lines are moderate, the former in no case exceeding No. 3 of Broca's scale,\* usually but No. 1 or 2 in the males.

On the other hand, every skull, without exception, male or female, has a prominent glabella. In the males it equals No. 3 or No. 4 of Broca's scale, rarely as low as 2; in the females 2 or 3. Even in the children's skulls this character begins to show itself.

The sutures of the cranium are generally less complex than in European skulls, and Wormian bones in the lambdoid suture are less frequent and more simple in character. Metopism,† or persistence of

\* "Instructions Craniologiques et Craniométriques," "Mém. de la Soc. d'Anthrop. de Paris." T. ii. 2nd ser. 1873.

† One of the many convenient terms introduced by Broca into craniology. See "Notions complémentaires sur l'ostéologie du Crâne," "Bull. de la Société d'Anthrop. de Paris," 29 Mai, 1875; and "Instructions Craniologiques et Craniométriques," "Mém. de la Soc. d'Anthrop." Tom. ii. 2nd ser. 1873.

the frontal suture into adult age (see Fig. 4), does not occur in a single instance; whereas out of the sixty Italian skulls, as many as ten are metopic, which nearly agrees with the statement of Broca, that in European skulls this feature occurs in one out of every seven. The condition of the sutures at the region of the skull, called the "pteron" by Broca (the anterior part of the temporal fossa, near the great wing of the sphenoid bone, Fig. 1, P), is of some interest as a race-character. These conditions may be classified thus:—1. The squamosal actually coming in contact with the frontal (*Pteron retourné*, Broca). 2. The squamosal coming near the frontal (less than half a centimetre) "stenocrotaphitic" crania. 3. An "epipteric" bone, or small separate ossification developed at the upper end of the great wing of the sphenoid. 4. Neither of the above conditions present, but a simple sphenoparietal suture of more than half a centimetre in length, as in the skulls usually considered normal among Europeans (*pteron en H.* Broca). Comparing both sides of the whole number of Australians and of Italians examined, the relative frequency of the different conditions in the two races, reduced to terms of 100, is as follows:—

|                     | No. 1. | No. 2. | No. 3. | No. 4. | Total. |
|---------------------|--------|--------|--------|--------|--------|
| Australians .. .. . | 9.1    | 37.3   | 14.5   | 39.1   | 100    |
| Italians .. .. .    | 2.5    | 14.2   | 10.8   | 72.5   | 100    |

The form of the skeleton of the face is, as has been mentioned before, extremely characteristic of race, though it has not usually received as much attention as it merits. The facial angle, as it is called, or angle formed by the profile of the face with a horizontal line, has certainly been very much talked about since the time when Camper first drew attention to its interest as a distinguishing character of higher or lower races. Many modifications of Camper's angle have been proposed, both as to the horizontal and the vertical line, and many methods of measurement have been adopted, none, however, so commodious as Broca's "median goniometer." Measured by this instrument, the angle having its apex at the "alveolar point" (anterior and inferior point of premaxilla in the median line, Fig. 1, A) and one limb passing through the centre of the external auditory meatus (Au), and the other through the "ophryon," or centre of forehead, immediately above the glabella (Op), which may be called the ophryo-alveolo-audicular angle, averages in 42 adult Australian crania of both sexes, 64.5°, or 63.9° for the males and 64.8° for the females; in 60 Italians the average of both sexes is 68.0°, or 67.9° for the males and 68.2° for the females. The size of this angle, it will be observed, depends upon several distinct conditions of the skull, which are not directly related to each other; the chief of which are—(1) the prominence of the forehead, (2) the projection forwards of the upper jaw, and (3) the length of the face from above downwards. The difference of the angle in the two races is chiefly due to the second, for the Australian forehead, though considerably narrower than the European, is very nearly, if not quite, as prominent; the average distance between the basion and centre of the frontal bone (the frontal

radius) being almost exactly the same in both races. This is not surprising considering, as mentioned before, the actual height of the skull at the upper part of the frontal bone (bregma) measured from the basion is greater in the Australian than the Italian.

The prognathism or projection forward of the jaws is most readily estimated by comparing the distance from the basion to the nasion (naso-frontal suture), or the *basio-nasal length* (Fig. 1, B N), with that from the basion to the alveolar point, the *basio-alveolar length* (B A), both most easily measured with the sliding callipers. When the latter dimension considerably exceeds the former, the face is said to be *prognathous*; when the reverse is the case, it is *orthognathous*; when the two dimensions are equal or thereabouts, it is *mesognathous*.

The exact degree of gnathic projection is expressed by an index formed by the relation of the basio-alveolar (B A) to the basio-nasal length (B N), the latter, as the more fixed, being taken as 100. If the index is between 98 and 102, the face may be considered mesognathous; if below 98, orthognathous; if above 102, prognathous.

The Australians taken altogether come into the prognathous category, the general average of the indices of the adult skulls of both sexes, in which the face is preserved, being 104; that of the females alone being nearly 105, and that of the males 103. There is considerable individual variation. In seven cases out of the forty-two, B A is equal to B N, and in five it is actually less. Among the sixty Italian crania measured for comparison, there is also much individual difference, some few being prognathous, and six having the two dimensions equal; but taking the general average, orthognathism prevails, the mean index being 97. In a very well-formed English skull, the gnathic index is as low as 92.

The height of the face of the Australians is less than in the Italians; the length from the nasion to the alveolar point (N A) averages in the males of the former, 67 millimetres, in the males of the latter, 70 millimetres.

The nasal bones of the Australians are extremely characteristic, being remarkable among all races for their shortness, and for the depression of their upper part, which is sunk beneath the overhanging glabella. The importance of the general form of the nasal aperture as a race-character, was pointed out by the late Dr. Williamson, in his catalogue of the crania in the Army Medical Museum; but the readiest mode in which this may be estimated and expressed is one of Broca's numerous and valuable contributions to craniology.\* His "nasal index," or ratio between the greatest width of the nasal aperture (Fig. 2, n n) and its height—including the nasal bones, and measured therefore from the nasion or centre of the fronto-nasal suture (N) to the lower border of the aperture or base of the nasal spine (S)—is one of the most useful of all the cranial indices in distinguishing races, and is of great assistance in forming an idea of the characteristic

\* "Recherches sur l'Indice Nasal," 'Revue d'Anthropologie,' Tome i. 1872.

physiognomy of the individuals composing them. The most usual height of the nasal aperture is about 100 millimetres, the width about 50 millimetres; the index, consequently, 50. This may be taken as a general mean of all races, and thus individuals or races in which the index varies only slightly on each side of this figure (between 48 and 52) are called by Broca, *mesorhine*. Those in



Fig. 2.—Front view of skull of Australian. P P, Parietal eminences. Z Z, Zygomatic arches. Op, Opisthion. N, Nasion. S, Spinal point. n n, Width of nasal aperture. O O, Width of orbit. o o, Height of orbit.

which the index is lower than 48, are *leptorhine*, or narrow-nosed; those in which the index is 53 or higher, are *platyrhine*, or broad-nosed. The Australians come decidedly under the latter category, the general average index of 41 crania of both sexes being 56.5.\* Out of the whole number, 34 are platyrhine (more than half have an index between 54 and 58, the highest index being 69), 7 are mesorhine, and these nearly all on the platyrhine side, in one only does the index fall below 50, and not one in leptorhine. Indeed, a leptorhine Australian cranium would be as great a phenomenon as a brachycephalic one, and would require strong proof of its authenticity.† The females, on the whole, are rather more broad-nosed than the males, their average being 57.6, that of the males being 55.8. The average nasal index of ten male Australian crania in the Army Medical Museum at Netley, is 54.8.

\* This, as with the other general averages, is not the mean of the individual indices, but what is more accurate, the index of the means of the dimensions i.e. mean width  $\times 100$  mean height.

† There is, however, one in the collection of the Anthropological Institute, which appears to be genuine. The index is only 46.



In the sixty Italian skulls, the average nasal index is 47, there being little difference between the sexes; they are, therefore, as a race, leptorhine, though approaching the confines of the intermediate category. There is, however, very considerable variation among them, as many as 8 being platyrhine, 18 mesorhine, and 34 leptorhine; the highest being 58.3, the lowest 39.6.

The general character of the face depends much on the form of the orbit. In the Australians this is elongated and rectangular rather than round, and with the upper and lower border nearly parallel. The orbital index of Broca, or relation of the height (Fig. 2, *o o*) to the width (O O) of the anterior margin, measured according to the method for which I must refer to his memoir,\* gives a good idea of its general shape. A low orbital index shows a wide and depressed orbit, generally overshadowed by a heavy superciliary ridge; a high index shows a round, open orbit. There is much individual variation in this character, as in all others derived from the cranium, in every race; but the averages often give useful differentiating characters. As with the other indices, it is convenient to group them into three—the high (*megaseme*), intermediate (*mesoseme*), and low (*microseme*), the limits of which are set by Broca at 89 and 83 respectively; 86 being taken as the general average of all races. The orbital index of the average male Australian of this collection is 81.8, of the female 82.9, or of both sexes together 82.3; so that taken all together, they are *microseme*. With regard to the variations, 15 out of the 42 are *mesoseme*, and the highest index among the males is 88.1, so that not one of this sex is *megaseme*. Two females, however, enter this category, having respectively indices of 89.7 and 92.1. This quite accords with the fact pointed out by Broca, that as a general rule the orbital index of the female is greater than that of the male; indeed, these Australians are in this respect exceptionally equal. The mean orbital index of the ten male Australians at Netley accords remarkably with that of those in the College of Surgeons' collection, being exactly 82.0. The Italians have a higher orbital index, and therefore rounder orbits than the Australians, the mean index being 86.0 for the males and 90.9 for the females.

The malar bones are remarkably small and weak in the Australians, the lower border especially is very little developed. They also slope away from the median line of the face, and the outer margin of the orbit, as best seen in the profile view of the face, is placed considerably behind the inner margin, offering the greatest contrast in this respect to the Mongolian type, which reaches its greatest development in the Eskimo. The malar bones of the European are deeper and stronger than the Australian, though they also slope backwards from the middle line.

The nasal spine is never large, usually No. 2 of Broca's scale,

\* 'Recherches sur l'Indice Orbitaire.' Paris, 1876. Also 'Instructions Craniologiques et Craniométriques.'

or often No. 1, and in two cases it is obsolete, as in the apes. The lower margin of the nasal opening is not sharply defined, as in the European; but the floor of the nasal chamber passes gradually into the anterior or external surface of the alveolar process of the maxilla.

The palate, though varying in different individuals, is often of a form very rarely seen among Europeans, i.e. long and narrow, with lateral margins nearly parallel, and the anterior margin straight (hypsiloid). It has very seldom the even semicircular form (parabolic) seen in many other races.

Though the mandible or lower jaw varies in form in different individuals, when a considerable series is examined and compared with a corresponding series of Europeans, it will be seen that in the majority of the Australians the symphysis is shorter from above downwards, the mentum or chin more retreating, the horizontal ramus longer and lower, with its upper and lower margins more nearly parallel, the ascending ramus not so high, and broader from before backwards, and the coronoid process less developed. In all these characters, as in many of those of the cranium mentioned above, especially the relative smallness of the cranial cavity, the smallness of the nasal bones, the form of the lower margin of the nasal aperture, and the prognathism, the Australian presents some approximation towards the anthropoid ape.

The teeth of the Australian differ considerably, as has often been pointed out, from those of the European, and indeed from most other races, in their superior size, and in the more complete development of the cusps of the molars. In order to estimate with precision the difference in size, I have obtained the following average measurements from examples of both races expressed in millimetres; but as the teeth are lost in many of the skulls in collections, the numbers examined in both cases are not quite so abundant as might be wished:—

|                                  | Male European. | Male Australian. | Female Australian. |
|----------------------------------|----------------|------------------|--------------------|
| Width of upper canine . . .      | 7.50           | 8.54             | 8.33               |
| Length of three upper molars . . | 41.33          | 46.67            | 46.00              |
| Length of three lower molars . . | 45.85          | 51.43            | 49.67              |
| Breadth of second upper molar    | 11.05          | 12.67            | 12.21              |

The third molars, or wisdom teeth, are more constant, earlier in appearance, and better developed, both as to crown and root, than in the European. There are very few instances in which these teeth are very small and single-rooted among the Australians, and fewer still in which they are absent.

The teeth generally, as with all savages, are remarkably free from decay, though as life advances they wear down from the attrition



occasioned by gritty particles in their food. But it is very rare to find skulls, even the oldest, in which any considerable number of teeth have been lost during life.

For an examination of the characters of the remainder of the skeleton, the materials at my disposal are, unfortunately, very insufficient. The attention of collectors has hitherto been concentrated too much on the skulls, and the preservation of complete skeletons, certainly a matter of greater difficulty, has been much neglected.

The bone, or group of bones, which next to the cranium is most likely to afford good differential characters for races, is the pelvis. The very striking difference between this part in all the apes and in man, would readily lead to the supposition that some difference might be found in it between the higher and lower races of the latter, and it is therefore natural that attention should be directed to the subject.

The most marked difference between the pelvis of man and that of the apes is expressed numerically in the "pelvic index," or relation between the antero-posterior to the transverse diameter of the brim, the latter being taken as 100. In various anthropoids this index ranges between 122 (orang) and 160 (chimpanzee) in the males, and somewhat less in the females. In the European males the average in sixty-three measured by Verneau,\* was 80, which nearly corresponds with an average of eleven measured by myself, viz. 81. I have been able to measure eight male Australian pelvises, and find the average index is as high as 99.5, the numbers in the different individuals being respectively 108, 105, 102, 100, 98, 98, 95, and 90; the various Europeans ranging between 96 and 71. The pelvis of the negro has been shown by Vrolik and others to possess the same peculiarity of form. There are other characters of the pelvis, and also of the form and relative proportions of the bones of the limbs by which the Australian appears to differ from the average European; but I will pass them by for the present, as the number of individuals examined is really not sufficient to draw general conclusions from with safety, merely indicating that as far as they go, they appear to show that the Australian resembles the negro and differs from the European in the relative superior length of the second compared with the proximal segment of both limbs, or in other words, the radius and tibia, as compared with the humerus and femur, are relatively longer in the black races.

I must now bring to a conclusion this brief summary of the physical characters of the Australian aboriginal people, for, beyond an imperfect knowledge of their osteology, we have at present no information as to their anatomical structure. The past history of this race, absolutely unknown from documents or traditions of any historic value, is a most interesting subject for speculation. Whether they have, as some suppose, fallen from a higher state of civilization and structure, and have, by whatever cause, degenerated into their present

\* 'Le Bassin dans les Sexes et dans les Races.' Paris, 1875.

condition, or whether they represent a phase in the history of mankind generally, both social and physical, once universal, now confined to the Australian continent, and thus offer a parallel to so many of the phenomena connected with the fauna and flora of that remarkable land—a land of living fossils, as it may be called—is at present a question which fails to be answered for want of sufficient data. It may be stated, as a simple matter of fact, and with only such weight allowed to it as to other negative evidence of the kind, that hitherto no remains of any race, presenting the characters of the Australian savage, or indicating so great a departure from the normal modern European standard, have been discovered in any European land. Even for a parallel condition of culture, we must go back to very early prehistoric times.

Whatever the past history of the race may have been, its future is no matter of speculation. On April 28, 1770, the day when Cook first landed on the Australian shore, its fate was determined, and that fate, whether for good or for evil, in the great and complex succession of events which combine to make up the history of the world and shape the future destiny of mankind, is *extinction*. The causes and methods of this extinction will be best illustrated by the story of a kindred and neighbouring people, with whom the event is already an accomplished fact.

To the south of the southern extremity of Australia, and separated from it by an interval of about 150 miles, lies the large island now called Tasmania, having an area equal to about three-fourths that of Ireland. It was discovered in 1642 by Abel Jansen Tasman, on his first voyage of exploration in the South Seas, and named by him Van Dieman's Land, after the governor of the Dutch East Indian possessions. It was then, and indeed until 1798, when its insularity was proved by Bass and Flinders, thought to be part of the mainland of New Holland or Australia. Tasman anchored in the bay, which he named "Frederick Henry," and though he inferred from various signs that the land was inhabited, he did not see any of the natives during his short stay. In 1772, the French navigator Marion du Fresne arrived with two vessels at the same spot visited by Tasman, and there, on the 4th of March, the first meeting of the aborigines with Europeans took place. The former came with confidence down to the French boats, bringing their wives and children with them, but in consequence of a misunderstanding a conflict took place, in which one of the natives was shot and the rest fled.

The first Englishman who approached the shores of Tasmania was Captain Furneaux, of the 'Resolution,' who in March, 1773, having been accidentally separated from the ship of his commander, Captain Cook, coasted along the south and east shores of the island, but bad weather preventing him from landing, he saw none of the people, though he says the country "appeared to be thickly inhabited, as there was a continual fire along shore as we sailed."

On the 26th of January, 1777, Captain Cook, on his third voyage, entered Adventure Bay, Bruni Island, and then the intercourse between the English and the Tasmanians, so fatal to the latter, commenced. Cook thus describes them: "They were quite naked, and wore no ornaments, unless we consider as such, and as a proof of their love of finery, some large punctures or ridges raised on different parts of their bodies, some in straight and others in curved lines. They were of the common stature, but rather slender. Their skin was black, and also their hair, which was as woolly as that of any native of Guinea; but they were not distinguished by remarkably thick lips or flat noses. On the contrary, their features were far from being disagreeable. They had pretty good eyes; and their teeth were tolerably even, but very dirty. Most of them had their hair and beards smeared with a red ointment; and some had their faces also painted with the same composition."\*

The next European visitors to Tasmania were the French Admirals D'Entrecasteaux and Baudin, in 1792 and 1802; the latter being accompanied, as naturalist, by Peron, who has given us a full description, accompanied by the first published drawings of the people. These, however, are little better than caricatures.

In 1803, Van Dieman's Land was taken possession of by the English, and colonized by expeditions from New South Wales at two points, Port Dalrymple on the north, and Restdown, afterwards Risdon, on the Derwent, near the future Hobart Town. The latter settlement was formed by a military party and convict labourers, and here took place, in May, 1804, the first serious conflict between the natives and European invaders. A party of several hundred blacks—men, women, and children—engaged, as it subsequently appeared, in a kangaroo chase, were suddenly seen running down the side of a hill towards the infant colony. The alarmed settlers, thinking they were about to be attacked by a strong force, without any parley, fired volleys among the harmless and unhappy natives, killing, it is said, as many as fifty before the rest could make their escape. After this, of course it was long before amicable relations could be re-established. In fact the "Black War," thus begun, ended only with the departure of the last natives from the island in 1835.† The usual difficulties which attend the colonization of a country already inhabited by a different race from the new comers, were aggravated in the case of Tasmania by the fact that a considerable proportion of the latter consisted of convicts of the most hardened and degraded type, who, frequently escaping from the European settlements, took to a roving and lawless life in the forests as bushrangers, or on the islands in the straits as scalers. From these men, utterly selfish, brutal, and cruel,

\* 'Third Voyage,' vol. i. p. 96.

† I am indebted to the painfully interesting work, 'The Last of the Tasmanians,' by James Bonwick, for most of the facts mentioned in connection with this subject.

the natives in most cases first received those impressions of European civilization and character which all the endeavours of the more humane colonists and of the Government could never eradicate; and the injuries that were inflicted by them, led to reprisals upon the more peaceful and well-intentioned settlers, which rendered life, except in the immediate neighbourhood of the most settled districts, so insecure as sensibly to damage the prospects of the colony, and to cause an urgent cry for Government interference. It is stated by Mr. Calder\* that "in the five years preceding the close of 1831, ninety-nine inquests were held on the bodies of white people killed by blacks, and of course there were many more who were not known; and in the same period sixty-nine Europeans were reported wounded in encounters with natives." Of the corresponding losses upon the other side it is not possible to form an estimate. An unsuccessful endeavour was made by the Government to divide the country between the two races by a line of demarcation, and a proclamation to that effect was issued on April 15th, 1828; but as there were no means of imparting a knowledge of its contents to those most concerned, who naturally imagined they had a right to wander at their free will through the land which was once their own, it led to no result. More severe measures were then tried, and on October 1st, 1830, martial law was proclaimed against the blacks throughout the island, and the famous operation of the "Line" commenced. The intention of this was to surround the whole of the native tribes by a military cordon, reaching across the island, and gradually to close upon them and finally drive them into Tasman's Peninsula, on the east side of the island, which has a narrow neck, scarcely a mile in width, which was afterwards to be guarded and fortified; and here they were to be kept, while the European population enjoyed their lands in peace. This great operation, which employed nearly the whole population, military and civil, for many months, and cost the colony, it is said, upwards of 30,000*l.*, resulted in the capture of a single black. When the line closed on the neck of the peninsula it was found that all the rest, active, supple, and naked, acquainted with the passes and byways of their accustomed hunting-grounds, had eluded the vigilance of their would-be captors. The original number of the natives appears by this time to have been greatly diminished. Those that had become partially civilized, and had attached themselves as labourers and dependents upon the European farms and families, were dying out, as such people always do, under the influence of the altered mode of life, and the habits (especially spirit drinking) and diseases acquired by contact with whites; and those that retained their original wild condition, were hunted from place to place, and harassed by perpetual skirmishes, not only with the English, but with each other; for when one tribe found its land occupied by the English it was driven into the

\* "Some account of the Wars of Extirpation and Habits of the Native Tribes of Tasmania," 'Jour. Anthropol. Inst.' vol. iii. 1872, p. 7.



territory of another, a serious matter to people with no resources for food but the chase in a country not abundantly supplied with wild animals. Under these depressing circumstances not only was the mortality of the adults great, but that of the children was greater still; and so it came about, as was ascertained by the events now to be narrated, though it was not suspected by the English colonists, that by this time the entire native population of the island had been reduced to little more than 300.

After the failure of the "Line," other methods were tried to secure the natives, chiefly the offer of rewards for individual captures, but the desired end was finally achieved in a manner almost unexampled in the history of such transactions. There was at that time living in Hobart Town a man of the name of George Augustus Robinson, a bricklayer by trade, of strong religious feelings, and of great enthusiasm for the cause of the oppressed blacks. He had for some time entertained the idea of gradually reclaiming and civilizing them by methods of conciliation; and he was well fitted for this object, having a remarkable natural gift for acquiring influence over them and gaining their confidence and esteem. He gathered round him at a place at Bruni Island, allotted him by the Government, as many as he could induce to adopt settled habits, taught them the rudiments of European education, and learned what he could of their languages and ideas. Believing that the only remaining hope for the savage tribes was to bring them under similar influences, he undertook, notwithstanding their exasperated state, to go among them, with a few English and native companions (among whom were the two by whose busts, now in many of our Anthropological museums, the features of the Tasmanian will be chiefly known to posterity, Wouraddy, and his wife Truganina, afterwards celebrated as the last survivor of the race), without arms of any description, and to persuade them, by promises of protection and good treatment, voluntarily to surrender their freedom. In the course of three years he actually succeeded in accomplishing his end. The last party of eight, consisting of one man, four women, and three boys (one of the latter being afterwards known as William Lanney, the "last man"), were taken at Western Bluff, December 28, 1834, and brought into Hobart Town, January 22, 1835, amid great rejoicings from the colonists. As the successive parties were brought in by Robinson, they were shipped off, first to Swan Island, then to Gun Carriage Island, and finally established on Flinders Island in Bass Straits. The whole number settled here scarcely exceeded 200. They were fed, clothed, and educated (most of them learning to read and write) at Government expense; but the unfavourable climate, total change of mode of life, absence of all the interests and excitements of the chase or of war, and home-sickness, told rapidly on their health. They died one after the other, until, in October, 1847, being reduced to forty-four in all—twelve men, twenty-two women, and ten children—this remnant, thoroughly tamed and not likely to occasion any further alarm to the English colonists, were once more

allowed to return to their native land. A reserve of 1000 acres was assigned to them at Oyster Cove, not far from Hobart Town, and here they were kept under superintendence. Their numbers, however, continued to decrease at the same rate as before, and they lived the degraded life common to half-reclaimed savages, without interests, occupations, or hope. In 1854, there were three men, eleven women, and two boys alive. On the 3rd of March, 1869, died the last male of the race, William Lanney, mentioned before. He had become a sailor, and had made several voyages in a whaling ship, but unfortunately had, like so many in his position, taken to intemperate habits. In June, 1876, died the last woman, Truganina, or Lalla Rookh, as she was afterwards called, the faithful companion of Robinson's conciliatory missions, and who had been, at least on one occasion, the means of saving his life.

I have given this brief outline of what may be called the political history of the Tasmanians, though perhaps departing in doing so from the general scope of the lecture, because of its completeness, and of the illustration it affords, in a concise form, of the almost inevitable results of the contact of two such absolutely different races as the English and the Tasmanian. The details of the history are saddening and painful in the extreme, and yet it would be difficult to say what the world has lost by the extinction of the Tasmanian aborigines.

It appears tolerably certain, from what has been mentioned before, that the Tasmanians were not a numerous race, the various estimates of the whole population of the island, at the time of its settlement by the English, ranging between 4000 and 7000; so they must have been very thinly scattered, and many large districts must have been quite uninhabited. Their isolation from all the rest of the world was more absolute even than that of the Australians, and they were consequently inferior even to them in all the arts of civilization. They possessed no boats by which the straits between Tasmania and the Australian land could be crossed, and they show no indications of ever having been visited by, or receiving any extraneous culture from, natives of any of the Pacific Islands.

Like the Australians, they were divided into numerous small tribes, each speaking a different dialect, as many as nine having been recognized. They had no fixed habitations, wore no clothes of any kind, did not cultivate the ground, or keep domestic animals, had no pottery, and no bows and arrows. They were inferior to the Australians in not knowing either the boomerang or the throwing stick, in having no shields, no dogs, and apparently not knowing how to procure fire as occasion needed, as they always carried with them burning torches of vegetable fibre, which it was the especial duty of the women to tend and keep alive.

It is difficult, indeed, to imagine human beings living in a lower social condition than that of the aboriginal Tasmanians, and yet the partial education which some of the race underwent before their final



extinction, showed that they possessed capacities, intelligence, and moral qualities, by no means inferior to those of many other of the uncivilized races of the world.

As might be supposed, the Tasmanians, having lived in all probability for a great length of time on a restricted portion of the earth's surface, under similar external conditions, and without any intermixture from any alien race, have developed, or at all events perpetuated, a very great sameness of physical characters; and have come to possess a peculiar structural type, by which, taken in its entirety, they can be distinguished from all other people.

It is greatly to be regretted that so little evidence of this has been preserved. Four complete skeletons\* and less than thirty skulls, of both sexes and various ages, in this country, are all that we have by which to estimate their stature, proportions, and conformation generally. Their external appearance we judge of by descriptions, some portraits more or less indifferent in execution, some valuable photographs (though on too small a scale) of the latest survivors, and two excellent busts, before mentioned, of a man and a woman modelled by Mr. Murray, of Hobart Town. Of their remaining anatomical structure, nothing will ever be known; in fact we must now, when speaking of them zoologically, treat them as we do fossil animals, and rely chiefly on their bones for distinguishing characters; and the habit of burning their dead, which prevailed as long as they remained in their natural condition, renders these far scarcer than could be wished. It is greatly to be hoped, however, that the present occupiers of their land, who have profited so largely by their extinction, will spare no pains to search for, and secure to science, all that still remains of the race, which they or their predecessors have been the means of destroying.

The height of the Tasmanians is stated to have been somewhat below that of the Australians, but they were of rather stouter build, their bones being generally less slender. The average height of the three male skeletons in England is 5 feet 3½ inches, that of the female 4 feet 7½ inches. Of course these numbers are too small to place much value upon; but they do not differ greatly from Mr. G. A. Robinson's measurements of twenty-three Tasmanian men, whose height varied between 5 feet 1 inch and 5 feet 7½ inches, the average being 5 feet 3½ inches, and of twenty-nine women, who were between 4 feet 3 inches and 5 feet 4½ inches, the average being 4 feet 11½ inches. In colour, they were not unlike the darker complexioned Australians, but they completely differed from that race, or at least from the great majority of them, in the character of the hair, which was not straight, but crisp or frizzled. The women

\* These have all been obtained and sent to England by Mr. Morton Allport, of Hobart Town. Two are in the Museum of the Royal College of Surgeons, one in that of the Anthropological Institute, and one in the splendid private collection of Dr. Barnard Davis, at Shelton, in Staffordshire.

used to shave or burn it off close to the scalp, but the men allowed it to grow long, when it assumed the form of small, corkscrew ringlets, which they wore in the habit of covering with grease and red ochre, giving it the appearance of a mat or mop of red strings hanging over the head and neck. Naturally its colour was brown of the darkest shade, or what is usually called black. They had a well-developed beard and whiskers, of the same fine curly or "frizzly" nature. In the general character of the features, they do not appear to have differed much from the Australians, having similar heavy brows, short, broad noses, and wide mouths.

The osteology of the Tasmanians has been described by Dr. Barnard Davis\* and by Dr. Topinard,† from materials in the collections at Shelton and at Paris. The Museum of the College of Surgeons contains the largest series of skulls at present existing, but they have hitherto been but imperfectly and partially described. They are fifteen in number, of which three are young, and therefore not available for average measurements. Of the adult skulls, six appear to be those of men and six of women. The sexual characters are very well marked, the difference in size being particularly striking. There is no case of artificial or pathological deformation among them.

The crania have the general angular form, prominent median ridge above, and flattened upper parietal region noticed in the Australians, but their special character is a prominence of the parietal eminences, not found in any of the Australian crania, and developed to a greater or less degree in all, and giving a greater latitudinal index. This is even seen in the cranium of a young infant, the form of which is characteristically different from that of an Australian child of corresponding age. Most of the skulls of this series show the elevations and depressions of the surface pointed out by Topinard, as distinguishing the Tasmania crania in the Paris collection, for a description of which I must refer to the memoir cited above. Seen from behind, the skull appears pentagonal, though broader in proportion to its height than the Australian. The glabella is prominent, and overhangs the nasals in every case, even in the females, though to a less extent than in most Australians. The mastoids, infion, and other muscular ridges, are rarely much developed.

Having mentioned that there was no case of metopism or persistence of the frontal suture among the Australians, it is interesting to note that one of the Tasmanian skulls in the collection, that of an old woman, is metopic, and that the skeleton of an adult man in the Museum of the Anthropological Institute is in the same condition. With regard to the ptericon (and this is important in relation to the formation of this region in the Melanesians), in no case does the

\* "On the Osteology and Peculiarities of the Tasmanians." Three Plates. Nat. Verhand. der Hollandsche Maatsch. der Wetenschappen, 1874.

† "Etude sur les Tasmaniens," Mem. de la Soc. d'Anthrop., t. iii. p. 307.

squamosal meet the frontal, though it comes very near it in fifteen out of thirty-four cases, and in fourteen epipteric bones are developed. In only five out of the thirty-four is the sphenoparietal suture longer than half a centimetre.

The capacity of the Tasmanian cranium has been estimated, both by Barnard Davis and by Topinard, as somewhat greater than that of the Australian, and the measurements of this series lead to a similar conclusion. The average of the six male crania is 1309 cubic centimetres, or 79.9 cubic inches; that of the six females; 1135 cubic centimetres, or 69.3 cubic inches; the general average, 1222 cubic centimetres, or 74.6 inches. Of course these data are taken from too small a series to be regarded as more than approximations. They are somewhat lower than those given by both the authors just named, and though something may be due to difference of method of measurement, it is clearly not entirely so, as in other dimensions, in the estimation of which there is no difficulty, I find that my skulls are inferior to theirs. Thus the average horizontal circumference of the six males is 20.2 (the maximum being 20.4), while the skull at the Anthropological Institute is 21.3, the average of six in the Shelton collection 20.6, and the average of the six measured by Topinard is also 20.6.

As mentioned above, in consequence of the development of the parietal eminence, the latitudinal index is considerably greater than in the Australian. In my series it varies between 72 and 80, the average being 76.0. It is curious that this is exactly the same as the average of nine skulls at Paris measured by Topinard, but the fourteen in the Shelton collection give, according to Dr. Barnard Davis, a lower average, viz. between 73 and 74. The average altitudinal index is 72.8, or nearly the same as that of the Australians. Individually, in twelve out of fifteen crania is the height less than the breadth. The superior width of the skull lies wholly in the parietal region, the average frontal and zygomatic diameters not differing appreciably from those of the Australians.

Turning to the face, we find the principal features presenting a great resemblance to those of the Australians. The projection of the jaws, although in one instance it is so excessive as to disturb the average considerably (the index in this case being 113), is not generally so great as in the Australians—only four out of nine capable of being measured (a very insufficient number for obtaining an average of so variable a character) being within the limits of true prognathism, four being mesognathous, and one truly orthognathous (index 97), as defined above. The ophryo-alveolo-auricular facial angle gives an average of 67.8, or considerably higher than that of the Australian, almost as high, in fact, as the Italian. The face is short from above downwards, the measurement N A being less even than in the Australians (65 for the males, 58 for the females), and the malar bones are small, very shallow from above downwards, and retreating. The orbits are remarkably different in the two sexes; in the males they are low and elongated, with heavy overhanging supra-

ciliary ridges, having an average index of 76.3, lower even than the male Australians; while in the females they are more rounded and open, giving an average index of 85.4, the general average for the race being 80.8, or decidedly microsema. Broca gives the general average of the orbital index of the Tasmanian skulls at Paris at very nearly the same figure, viz. 79.33, but he did not find so great a discrepancy between the sexes.

The form of the nasal bones and of the nasal aperture is not very different from that of the Australians, and, as with them, there is no example of a leptorhine nose among them. Two are mesorhine and the remaining ten platyrhine, the average index of the twelve being 56.8, which accords remarkably with Broca's average of 56.92, found in eight specimens at Paris. The general average of this important index is practically therefore the same as in the Australian.

In the large size, and strongly pronounced character of the teeth, the Tasmanians resemble the Australians; in one point, however, they seem to differ, not only from that but from all other kindred races; and this is one which, I believe, has not been previously recorded. It is the tardy development and irregular position of the posterior molars. These teeth are generally of large size, but there appears to be too little room for them in the jaw, so that only in two out of eleven adult skulls in which their condition can be observed, are all of them normally placed; in all the others, one or more of the wisdom teeth are either retained beneath the alveoli, or are in oblique or irregular positions. This is the more remarkable, as I have never observed a similar condition in any single authentic Australian skull, although occasionally, as before mentioned, small and imperfectly developed wisdom teeth may be found among them.

In the three proportions of the skeleton, which have been mentioned, in which the Australian differs from the European, viz. the greater antero-posterior diameter of the pelvis as compared with its width, the greater length of the tibia as compared with the femur, and especially the greater length of the forearm as compared with the humerus, the few Tasmanian skeletons which I have examined agree completely with the Australian type. The average of the pelvic indices of the three male Tasmanian skeletons in this country is 93; that of the one female, 79.

It will be seen by a reference to the map, that Tasmania, Australia, and the large, numerous, and closely placed islands, which lie between the latter and the Asiatic continent, divide the two great water tracts, called respectively the Indian and the Pacific Oceans. The Pacific Ocean proper is studded over with an enormous number of islands, all, with the exception of the New Zealand group, of moderate or small size, and to which the term Polynesia is collectively applied. Although this ocean had been traversed several times by the enterprising Spanish, Portuguese, and even English voyagers of the early part of the seventeenth century, and the route from the west coast of America to the Malay Archipelago was well known, the discovery of the greater



number of the islands and the establishment of permanent relations with their inhabitants, was reserved for the numerous expeditions made at the latter part of the last century, which had for their special object the exploration of this then comparatively unknown region of the world. Among these the most memorable, both for the extent of new acquisitions to knowledge and for the importance of the results upon the world's history, were the three voyages of Captain Cook. At that time the observation was made, to quote the words of Forster, who accompanied Cook as naturalist in his second voyage, that there are "two great varieties of people in the South Seas—the one more fair, well-limbed, athletic, of fine size, of a kind, benevolent temper; the other, blacker, the hair just beginning to become woolly and crisp, the body more slender and low, and their temper, if possible, more brisk, but somewhat mistrustful. The first race inhabits Otaheite and the Society Isles, the Marquesas, the Friendly Isles, Easter Isle, and New Zealand; whilst the second peoples New Caledonia, Tanna, and the New Hebrides, especially Mallicollo." Subsequent observation has fully confirmed this division, and since the anatomical characters of the two races have been studied, it has been found that they show many strongly marked contrasts. This is seen especially when pure types of each have been examined, for, as might be expected, with races living in close proximity, often occupying the same small island, and prone to invade each other's territory, and to make extensive migrations by sea, a great mixture has taken place, not only along the boundaries of the respective regions inhabited by each, but even extending at certain points far into the interior. As it has become necessary to give distinctive names to these races, that of Polynesian, at first applied indiscriminately to the whole, is now usually restricted to the fairer race of Cook and Forster, while "Melanesian" has been invented for the darker race, although this word has frequently been used in a wider sense than I shall employ it here, to include Tasmanian, Papuan, and even Australian. "Papuan" is often also used as a race-designation for the people inhabiting the New Hebrides and adjacent islands; but the appropriateness of these terms will be better discussed after the facts at present known, connected with the structure and distribution of the races, have been stated.

The islands which at the present time are either wholly or mainly inhabited by the Melanesian race, are that group lying in the western part of the ocean, not far from the coast of Australia, and joining at their northern extremity to the great island of Papua or New Guinea, the principal being New Caledonia, the New Hebrides, the Solomon Islands, New Britain, and New Ireland, which form a nearly continuous semicircular chain embracing the north-east coast of Australia; and lying somewhat away from the rest, the Fiji group, the last but one of the annexations of the British empire.

The most southernmost and largest of these is New Caledonia, about 200 miles long and 30 broad. It was discovered by Cook in 1774 on his second voyage, and has recently been taken possession of

by the French, and used as a penal settlement. To the north and east lies the long chain of the New Hebrides, with the Santa Cruz Islands still farther to the north. These were first discovered by the celebrated Spanish voyager Quiros in 1606, who considered them to be part of a southern continent to which he gave the name of "Tierra Austral del Espiritu Santo"; the latter part of this name being still retained for the largest island of the group, 70 miles long by 25 broad. They were visited in 1768 by the French Admiral, Bougainville, who, besides landing on the "Isle of Lepers," did no more than discover that the land was not a continent, but composed of numerous small islands, which he named the "Great Cyclades." Cook, in 1774, made a complete exploration of them, and thought himself justified therefore in changing the name to "New Hebrides," by which they are now generally known. He visited and stayed some time at Mallicollo and Tanna, but was repulsed by the natives at Erromango; he also partially surveyed several of the other islands, and gave the name of "Sandwich" to one, now more generally known by its native name of Vati.

The New Hebrides, and the nearly adjacent Santa Cruz Islands, have not yet been annexed by any European power, but they have for some years past been visited by the crews of European vessels, actuated by very different motives, and producing very different effects by their visits on the natives. These may be divided into four classes—(1) traders in sandalwood; \* (2) collectors of labourers for the plantations of Queensland, Fiji, &c., often no better than kidnappers; to repress and repair the infamous deeds of these two classes, came (3) officers of the English war vessels which cruise in those seas, some of whom, as Captains Erskine and Goodenough, have given interesting accounts of the condition of the islands; and (4) missionaries of various denominations. It is very unfortunate for the reputation of the Melanesians, that the most striking historical events connecting them with our country have been the murders of three most excellent men, who were zealously labouring for their welfare, the Rev. J. Williams, at Erromango, in 1839; Bishop Patteson, at Nukupu, in 1871; and Commodore Goodenough, at Santa Cruz, in 1875—all due, in great probability, to the irritation and suspicion caused by the behaviour of previous visitors of different character and motives. Captain Goodenough himself wrote, "It is remarkable that just in proportion to the amount of people who have been taken away as labourers, so are the natives inclined to assault Europeans. Where white men are least known, the people are most friendly."†

\* One of these men, after he had taken in his cargo, was known to fire indiscriminately among the natives, in order to spoil the trade to those who should come to the island after him, and so keep up the price of the article.—Erskine's 'Journal of a Cruise among the Islands of the Western Pacific,' 1853, pp. 330 and 333.

† In historical justice, it should, however, be recollected, that Cook on his first visit to several of the islands of the Pacific was attacked by the natives, and only avoided bloodshed by abandoning the attempt to land.

The social condition of all the natives of these various islands when first discovered was greatly in advance of that of the Australians and Tasmanians, as the following extracts from Cook's account of his landing in New Caledonia, show:—"The ground near the village was finely cultivated, being laid out in sugar-canes, plantains, yams, and other roots; and watered by little rills, conducted by art from the main stream, whose source was in the hills. Here were some coconut trees, which did not seem burdened with fruit. We heard the crowing of cocks, but saw none. Some roots were baking on a fire in an earthen jar, which would have held six or eight gallons; nor did we doubt its being their own manufacture. \* \* \* The plantations were laid out with great judgment, and cultivated with much labour."

The condition of the other islands differed only in details. Their inhabitants possessed fixed habitations, thatched, and sometimes of more than one story, grouped together in villages: as just mentioned, they cultivated the ground, and they reared domestic animals, fowls, and in some cases pigs. They had large double canoes, 30 feet long, connected by a deck or platform, and with a lateen sail or sails, though of a more clumsy construction than those of the Friendly Islands, as the keen eye of the great navigator does not fail to notice. The men wore a girdle of bark or leaves, and the women a short petticoat. They had also earrings of tortoiseshell, necklaces or amulets and bracelets of shells and stones. They fought with bows and arrows, spears and darts. In many respects their moral character, as far as Cook was able to judge of it, contrasted favourably with that of the still more civilized and polished inhabitants of the Society and Friendly Islands, among whom he had just been sojourning. The New Caledonians were "not the least addicted to pilfering, which is more than can be said of any other nation of this sea." Some remarkable instances are related of the honesty of the people of Malli-collo, and the women were everywhere far more reserved and decorous in their behaviour than the true Polynesians.

Captain Goodenough estimated the population of the New Hebrides, Banks, and Santa Cruz Islands, in 1875, at about 70,000, but gives striking evidence of its rapid decrease since the establishment of regular intercourse with Europeans. Not a single island that he visited but presented the same appearance of diminishing population.

It is probable that the range of the Melanesian race was at one time more extensive than at present, and that they were settled in the islands where they at present dwell, and also in many others now occupied by Polynesians, before the arrival of the last-named race, who appear in many cases to have supplanted them. Even in the true Melanesian area, geographically speaking, there is a considerable infusion of Polynesian influence, apparent in the physical characters, customs, and language of the people. The inhabitants of some of the Loyalty Islands, near New Caledonia, for instance, are almost pure Polynesians, derived from an immigration which took place from Uea or Wallis Island in the beginning of the last century. Among the

New Hebridean Islands there are several Polynesian colonies of quite modern origin. In New Caledonia, according to Bourgairel,\* the yellow race (Polynesians) number about one-fifth of the whole population, the black race (Melanesians) two-fifths, the remainder being formed by a mixture of the two. The chiefs, and what may be called the aristocracy of the island, mostly belong to the lighter race. On the other hand, traces of the former presence of a Melanesian population are found in some of the central and even eastern Polynesian Islands, as far, according to W. L. Ranken, as Nine (Savage Isle), Penrhyn Atoll, and Rarotonga,† and in all probability in New Zealand. The different proportions in which the two races are mixed is one of the circumstances which has given rise to the diversities observed in the appearance and character of the inhabitants of many of the islands.

As there is every reason to believe that the Melanesians have been established in the islands they now occupy for an immense length of time, and as they are not naturally given much to rove from place to place, like their lighter-coloured neighbours the Polynesians, strongly marked, special characters have been developed in the inhabitants of the different islands; and it is probable that if sufficient materials were collected, we might be able to distinguish even by the skull alone the particular island from which it was derived. Those who doubt the value of the cranium as a race-character may be surprised at this assertion; but the very few and imperfect observations already made lead me to think that it is probably true. The fact that a skull brought from a particular island without any history, beyond its having been found there, presents characters unlike those generally associated with the inhabitants of that island, proves nothing, as it may have belonged to an individual of another race, who had found his way there by some accidental circumstance. The frequent occurrence of such a case, should convince collectors of the necessity of obtaining larger series from each locality than we are now at present contented with. The larger the series, the more chance is there of obtaining average characters of the predominating race, and of eliminating the influence of individual variations and accidental mixtures.

Unfortunately our knowledge of the distinctive characters of the people of the various islands of the New Hebrides and Santa Cruz Archipelagos is still most imperfect, and that of the Salomon Islands and New Ireland and New Britain even more so. It will be better, therefore, for the present purpose to group them all together, and attempt to describe the characters of what may be considered as the average or generalized Melanesian type.

In stature these people present considerable variation. Some, as

\* Bourgairel, "Des Races de l'Océanie Française," *Mém. de la Soc. d'Anthropologie de Paris*, vol. i. 1860.

† "The South Sea Islands," *Journ. Anthropol. Inst.* 1877.



those of Mallicollo, are decidedly undersized; they are described by Cook as "a rather diminutive race," and by Goodenough as "a small, poor, weedy people." Cook says, "the people of Tanna are of middle size, rather slender than otherwise; many are little, but few tall and stout." Erskine says, "the people of Vati are of larger stature than the Tannese." Goodenough tells us, "the natives of Espiritu Santo are fine-looking men compared to those of Mallicollo, and reminded me of Fijians;" but we have no accurate measurements of any sufficient number, and there are no skeletons in any of the English museums.

Their head is narrow, the forehead especially, and often retreating. The brow is not so prominent as the Australian. The nose is narrow at the root, but broad below, with wide nostrils; its root is not so depressed as the Australian, and its dorsum is often prominent and arched. In many cases, especially among the northern islands, it assumes what is commonly described as a "Jewish form," arched, and with the tip prolonged downwards. So common does this form of nose appear, that it may almost be considered characteristic of the race. The whole face is rather "hatchet shaped," the sides sloping away from the middle line. The jaws are prognathous and the lips thick. The complexion, though often called "black," in common parlance, is really a dusky brown or chocolate colour. By the character of the hair they are distinctly separated from the Australians, the Malays, and Polynesians, and allied to the Tasmanians and the Negritos, or black people of the Malay Archipelago. On the head it is rather coarse, elliptical in section, and more or less closely curled or frizzled. When allowed to grow long, sometimes it hangs down in close spiral ringlets, as with the Tasmanians, but it more often forms a large fuzzy mop, standing out to a considerable distance all round the head, which remarkable *coiffure* frequently occupies a considerable amount of time and attention on the part of the owner to keep in order. Though the hair is always naturally black, or nearly so, its colour is often artificially modified by the application of caustic lime, made from burnt coral, and by various colouring agents—a practice common among the inhabitants of the Pacific, and which has given rise to reports of fair, brown, and red hair among them; whereas black, or the dark shade of brown commonly so-called, is the universal colour of all the races spoken of in this lecture, as of the great majority of the people of the world. The beard is generally well developed, as is the hair upon the limbs and chest.

My remarks upon the osteological characters of the Melanesians must, from the paucity of materials, be limited to the skulls, and chiefly to those in the collection under my charge. These are twenty-one in number, six from the Isle of Pines, a small island near the southern extremity of New Caledonia; three probably from Vati or Sandwich Island; eight from Mallicollo, collected by the late Commodore Goodenough, and by Dr. A. Corrie, Assistant Surgeon to the 'Pearl'; two from Vanikoro, and two from the Salomons. Crania from New

Caledonia have been described by Bourgalet, and from the New Hebrides by Dr. Barnard Davis and Mr. Busk.

The skulls from Mallicollo all present a remarkable flatness of the frontal region, strongly suggestive of artificial pressure in infancy, such as is, or was formerly, practised by many of the Western Americans. It is not, however, the flattening produced by squeezing between two boards, as with the inhabitants of British Columbia, as there is no sign of counter pressure on the occiput, and no lateral bulging of the cranium. The forehead is simply depressed, the remainder of the skull retaining its normal form. This peculiar conformation of the head attracted the attention of Cook and Forster in the living people. The latter says: "In Mallicollo we observed that the greater part of the skulls of the inhabitants had a very singular conformation; for the forehead, from the beginning of the nose, together with the rest of the head, was much depressed, and inclining backwards, which causes an appearance in the looks and countenances of the natives similar to those of monkeys."\*

No evidence has, however, yet been obtained of the existence of such a practice among the inhabitants, and no crania from any of the other islands yet examined present any sign of it. If it should prove to be a natural conformation, it will be one without parallel in any known race; if the result of custom, it will be very singular, as being peculiar to one out of hundreds of islands of the oceanic area.†

The average capacity of the eighteen Melanesian skulls in the collection which can be measured is 1320 cubic centimetres, or 80·5 cubic inches. This includes some females; but as there is some difficulty in distinguishing the sexes in several cases, I have taken them all together. It will be observed that this is higher than the average Australian male by about 2 cubic inches; showing, if so small a number of specimens can be relied upon, that the Melanesian, like his nearer relation the Tasmanian, is better endowed in this respect than his Australian neighbour.

The most striking general character of the cranial part of all these skulls is their great length and narrowness (see Fig. 3), the sides being remarkably flat, especially in the posterior parietal region. In this conformation they differ totally from the Tasmanians. The average latitudinal index among twenty skulls is 70·4, lower than the Australian, and in fact than any other known race;‡ and among them are some of the longest and narrowest normal skulls known, one having an index as low as 62. The highest of the series is 75. The relative proportion of height compared to breadth in skulls of the New Caledonia

\* J. R. Forster, 'Observations made during a Voyage Round the World,' 1778, p. 267.

† Flattening of the occiput is not uncommon among the South Sea Islanders, as among many other races; but it is probably undesigned, and arises from the practice of keeping the infant lying on its back upon a hard board or pillow.

‡ It is singular that the Eskimo, though so widely different in many other characters, approaches nearest to the Melanesian in the lowness of the latitudinal cranial index.

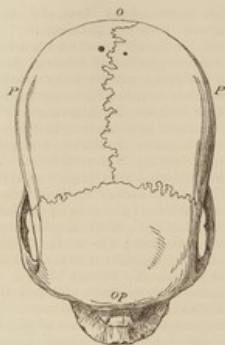


Fig. 3.—The upper surface of the skull of a Melanesian, from the island of Vanikoro, as an example of a dolichocephalic cranium, the relation of the greatest breadth (P P) to the length (Op to O) being as 70 to 100.

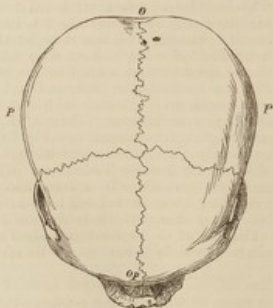


Fig. 4.—The upper surface of the skull of a Polynesian, from the island of Lifaka (Tongan group), a brachycephalic cranium, the relation of the greatest breadth (P P) to the length (Op O) being as 84 to 100. It also shows metopism, or persistence of the frontal suture.

donians has been already commented upon by Dr. Barnard Davis, who has applied the term "hypsi-stenocephalic" to them.\* It is remarkable that in this series (none of which are from New Caledonia itself, though from neighbouring islands) the height of every skull, measured from the basion to the bregma exceeds the greatest parietal diameter, and the average altitudinal index is 74.6, or considerably greater than in either the Australian or Tasmanian. In six skulls of New Caledonians, apparently of the pure Melanesian race, in the Army Medical Museum at Netley, the average latitudinal index is 70.1, and the altitudinal index 73.9. These results nearly accord with those obtained from the larger collection at Paris, the respective indices of which, according to Broca, are 71.8 and 73.7, but these probably include some specimens of the mixed race.

In no race known does the condition of the pterion differ so greatly from the average of Europeans as the Melanesian. This is more especially seen in the Mallicollo skulls, where it is the exception for the squamosal not to join the frontal bone, as it does so in ten cases out of sixteen cases, and sometimes very largely. Among these eight skulls there are also two cases of metopism.

The face is generally short, shorter even than that of the Australian, but it has much the same general characters, as narrowness of the frontal region, and weak and retreating malar. The prognathism is almost always marked, the indices of the different skulls in which the bones of the face are sufficiently perfect to allow of measurement never falling below 100, and rising as high as 111 in two and 115 in one case, the average being 105.4. The nasal bones and the nasal aperture are short and broad, but the former have not the extreme reduction and flattening characteristic of the Australian. The index is invariably above 50; the lowest being 51.1 and the whole series averaging 54.9, or rather below that of the Australian.

In the form of the orbit the Mallicollo skulls differ considerably from the others, the upper margin being elevated, drawn back as it were by the depression of the forehead, so as to give an almost circular shape to the opening, as in the case of the deformed skulls of the ancient Peruvians, an argument in favour of the artificial origin of this conformation. The average of the orbital indices in the skulls from this island rises as high as 90, whereas in those from the other islands it is not higher than 81, much the same as the Australian. The prominence of the supraorbital ridges and glabella is occasionally strongly pronounced, but is not universal as in the Australians.

The lower jaw, in some cases, presents most of the marks of inferiority of character which have been pointed out when speaking

\* On the Peculiar Crania of the Inhabitants of certain Groups of Islands in the Western Pacific, 1866. *Natuurk. Verhand. van de Hollandsche Maatschappij der Wetenschappen te Haarlem*, xxiv. Deel.



of the Australians. The teeth have unfortunately been lost in the greater number of the crania of this series, so that I am not able to give average measurements of any value; but they do not appear generally to have been so large and well developed as in the Australians. In one skull from the Isle of Pines, the third molars are misplaced, as was found to be so frequently the case with the Tasmanians.

People having very much the same physical characters as the Melanesians inhabit the islands of the Louisiade Archipelago, those of Torres Straits, and a very considerable part of New Guinea, and even some of the islands farther west, as Aru, Timor, Gilolo, &c. The exploration of New Guinea in an ethnological sense is only now commencing, and promises a most interesting future. The greater part of the island is certainly inhabited by a dark-skinned race, with crisp or frizzled hair; indeed the name by which they are frequently known, "*Papmans*," is said to allude in the Malay language to the latter peculiarity. It is, however, very doubtful whether they all possess the uniform characters of the genuine Melanesian. In a collection of skulls lately presented to the Museum of the College of Surgeons from the east end of the island, by Dr. P. Comrie, late of H.M. ship '*Basilisk*,' while some present the characteristic form of that race, others are short and round, and have facial characters indicating either Polynesian, Malay, or Negrito mixture. The same appears to be the case in other parts of the island.

The Museum of the College contains seven skulls of adult males from islands in Torres Straits, chiefly Erroob or Darley Island, collected by Mr. Jukes during Captain Blackwood's Survey in 1842-46, and by Mr. Huxley in Captain Owen Stanley's Survey in 1847-50. The average cranial capacity of these skulls is 1340 cubic centimetres, or 82 cubic inches; the average latitudinal index, 72.6; the average altitudinal index, 75.6; gnathic index, 105; orbital index, 84.2; and nasal index, 52.8; so that except that the last measurement is somewhat lower (but it is only taken from five skulls, the other two having the face damaged) and the breadth rather greater, there is little to distinguish them from the New Hebrideans. In culture these people are quite on a par with the last, and contrast strongly with the Australians with whom they come in contact at Cape York.

The inhabitants of the Admiralty Islands to the north of New Guinea, on which no European landed until it was visited by the '*Challenger*' in March, 1875, appear to belong to the same race, according to an interesting description of them by Mr. H. N. Moseley,\* but their cranial characters have not yet been described.

Black-skinned people, with close curly hair, have long been known to exist still farther to the west of the Malay Archipelago, in the Philippines, the Andamans, and even the interior of the Malay Penin-

\* "On the Inhabitants of the Admiralty Islands," *Journal of the Anthropological Institute*, May, 1877.

sula. As long as very little was known of their anatomical conformation, they were confounded with the Melanesians, and the name "Negrito," first applied to them by the Spaniards in Luzon, has often been used for all the people having these two characters, dark complexions and frizzly or woolly hair, throughout the Indian Archipelago and Pacific Ocean, even as far as Tasmania. More complete information has, however, shown that the blacks of the western and northern Malay region differ in many characters from the Melanesians, and I shall follow Quatrefages in restricting the term "Negrito" to them.

They are found at present in the most unmixed condition in the Andamans, a chain of long, narrow islands, in the Bay of Bengal, about 20 miles in breadth and 140 in length, and divided by several narrow channels. These islands were surveyed in 1789 by Lieut. Blair, of the East India Company's Service, and a penal settlement founded upon them, but this was abandoned a few years afterwards; and the islands were not visited by Europeans again until in 1857, after the Indian Mutiny, a commission, consisting of Drs. Mouat and Playfair and Lieut. Heathcote, was sent to examine them, and in consequence of their report, Port Blair was established as a convict settlement for our Indian possessions.

The islands were inhabited by a peculiar race of people, who must have lived in them for a great length of time, with very little, if any, admixture from other races, and have consequently acquired strongly marked and very uniform characteristics. Their warlike disposition, notwithstanding their diminutive size, and their implacable hostility to strangers who were led by accident or design to their shores, have been the chief causes of their isolation. The earliest accounts that were published of their condition led to the belief that their moral and social organization was upon the lowest scale, and that they were among the most degraded of mankind; but the larger experience which has been acquired since the establishment of the settlement, the elaborate memoir of Quatrefages,\* containing references to all that had previously been written, the more recent information furnished on personal observation by Day,† Dobson,‡ and others, and the very detailed account of the customs and arts of the Andamanese lately transmitted to the Anthropological Institute, with a large collection of their weapons and manufactures, by Mr. Man, has caused a considerable modification of this idea.

The numerous photographs which have been taken and sent to this country give a very good idea of their external physical characters, and a close examination of them shows that the resemblance to African negroes, which appears to strike everyone who sees them

\* "Étude sur les Minéopies," *Revue d'Anthropologie*, tome i. p. 37, 1872.

† *Proc. Asiat. Soc. Bengal*, June, 1870, p. 133.

‡ *Journal of the Anthropological Institute*, vol. iv. p. 437.

for the first time, is rather superficial, and depending much upon colour and the character of the hair, though, by the way, this last is seldom seen, as both men and women have an almost universal custom of keeping the head closely shaved. When the hair does grow, however, it is found to be as finely frizzled as that of the most "woolly-headed" African. A specimen sent home by Mr. Man, for which I am indebted to General Lane Fox, is smaller in transverse section and more flattened than that of any Melanesian or Papuan which I have examined, and very nearly as much so as the hair of the Bushmen of South Africa. Whether the men are full-bearded I cannot say, as the face is always as carefully cleared of hairy appendages as the scalp. The head is very short and round, the forehead flat and tolerably full; the space between the eyes wide; the nose small, straight, and not very broad. In photographs of the full face of Australians, Melanesians, and African negroes, the width between the outer margins of the alae nasi is usually fully one-third of the whole breadth of the face, sometimes more, rarely less, corresponding to the platyrrhine character of the nasal aperture. In the Andamanese it is scarcely more than one-fourth, as in the mesorrhine races. The jaws are not particularly prominent, nor the lips developed and everted to anything like the extent of the African negro, scarcely more, in fact, than in most Malays. The chin appears rounded and well formed.

These characters are taken, as I have said, only from the inspection of photographs, but they are strongly confirmed by examination of the actual crania. The number of specimens available till the last few years were very few, but now is rapidly increasing, and I hope in a short time, through the kind assistance of Dr. J. Dougall, Surgeon-Major, H.M. Madras Army, Senior Medical Officer at Port Blair, to have materials enough to draw up a complete account of their osteology. At present I will only indicate some of the more important points regarding the cranium, founded on the examination of nine specimens, two belonging to the Middlesex Hospital Museum,\* one in the Army Medical Museum at Netley, and six in the Museum of the College of Surgeons. Of these, five are males and four are females. As the numbers are so nearly equal, and the differences between them are not great, they may be taken together in the following average measurements. In accordance with the diminutive size of the race (for the men are said to average somewhat under 5 feet, and the women less), the crania are of very small general size, the average circumference being 471 centimetres, or 18.5 inches, and the average capacity 1184 cubic centimetres = 72 cubic inches, the highest being 1280 = 78, the lowest 1100 = 67. The antero-posterior diameter averages 164 centimetres, or 6.5 inches. The breadth of the skull in the parietal region considerably exceeds the Tasmanian, giving a latitudinal index which varies in the nine

\* These were described by Mr. Bask, in 'Trans. Ethnol. Soc.' June, 1865.

skulls under consideration between 77 (which is quite exceptional and perhaps somewhat malformed) and 85, the average being 81.7. This is corroborated by the measurements of four skulls of Minicopias (as the Andamanese are sometimes called) in the collection of Dr. Barnard Davis, the average of the indices of which is 81; so we have here a truly brachycephalic race. Exactly contrary to what obtains among the Melanesians, the height is in every case less than the breadth, the average altitudinal index being 77.7. This relation is more due to the breadth being excessive than to the skull being low in proportion to length, as it will be seen that the last-named index is higher than that of any other of the races we have hitherto considered. The general contour of the cranium is more rounded and "well filled" than in any of those races. The forehead is flat, the glabella very little developed, and with no marked depression beneath. The nasal bones are straight and tolerably well formed, the aperture of moderate width, the nasal index varying between 47 and 53, the average being 50.6, so that they are distinctly mesorrhine. The orbits of the males and females appear to differ nearly as much as in the Tasmanians, the index of the former being 85.6, of the latter 90.7. Some few of the crania show a considerable amount of alveolar prognathism, but generally much less than in any of the other black races. The average is only 100.3, so they may be considered as a race to be mesognathous. The whole profile of the face, from the middle of the forehead to the alveolar margin, is remarkably straight.

People of small stature, with dark skins, round heads, and curly hair, apparently allied to the Andamanese, have been found in either a pure or mixed state in the interior of the Malay Peninsula (where they are called Semangs), in several of the Philippine Islands (called Aetas), in Formosa, and even as far north as the Japanese island of Kiou-siou. Their range appears formerly to have been more extensive, as they are supposed to have contributed something to the very mixed population of the mainland of Southern India, and their influence may be traced without much doubt into New Guinea, and even Borneo. All these indications appear to show that the present scattered and isolated Negrito populations, chiefly inhabiting comparatively inaccessible regions in the forest-clad mountain ranges in the interior of the islands, are the remnants of a race which once spread over a wide area of south-eastern Asia, but have been gradually dispossessed of their territory by the encroachments of other races, especially the Malays, of whom I must speak next. The whole of the evidence which has at present been collected on this subject will be found in the great work 'Crania Ethnica' of Quatrefages and Hamy, now in the course of publication.

The Malays at present occupy the southern half of the Malay Peninsula, and almost the whole of the Archipelago which is not still in possession of the darker, frizzled-haired people already spoken of. Though a totally distinct race, and when pure presenting most



opposite physical characteristics to the latter, a great mixture has occurred at many points where they inhabit common ground, and it is often difficult to determine which element prevails most strongly in some of the islands near the junction of the territory mainly inhabited by each. I should also mention that there is some evidence of the existence of a third race, in the island of Gilolo and elsewhere, which appears to possess the characters of neither Malay, Negrito, nor Melanesian, or such as would probably be derived from a blending of either; but very little is at present known about them.\*

Mr. A. R. Wallace, whose great opportunities of studying the appearance and character of the Malay race are so well known, has given the following graphic description of them:—†

"The true Malay race, as distinguished from others who have merely a Malay element in their language, present a considerable uniformity of physical and mental characteristics, while there are very great differences of civilization and of language. They consist of four great and a few minor semi-civilized tribes, and a number of others who may be termed savages."

1. Malays proper, inhabiting the Malay Peninsula, and almost all the coast regions of Borneo and Sumatra.

2. The Javanese, Java, part of Sumatra, Madura, Bali, and Lombok.

3. The Bugis, Celebes.

4. The Tagalas, the Philippine Islands.

The savage Malays are the Dyaks of Borneo, the Battaks and other wild tribes of Sumatra, the Jakuns of the Malay Peninsula, &c.

"The colour of all these varied tribes is a light reddish-brown, with more or less of an olive tinge, not varying in any important degree over an extent of country as large as all Southern Europe. The hair is equally constant, being invariably black and straight, and of a rather coarse texture, so that any light tint, or any wave or curl in it, is an almost certain proof of the admixture of some foreign blood. The face is nearly destitute of beard, and the breast and limbs are free from hair. The stature is tolerably equal, and is always considerably below that of the average European; the body is robust, the breast well developed, the feet small, thick and short, the hands small and rather delicate. The face is a little broad, and inclined to be flat; the forehead is rather rounded, the brows low, the eyes black, and very slightly oblique; the nose is rather small, not prominent, but straight and well shaped, the apex a little rounded, the nostrils broad and slightly exposed; the cheek bones are rather prominent; the mouth large, the lips broad and well cut, but not protruding; the chin round and well formed.

"In this description there seems little to object to on the score of

\* See Hamy, "Les Alfours de Gilolo," *Bulletin de la Société de Géographie*, Mai, 1877.

† "The Malay Archipelago," vol. ii. p. 270.

beauty, and yet, on the whole, the Malays are certainly not handsome. In youth, however, they are often very good-looking, and many of the boys and girls, up to twelve or fifteen years of age, are very pleasing, and some have countenances which are, in their way, almost perfect. I am inclined to think they lose much of their good looks by bad habits and irregular living. At a very early age they chew betel and tobacco almost incessantly; they suffer much want and exposure in their fishing and other excursions; their lives are often passed in alternate starvation and feasting, idleness and excessive labour—and this naturally produces premature old age and harshness of features.

"The Malayan race, as a whole, undoubtedly very closely resembles the East Asian population from Siam to Mandchouria. I was much struck with this, when in the island of Bali I saw Chinese traders who had adopted the costume of that country, and who could then hardly be distinguished from Malays; and, on the other hand, I have seen natives of Java, who, as far as physiognomy was concerned, would pass very well for Chinese.

"It appears, therefore, that whether we consider their physical conformation, their moral characteristics, or their intellectual capacities, the Malay and Papuan [i. e. Melanesian] races offer remarkable differences and striking contrasts. The Malay is of short stature, brown-skinned, straight-haired, beardless, and smooth-bodied. The Papuan is taller, is black-skinned, frizzly-haired, bearded, and hairy-bodied. The former is broad-faced, has a small nose, and flat eyebrows; the latter is long-faced, has a large and prominent nose and projecting eyebrows. The Malay is bashful, cold, undemonstrative, and quiet; the Papuan is bold, impetuous, excitable, and noisy. The former is grave, and seldom laughs; the latter is joyous, and laughter-loving—the one conceals his emotions, the other displays them."

There is certainly no very great uniformity in the characters of the skulls in our collections which are said to belong to Malays. But at present craniology is labouring under a great disadvantage, owing to paucity of materials and want of accuracy in the indications as to the precise origin of the specimens with which we have to work, and hence is open to the criticisms which Wallace and others have bestowed upon it, as in the work just quoted. If we group in one category a varied series of skulls from the Malay Islands, which may be composed in greater or less proportion of true Malays, of Negritos, of Melanesians, of Chinese, Spanish, Dutch, and even English, we shall have much difficulty in assigning to them any common distinctive characters. Endeavouring as much as possible to avoid this source of confusion, I have selected seven male skulls, which appear to me to be characteristic of the Malay race in its purest form, and from them have taken the following averages. In general conformation they present as great a contrast to the Papuan or Melanesian type, as has been noted in the external and mental qualities of the respective races. On the other hand, their resemblance to the Negrito

skulls is very singular: except in size, many of the Malay and the Andamanese skulls are wonderfully alike.\* In capacity these skulls average 1424 cubic centimetres, or 86.9 cubic inches, or considerably higher than those of any of the races hitherto spoken of, and nearly equal to that of the Italians. They are all more or less short and round, the average latitudinal index being 81.4, so that they are equally brachycephalic with the Andamanese. The height is in every case less than the width, the average index being 76.4. The sutures are generally very complex; the pterion in no case shows a union of the squamosal and frontal bones so common in the Melanesian; the forehead is flat and smooth, without projection of the glabella or supraciliary ridges; the nasal bones are flat and straight, the aperture mesorhine, the average index being 50.5; the orbits are fairly round, the average index being 90 (megasceme); the malar bones are large and prominent, the lower part especially projecting forward, quite differently from that of the Australian and Melanesian; the outer margin of the orbit is placed on a much more forward level than in those races, causing the whole face to be broader and flatter. This is a character which allies the Malays with the Mongolian people of the continent of Asia, in whom it is very strongly pronounced. The face is rarely prognathous, usually the reverse, the average index in these examples being 98.2; so that, taken together, they come into the mesognathous category. The palate is short and round, and the teeth small. Of the remainder of the skeleton I have nothing of any value to add from my own observation.

The last, and perhaps in some respects the most interesting and important, of the races of which I shall have to speak this evening is the one which has been called Malayo-Polynesian, Brown Polynesian, Mahori, or simply Polynesian. It is the one which, with, as before indicated, a certain proportion of admixture of the Melanesian race, and with considerable local variations, forms the native population of all the remaining islands scattered over the vast area of the Pacific Ocean. These islands, roughly speaking, form a triangle, with the Sandwich or Hawaiian group, Easter Island, and New Zealand at the three corners, at a distance of 5000 miles apart. Notwithstanding the apparent isolation of many of these, mere little specks as it were in an illimitable expanse of ocean, the greater number of them were when first discovered by Europeans in the last century inhabited; and what is more remarkable, inhabited by people having a great similarity in appearance, in social customs, and in language, so much so that no competent observer who has studied them closely appears to doubt that they must have had a common origin, and that whatever diversities they may now present must be due to local conditions or

\* Wallace has already remarked that the Negritos "in most important characters differ more from the Papuan than they do from the Malay." *Op. cit.* vol. ii. p. 278.

admixture with other races. The carefully preserved traditions of the people all tend to the same conclusion. The researches of Hale, attached to Commodore Wilkes' exploring expedition, followed out most ably by Quatrefages,\* have even led to the construction of a map, on which are indicated the routes by which the different islands have been peopled, and the dates at which the various emigrations took place have been approximately settled from computations based upon the genealogies of the reigning chiefs. Although much of this is of course mere conjecture, it has only been arrived at after a very full and careful collection of traditions, language, customs, and physical characters of the inhabitants of a large number of the islands, and it forms a valuable basis for future researches into the subject. According to the view of Hale, adopted and modified by Quatrefages, the Polynesians came originally from the Malay Archipelago. The island of Boron is fixed upon by the last-named anthropologist for their last point of departure, though their earlier home may have been somewhere in the mainland of Asia, where probably the kindred race from which the modern Malays are derived was also developed. They proceeded eastward, passing to the north of New Guinea and the Solomon Islands, which they probably found already inhabited by the black population, and on which they could not effect a landing, and settled in the Samoan and Tongan Islands, where their descendants still exhibit the purest type of the race. These islands, and especially Savaii, or Havaii, as it is called in all other Polynesian dialects except the Samoan which alone pronounces the sibilant, became centres, as the population increased, for emigration, which, as these people, like the Malays, are able navigators, was readily accomplished. This accounts for the name Havaii recurring as the native designation of the Sandwich Islands, and for the general tradition in New Zealand and elsewhere of the ancestors of the present inhabitants having come from an island of that name.† For the facts which have been collected bearing upon the details of these migrations, I must refer to the works just mentioned.

The social condition of the Polynesians when first discovered was somewhat in advance of that of the Melanesians. They lived in villages composed of large, airy, thatched houses, cultivated bread-

\* *Les Polynésiens et leur Migrations*, Paris, 1865.

† In Cook's account of his first visit to New Zealand (in 1770) he says:—"Having now given the best account in my power of the customs and opinions of the inhabitants of New Zealand, with their boats, nets, furniture, and dress, I shall only remark that the similitude between these particulars here and in the South Sea Islands (i.e. the Society Islands) is a very strong proof that the inhabitants have the same origin; and that the common ancestors of both were natives of the same country. They have both a tradition that their ancestors, at a very remote period of time, came from another country, and, according to the tradition of both, that the name of that country was *Hawaï*; but the similitude of the language seems to put the matter out of doubt." *Voyages by Hawkesworth*, vol. iii. p. 473, 1773. This, it must be observed, was written before the discovery of the North Pacific Havaii (Cook's Owyhee), or the Samoan Savaii or Havaii.



fruit, cocoa-nuts, plantains, yams, shaddock, sweet potatoes, and sugar-cane. As domestic animals, they kept pigs, fowls, and dogs. They mostly wore some kind of clothing, generally made of a kind of cloth manufactured from the inner bark of a tree. The practice of very elaborate and artistic tattooing of the skin prevailed extensively. They had no metals, and generally no pottery, but used stone axes, shells, gourds, &c., for domestic purposes. Their weapons were bows, spears, and clubs. Their large and finely built canoes excited the admiration of so good a judge as Cook, and their skill in handling them gained for one group the title of "Navigator Islands" from the French Admiral Bougainville. They were governed by chiefs, and had an hereditary aristocracy, who preserved their pedigrees with great care, and they possessed many complex social customs, among which that of the "taboo" was one of the most influential in its effects on their daily life.

The agreeable and courteous manners of these people, and their docility and generosity, always impress those who come in contact with them, although when excited, as in the not infrequent wars among themselves, they are capable of great cruelty, and human sacrifice and cannibalism prevailed extensively in many of the islands. Indolence, and a considerable laxity in several points of social morality, are also among their failings. As is well known, they have shown a great aptitude to adapt themselves to the external usages at least of European civilization, and the primitive, picturesque, if barbarous mode of life is everywhere rapidly giving way to an imitation of English or American institutions, dress, and customs. Hawaii, which exactly one hundred years ago came for the first time in contact with European influence, by its accidental discovery by Cook on his way to explore the north-west passage by Behring's Straits, has now, though still under native rule, its constitutional government by king, lords, and commons, its churches, its schools, its newspapers, and, as announced within the last few days, its railway.

With the disappearance of the ancient customs, strange to say, the people are themselves disappearing. All accounts tell us of a steady diminution of the population, not only in islands where, as in New Zealand, Europeans have invaded and practically annexed the land, and so curtailed the means of subsistence of the natives, but even in others where the original independence has been retained, the introduction of European institutions and customs, good and bad, and especially of diseases before unknown in those seas, appear to have a blighting effect upon the vitality of the islanders. We all remember how virulently destructive was measles, accidentally introduced among our new fellow-subjects in the Fiji Islands a very few years ago; and pulmonary consumption, apparently unknown in former times, now occasions an immense mortality. The cause of the rapid diminution of the Polynesian population is, however, too large and complex a question to be discussed here; the fact is, however, well attested. As an example, in the Hawaiian Islands, leaving out of the question the probably

exaggerated estimate of Cook, since a regular census has been established, the population has diminished from 130,000 in 1832 to 60,000 at the present time.

Nearly all who have had personal opportunities of observation, agree that the inhabitants of the Samoan or Navigator Islands, and of the neighbouring Tonga or Friendly Islands of Cook, may be looked upon as the most typical representatives of the Polynesian race; and I shall therefore speak of their physical characters first. They certainly present the greatest contrast to the Melanians, and perhaps the greatest resemblance to the Malays; indeed, the Rev. S. J. Whitmee, who lived many years in Samoa, and has studied the natives with great care, says, in an interesting article in the 'Contemporary Review' for February, 1873, that morally, intellectually, and physically, the description given by Wallace of the Malays (quoted above) applies exactly to the Samoans, with the only difference that the latter are a people of much larger stature, a circumstance which he attributes to their more abundant supply of food. Commodore Wilkes thus describes the Samoans:—"The average height of the men is 5 feet 10 inches, and some of the chiefs, whose limbs are well rounded, would be called fine-looking men in any part of the world. Their features are not in general prominent, but are well marked and distinct, and are all referable to a common type. The nose is short, and wide at the base; the mouth large, and well filled with large and white teeth, with full and well-turned lips; the eyes black, and often large and bright; the forehead narrow and high, and the cheek bones prominent. It was observed that some of them had the eyes turned up at the outer corner, like the Chinese. Of beard they have but little, but their hair is strong, straight, and very black. The general form of the skull is broad and short, and it is highest near the crown." The colour of the skin, as in other Polynesians, is yellowish or light brown; sometimes as light as that of Southern Europeans, but varying somewhat according to the habitual exposure to the atmosphere and sun and other causes.

The Museum of the College contains, unfortunately, only five crania of Central Polynesians on which to found a description of the race characters; but they agree so well in all their principal features, that I think it probable that they are fair specimens of the type. Of these three are Samoan, one Tongan, and one from St. Augustine's Isle, in the Ellice group. They are all adult males.

Their average capacity is 1420 cubic centimetres, or 86.7 cubic inches. They are all round skulls (see Fig. 4), the indices of breadth varying between 77 and 88, the average being 82.2. The height is either equal or less than the breadth in each case, though they may generally be described as high skulls, the average index being 77.8. In no case does the squamosal meet or even approach near the frontal, and none has epipteric bones. They are all phenozygous, but very slightly so. The forehead is flat, the glabella not greatly developed, the face long and straight; the nasal aperture narrow, the nasal index

varying between 39.3 and 46.3, the average being 44.3; the orbits round and high, the average index being 92.8. The jaws in three cases are mesognathous with indices of 99, 99, and 100 respectively; but one is remarkably orthognathous, with an index of only 92; this may, however, be an exceptional case: the other cannot be measured. The malar bones are greatly developed, as in the Malay, presenting a marked contrast to those of the Australian. The size and forward position of these bones are among the features by which they can be most readily distinguished from European skulls. The lower margin of the orbit, and the long axis of the orbital aperture instead of being nearly horizontal, as in the Australian and Melanesian, are inclined downwards at the outer side. The palate is short and semi-circular; the teeth not particularly large. It will be seen that in all their essential features these skulls resemble those of the Malays. They are, however, rather larger, and especially higher; the face is longer and somewhat less prognathous, and the nose is narrower.

When a typical Polynesian, as a Samoan cranium, and a typical Melanesian, as one from the New Hebrides, have once been compared and contrasted, they can be recognized at a glance; as they differ quite as much as does the external appearance of the people. Some skulls which were presented many years ago from the island of Lifu (Loyalty group) by Dr. George Bennett, are most characteristically Polynesian—the nasal index alone would separate them from the Melanesians, among which they would be arranged geographically; and this perfectly accords with what we know of the external characters and history of the people to whom they belong, the Loyalty Islands having been colonized, as already mentioned, some 150 years ago from Wallis Island, in Central Polynesia.

It is very interesting to observe the physical evidence of the gradual blending of the two different types in different proportions in regions where, on other grounds, they have been supposed to be intermixed. Thus among skulls brought from the Fiji and most of the neighbouring islands, some are purely Polynesian, some as purely Melanesian, others presenting a combination of characters. Professor Rolleston has been kind enough to allow me to examine a series of crania lately acquired by the University of Oxford from the Central Caroline Islands, inhabited by a population generally admitted to present the characters of a mixed race. These skulls exactly corroborate this view. All the principal cranial indices are intermediate between those proper to the Melanesian and those belonging to the Polynesian type.

The Maoris, or native population of New Zealand, if true Polynesians, as is usually supposed, have departed considerably from the Samoan type. They are darker in colour, have usually more curl in their hair, stronger beards, more prominent and aquiline noses, longer heads (the average cranial index of all that I have measured being 75), rather lower orbits (89), and slightly wider though still leptorhine noses (47). It is possible that this change of type may have taken

place simply as the result of three or four centuries' isolation under different conditions, and is therefore something similar to that which appears to be in process among the English in North America; but it is very suggestive of an admixture of Melanesian blood, as every one of the points mentioned form an approximation more or less pronounced towards that race. Although it has been doubted by some authors, it is asserted by others that there are Maori traditions indicating the existence of an aboriginal population, though probably not a numerous one, upon the islands before they were invaded from Rarotonga in the beginning of the fifteenth century. If this were the case they were probably Melanesians, and their absorption into the ranks of the conquering race would cause the physical changes noted above.

However this may be, the present Maoris are a fine race, tall, muscular, and well built; brave, active, and intelligent; "in truth," as Sir David Wedderburn remarks, "as near an approach to the ideal of a 'noble savage' as has ever existed in modern times." \* Notwithstanding this, and the great aptitude some of them have shown for adopting the habits of European civilized life, several being already members of the legislative assemblies in New Zealand, and one having at present a seat in the cabinet, their extinction under English influence appears to be coming on as certainly as that of their very inferior Tasmanian and Australian brethren. Their numbers in 1849 were estimated by Sir George Grey at 120,000, ascertained by census in 1858 at 56,000, and in 1874 at 45,470, all but 2000 being inhabitants of the North Island.

The Maoris themselves are guilty of having exterminated in a very ruthless and complete manner, even within the present century, a kindred race. The history of this transaction illustrates very well on a small scale one of the processes by which the ethnology of the Polynesian Islands, and indeed, we may say, of the whole world, has been gradually modified. In 1835 a party of New Zealand natives, finding themselves short of room in their own country, probably either directly or indirectly through the encroachments of European settlers, resolved to seek their fortunes elsewhere, and chartering an English brig, sailed for the Chatham Islands, which were then inhabited by a people called Morioris, a branch of the Polynesian stock, but who having long lived on a small and not very productive island, were inferior in physique and warlike acquirements to the Maoris. The invaders had, therefore, little difficulty in taking possession of the islands, and in a few years had destroyed and eaten most of the original inhabitants, and reduced the rest to slavery. At the present time, according to Mr. E. A. Welch, the islands are inhabited by as varied and motley an assemblage of people as can well be imagined:—Morioris, Maoris, Kanakas, Negroes, Chinese, Spaniards, Portuguese, Danes, Germans, English, Irish, Scotch, Welsh,

\* "Maoris and Kanakas," *Fortnightly Review*, June, 1877.



Yankees, natives of South America, a Manilla native, a Laplander, a Russian Finn, a half-caste native of New Holland, &c.\*

As far as we know, the Eastern Polynesians, the Hawaiians, Marquesans, and Tahitians, do not differ materially in their physical characters from the Samoans. The Marquesans were described by Cook as "without exception the finest race of people in this sea. For fine shape and regular features, they perhaps surpass all other natives." I wish that I could give some details of their cranial conformation from actual observation, which would corroborate or modify the ordinary view of their origin and affinities, but I have not hitherto had an opportunity of doing so. Dr. Barnard Davis has a magnificent series of 116 crania of Kanakas, or natives of the Hawaii or Sandwich Islands, and gives their latitudinal index in his valuable "Thesaurus" at 89, which nearly corresponds with that of the Central Polynesians. It will be interesting to see whether the facial characters also agree.

In bringing to a conclusion this very slight and superficial sketch of the anthropology of an immense region of the earth's surface, I may be expected to say something as to the meaning attached to the word "race," so frequently used. It is better to confess at once that it is extremely indefinite and arbitrary, than to attempt to give an accurate definition. To such groups as I have spoken of under this designation, some anthropologists would apply the term "species." Although this word has not now the definite signification that was formerly attached to it, yet having some experience of its customary use among zoologists, and looking from a purely zoological point of view at the distinguishing characters of these types, races, varieties, or whatever we like to call them, I certainly cannot apply the term species to them in the same sense in which it is ordinarily used in zoology; much less can I believe in the view of the separate and distinct origin of any of these races.

The attempt to form a precise and harmonious scheme of classification is here, as elsewhere, beset with insurmountable difficulties. The endless gradations of distinctive characters can only be most rudely expressed in our artificial systems. We may speak of branches and sub-branches, varieties and sub-varieties, races, species, &c.; but these all are attempts to express degrees of difference connected by endless intermediate conditions, and passing insensibly from one to the other. The first and lowest degree or indication of race characteristics in man, is seen in the inherited traits of various members of a family, or tribe; the next in the more strongly marked and more permanent characters seen in the inhabitants of some district, especially where distinction of language interposes a barrier to communication and intermarriage. Where there are few natural or artificial barriers to mutual and extended intercourse, the characteristics of the different

\* E. A. Welch and Barnard Davis, "The Morioris or Native Race of the Chatham Islands," *Journ. Anthropol. Soc.* Nov. 1869, p. 97.

families or tribes become blended, and an absence of uniformity and an irregularity or variety in characters is produced. On the other hand, isolated groups of people tend to uniformity of character in some special direction. Certain peculiarities become in the course of ages more and more pronounced, and the longer time that this process continues, the more permanent and indelible do such peculiarities become, and the more stable is the type produced; exactly as is well known to be the case with the different breeds of domestic animals. This applies not only to the bodily, but also to the intellectual and moral qualities. As the necessity for depending for very existence on the acuteness of the perceptive organs may, in some races, during the course of generations increase the powers of vision and smell, and modify the anatomical structure of the organs by which these senses act, so also may certain mental and moral characteristics in the course of time become stamped more or less firmly upon all members of the race.

The view of this great question, which appears to be most philosophical as well as most consistent with facts, is that which is intermediate to the two extremes held by certain anthropologists; viz. that of the inherent, radical, and impassable distinction between the different groups of man and that of the perfect equality and identity of all mankind. The theory that an Australian or a Polynesian merely requires to be educated and placed in the same circumstances with a European to be his equal in maintaining his position in those circumstances, or *vice versa*, ignores the teachings of physiology. He can no more be expected to do so than the foal of a cart-horse, with any amount of training which may be bestowed upon him, can be expected to win the Derby. But just as the cart-horse and the thorough-bred have been developed from one original stock, and will unite and produce intermediate forms, and will without selective breeding revert to some common form, so it is with the races of man, however much this may be disputed by the extreme school of polygenists.

This being the general view of the position of these races, the divisions we make are necessarily arbitrary, and have no natural barrier between them, and no strict equivalency, and the nature of our classification will depend upon what characters we lay most stress upon as indications of affinity. We see already in the subjects of this course very striking characters, those of the hair and of the form of the skull, not correlated, as in the Andamanese and Melanesians. The various groups of men upon the world, whether originally all straight-haired or all frizzly-haired, must, it has been argued, have separated at some time into two primary divisions, the *Leiotrichi* and the *Ulotrichi* of Bory de St. Vincent, a view to which Professor Huxley is inclined to give much weight. This would be a simple starting point for our classification. But on examining other characters, some of which seem equally important, difficulties arise. First let us take the case of the Australians. Their general aspect, all their cranial and skeletal characters ally them so closely to the Melanesians, and

also to the African negroes, that it is extremely difficult to suppose that so many coincidences could have arisen in two stocks which had already diverged so far as to fix permanently the distinctive characteristics of the hair. Again, take the Negritos of the Indo-Malayan Archipelago. Here we have a woolly-haired people, with scarcely any of the osteological and perhaps cerebral characteristics of the other negroid races. The alternative supposition that woolly hair could have originated independently, upon different branches of straight-haired races, is also beset with difficulties. It is clear, however, that setting aside the doctrine of separate creation, one or other of these events must have taken place; but which is the more likely is impossible, in our present state of knowledge, to decide.

Very much still remains to be done with regard to the history of man in the part of the world we have been considering this evening, both in the confirmation or amendment of the truth of these general conclusions, and in the completion of the various details. And now is the time, if ever, when it must be done.

Many of these people have lived in their sea-girt homes, isolated from the rest of mankind, for ages untold, and with probably little or no change in their habits or physical characteristics. Among others, the movements, migrations, and interchange of ideas and customs, and progressive improvements, which have taken place have been of the most partial, slow, and gradual character. But within the lifetime of some still among us, a marvellous transformation has been wrought among them. It is scarcely a hundred years since the veil of darkness and mystery which enshrouded these regions was uplifted, and the very existence of most of the races of which I have been speaking was first revealed to the civilized world. It is only within the present century that the great movement has taken place, the rush of the Anglo-Saxon race into the islands of the Pacific, which is rapidly shaking to the foundations all the old ethnological landmarks, and, with accumulating speed, sweeping away, not only the characteristic customs, traditions, and languages of the people, but even the very people themselves. In another half century, the Australians, the Melanesians, the Maoris, and most of the Polynesians, will have followed the Tasmanians to the grave. We shall well merit the reproach of future generations if we neglect our present opportunities of gathering together every fragment of knowledge that can still be saved, of their languages, customs, social polity, manufactures, and arts. The preservation of tangible evidence of their physical structure is, if possible, still more important; and surely this may be expected of that nation, above all others, which by its commercial enterprise and wide-spread maritime dominion has done, and is doing, far more than any other in effecting this destructive revolution.

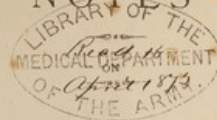
[W. H. F.]

TABLEAU OUTLINE OF THE PRINCIPAL PHYSICAL CHARACTERS OF THE RACES TREATED OF IN THIS LECTURE.

| Race.                          | Stature.       | Colour.     | Hair.             | Back &c.       | CRANIAL.                            |                   |                  | FACIAL BONES.    |                           |                |
|--------------------------------|----------------|-------------|-------------------|----------------|-------------------------------------|-------------------|------------------|------------------|---------------------------|----------------|
|                                |                |             |                   |                | Capacity of Brain, in Cubic Inches. | Index of Breadth. | Index of Height. | Cranial.         | Orbital.                  | Nasal.         |
| AUSTRALIAN                     | Medium         | Blackish    | Straight or Waved | Well developed | 78                                  | 72                | 72               | 103 Prognathous  | $\frac{82}{82}$ Microsome | 57 Platyrrhine |
| TASMANIAN                      | Medium         | Blackish    | Frizzly           | Ditto          | 80                                  | 76                | 73               | 103 Prognathous  | $\frac{76}{81}$ Microsome | 57 Platyrrhine |
| MELANESIAN                     | Variable       | Blackish    | Frizzly           | Ditto          | 80                                  | 71                | 75               | 105 Prognathous  | $\frac{81}{81}$ Microsome | 55 Platyrrhine |
| NEGRO                          | Very Small     | Black       | Very Frizzly      | ?              | 74                                  | 82                | 78               | 100 Mesognathous | $\frac{86}{88}$ Mesosome  | 51 Mesorrhine  |
| MALAY                          | Small          | Light Brown | Straight          | Nearly absent  | 87                                  | 81                | 76               | 98 Mesognathous  | $\frac{90}{90}$ Mesosome  | 50 Mesorrhine  |
| POLYNESIAN                     | Tall or Medium | Light Brown | Straight          | Scanty         | 87                                  | 82                | 78               | 98 Mesognathous  | $\frac{93}{93}$ Mesosome  | 45 Leptorrhine |
| ITALIAN (added for comparison) | Medium         | White       | Straight Waved    | Well developed | 89                                  | 80                | 73               | 97 Orthognathous | $\frac{86}{88}$ Mesosome  | 47 Leptorrhine |



NOTES



# NEW ZEALAND.

FOR THE USE OF EMIGRANTS.

BY

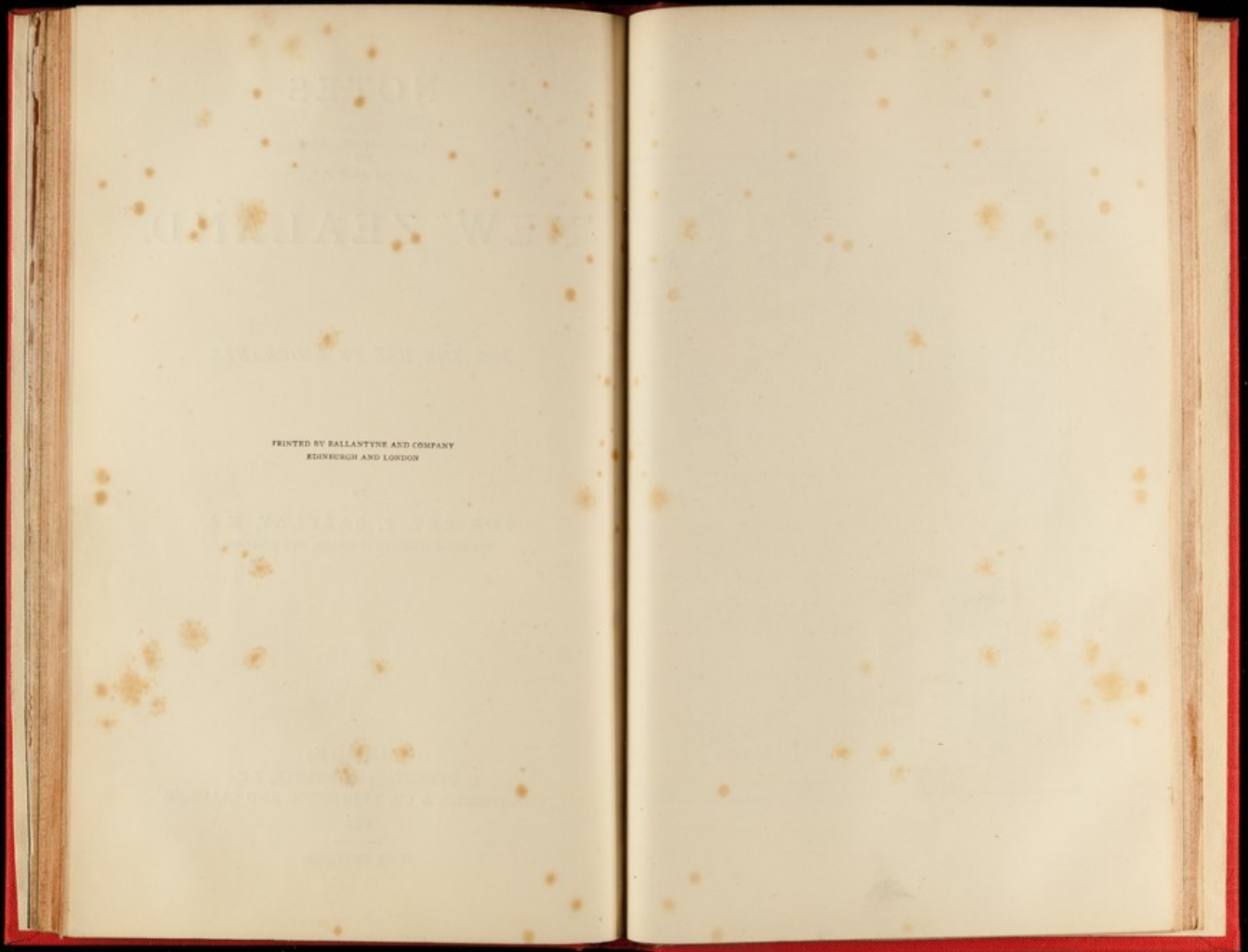
THE REV. P. BARCLAY, M.A.  
FORMERLY MINISTER AT NAPIER, NEW ZEALAND.

LONDON:

G. STREET, 30 CORNHILL, E.C.  
JOHN MENZIES & CO., EDINBURGH AND GLASGOW.

1872.

PRICE TWOPENCE.





[illegible]

*Marine Distance Table specially compiled for this Map by Capt. Foster of the Teledindia showing the true commercial position of New Zealand and its proximity to the South.*

From NEW ZEALAND (Wellington)

[illegible]

Estimated area of

| S. W. ZEALAND.       |        | <i>Area</i> |
|----------------------|--------|-------------|
| North Island         | nearly | 36,000,000  |
| South Island         | about  | 36,000,000  |
| Stewart, Chatham &c. |        | 2,000,000   |

BRITISH ISLES.

|                 |                         |
|-----------------|-------------------------|
| England & Wales | 28,000,000              |
| Scotland        | 10,000,000              |
| Ireland         | 20,000,000              |
|                 | <u>Total 58,000,000</u> |

## NOTES ON NEW ZEALAND.

### I.

#### ITS DISCOVERY AND SETTLEMENT.

NEW ZEALAND was discovered and named by Tasman, a Dutch navigator, in the year 1642.

It may be said to have been re-discovered in 1769 by Captain Cook, who passed through the Straits still bearing his name, and touched at various points on the coast. As his custom was, then and on his subsequent visits he tried to benefit the natives by giving them useful seeds and plants, and by introducing pigs and cattle. These were of much use in a land which had no indigenous wild animal larger than a rat, and where, though vegetation is excessive, there was a want of food-producing plants and herbs.

During the next fifty years, trade and intercourse began to spring up between New South Wales, which had to some extent been colonised, and New Zealand.

In 1814 the first church missionaries arrived from New South Wales, and soon after others came from England, who began to teach the natives the truths of Christianity. About the same time, and for twenty or thirty years thereafter, various little communities settled along the coast. These consisted chiefly of sawyers, whalers, and produce-collectors, who all found work of some kind by which they could make a livelihood. Many vessels, especially whaling-ships, began to resort to the bays and harbours for spars, provisions, &c. Thus the country gradually became better known in England, where the splendid harbours, the magnificent forests, the fertile soil, and the salubrious climate came to be spoken of. Hence the desire arose for its regular colonisation. Accordingly, in 1838, an influential body of public men formed a New Zealand Company. Soon after the British Government made it a colony of the empire, and sent out Captain Hobson, R.N., as first Governor, who, in 1840, founded the city of Auckland as its future capital, on the



their own traditions, and by the traces that remain of villages, the population cannot have been much less than 150,000. But unfortunately they brought all their evil habits and their love for war with them, and their numbers speedily began to decrease. And they are still decreasing, chiefly from these old habits, and partly from the state of semi-civilisation into which they have been brought during the last fifty years. There cannot now be more than 38,000, of whom about 2300 are settled in little communities over the South Island, the great majority being pretty equally scattered over the North Island.

Christian missions were established among them many years ago. These have been only partially successful in their highest ends. But though it is very difficult to change the manners and customs of a people, they have been the means, along with other influences, in putting down heathen practices, and to some extent in improving their social condition.

Unfortunately, in 1859 a dispute arose between them and the Government about land in the province of Taranaki. Not being amicably settled, war ensued, which by and by spread over a considerable part of the North Island. A few years before this a native king had been set up in the Waikato country, and though the king and his party took no active part in the war, yet this tended to complicate matters. Then a false prophet arose, who concocted a strange mixture of Paganism and Judaism, and under a pretence of inspiration succeeded in getting a great many followers, not only from the more remote tribes of the interior, but even from those who had for a considerable time been in close intercourse with the settlers. At this period every tribe in the country had made an open profession of Christianity, although some of them afterwards relapsed into heathenism.

This party, with their horrid rites and monstrous cruelties, directed not only against the colonists, but also against their own countrymen who adhered to British rule, still more complicated matters. With more or less intermission, and with some very sad occurrences, the war lasted for about ten years.

It is now practically at an end, although the pursuit of Te Kooti, and one or two other ringleaders among the insurgents, is still being carried on by the armed constabulary. Those who know New Zealand say that there is no likelihood of the renewal of native disturbances at any future time; for the natives have suffered so much, that many of the tribes who were hostile have submitted, and the few who have not, begin to see the hopelessness of carrying on the contest.

They still possess a very large quantity of land,—very much more than they can ever occupy. Part of this is rented by the colonists, who also pay them large sums of money in the form of wages for making roads, clipping sheep, &c. A system of direct purchase through the medium of the native land-court,

which investigates and registers native titles, has recently been established, and appears on the whole to work satisfactorily.

In reply to statements that have from time to time been circulated in this country, it may be stated shortly, that the colonists have never oppressed the natives. On the contrary, the probability is, had not the British Government been established, that nearly the whole race would by this time have perished through their perpetual wars and barbarous customs—particularly the practice of female infanticide, which at one time was all but universal.

The habits of the people are now undergoing a rapid change. In the districts contiguous to European settlements, their advance in civilisation is already apparent in the better style of their dwellings, &c., while some of the more enterprising among them derive a comfortable income from sheep-farming on a small scale, and from other industrial pursuits.\*

#### IV.

##### GENERAL DESCRIPTION.

We shall begin with some remarks upon its climate.

Very different accounts are given of the climate of New Zealand, which its shape and position go a long way to explain. Extending over nearly 14° of lat., and of no very great breadth, its climate must of necessity be very various, just as in Great Britain the climate of Caithness in the north of Scotland is very different from that of Devonshire in the south of England. So that while in the north of New Zealand oranges and other semi-tropical fruits may be grown, in the south the climate is very much that of England. It may be well to remind our readers, that as New Zealand lies on the south side of the Line, the sun goes round by the north, so that we there speak of the warm and sunny north, and not of the sunny south. Snow, which is rarely seen in any part of the North Island, except on the lofty hills and mountains (and if seen elsewhere, only remaining for a short period), is not quite so uncommon in Otago, and, indeed, on nearly the whole west coast of the South Island, where the mountains, flanked in some cases by glaciers, rise to the height of 12,000 or 13,000 feet. Speaking generally, the climate of the South Island, though rather warmer, may be described as that of England—Nelson being its Devonshire; while the climate of the North Island is more like that of France, although free from the extremes of heat and cold to which that country is subject. For

\*The writer is indebted for the latter portion of this section to Walter Lawry Buller, Esq., Sc.D., F.L.S., &c., Resident Magistrate at Wangamui, who has also kindly read over the whole tract in MS., and given some valuable hints.

New Zealand having no great breadth at any place, has its climate tempered by the surrounding seas and by the high winds which not unfrequently prevail. At the city of Auckland, which, like Corinth, is situated between two seas, the climate is moist and warm. But within the large province bearing the same name it varies considerably, and there are few places in the world in the enjoyment of such a climate as the Bay of Plenty and Turanga or Poverty Bay. In Hawke's Bay province, where the rain-clouds seem to be caught and frequently emptied by the Ruahine mountains on the west, and where the formation is limestone, it is dry and hot in summer, but seldom unpleasantly so. In Wellington it is more bracing than in either of these provinces, from the strong winds which frequently blow through Cook's Straits. Within the province, on the coast towards Wanganui, there is more moisture than on the east coast, but only of such amount as to make it one of the best agricultural districts in New Zealand. The same description will apply to Taranaki, which has been called the garden of New Zealand. Nelson, with its warm northern exposure, has a pleasant though slightly enervating climate. In the south-west part of the province, and in Westland, comprising the Hokitika gold-fields, there is rather too much wind and rain. In Canterbury, on the east side of the South Island, the climate is much better, although from the cold winds that blow down from the snowy mountains in winter, and the hot winds that occasionally blow over most parts of New Zealand in summer, and have there the full sweep of wide plains to traverse, the extremes of heat and cold are somewhat greater than in the other provinces. Dunedin, from its situation and surrounding hills, has not so pleasant a climate, but that of the province of Otago, of which it is the chief town, is generally much better.

It should be noted, in conclusion, that with the exception of Westland, fogs are of very rare occurrence in any part of New Zealand. This may be one cause among others why it is so healthy a country. In general, suitability to the Anglo-Saxon constitution, in recruiting properties for the invalid, and in fitness for agricultural and pastoral pursuits, the climate of New Zealand ranks as one of the finest in the world. The late Dr Thomson, Surgeon H.M.'s 58th Regiment, in his able work on New Zealand (where he was stationed for several years), has spoken to this effect, proving what he affirms by the singularly favourable tables of sickness and mortality among the troops. And there can be no better standard than these for estimating the salubrity of any climate. Many weakly and consumptive people have gone to New Zealand solely on this account, and unless disease has taken a deadly hold on them, they have as a rule recovered their strength and vigour so as to be fitted for all the duties of life. There can be little doubt that New

Zealand will become the sanatorium of Australasia, and that, at Rotorua, in the North Island, with its wonderful hot springs and lakes, its cascades and almost ready-made warm baths, a town will be in existence within a few years, to which multitudes will resort, as they do on this side of the world to Harrogate, to Bridge of Allan, to Aachen, or to Kissengen. A good many officers and others from India have also gone to New Zealand, partly for the sake of its climate, and partly because they find they can live less expensively than they can do in England, and also because they can find better investments for their money.

We now go on to the general description of the country.

Beginning with the extreme north, the peninsula which extends about two hundred miles to the north of Auckland city has been spoken about as having the same resemblance to the rest of New Zealand as Cornwall and Devon have to England. Its surface is varied by ranges of lofty hills and deep bays. Some of these latter have a narrow entrance between high bluffs, but within they spread out into a broad expanse of water surrounded by river harbours. The Kaipara spreads out not unlike the human hand, with several long fingers. It receives many streams, one of which, the Wairoa, is navigable by tolerably large ships for about fifty miles. An immense timber-trade has been carried on here for many years, as a great part of the country is covered with Kauri forests. The same trade is carried on at various points on the coast. The Bay of Islands, with its beautiful harbour in the N.E. of the peninsula, was about the first settlement in New Zealand, and the first mission station. But the available country is not large, and the establishment of the seat of Government on the splendid harbour of the Waitemata has prevented it from attaining any great commercial importance. The whole peninsula is well watered, and there are numerous fertile valleys scattered over its surface. Throughout there are a great number of small settlements, such as Albertland, Wangarei, Hokianga, Wangaroa, Matakana, Monganui, between which and Auckland a great coasting-trade is kept up by small steamers and other craft. And a railway is in process of construction between Auckland and Kaipara. At Waipu there is a large settlement of Scotch Highlanders, who went first to Nova Scotia, and thence to New Zealand, where they found a finer soil and a much better climate.

On the Waitemata, opening to the east coast, and not far from Manukau harbour, opening to the west, stands the city of Auckland (lat. 37°), amidst a network of navigable waters. Its population, including Parnell and Newton, is about 21,000, while the townships or villages within a circuit of ten miles, Otahuhu, Onchunga (its port on the Manukau), Howick, &c., may contain



10,000 more. From its situation in reference to Australia, and even to North and South America, Auckland must in course of time become one of the great centres of commerce for the Southern Seas. It has already a splendid wharf, at which the largest ships can lie, substantial warehouses, and many public buildings, occupied as churches, banks, government offices, &c. It is, as may be said of New Zealand towns generally, a finer town than the towns in Great Britain of a corresponding size.

Immediately to the south, about Tamaki and Otahuhu, there is a fine tract of fertile soil well fenced and highly cultivated. Still farther south we approach the Waikato country by a splendid road extending forty miles. Within a year or two it is hoped that the railway which is now in progress will be completed as far as the Bluff. There the great Waikato River, navigable with its affluents for several hundred miles, turns westward, and falls into the sea a little to the south of the Manukau.

The Waikato district is one of the finest in New Zealand, and while the natives are still numerous, the European population is beginning to flow in. On the rivers which provide water-communication, Ngaruawahia (the burial-place of the so-called Maori king), Alexandra, and various other townships, are growing into importance. Banks and churches of various kinds are being established, and for the first-named place a coach leaves Auckland daily. But there cannot be more than a very few thousand people in the whole district, which is capable of sustaining two or three millions in plenty and comfort. Along the rivers, in the plains, and in the valleys, there is a very great amount of soil admirably adapted for agricultural and grazing purposes.

Inland from the Bay of Plenty, and toward the south, are the hot lakes of Rotorua, forming, with their surroundings, one of the most remarkable districts on the face of the earth, according to the testimony of Hochstetter and other travellers. In the south of the province, and near the centre of the North Island, lies Lake Taupo, about eighty miles in circumference. Its placid waters are yet undisturbed save by the canoe of the natives, who are more numerous in this district than elsewhere. To the south of Taupo lies a very wild and mountainous country little visited by Europeans. Here rise the giant mountain of Ruapehu to the height of 9000 feet, and the semi-active volcano of Tongariro to that of 7000 feet. In this district the Waikato, which flows northward through Lake Taupo, has its source, and also various other streams, some of which flow eastward towards Hawke's Bay, and others into Cook's Straits on the south-west.

About fifty miles to the east of Auckland we come to the Thames Valley and Coromandel districts. From all accounts

there is a considerable quantity of arable land, and a great deal of very fine timber. But the energies of nearly all the people there are mainly directed to gold-mining, which has of late been yielding large returns. The chief town of the district is Shortland, which, with Grahamstown, &c., may contain 7000 people. Thence we go to the Bay of Plenty which is about 150 miles wide, and 50 or 60 deep. On the coast of the bay there are a few small settlements, and here and there considerable tracts of arable land. The principal township is at a singularly beautiful place named Tauranga, which will likely become the chief town of the district from possessing the best harbour on a long line of coast. Coming round the East Cape, where the country is rather mountainous, we arrive at Turanga, generally called Poverty Bay. This unfortunate name—never was there a greater misnomer—it received from Captain Cook, because he failed in getting provisions for his ship. It is a beautiful place, with park-like scenery, clear streams, and a delicious climate. There is a large quantity of very fine land in this district, a part of which is now in the hands of Europeans, who are settling there in considerable numbers. A township under the name of Gisborne has been established, which will, doubtless, make rapid progress, as the harbour, though not perhaps fitted for large ships, is very commodious for small craft. Thence a steamer plies regularly to Napier in the province of Hawke's Bay (100 miles).

Hawke's Bay is a deep indentation in the coast line, receiving several rivers, such as the Wairoa, navigable for some miles, the Ngauroro, the Tuki-Tuki, &c. On the banks of these and other streams there is a large amount of arable land, while the plains near Napier (pop. 2200, lat.  $39\frac{1}{2}^{\circ}$ ), the chief town of the small province of Hawke's Bay, must contain about 90,000 acres. A considerable portion of this is under cultivation, while a larger part is fenced and laid down in English grass. There is a fair amount of trade and commerce at Napier, considering the size of the place and the sparseness of the population in the country districts, which, with the partial exception of the plains already spoken of, are almost entirely occupied by sheep-runs. Yet, with the increase of population there and elsewhere, large portions of most of these runs will be available for farming purposes. On several of the well-made roads in this province coaches have been running for some time, and recently one has been started between Napier and L. Taupo, in the centre of the island. And it is hoped that ere long a railway will connect Napier with the fine district of Waipukurau (45 miles S.), and after a very few years with Wellington (200 miles).

Thence we come along to Wellington province. On its eastern side the best district is named the Wairarapa (pop. 3500), where the land is very much occupied as in Hawke's Bay. Here there

are several rising townships—Masterton, Featherston, Carterton, and Grey Town. Coming down the Hutt Valley, with its pretty gardens and cultivations, we arrive at the magnificent land-locked harbour of Wellington, nine miles in circumference, forming a safe retreat from the stiff gales which occasionally blow in Cook's Straits. The city of Wellington (pop. with suburbs, 10,000, lat.  $41\frac{1}{4}^{\circ}$ ), which was founded by Colonel Wakefield and the New Zealand Company in 1840, lies on the west side of the harbour. It is now the seat of the Colonial Government, and a place of very considerable commercial importance. Like Auckland, it has its wharf suitable for ships of any tonnage, its shops and hotels, and some fine public buildings, such as those for the Legislative Council and House of Representatives. Its growth has been retarded by the want of arable land in the immediate neighbourhood, and by the difficulty of access through the hilly country behind it. This difficulty has been greatly obviated by well-made roads towards the Hutt and the Wairarapa on one side, and Wanganui on the other, on which public conveyances are daily running, and it will be entirely obviated when the projected railways are accomplished facts.

The country from Wellington to Wanganui is upon the whole remarkably good, and well adapted for agriculture, which at Manawatu (70 miles from Wellington), Rangitikei, Turakina, and Wanganui (120 miles), is carried on to a considerable extent. Various townships have been, or are being planted, which, with the expected tide of emigration, may very soon become populous villages. Wanganui on a large navigable river of the same name, which flows through a fine arable country for a great part of its course, is the chief town of the district. Near the sources of the Manawatu River, and stretching towards the Ruataniwha plains in Hawke's Bay province, lies an enormous extent of forest land, generally spoken of as the Forty-mile Bush. Many thousand acres have recently been acquired by purchase from the natives, and as a main road is being rapidly cut through the forest, this land will presently be open for settlement. There are few better fields than this large and fertile district for industrious and enterprising colonists.

Farther up the west coast we come to the small but fertile and well-watered province of Taranaki, tempting one to apply the proverb, "That good things are made up in small quantities." Its chief town is New Plymouth (pop. 1200, lat.  $39^{\circ}$ ). Since the war, which to some extent devastated this district, is over, immigration may be expected to increase. Here the snow-crowned Mount Egmont, rising almost from the ocean to the height of 8500 feet, with its lower parts clothed in magnificent forests, presents a picture of beauty and grandeur hardly to be equalled. Still farther north, and completing our circuit of the North Island, lies a somewhat narrow and rugged country between the Waipa, the chief affluent of Waikato River, and the sea.

There are two or three available harbours, however, such as Kawhia and Raglan, where small settlements have been attempted, but from the war and other causes they have as yet been only partially successful.

We now cross Cook's Straits to the South Island, the northern portion of which is occupied by the provinces of Nelson and Marlborough. At Nelson one of the earliest settlements was made by the New Zealand Company, but from various causes its growth has not been very rapid. About Richmond, Waimea, Motueka, and Collingwood, there is some extent of arable land, yet there is hardly the same field for farming enterprise as in some other parts of New Zealand. The town of Nelson (pop. 5600, lat.  $41\frac{1}{4}^{\circ}$ , 150 miles from Wellington) is beautifully situated on Blind Bay. Not very far off are mines of coal, chrome, and copper, while towards the west, and along the Buller and Grey rivers, large quantities of gold have been found. Here are the townships of Charleston (pop. 1400), Westport (pop. 900), &c. In the south part of the province, the country is very rugged and mountainous, although there is a large district lying eastward, watered chiefly by the river Dillon, admirably adapted for sheep-farming. To the north-east of this lies the province of Marlborough, of which Picton (pop. 700) is the chief town. The best part of this province is to be found in the Wairau plains, near the town of Blenheim. Northward of these plains is a rough country, broken up with creeks and harbours of every size and shape. The chief of these is Queen Charlotte's Sound, with its double entrance, running about twenty-five miles into the land, and closely hemmed in by abrupt wooded hills.

We have now come to the central district in the South Island, the magnificent province of Canterbury, settled by an English colony in 1850. Its chief port is Lyttelton (pop. 2600), situated on an inlet of the sea between Bank's Peninsula and the coast line. This inlet makes a very good harbour, though scarcely equal to either of those at Wellington and Auckland. Wharves and jetties have been constructed to accommodate the great amount of traffic carried on. Behind the town are precipitous hills, which are crossed by a steep zigzag road, and penetrated by a railway to Christchurch. This city (pop. with suburbs, 13,000, lat.  $43\frac{1}{2}^{\circ}$ ), which is the chief town of the province, is situated on the banks of the Avon, and not far from the Heathcote, where small coasters come. It has excellent markets, and well-kept streets lighted with gas, and no doubt its traffic will be greatly increased by the railways which are beginning to radiate from it in several directions. There are various other townships on the plains or on the coast, of which Kaiapoi, Rangiora, Timaru (pop. 1500), are the more important. Along the sea-board there is a very considerable quantity of arable land, but the greater part of the plains, containing about three millions of acres, are occupied with



sheep-runs. There is almost no timber here except what has been planted. Another drawback is the large number of rapid and frequently dangerous rivers flowing from the lofty mountains across the plains, the chief being the Hurunui in the north, the Courtenay, the Rakaia, the Ashburton, and the Waitaki on the south. But ways and means are being used to obviate these dangers and drawbacks; and meanwhile, building timber and fencing-stuff can be had in the forests which cover a great part of Bank's Peninsula. On this account this peninsula is a valuable adjunct to the province, and not the less so that it contains several very good harbours. There are various thriving settlements planted here and there over it, which, in addition to the regular timber-trade, carry on a brisk trade in firewood, fish, fruit, and vegetables with Lyttelton and Christchurch. In the south end of the province, along the Ninety-mile Beach, there is a large tract of pastoral country of the best description. Here and there are hundreds of acres of arable land near the chief townships, such as Timaru, Geraldine, &c.

There is little to say about the county of Westland, which is a long strip of country on the western sea-board, with a somewhat humid climate. No doubt there is good land for agriculture in the valleys that run up toward the rugged mountains, but Westland is scarcely the best place for farming purposes. A few settlers will, however, always be welcomed, and will get employment in supplying the large digging population with vegetables and farm-produce generally; for gold-mining, which has for some years been attended with great success, continues to be the chief industry of the district. It is this that has attracted the large population, and led to the establishment of townships such as Hokitika (pop. 3600), Greymouth (pop. 2200), Ross, &c., which a few years ago had no existence. On this account also it was found necessary to create the whole districts west of the Southern Alps into a county separate from the province of Canterbury. These Southern Alps, beginning in the south of Nelson province, and stretching through Canterbury into Otago, cover a tract of country about 200 miles in length and 50 in breadth. Many of their peaks attain to 8000 or 10,000 feet in height, and are, of course, covered with perpetual snow. Mount Cook has an altitude of 13,200 feet.

To the south of Canterbury lies the large province of Otago, more than half the size of Scotland, and in many ways not unlike it in natural features. Here, as generally in the south island, the eastern sea-board is by far the finest part of the country. There are many well-wooded and well-watered agricultural and pastoral districts of great fertility, in the midst of which several flourishing townships are rising up; and while a considerable portion of the country has been occupied by the colonists, there yet remains very much land to be taken up. To-

ward the north is the rising port of Oamaru (pop. 1700), noted for its valuable building-stone, which it largely exports, as well as the usual products of the country. Farther south is Dunedin, the chief town of the province (pop. 15,000, lat. 45°47'). It is situated at the head of a loch, which serves as a harbour, about nine miles from Port Chalmers (pop. 1500), where the largest ships find anchorage, and where a large graving-dock has been built. Like the other chief towns in New Zealand, it contains several fine buildings, such as banks, post-office, churches, and schools. Recently a university has been established, and four professors, who would do no discredit to colleges anywhere, have been appointed. With Port Chalmers the communication is kept up by steamers and other craft, but a railway is being made, and by and by will be opened. There are capital roads throughout the eastern division of the province, on some of which coaches run regularly to Oamaru and thence to Christchurch, and to Queenstown on Lake Wakatipu, a large irregular sheet of water lying towards the west (on which a small steamer now plies), and to other places. The trade in Dunedin is very considerable, having received a great impulse from the gold discoveries in 1860. The diggings extend over a considerable part of the interior, and such have been the returns as to attract multitudes of people from all parts, although the Scotch population still largely predominates. Thus a demand arose for all farm-produce and marketable commodities; land, especially about Dunedin, rose to a high price, and so the landholders came into much more comfortable circumstances.

To the south of Dunedin lie the fine districts of Taieri and Tokomairiro, well peopled and largely cultivated. Here there are several rivers, of which the Taieri and the Clutha are the largest. The latter flows from Lakes Wanaka and Wakatipu by two streams, and after a course of about 250 miles it falls into the sea at Molyneux. From its rapidity, it is not of much use as a means of communication.

Farther south lies the district of Southland, with its chief town, Invercargill (pop. 2000, lat. 46°47'). The climate here is not quite so pleasant, especially towards Foveaux Strait, but inland it is better. There are large tracts of good agricultural land, chiefly towards the Mataura River, some of which is cultivated by a joint-stock company with steam-ploughs and other appliances of modern husbandry. The country is well watered by several rivers, which all flow into Foveaux Straits. The western half of the province is a wild mountainous country, abounding in lakes, and its inhospitable coasts intersected by huge arms of the sea of immense depth. Ships but rarely visit this coast, save when driven by stress of weather, or when they are in want of water and spars. At Martin's Bay, in the north-west, where a tract of alluvial soil has been discovered, and where there is

plenty of timber fit for shipbuilding, a settlement has recently been attempted, but with what success remains to be seen.

On the other side of Foveaux Straits lies Stewart Island, about the size of a large English county. It is deeply indented on the east side by Paterson's Inlet, one of the safest harbours in New Zealand. As yet there are no regular settlements here, although there is a considerable extent of pastoral land, and also some fertile valleys.

## V.

## MINERAL WEALTH.

The mineral wealth of New Zealand is very great. Mention has already been made of the gold-diggings in various parts of the country. These have proved very valuable, the yield up to this time being equal to £25,000,000 sterling, and they are far from being exhausted. Dr Hector, Director of the Geological Survey in New Zealand, is of opinion that as yet the surface has only been "scratched." The area in the South Island in which gold is found may be about 15,000 square miles, stretching through Otago and Westland into the province of Nelson. In the North Island the area is very much less, gold in any paying quantity having as yet been found only in the Thames and Coromandel districts. In the South Island it is generally found in alluvial diggings, in the North in quartz rock, from which it needs to be extracted by quartz-crushing machinery set up by joint-stock companies.

Silver has been found in various places, but little can be said of the quantity as yet. Tin has also been recently discovered.

Sulphur exists in considerable quantities in several parts of North Island, chiefly near Rotorua hot-lakes, and on White Island in the Bay of Plenty. Small quantities of manganese, chrome, mercury, and lead are also found, chiefly in the South Island. Iron seems to be abundant in several parts of the colony. On the west coast of both islands there is a very great amount of iron-sand, which is convertible into steel of the best quality.

The supply of coal is immense over the greater part of New Zealand, but the mines have been worked in comparatively few places. It is of various qualities, and has been much used at the gold-fields, in the numerous coast-steamers, &c. It is also finding its way into domestic use, especially in Otago, although the greater portion of coal so used comes from Newcastle in New South Wales. No doubt, when a larger supply of the better class of coals is obtained, through more abundant labour and deeper and more skilful mining, and from the mines being ren-

dered more accessible by roads and railways, New Zealand will be able to supply not only itself, but will aid in supplying other lands with this most useful of all minerals.

Limestone and building-stone are found in many localities. Marble and granite of various colours and qualities are found chiefly on the west coast of the South Island. In Auckland, many of the buildings are of scoria from Mount Eden, an extinct volcano; but limestone for building and farming purposes is within easy distance by boat, or road, or railway. The Oamaru white stone is quite celebrated, and has been exported in large quantities to different parts of New Zealand, and even to Melbourne. It is used for monumental and ornamental work of all kinds. Cement of good quality can be made from cement stones and the volcanic tufas that are found in different parts of both islands.

## VI.

## ANIMAL AND VEGETABLE PRODUCTIONS.

New Zealand might be regarded as a very empty land in respect of animals till within the last hundred years. A small rat, which has been almost if not quite exterminated by the European rat, and a wild dog, supposed to have been introduced either by the Maories or soon after, and a few harmless lizards, seem to have constituted nearly all the animal life in the country. Birds, however, are numerous, and some of the forms are very singular. A tribe of colossal ostrich-like birds has become extinct, and other species are fast disappearing with the advance of colonisation. These are being replaced by more useful species through the agency of the Acclimatisation Societies. In the neighbourhood of Auckland, and in some other places, pheasants and partridges are abundant. Most of our common singing-birds have also found their way there; and as the rook has very recently been added to the imports, the homesteads of New Zealand, especially those which the taste of the owner has surrounded with English trees, will soon have a very home-look about them. It is unnecessary to add that all kinds of domestic poultry are there, and that in such a climate they thrive remarkably well. Fortunately there are no snakes, serpents, or any noxious reptiles. From all these New Zealand is as free as Ireland itself. The cattle introduced by Cook seem to have died out for the time, but the pig has multiplied exceedingly, and in some remote districts has become a wild animal, living on fern root, and not seldom carrying off the young lambs.

In more recent years large numbers of every kind of domestic animal, and many of them of high quality, have been introduced.



Very large prices have been paid by some of the colonists for horses, cattle, pigs, and especially for sheep, which have been imported not only from England, but from the best continental breeds, such as that at Rambouillet, belonging to the late Emperor of the French. That the climate is admirably adapted for all sorts of domestic animals is proved by their multiplying so fast, and by their comparative freedom from many of their European diseases. Deer have also been introduced in various parts of the island, and seem to do very well. There are also hares and rabbits, but the latter are no great acquisition.

The rivers in New Zealand are on the whole destitute of fish, but it is hoped that ere long salmon, trout, and other home varieties will be quite common. The sea is tenanted by whales and seals, although not in such abundance as some years ago. There are also various kinds of fish—the butterfish, the snapper, the moki, a flat fish like a flounder, and also one about the size and shape of a herring, and passing under that name, as well as various others. Oysters, mussels, and crayfish also abound, and in several places whitebait of very good quality. There is no doubt that New Zealand fisheries, which in time past have not been much looked after, but which are now protected by legislative enactments, will ere long become of great importance.

Insects are rather abundant, and some of them are not over-pleasant neighbours. But with the introduction of birds, and with the progress of cultivation, it is to be hoped they will become, as in some parts they have already become, less troublesome. Wasps are known only by their absence, while the common bee has its place and work at many a homestead, and also in the forests, where trees are frequently cut down, with their cavities filled with immense quantities of honey.

It would occupy too much space, in such a publication as this, to give a proper account of the vegetable life in New Zealand, its abundance and variety being alike remarkable. The mountains, plains, and valleys are perpetually green, there being, exclusive of herbage and smaller plants, upwards of a hundred kinds of trees and shrubs. A New Zealand forest, from the thickness of the undergrowth, the size of the larger trees, and the interlacing of these by climbing plants, has a very different appearance from the forests in the home country. In some of the more cultivated parts of the country there are beautiful hedges, generally of thorn, sometimes interspersed with myrtle, roses, and geraniums. One of the most valuable trees in New Zealand is the kauri, now confined to the north part of the province of Auckland. This is much used for building purposes, while kauri gum is a valuable article of commerce. Then there are the red and white pine extending over a large part of the country, the puriri, the rimu, the totara, and many others. Some of these have been found a hundred and fifty feet high, and eight

or ten in diameter, so that most of our home-trees seem stunted to any one who has been in New Zealand. The timber of not a few is capable of a very high polish, and it is now being made use of to some extent in the manufacture of house furniture, useful and ornamental.

There are also different varieties of ferns, from the tiniest little plant up to the fern-tree, which sometimes rises to 25 or 30 feet, and numerous species of highly ornamental shrubs. The wild flax (*phormium tenax*) must however be specially noted, as a most valuable article of commerce. Formerly, it was the material from which the natives prepared their clothing, mats, nets, and baskets. But within the last few years, while a great quantity has been manufactured into ropes and cordage in New Zealand, a very large quantity has been sent in a partly prepared state to Britain, where it commands from £30 to £42 per ton, according to its measure of preparation. But this industry will not attain its full development till some more simple and effectual means of separating the gummy substance from the fibre has been discovered.

In addition to the native New Zealand trees and plants, a great many others have been introduced from various parts of the world. Australia has contributed its blue and red gum, the acacia and sundry others, while most of the trees common in the British Islands have been added from time to time. The oak, the ash, the willow, the beech, the poplar, and the elm, have all a place in New Zealand. Although they do not become ever-green, like the trees of the country, they retain their leaves for a longer period, and their growth is much more rapid than in their native land.

Fruit is abundant in most parts of New Zealand. To the north of Auckland, oranges, citrons, and loquats may be grown, while farther south, peaches, apricots, grapes, figs, melons, tomatoes, apples, plums, pears, strawberries, gooseberries, &c., are found according to temperature. Roots and vegetable of all kinds also abound; pumpkins, carrots, turnips (of which 25 to 30 tons per acre is not an uncommon yield), peas, cabbage, parsnip, onions, and magnificent potatoes, grow largely. Hops have also been tried with success, chiefly in the Nelson province. In short, it may be added, that nearly all orchard and garden productions, fruits, flowers, and vegetables known in Britain are known in New Zealand, where also they generally come to greater perfection.

In regard to farm-produce, much the same may be said. Wheat (of which 48 to 55 bushels per acre may be obtained), barley, and oats are freely grown, with the addition of maize in some parts of the North Island. But agriculture has not been followed out on any very extensive scale as yet, from the scarcity and expense of labour, and from the want of an adequate market for much produce. More and more, however, the colon-

ists are giving themselves to this mode of life, and as population increases, which, from the new Government scheme of immigration, it is expected to do, yet more attention will be paid to farming. The better parts of the sheep-runs, especially of those nearer the towns, will be let or sold for this purpose, and a number of moderately sized farms will be laid down, although for some years these may not be regularly cropped over as farms generally are in Britain. And there is no doubt that a steady industrious man having 40 or 60 acres fenced and chiefly laid down in clover and good English grasses, with little or no winter to provide against, can make a very comfortable livelihood for himself and his family. To this position any such man may easily attain from the comparatively high wages he would receive during his first few years in New Zealand. And the meat-preserving companies, which are already doing a great business, in spite of the prejudices among many against tinned beef and mutton, will help to secure a price that will pay the farmer.

## VII.

### PROSPECTS FOR COLONISTS.

This leads me to remark that large quantities of land are being opened up for settlement by the Government. Several portions of that recently acquired tract of country in the Forty-mile Bush, already alluded to, have been reserved for special settlements. The regulations in connection with these have not yet been published, but most probably the gist of them will be that grants of land at a low rate per acre will be given on a system of deferred payments. Roads and railways are surveyed through the district, and thus a great deal of work, which will be paid for at an average rate of 5s. 6d. per day, can be had in the immediate neighbourhood. But indeed this is true of most parts of New Zealand, so that none, to whatever province they go, need fear any want of well-paid work; for a large portion of the Government loan (amounting to £1,000,000) has been allocated for such work.

The best thing generally for immigrants to do, especially for such as have no money and no definite trade, is to engage in such work, or to take situations as ploughmen, shepherds, overseers. And then, after working a very few years in this way, they will have saved enough money to make a good start in farming. Even if men have a little money when they arrive, it is generally unwise to take up land at once. Their capital can be placed at 8 or 10 per cent. on mortgage for twelve months, or put in the bank at 5 per cent. During this time they can look about them and gather some colonial experience, meanwhile doing any

honest work that may come in their way. For there, as elsewhere, anything is better than idleness, through which money may be lost, or slovenly habits contracted.

Large capitalists have more at their command, and can either permanently invest their money at 10 per cent., or get land and hire labour, and, to some extent, experience. But wisdom and caution are quite necessary in their case also, in entering on investments of any kind in a new country.

The class of immigrants who are most benefited by going to such a colony as New Zealand are the small farmers who do their own work with little or no hired labour. In this country many of them must have great difficulties to contend with, and it is hard to see how, considering the high rents they have to pay, from the competition for farms and the ever-increasing expenses of farming, they can squeeze out an existence from the oft unfertile soil, which few of them have the means of enriching by artificial manures and improved methods of husbandry. And if they have large families, how difficult it is to educate them and to launch them out into the world! With a little variation, the same things are true of ploughmen, many of whom are, for the greater part of the year, entirely separated from their families, because on many farms no cottages are provided. At first, indeed, they would have a good deal to contend with in a new country, and labour and toil are necessary there as they are here. The tree must be planted before you gather the ripe fruit. But just as trees grow much more quickly there than in this country, so a pleasant home and a profitable farm may be had much sooner there than here. The truth is, that any sober, industrious man, with God's blessing on his labours, may create himself such a home in New Zealand, but he *must* be sober and industrious. Of course he will do it much sooner if he can take £200 or £300 with him, and act prudently when he goes there, avoiding dishonest men and dishonest ways, and not rushing hastily into a thing before he well knows what he is about. If he be a family man, he will find his sons and daughters helpful to him. He can keep them more or less about him, which he can hardly do in Britain. But indeed, from the immense disproportion between the sexes, he will not likely keep his girls long under his roof. Very soon they will marry, and get homes of their own. Before this, they could, if they chose, take situations at wages of from 8s. to 12s. a-week, being found in everything except clothing. It is worthy of note that women are never employed in any out-door labour in New Zealand, as they not unfrequently are in many parts of this country.

The following is part of a letter which the writer of this tract had from a girl who went out in the *Halcione* last year:—"We had a very nice voyage out. . . . We had plenty of rough weather, but not a storm. Our captain was very kind to us; he



not only made everything comfortable, but did all he could to amuse us. . . . We landed at Wellington in eighty-five days, which was considered a very quick passage. . . . When we landed at Napier we found everything very comfortable for us. We were kindly received by all who had anything to do with us. . . . We only stayed one night in the Barracks,\* when we all got situations, some in town and some up-country. Most of the girls I have seen since, and they are all liking their places well. . . . I think there is nothing to hinder any one who does what is right to get on here very well. . . . I may say, before I close, that I like Napier very much indeed. I was surprised at the beauty of the country when I landed. I beg to thank you for sending me out here, and hope that God will enable me to do my duty, so that you will not regret sending me out." The following extract is from the Report of Mr Colin Allan, agent of the Dunedin Labour Exchange:—"It will be seen from the return that farm-servants and female domestic servants are the classes most in demand in the province. . . . The most constant and urgent requests come from the country districts for good household servants and dairymaids, and any number of females competent to fill these situations could be absorbed at wages ranging from £30 to £45 per annum." This, which is said of the province of Otago, might be said of almost every part of New Zealand.

For the investment of capital which one may create for himself or take with him to New Zealand, if he does not choose to buy land or increase any business in which he may be engaged, there are various ways in which he may attain his end. He may lend money on mortgage, at 8 to 10 per cent, with as much safety as he may in this country at 4 or 5. There are various banking companies, insurance offices, navigation companies, &c., which may also be considered safe investments, and gold-mining companies, which are of course attended with more risk. Some may think that so high a rate of interest involves great risk. But it is not so. The truth is, that the resources of the colony are very great, while the resources of the colonists, whereby they can take any advantage of those resources, are generally not great, and money being thus scarce, yet necessary, sells dear like any other commodity. The three principal banking-companies paid 15 per cent. in 1869, while the other two paid respectively 6 and 10. There are about one hundred and thirty joint-stock companies, of various kinds. Post-offices are very numerous, and, for so limited a population as that of New Zealand, do a very large business. Nearly a hundred of them have saving-banks attached to them (receipts during first three years, beginning with February 1867, about

\* Immigration Barracks.

£550,000), which are most useful in all new countries where the regular banking companies have their offices in towns, which may be far distant. And yet many a little township has its bank far sooner than its church. The North and South Islands, which are separated by forty miles of sea, have been for some time connected by a submarine telegraph, and now the telegraph wire is extended over a great part of the colony. Nearly 2000 miles have been erected, and the revenue cannot now be much less than £50,000 per annum.

#### VIII.

##### SCHOOLS AND CHURCHES, ETC.

In the different provinces there are different Education Acts, which cannot be spoken of at length. In some there is help given both to national and denominational schools, while in others it is given only to national, and those churches which wish denominational are left to provide such for themselves. So far as the writer knows, the truths of religion are more or less taught in all the schools. The schools are quite as numerous as could reasonably be expected in a new country. Most of the towns are better provided with the means of education than larger towns in Britain, and even the country districts are tolerably well provided. For the country schools there is sometimes a want of well-trained teachers, and thus unsuitable men, who think any one can teach, occasionally get themselves appointed. But these things will rectify themselves ere long, and they will be helped in this by the action of the Government examination boards. In Dunedin a university, with four professors, has been established, and though it may lack the prestige of time-honoured institutions, such as Oxford and Edinburgh, Cambridge and Dublin, the teaching may be quite as effective so far as, with such a (temporarily) limited staff, it can be carried on. This institution may hereafter be affiliated to the New Zealand University, to establish which active steps have been already taken by the Government of New Zealand. As a rule, those who go to so distant a colony, and not a few of whom have in various capacities been over a great part of the earth's surface, are more intelligent than the average population in England or Scotland, and are more keenly alive to the advantages of education. From the mixed population, too—English, Scotch, Irish, with a sprinkling of other nations—a town of 2000 people is very different from many a village of the same size in this country, where the inhabitants are all one set, pervaded by the same ideas, and the half of whom have never been fifty miles away from home. This is attested also by the demand there is

for newspapers and magazines of all kinds. In addition to the immense number of these that come in from the home country, Wellington, Auckland, Dunedin, Christchurch, and Nelson have daily, weekly, and bi-weekly papers, and perhaps a monthly or bi-monthly magazine. Even the smaller towns have always one or two weekly or bi-weekly papers.

In regard to churches, there is no Established church of any kind in New Zealand. All are self-supported, though they are sometimes aided to a small extent by societies in this country. There are the same denominations there as in Britain, save that the Presbyterian Church, though under two organisations, is virtually one and undivided. The Church of England has most adherents over all the colony, except in the Scotch colony of Otago, where the adherents of the Presbyterian Church are much more numerous. The Wesleyans and the Roman Catholics have also a very considerable number of adherents. It would be desirable that the home churches should give rather more sympathy and aid in men, and sometimes, in the case of new settlements, in money. For it is generally very difficult to set up the means of grace in such places, although, when wisely set up and administered, they are upon the whole tolerably well supported. Above all others, the Scotch churches would need to show more wisdom, and much more energy and liberality.

Nearly all the churches in New Zealand have flourishing Sunday-schools in connection with them—institutions which, when managed with wisdom and vigour, go a long way to promote religion and morality.

There is much less crime in New Zealand than in a corresponding population in this country, and very much of what there is arises from drunkenness. The civil and criminal law is substantially the same as in England. For judicial purposes the colony is divided into districts, each presided over by one of the Judges, of whom there are five, including the Chief-Justice. An assize is held in the chief town of each province for the trial by jury of any civil or criminal cases which may prove beyond the jurisdiction of the inferior courts.

I cannot do better than close these brief notes by quoting part of a speech made in 1870 at a public meeting in London:—

"In the year 1867, the population was 218,000; it is now 240,000. In February last year, 687,000 acres were under crop, and the colonists possess 9,000,000 sheep, 300,000 head of cattle, and 65,000 horses. The population have also 600 thrashing-machines, 700 reaping-machines, 12 steam-ploughs, and 28 steam-harrows; they produce annually 4,000,000 pounds of butter, and 1,300,000 pounds of cheese. The value of their

export of wool amounts to £1,500,000. Their export of gold to £2,500,000, and of other products to about £500,000. When it is remembered that all these exports are produced by a population of something under 240,000 persons, I think it marvellous, and it promises much for the colony."

Of course, the exports, &c., are larger now, as is also the population.

Further, Carl Ritter, the eminent geographer, said, as early as 1842, in enthusiastic language, "That New Zealand seems destined, before all other countries, to become a mother of civilised nations. Fertile and well-watered alluvial plains are there awaiting the enterprising settler, the virgin soil on which he founds a new home, a land blest with the most genial climate, where he has but to battle with and subdue the wilderness, to reap the never-failing fruits of his labours."

We may quote also from "New Zealand: its Physical Geography, Geology, and Natural History. By Ferdinand von Hochstetter, Professor of Mineralogy and Geology at Vienna. Stuttgart: J. G. Cotta. 1867." He went as naturalist with the Austrian Expedition in the *Novara*. He says: "New Zealand bears the most resemblance to the mother country, by virtue of its insular position, its climate and soil, and the whole form and structure of the country. It lies towards the neighbouring Australian continent, like Great Britain towards Europe. Blest with a genial oceanic climate, so admirably suited to the Anglo-Saxon race; with a fertile soil, well watered, and splendidly adapted to agriculture and farming—with a manifold coast-line, suiting perfectly to the notions and habits of the first maritime nation of the world; it is a country without dangerous animals, without poisonous plants, but rich in mineral treasures; a country where horses, cattle, and sheep thrive, where fruit, grain, and potatoes grow most abundantly; a country adorned with all the charms and beauties of grand natural scenery; a country which can easily support a population of twelve millions—which promises the bold and persevering emigrant a lucrative and brilliant future—such a country appears, indeed, destined before all others to become the mother of civilised nations."

"A GOOD LAND, A LAND OF BROOKS OF WATER, OF FOUNTAINS AND DEPTHS, THAT SPRING OUT OF VALLEYS AND HILLS: A LAND OF WHEAT, AND BARLEY, AND VINES, AND FIG TREES, AND POMEGRANATES: A LAND OF OIL-OLIVE AND HONEY: A LAND WHEREIN THOU MAYST EAT BREAD WITHOUT SCARCENESS; THOU SHALT NOT LACK ANYTHING IN IT: A LAND WHOSE STONES ARE IRON, AND OUT OF WHOSE HILLS THOU MAYST DIG BRASS."



Since this tract was in type, the following letter has been received from the agent at Plockton, Lochalsh:—

"PLOCKTON, 30 March 1872.

"REV. AND DEAR SIR,—I have much pleasure in acquainting you that letters have now come from all the adult emigrants we sent last year from this place to New Zealand, and that the whole of them agree in confirming all the favourable accounts you have given us in your interesting lectures on that country.

"You would imagine the writers were in raptures, when describing the great beauty of the land, the variety of its productions, the salubrity of its climate, the fertility of the soil, and its adaptation for the growth of all the pleasing and nourishing cereals, roots and fruits, as well as the richness of its luxuriant pastures for the rearing of all kinds of cattle and sheep.

"They speak highly of the abundance of fish and fowl on its coasts: of its green meadows, majestic forests, and undulating mountains, reminding them of the mother-country,—only that the natural objects and prospects in the land they left are miniatures when compared to those in the adopted land.

"From what they say, I would infer that New Zealand would yield almost everything needful for living in plenty and comfort, and that the climate was never uncomfortably hot, nor at any time disagreeably cold. I fully believe from the accounts given, that hundreds will yet express themselves very grateful that you ever came to the Highlands. Those who have already left us, say that their happiness would be complete if their friends would only join them, where willing hands are in great demand, wages good, and food cheap and plentiful.—I remain, &c.

(Signed) F. D. McDONELL."

REV. P. BARCLAY,  
Edinburgh."

## APPENDIX.

### A.

#### EUROPEAN POPULATION. 1871.

|                                               |         |                                     |         |
|-----------------------------------------------|---------|-------------------------------------|---------|
| Males, . . . . .                              | 150,356 | Tonnage of British vessels entering |         |
| Females, . . . . .                            | 106,037 | N. Zealand ports, . . . . .         | 253,512 |
| Total, . . . . .                              | 256,393 | Of Foreign, . . . . .               | 19,639  |
| Of whom under fifteen years of age, . . . . . | 101,349 | Total, . . . . .                    | 273,151 |
| Native population about, . . . . .            | 38,000  |                                     |         |

Value of imports, 1870, £4,639,015; exports, 1870, £4,822,756.

The principal exports (1870) are:—

|                       |            |                                   |         |
|-----------------------|------------|-----------------------------------|---------|
| Gold, . . . . .       | £2,163,910 | Barley, . . . . .                 | £21,525 |
| Wool, . . . . .       | 1,703,944  | Butter and cheese, . . . . .      | 22,322  |
| Gum, Kauri, . . . . . | 175,074    | Sawn-timber, logs, &c., . . . . . | 18,323  |
| Flax, . . . . .       | 132,578    | Sheep, . . . . .                  | 16,459  |
| Tallow, . . . . .     | 75,583     | Meats, preserved, . . . . .       | 14,108  |
| Wheat, . . . . .      | 71,851     | Silver, . . . . .                 | 11,380  |
| Oats, . . . . .       | 44,195     | Oil, . . . . .                    | 10,749  |

### B.

#### GOVERNMENT EMIGRATION TO NEW ZEALAND.

THE GOVERNMENT OF NEW ZEALAND having decided on the construction of Railways and other Public Works in various parts of that Colony—and there being also a considerable demand for Agricultural Labourers and Female Servants—are prepared to grant assisted passages to the following classes of Emigrants:—

*Natives, General Farm Labourers, Ploughmen, Gardeners, Shepherds, a few Country Mechanics, Single Female Domestic Servants and Dairy-maids.*

1. MARRIED COUPLES and families can obtain passages on the terms under-mentioned, viz.—The sum of £5 per adult in *cash* will be accepted in full payment for the passage. If the Emigrant is unable to pay the whole of the money before sailing, he will be required to sign a

promissory note for a sum equal to *double* the amount remaining unpaid, thus:—

When only £1 per adult is paid in cash, the sum to be repaid by promissory note will be £8 each adult.

When only £2 per adult is paid in cash, the sum to be repaid by promissory note will be £6 each adult.

When only £3 per adult is paid in cash, the sum to be repaid by promissory note will be £4 each adult.

When only £4 per adult is paid in cash, the sum to be repaid by promissory note will be £2 each adult.

The Government will not give assisted passages to more than *three* children under twelve years (including infants) in each family; but parents may pay full passage-money for children in excess of that number. Every person above the age of twelve years is reckoned as an adult; children between *one* and *twelve* are reckoned as half an adult; and infants under one year are not reckoned.

2. SINGLE WOMEN.—Passages without *pre-payment* are given to single women, namely—Cooks, General Servants, Dairymaids, &c. They will be required to sign promissory notes for £5 each, payable in quarterly instalments, the first payment to be made three months after the date of their arrival. These passages will be restricted to females who are not under fifteen nor over thirty-five years of age.

3. SINGLE MEN.—As respects single men, the sum to be paid in *cash* for the full passage will be £8 for each statute adult. If the applicant cannot give that sum, he may pay £4 in advance, and sign a promissory note for £8.

New Zealand is larger than England, Wales, and Scotland united; yet the European population in 1871 numbered only 256,167 souls.

Most of the land in New Zealand is well adapted for agricultural and pastoral purposes. The total yield of wheat for the year 1870 was 2,349,914 bushels. The number of sheep in the whole colony at the close of 1871 was about *ten millions*, or nearly forty sheep to each head of the population.

For the year 1870 the produce of the New Zealand gold-fields was valued at £2,163,910.

The climate of New Zealand is temperate and healthy.

Mechanics and labourers work eight hours as a standard day's work.

For further particulars and detailed conditions, apply personally or by letter at the Offices of the Agent-General for New Zealand, 7 WESTMINSTER CHAMBERS, LONDON, S.W.; or at 3 HOPE STREET, EDINBURGH; or personally to the LOCAL AGENTS.

|                                            | ACCORDING TO THE LATEST ADVICES. |              |              |               |
|--------------------------------------------|----------------------------------|--------------|--------------|---------------|
|                                            | AUCKLAND.                        | HAWKE'S BAY. | WELLINGTON.  | GEN. AVERAGE. |
| TRADESMEN—                                 |                                  |              |              |               |
| Carpenters, per diem,                      | 7s. to 8s.                       | 10s.         | 8s. to 10s.  | 8s. to 10s.   |
| Bricklayers, "                             | 10s. to 14s.                     | 10s.         | 8s. to 10s.  | 8s. to 10s.   |
| Painters, "                                | 7s. to 9s.                       | 8s.          | 8s. to 10s.  | 8s. to 10s.   |
| Blacksmiths, "                             | 7s. to 9s.                       | 8s.          | 8s. to 10s.  | 8s. to 10s.   |
| Tailors, "                                 | 7s. to 9s.                       | 8s.          | 8s. to 10s.  | 8s. to 10s.   |
| Ropemakers, "                              | 7s.                              | 8s.          | 8s. to 10s.  | 8s. to 10s.   |
| Shoemakers, "                              | 5s. to 6s.                       | 8s.          | 8s. to 10s.  | 8s. to 10s.   |
| General Labourers, "                       | 4s. to 6s.                       | 5s. to 7s.   | 5s. to 7s.   | 5s. to 7s.    |
| PAID LABOUR—                               |                                  |              |              |               |
| Married Couples, per year, all found,      | £20 to £21                       | £20 to £21   | £20 to £21   | £20 to £21    |
| Single Men, "                              | £20 to £21                       | £20 to £21   | £20 to £21   | £20 to £21    |
| Single Women (Dairymaids), "               | £20 to £21                       | £20 to £21   | £20 to £21   | £20 to £21    |
| FEMALE DOMESTIC SERVANTS—                  |                                  |              |              |               |
| Cooks, per year,                           | 30s. to 40s.                     | 26s. to 30s. | 25s. to 35s. | 28s. to 40s.  |
| General Servants and Housemaids, per year, | 23s. to 30s.                     | 26s. to 30s. | 18s. to 28s. | 20s. to 30s.  |

The Return for Otago gives the Rates of Wages as follows:—  
Carpenters, per diem, 8s. to 10s.; Bricklayers, per diem, 8s. to 10s.; Painters, per diem, 8s. to 10s.; Blacksmiths, per diem, 8s. to 10s.; Tailors, per diem, 8s. to 10s.; Ropemakers, per diem, 8s. to 10s.; Shoemakers, per diem, 8s. to 10s.; Gardeners, per week, all found, 20s.; 18 ax-diggers, per week, all found, 20s.; Bushmen and Station-hands, per week, all found, 20s.; Harvest-men, per week, all found, 20s.; 18 ax-diggers, a year, all found, £50; Farm servants, a year, all found, £45; Female Domestic Servants, per annum, all found, £45 to £55; Cooks, a year, all found, £40 to £52; Dairy-maids, a year, all found, £40 to £45.

#### AVERAGE RETAIL PRICES OF Provisions in the following Provinces, and General Average of the same.

|                       | OTAGO.     | HAWKE'S BAY. | WELLINGTON. | SEELON.    | CANTERBURY. | GEN. AVERAGE. |
|-----------------------|------------|--------------|-------------|------------|-------------|---------------|
| Bread, per cwt. loaf, | 6d. to 7d. | 6d. to 7d.   | 6d. to 7d.  | 6d. to 7d. | 6d. to 7d.  | 6d. to 7d.    |
| Beef, "               | 4d. to 6d. | 4d. to 6d.   | 4d. to 6d.  | 4d. to 6d. | 4d. to 6d.  | 4d. to 6d.    |
| Mutton, "             | 4d. to 6d. | 4d. to 6d.   | 4d. to 6d.  | 4d. to 6d. | 4d. to 6d.  | 4d. to 6d.    |
| Tees, "               | 2d. to 3d. | 2d. to 3d.   | 2d. to 3d.  | 2d. to 3d. | 2d. to 3d.  | 2d. to 3d.    |
| Sugar, "              | 5s. to 6s. | 5s. to 6s.   | 5s. to 6s.  | 5s. to 6s. | 5s. to 6s.  | 5s. to 6s.    |
| Potatoes, "           | 5d. to 6d. | 5d. to 6d.   | 5d. to 6d.  | 5d. to 6d. | 5d. to 6d.  | 5d. to 6d.    |

NOTE.—The return for AUCKLAND does not give the prices of provisions. Clothing one-third dearer than in this country.  
7 WESTMINSTER CHAMBERS, LONDON, S.W., February 1872.



## TEMPERATURE of AIR in Shade (Fahrenheit). 1870.

|                         | Mean. | Highest. | Lowest. |
|-------------------------|-------|----------|---------|
| Auckland, . . . . .     | 59.3  | 81.8     | 35.6    |
| Taranaki, . . . . .     | 57.2  | 82.2     | 33.4    |
| Napier, . . . . .       | 59.3  | 94       | 35      |
| Wellington, . . . . .   | 55.4  | 81       | 34.5    |
| Nelson, . . . . .       | 55.6  | 83       | 28      |
| Christchurch, . . . . . | 52.6  | 85.8     | 25.7    |
| Hokitika, . . . . .     | 52.6  | 72.8     | 30.2    |
| Dunedin, . . . . .      | 50    | 83       | 31      |
| Southland, . . . . .    | 49.9  | 81       | 22      |

## RAINFALL, &amp;c. 1870.

|                         | In.        | Days. | Snow. | Hail. |
|-------------------------|------------|-------|-------|-------|
| Auckland, . . . . .     | 44.831 in  | 190   | 0     | 5     |
| Taranaki, . . . . .     | 54.720 in  | 175   | 0     | 5     |
| Napier, . . . . .       | 32.410 in  | 93    | 0     | 0     |
| Wellington, . . . . .   | 48.205 in  | 158   | 1     | 7     |
| Nelson, . . . . .       | 48.430 in  | 85    | 0     | 0     |
| Christchurch, . . . . . | 28.364 in  | 137   | 1     | 9     |
| Hokitika, . . . . .     | 116.680 in | 188   | 0     | 6     |
| Dunedin, . . . . .      | 39.202 in  | 171   | 4     | 10    |
| Southland, . . . . .    | 53.950 in  | 159   | 3     | 19    |

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THE ARMY

PRODUCTS AND RESOURCES  
OF  
TASMANIA,  
AS ILLUSTRATED IN THE  
INTERNATIONAL EXHIBITION,  
1862.

BY  
GEORGE WHITING,  
SECRETARY TO THE INTERNATIONAL EXHIBITION COMMISSIONERS  
FOR TASMANIA:

SECOND EDITION, ENLARGED AND CORRECTED.

WITH AN APPENDIX, CONTAINING PAPERS ON  
THE VEGETABLE PRODUCTS EXHIBITED BY TASMANIA  
BY THE HON. W. ARCHER, ESQ., M.H.A., F. L. S.,  
AND ON  
THE CLIMATE OF TASMANIA, BY DR. E. S. HALL.

Rebort Gown:

PRINTED AT THE DAILY "ADVERTISER" STEAM PRESS.

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THE  
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1862.





## INTERNATIONAL EXHIBITION COMMISSION.

Hon. President: SIR H. E. F. YOUNG, K.C.B., &c., &c.

### Commissioners for Tasmania:

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| JOSEPH MILLIGAN, Esquire, F. L. S. |                       |

GEORGE WHITING, Esquire, Secretary.

Office, 18, Murray-street, Hobart Town.

## LOCAL EXHIBITION IN HOBART TOWN.

THE Products collected by this Commission to illustrate the Resources of Tasmania in the International Exhibition in London in 1862, were opened for local exhibition in Hobart Town, December 3rd, 1861. The following report of the ceremonial is taken from the *Hobart Town Daily Mercury*:-

"The Exhibition was formally opened yesterday by His Excellency the Governor Sir H. E. F. Young, Honorary President of the Commission.

"Amongst those present were Sir Valentine Fleming, Chief Justice, the Hon. T. D. Chapman, Premier, the Colonial Secretary, the Colonial Treasurer, the Attorney-General, the Solicitor-General, the Hon. W. Nairn, President of the Legislative Council, Hon. W. Archer, M.L.C., the Right Worshipful the Mayor of Hobart Town, the Ven. Archdeacon Davies, Lieutenant-Colonel Russell, J. Allport, with other gentlemen. Several Ladies graced the ceremony with their presence.

"His Excellency and Lady Young, accompanied by Colonel Gore Browne and Mrs. Browne, arrived at half-past two o'clock, and were received by the Chairman and members of the Commission.

"The Chairman (Dr. Crowther) addressing His Excellency said,

SIR HENRY YOUNG,-

"The Commissioners have done themselves the honor of requesting that you would favour them by formally opening the Exhibition of Tasmanian products, intended for the International Exhibition. They have done so, not only from a desire to give all possible prominence and *clat* to an event so important in all its bearings on the future of Tasmania, but because they feel that the object of the Commissioners has had your cordial sanction and responsible aid from the beginning, and, moreover, because the ceremonial of proclaiming that this first stage of their labours has attained a practical maturity, would form a graceful termination of a long official connection with this colony, which has been distinguished by a marked desire to develop our material resources.

"Your compliance with their request would also leave, with many of the advocates of scientific progress in Tasmania, a pleasing memento of a valued friend and coadjutor.

"The Commissioners whom your Excellency appointed to represent the interests of Tasmania, feel some gratification in soliciting your inspection of the results of their labours, which have at length reached a stage in which success appears no longer doubtful.

"This point has not been reached without considerable difficulty and anxiety. The public appeals of the Commissioners, copiously advertised and addressed in circulars to almost every official and professional person in Tasmania, met with no adequate individual response, excepting in some few honourable instances. The Commissioners soon learned that if Tasmania were to be fairly represented in the Great Exhibition this important result must be brought about rather by the purchase of suitable products as a matter of business, than by reliance on the uncertain exercise of individual patriotism and liberality.

"The co-operation of every individual who had taken an active interest in former exhibitions was solicited, and in many cases this aid was cheerfully accorded. Individual Commissioners, each according to his facilities, have exerted themselves to carry out the objects of the commission,

and amongst these gentlemen the name of Mr. Boyd, of Tasman's Peninsula, stands pre-eminently conspicuous. The main part, however, of the products now displayed before the public have had to be sought for under circumstances of no ordinary difficulty, and to be purchased by public money.

"Among these products the timber of Tasmania occupies the most conspicuous position. H.M. Commissioners in England have granted permission for a Trophy of Tasmanian Timber to be erected in the Central Avenue of the Great Exhibition Building, the Commissioners have felt bound to respond to this act of consideration by endeavouring to occupy so prominent a position in the world's view, in a way creditable to Tasmania. Every portion of this structure now before your Excellency, for the design of which we are indebted to our Secretary, Mr. George Whiting, (who has been ably seconded in the mechanical arrangements by Mr. Kipling, builder,) will serve some purpose of illustration. Our spars, railway sleepers, joists, quartering, flooring boards, ship's knees, planking, &c., together with our valuable splitting timber, will be shown in every variety of kind and condition. New specimens will be seen fresh from the bush, others which have been felled in proper time and fairly seasoned, together with specimens, which have sustained the severest tests to which timber can be subjected, and have stood the wear and tear of a term exceeding that of a human generation. Piles and planks which have experienced the alternations of exposure to salt-water, fresh-water, and dry air, in our wharves; planks, timbers, and trenails, which have been exposed to all sorts of destructive agencies, in our stranded ships; posts which have remained in the earth almost intact for thirty-five years' duration, and many other such illustrations, will offer incontestable evidence that Tasmanian timber, if judiciously selected and prepared, is unsurpassed by the timber of any other country—in durability, and stubborn resistance to the ordinary vicissitudes to which wooden fabrics are liable. Much labour has been required, in this most unfavourable time of the year, in procuring the timber of which the trophy is constructed, the main portion of which was growing green in the forests when the Tasmanian Exhibition Commission was appointed.

"All these specimens will bear their Tasmanian and botanical names. They will be accompanied by an Herbarium (prepared by Mr. Boyd) of their leaves and blossoms, and will, it is believed, convey to the world a fair notion of what our woods really are.

"Of our ornamental woods, which are now coming into general request in the neighbouring colonies for cabinet work, a more varied and beautiful collection has never been exhibited. Many of the specimens will equal, if not surpass, for furniture, the finest samples of walnut, rose-wood or mahogany. The timber-buyers of Europe will find in this trophy a great variety of our fresh-felled timber. In close proximity to these will be seen specimens of similar kinds of woods cut in Autumn, and carefully seasoned under cover. Near to these a department of durability will arrest the attention by displaying the specimens which have been so long in use, and to which I have already alluded.

"The structure of the trophy itself will serve to display our Blue Gum, Stringy-bark, Peppermint, Blackwood, Myrtle, and Huon Pine; whilst around its base and in every available foot of surface will be disposed our most handsome cabinet woods, some in neat packing cases, and more in the varied and grotesque forms of their original growth. Our ship planking, measuring 80 and 90 ft in length without a defect, cannot fail to attract

the notice of those who are searching the world for a substitute for the now no longer easily procurable British oak. Prices will be attached to these sorts of timber which form so large an item in our exports to other colonies.

"The Trophy will also be made subservient to the illustration of another of our main branches of industrial production—namely, our sea-whaling. Two-whaleboats by the best boat builders of Hobart Town (Chandler and Miller) will be suspended from the sides of the pedestal. These boats are made of Colonial wood,—and the harpoons, and all other gear connected with them fitted up by colonial workmen.

"The octagonal column of the trophy will be surmounted by two jaws of the sperm whale. Whalebone as taken from the black whale, will be open to inspection. At each corner of the pedestal will be placed oil-casks, water-casks, and flour casks, of colonial manufacture, on which will be suitably displayed, the Oil and Head matter which command so sure a market in other countries. Tasmanian Wool, choice brands of which fetch the highest price in foreign markets of the wool of all these colonies, will be adequately represented, as the clip of the present season becomes secured. Already promises have reached the Commissioners of a large number of specimens on their way for exhibition, and it is gratifying to believe that in this our chief export Tasmania will still maintain the high character which she so honorably achieved in 1851.

"The mineral resources of Tasmania suggest hopes of great advantages at no very distant period, more especially as regards our coal, of which Your Excellency will perceive a varied and valuable collection from numerous localities selected by Mr. Gould, whilst other samples have been exhibited by private proprietors. Indeed coal is found to exist in nearly all parts of the island, and it is hoped that before long some practicable mode of rendering our unquestionably valuable coal beds available, will induce capitalists to enter largely into this important branch of industry.

"Our metalliferous collection comprises gold, which metal exists in greater or less quantities in various parts of Tasmania—particularly of the Fingal district. We cannot as yet claim to be considered a richly producing gold colony, but it has been deemed desirable that the small portion collected by a few hands in one district during the few months in which the commission has been in operation, should be shown, in order to prove that amongst our prospects of latent mineral wealth the discovery of gold in payable quantities is a contingency to be constantly kept in view. A much larger quantity of Tasmanian gold might have been purchased, but the sample exhibited is sufficient to show the characteristics of our gold.

"Our Iron Ores have representative samples, from various localities, some of the specimens being of great richness, and may possibly yet be profitably worked.

"Our Building Stone, which has been extensively used in constructing the public edifices of other colonies, is fairly illustrated. The valuable collection of Mr. Calder, who has taken an active interest in this branch of our industry, contains specimens from numerous quarries; yet so abundant is this valuable material that this ample collection represents only a portion of the quarries now in work. A church font, worked in stone from Point Ventenat, illustrates in a striking manner the admirable adaptability of this stone to this and various other purposes to which it has not previously been applied. Amongst these latter may be mentioned some grind-stones, exhibited, of great size and fine quality, and also some smaller ones



said to be eminently suitable for glass-cutting. Some of our Marbles, which have hitherto been used only for the making of lime, and which cover a considerable portion of Tasmania, have been discovered, when properly polished, to be eminently beautiful and suitable for internal decoration. Whilst on this subject, I cannot refrain from directing your Excellency's attention to some specimens of Flinder's Island topazes, the splendid appearance of which, when suitably mounted in articles of jewellery, as they are now exhibited, cannot fail to strike every spectator. The products of our fields, our orchards, and our gardens, deserve a passing notice. Our autumnal fruits are represented in admirably executed wax models from casts of last year's fruit in plaster of Paris. English Horticulturists will find amongst them many well known superior sorts, which have been greatly improved since their introduction into this country. Indeed, our climate seems peculiarly calculated for the growth of English fruits, which are exported hence to other colonies in vast quantities.

"The skins of the opossum and other Tasmanian animals will be sent to England in considerable quantity and variety. When it shall become known to European furriers that skins so well adapted for railway travelling as those of the opossum may be purchased in almost unlimited number at five shillings per dozen, this circumstance can scarcely fail to ensure their general use. Amongst the novelties of our exhibition will be found an extensive collection of the barks of Tasmanian trees. Some of these—as the bark of the blue gum and stringy bark trees—have been reduced to fibre by a process with which Your Excellency is familiar, ready for experimental trials of their suitability for paper-making, &c. Should they be found to answer that purpose, a vast demand may be created for a material which Tasmania could supply at a moderate cost in any quantity.

"I cannot venture to detain Your Excellency by a particular reference to many objects of interest which this collection comprises. A desire to conform as closely as possible to the directions of Her Majesty's Commissioners in England has induced the Commissioners here to confine this selection to articles which directly represent our material resources; and those which either have, or possibly soon may have, a positive commercial value in the world's market. Had they chosen to have converted the exhibition into a collection of mere curiosities, these might have added to its varied attractions, but such a collection would not have harmonized with the objects of the forthcoming international exhibition. Although many of our colonial manufactures form important items of our exports, such as carts, furniture, colonial axes, splitting knives, &c., yet these are not such articles (excepting cabinet furniture for the purpose of showing our ornamental woods) as would excite much attention in England. It is mainly on our capacity for supplying valuable and abundant raw produce, to be moulded to their varied purposes of elegance and utility, by the manufacturing industry and artistic skill of older communities, that Tasmania must for the present be content to rest her celebrity.

"In conclusion, the Commissioners would beg to impress on your Excellency the fact, that in the hurried collection which they have been able to make, they have included no article of an exceptional character, but have kept the one object in view, of giving a faithful and honest exemplification of what Tasmania can really furnish out of her ordinary resources, and what she can immediately reproduce should the occasion require it.

"I have the honour to request that your Excellency will now be pleased to declare the Exhibition to be opened.

"His Excellency replied—

DE. CROWTHER,—

"The interesting details which are set forth in your comprehensive Address as Chairman of the local International Exhibition Commissioners, established for you, for them and for your indefatigable and intelligent Secretary, a claim not only to my thanks, but to the thanks of the whole community.

"The difficulties you have overcome, with comparatively speaking, so little of the aid which was expected from the general body of the colonists, greatly enhance the merit of the success of the Commission.

"I desire too, to observe, that had the indiscriminate zeal and profuseness of voluntary contributors made the collection as universal in its character as the contents of an Economic Museum, the unique, definite, and most appropriate Exhibition, now before us, would be less strikingly conspicuous and suitable.

"The direct faithful representation of Tasmania's material resources, of commercial value, actual or prospective, as raw produce; and deserving of the attention of British and Foreign Manufactures; is truly a fulfilment, so far as this island is concerned, of the special design of an International Exhibition.

"The sight before us, is a very gratifying one. In common with others, I am desirous of allowing no further delay to take place in its examination.

"I thank you for the flattering consideration which has induced the Commissioners to give me opportunity, amongst the closing acts of my administration, to take part in this pleasing ceremonial.

"I now declare the Exhibition to be open.

"The Vice-regal party accompanied by the Chairman then proceeded round the building, and spent a considerable time in examining the various productions. The Exhibition will be open gratuitously to the public during the remainder of the week.

## PRODUCTS AND RESOURCES OF TASMANIA,

AS ILLUSTRATED IN THE INTERNATIONAL EXHIBITION, 1862.

ALTHOUGH the International Exhibition of 1862 will probably form a more complete collection of the World's produce than either of its progenitors of 1851 and 1855—the occasion seems to have been generally recognised, by new and consequently little known communities, as a legitimate opportunity for supplementing its educational utility—by the publication, for presentation with their contributions, of a condensed epitome of well authenticated, historical, statistical, and descriptive information, which no collection of illustrative products can supply. The Tasmanian International Exhibition Commissioners have (in common with the other Australian Colonies) directed their Secretary to prepare such an epitome.

The visitor to the Great Exhibition, who, like Layard at the ruins of Nineveh, may, in idea, stand face to face with a people of whom

he knows little—but who have here reproduced themselves to a great extent in their works—may desire further information respecting them; but his inquiries will be greatly modified by his personal interest, objects, and predilections. The Statesman and Politician may inquire into the genius of the people who have produced these works. Are they still identical in blood, in language, and in religion, with the energetic race from whom they sprung? Have they struggled for, won, and do they really appreciate the privilege of Constitutional Government? Is their liberty of speech and action tempered only by the decent restraints of self-moderation, mutual forbearance, and abstinence from infringement on the freedom of thought, word, and deed of their fellow man? Do they carry out the system of local self-government in Municipal and Parochial organization, which has formed the nursery as it forms the safe-guard of English rational liberty? Will they stand by "Old England" in the event of a possibly impending war? Do they volunteer? Are they learning to handle great guns? Did they subscribe liberally to the Patriotic Fund for the relief of the wives and families of our brave fellows who fell in the Crimea? Do they take readily to the Englishman's natural accessories—the ship, the steam engine, the horse, and (now) the rifle? Are the Cricket Match, the Horse Race, the Regatta, the Rifle Match, the Ploughing Match, the Cattle Show, accepted amongst them as established institutions? Are they "sailors to the manner born" in matters of whale fishing, boating, and yachting? Do they appreciate the value of intelligent co-operation in forming Companies for Gas, Steam Boats, Mining, Railway, and other purposes?—If they can answer these questions satisfactorily, and if the sterling character of their contributions offers a fair illustration of their country's capabilities and their own energy and enterprise, an honorable future lies before such a country and such a people; whose "manifest destiny" it may be—to work out an original phase of social, moral, or material progress from the new conditions of race, climate, position, and productiveness in which they fortuitously find themselves combined.

But (the Man of Business will more briefly demand) do they give us any practical proof of this capability? Do they offer us new raw material—for our mill-board or our paper mills—timber superior to oak, or equal to oak at a lower price, for building our ships and constructing our railways? Can they coal, provision, and refit our long-voyaged steamers, and merchant ships?

Very different still may be the range of inquiry of the man into whose mind the project of emigration has perchance constantly obtruded itself amidst the cares and embarrassments of old world competition. He may possibly anticipate increased anxiety as age creeps over him, and his children advance in turn to fight the Battle of Life in fields of employment already over-crowded—and in contests requiring, day by day, a higher standard of physical energy and intellectual qualification. Heart-sick with the weary up-hill struggle, he may sigh for some new home, where his family, now sorely perplexing, may prove a source of happiness, where he may rear "an independent shed" on his own land, and pass his remaining years under the shade of his own vine and his own fig tree. In his earnest examination of the evidences of material prosperity which he will find in the English Colonial Department, he may be arrested by the Wheat, or the Wool, or the Timber Trophy, and will ask himself—is the country where these came from the place where an honest and industrious man, with little capital, save the labour of his thighs and sinews, and the

skill of his hands, may hope to better his own condition, and that of his family? Does it contain or produce the main necessities of life—abundance of wood and coal for timber or for fuel—plenty of good water for irrigation, manufactures, machine power, and domestic use—animals for labour and for food—corn, oil, English crops, and English fruits—wool and furs, for clothing and for export? Is its climate suitable to the Englishman's constitution—and will it keep "the English rose" on the fair faces of his children? Is it English in its population, its laws, and its habits? Does it offer land worth the buying suitable for an English home, in lots to suit purchasers of moderate means, which may be selected without auction, and paid for by easy instalments—out of which he and his children can work out a present livelihood, and future competence? Is the country exempt from peculiar diseases—from dangerous wild beasts—from hostile Aborigines—from the unnatural and appalling contingencies of civil war?

These suggestive queries combine so many of the essential elements of human happiness and progress, that a writer may fairly apprehend a charge of exaggeration who should venture to claim them for any one country. Yet, it will be found, on referring to official statistics and notorious fact,—that there are very few of these queries which may not unhesitatingly be answered in the affirmative—on the part of Tasmania.

#### PHYSICAL GEOGRAPHY.

Tasmania, formerly known as Van Diemen's Land, is a somewhat escutcheon-shaped island, nearly as large as Ireland, lying about 120 miles south of the south-eastern corner of the Australian Continent. Its area comprises about 16 millions of acres, or about 25,000 square miles. It is of 165 miles average length, and 155 miles average breadth,—and has 700 miles of coast line, exclusive of small islands and indentations. The central part of the Island consists of a table land, averaging at least 3,000 feet above the level of the sea—on which are seven lakes, varying in size from 2,500 acres to 50,000 acres, and containing an aggregate of nearly 112,000 acres of freshwater. These lakes form the sources of many considerable rivers. The Derwent runs 120 miles, and its estuary is navigable to and above Hobart Town, where it is three miles wide, for forty miles from the open sea. The Tamar is navigable 40 miles to Launceston from the North Coast. The Huon, running a course of 110 miles, is navigable for steamers nearly 30 miles. These, and eleven other rivers, meander, summer and winter, through the mountain ranges, (some of them 5,000 feet high) and gently undulating hills, which intersect the Island—giving an aggregate course of ever-flowing water of 900 miles. Thirty-one smaller rivers run for considerable portions of every year, whilst thousands of creeks, rivulets, streams, and springs glide, leap, and dash through the wild ravines and rocky cascades of the country in romantic variety, forming a plentiful and continuous supply of the great essential of life and health—pure water, which frequently serves to keep the face of the country fresh and green, long after those of the neighbouring colonies have been parched with drought—and affording an amount of constant motive power for mills or for irrigation, perhaps unequalled, within the same distance from the sea, in any country in the world.

The bold green-stone and basaltic mountains of Tasmania—their heads for many months of the year capped with snow—form striking objects,



from whatever quarter the Island is approached. Its undulating intervening surface, mostly covered with forests of gigantic trees extending from the hill-tops down to the water's edge; its singular intersections of land and sea, particularly about the south-eastern coast,—offer to the admirer of Nature's works, scenery of the most wild and picturesque beauty, in lake-like bays and estuaries, fertile islands, rugged cliffs, romantic head-lands, and curious peninsulas. Here and there the cry of a settler reach down almost to the water's edge, and the waves carry the tidal pulses of the vast Pacific Ocean to within fifty yards of the farm-house door.

#### POLITICAL.

The political institutions of Tasmania secure the utmost latitude of rational freedom. By the Constitutional Act of 1854 the colony is governed by two elective bodies—the Legislative Council (15 members), and the House of Assembly (39 members). The members of the Legislative Council, who bear the prefix "Honorable" *ex officio*, are elected for nine years. This Chamber is indissoluble. Its constituency consists of £50 freeholders, graduates of universities, barristers and solicitors on the roll of the Supreme Court, legally qualified medical practitioners, officiating ministers of religion, and retired military and naval officers. The House of Assembly is elected for five years, and is dissoluble at the will of the Governor. Every Money Bill must originate in this House. No member of either House must be a judge of the Supreme Court, nor a minister of religion. Those who elect the House of Assembly are £10 householders in town and country, £10 pastoral licensees and lessees, persons receiving an annual salary of £100, and all the classes entitled to elect the Legislative Councillors. At elections—nominations are not made openly on the hustings, but are addressed, signed by the prescribed number of voters, to the Returning Officer, so as to be published by him some time before the election. Every man votes by ballot, striking out of a list the names he opposes, in a room by himself, and depositing his folded paper openly in the ballot-box. Further to secure every man in the secrecy of his vote, all distinguishing party badges, colors, flags, and bands of music are prohibited. Any person "giving or providing, receiving, or wearing cockades, ribbons, or other mark of distinction" is subject to a penalty of £50. Severe penalties are also prescribed for bribery, treating, and "undue influence." The results of this system of election are most satisfactory. In Tasmania there is no "putting on the screw." An "election riot" is unknown. The excitement and turmoil of an election are almost forgotten in a week. A more quiet, practicable, and business-like system of collecting the real political opinions of a constituency probably nowhere exists. The Tasmanians have not derived this system from Imperial or foreign legislation, but have framed it for themselves. So far, the political constitution of Tasmania has worked well, whilst those of some of the sister colonies have had to be constantly altered from their original form. The Tasmanian Statute Book, under Representative Government, may bear comparison with that of any other colony. Few changes of Ministry, and no violent changes of policy, have yet impeded the political progress of Tasmania, since she has possessed the inestimable privilege of self-government. In any country translated within a few years from a form of Government essentially despotic to one comparatively free, an excess of

party feeling may be expected to show itself occasionally—but such ebullitions, if not permitted to impede public business or to disturb the public peace—may be taken as healthful indications of the interest taken in public affairs. With a very few exceptional cases (which have been made the most of in disparagement of Tasmania) nothing has hitherto occurred to disturb the harmonious progress of her Legislation; and those few cases have served the useful purpose of showing that the political power of the colony is really in the hands of the intelligent and orderly portion of the community, of whatever class—whenever they choose to exercise it. Of the loyalty and good feeling of the population, generally, many proofs might be adduced. It has more than once happened that nearly all the Queen's troops have been suddenly taken away to quell disturbances elsewhere. At present there are scarcely regular soldiers enough in Tasmania to mount guard at Government House, and the Imperial establishment of Port Arthur, yet in no country does there exist a more confident sense of security for person and property.

#### THE TASMANIAN TIMBER AND WHALING TROPHY.

This structure, which has been designed to illustrate two of the most important branches of Tasmanian industry, will, it is believed, furnish information as to the abundance, variety, and lasting qualities of Tasmanian timber, which may prove acceptable to all persons interested in Ship-building, Railways, Public Buildings, and other purposes to which timber is applied. It will, probably, not less clearly illustrate the peculiar adaptability of Tasmanian Cabinet Woods, from their beauty of colour and marking, for Ornamental Furniture and other requirements of modern elegance and refinement. The fact ought to be mentioned, however, that the greater proportion of the Woods now exhibited was growing in the Tasmanian Forests but a few months since, and consequently may be found to be affected by "shakes," "sun-cracks," &c., which will not be discovered, in the same sorts of timber which may have been cut in the Autumn and seasoned under cover. In juxtaposition with the "green" specimens will, however, be seen—specimens which have been fully seasoned; and again, specimens which have undergone the severest tests to which timber is ever subjected during periods approaching to half a century. To render this Trophy a temporary Museum of the more useful Tasmanian Woods, specimens have been procured from the oldest Public Buildings of the Colony, each of which is fully labelled, and will tell its own tale. The Old Gaol and the Old Court House of Hobart Town, have furnished sleepers, door-posts, flooring-joists, boards, window-lintels, and architraves—of Huon Pine, Blue Gum, and Stringy-Bark, which are as sound as when built in forty years ago. These relics of the past, had they power of utterance, might relate legends of human trial, suffering, and adventure of early Colonial days, which would now be deemed incredible. But the evidence which they offer of their own durability must be taken as incontestible and complete. Nearly all the timber of the Old Hobart Town Court House has been found to be sound, and has been used in the erection of the New Post Office just completed on the same site. But the Builder and the Railway Engineer may ask, "Will Tasmanian Timber resist equally well the atmospheric influences of the open air?" The Naval Architect will inquire into its "behavior" under water. Let the old piles, and planks, and posts, in the Trophy supply the answer. Some of these old piles, which have been split down longitudinally

in order to facilitate inspection, have been partly submerged daily, as the tide rose and fell, for periods up to Twenty-one years, whilst forming part of the Wharves of Hobart Town. Blue Gum and other planks from the Wharf Platform will shew their power of resistance, for the same period, of copious showers, hot sunshine, dry winds, and heavy traffic. Other material witnesses to the durability of Tasmanian Wood have been summoned from a Colonial-built vessel, which has been stranded for Fourteen Years, in the shape of plank, timbers, trenails, &c., which also fully attest this fact. A Tasmanian schooner built of Blue Gum—the "Flying Squirrel," 97 tons—has twice been thrown by the surf above high-water mark—and on being got off did not exhibit the slightest deflection in her lines, or a sprung trenail, and has never even required to be pumped since undergoing this severe ordeal. Veteran posts from the earliest fences of the Colony, of Peppermint and other Woods, which have stood faithful sentinels over the crops and herds of the settlers of the last generation, here invite inspection of their almost unimpaired condition. What further proof can be required of the lasting and useful properties of Tasmanian Woods?

That these Woods, particularly the Blue Gum, may be seen in all conditions—the Ship-yards and Coach-factories of Hobart Town have furnished specimens as usually seasoned imperfectly, and as seasoned carefully. The specimens of Ship-timber, from Mr. Macgregor, have been ten years, and that from Mr. Ross has been twelve years, lying in an open Ship-yard, exposed to all weathers. With these specimens of rough seasoning may be compared the Blue Gum plank of Mr. Burdon, Coach-maker, which has been carefully seasoned under cover for seven years; and other specimens of Dr. Crowther's, which have been seasoning for ten years. This comparison will serve to shew that much depends on the seasoning of the Blue Gum; that it is a most valuable Wood when fairly seasoned, and that even when roughly prepared, this Wood is unsurpassed for all out-door purposes requiring strength and stability. Another variety of the Eucalypti—the Gum-topped Stringy Bark—nearly, if not quite equal, to Blue Gum, and procurable in greater abundance, a straighter grain, and of more free working character, has more recently become an object of considerable attention. Its durability and general quality are well illustrated by a plank which with the old piles has been exhibited by Mr. Oldham, that has been in use twenty years in the Platform of the Hobart Town Wharf.

In inviting all persons interested in the supply of the best Colonial Timber for the Dock-yards and Railways of the United Kingdom to examine these well-authenticated and varied specimens, it may be well to lay before them the result of scientific experiments which were tried ten years since, with a view to test the qualities of the Woods of Tasmania with the best Woods of India, of Europe, and of British America.

It is well known in engineering circles that Professor Barlow, in his "Essay on the Strength and Stress of Timber," gives the details of an experiment in England on the English and Indian Woods. These experiments, as also those of Captain H. C. Baker, on the Indian Woods, will be found in the article "Timber," in the *Encyclopædia Britannica*. Mr. Mitchell, D.A.C. General, made some similar experiments on the Woods of Tasmania, and (in 1851) detailed the results in a paper read before the Royal Society of Tasmania, which is published in the Society's Transactions, (Vol. 2, P. 1,) the object being to institute an impartial comparison between the Woods of Tasmania and those of India and Europe—as given in the tables of Captain Hall and Professor Barlow. The experiments had been thus performed:—

A piece of each Wood, two inches square, was laid with its ends resting on supports, seven feet apart. Weights were gradually increased in a scale, suspended from the centre of the piece of quartering so placed. Its elasticity was ascertained by increasing the weights till the Wood would no longer recover its straightness, after they were removed. Its strength was proved by increasing the weights till it broke asunder, and by observing its amount of deflection immediately before it broke. A portion of the broken Wood then had a cross bolt passed through each end, and was suspended, to try what weight it would bear before it could be pulled asunder length-wise. To facilitate the experiment, a portion of the middle of this two-inch piece was turned down in a lathe, and afterwards filed to a quarter of an inch square. It was by estimate determined after it broke—what was its direct cohesion on the square inch.

The trials were made on Blue Gum, Swamp Gum, and Stringy Bark—on green specimens, and on others which had been seasoned under varied circumstances, and for different periods. The following is a condensed synopsis of the mean of all these experiments:—

| No. of Expts. | Woods.                | Spe. Gravity. | Weight and Deflection. * |         | Break- ing weight. | Ulti- mate Defec- tion. | Direct Cohesion in sq. in. |
|---------------|-----------------------|---------------|--------------------------|---------|--------------------|-------------------------|----------------------------|
|               |                       |               | Lbs.                     | inches. | Lbs.               | Inches.                 | Lbs.                       |
| 31            | Morung Saul .....     | 947           | 349                      | 1.09    | 881                | 1.128                   |                            |
| 3             | Teak .....            | 745           | 300                      | 1.151   | 938                | 4.32                    | 15,550                     |
| 3             | Poon .....            | 579           | 150                      | .822    | 846                | 5.91                    | 14,787                     |
| 3             | English Oak .....     | 969           | 150                      | 1.590   | 450                | 5.90                    | 9,836                      |
| 3             | Ditto .....           | 934           | 200                      | 1.280   | 637                | 8.10                    | 10,853                     |
| 3             | Canadian Oak .....    | 872           | 225                      | 1.080   | 673                | 6.                      | 11,428                     |
| 3             | Dantzic Oak .....     | 756           | 200                      | 1.590   | 560                | 4.86                    | 7,386                      |
| 3             | Adriatic Oak .....    | 993           | 150                      | 1.430   | 525                | 5.73                    | 8,208                      |
| 3             | Ash .....             | 760           | 225                      | 1.266   | 772                | 8.92                    | 17,337                     |
| 3             | Beech .....           | 696           | 150                      | 1.026   | 593                | 5.73                    | 9,912                      |
| 3             | Rhin .....            | 538           | 125                      | 1.655   | 386                | 6.93                    | 5,767                      |
| 3             | Preh Pine .....       | 660           | 150                      | 1.134   | 622                | 6.                      | 10,415                     |
| 3             | Red Pine .....        | 657           | 150                      | .755    | 511                | 5.83                    | 10,000                     |
| 3             | New England Fir ..... | 553           | 150                      | .931    | 420                | 4.66                    | 9,947                      |
| 3             | Riga Fir .....        | 733           | 125                      | .870    | 422                | 6.                      | 10,707                     |

#### MR. MITCHELL'S EXPERIMENTS.

|    |                          |      |     |       |      |      |        |
|----|--------------------------|------|-----|-------|------|------|--------|
| 12 | Blue Gum .....           | 1631 | 492 | 1.650 | 1031 | 6.30 | 23,743 |
| 3  | Ash or Swamp Gum † ..... | 978  | 566 | 1.50  | 784  | 3.91 | 17,954 |
| 9  | Stringy Bark .....       | 291  | 417 | 1.625 | 867  | 5.07 | 23,443 |

\* Whilst elasticity remained perfect.

† Only used for Splitting Timber.

By this table it will be seen that Blue Gum will sustain about double the weight of English Oak before it breaks, and will even recover its elasticity after bearing a weight at which Oak will break. Its mean cohesive power beyond Oak is nearly, but not quite, in the proportion of 3 to 1. Mr. Mitchell states in his paper that, "The specimens experimented upon, were chosen because their ages were roused by the Gentlemen supplying them, and not on account of their being specially calculated to sustain great weights. Pieces could I have no doubt be found capable of bearing greater weights than any I have recorded;" and



adds as the result of his experiments, "The strength and elasticity of the Blue Gum exceeds generally those of all woods hitherto tested." There are probably many such superior pieces to be found in the Exhibition collection.

The result of these carefully conducted experiments has been completely borne out by observation in these colonies, whenever that wood has been severely tried, which fact the used and seasoned specimens now in the Trophy will go far to demonstrate. It is to be regretted that the same tests have never been applied to some other Tasmanian woods, such as She Oak, the light and tough Huon Pine, (of which the Whaleboats are built) and the Peppermint wood, both of which latter appear to be nearly impervious to atmospheric influences. The British Government possesses in the International Exhibition ample means of testing practically the Blue Gum, and comparing it in various shapes and conditions with other woods of first-class character. It may not, perhaps, be improper here to suggest that the appointment of a Commission of Enquiry to examine and report on the various woods in the Exhibition, might possibly eliminate results of even National importance, now that a supply of British Oak can no longer be relied on. In another quality for which British Oak is distinguished, it is believed that Blue Gum excels. It has been said that Oak is "less likely to rend, to break across, to splinter with common shot, than any other wood." Blue Gum is essentially a tough wood, the maul-heads, wheel-fellies, and boat-keels made of it, appear to be almost indestructible, and it is believed that it would stand the shot test well. In the possession of the Tasmanian Commissioners in London, is part of the head of a Blue Gum pile, of which about two inches deep of the bruised head was sawn off after the pile had been driven into the earth. This portion of the pile had received 200 blows from a driving ram weighing 21 cwt., 27 feet drop; and the toughness of the small portion which had to be cut off will fully attest its suitability for such purposes. A wood so tough and elastic, which splinters so little, must be valuable for constructing railway carriages. It is constantly used for making ordinary carriages and other vehicles in Tasmania.

The superiority of Tasmanian woods, particularly the Blue Gum, having thus been carefully demonstrated by experiment, and amply corroborated by the experience of their durability; it remains to be determined whether they can be supplied of the large size, and shapes required—say for ship-building? The structure of the Trophy, which is mostly formed of ordinary market timber, or of such sample timber as can be supplied in almost any quantity—will afford an answer to this question.

The Octagonal column, is formed of eight spars of Blue Gum, Stringy Bark, White Gum, Silver Wattle, Blackwood, and Sassafras.\* The eight sides of this column are formed at the base by eight large planks set on end, of Blue Gum and Stringy Bark, from Dr. Crowther's Timber Establishment, at Oyster Cove. The thickness of the Trees from which these planks have been taken will be seen at once by persons conversant with timber. The heart of Tasmanian trees is nearly always unsound. In these planks, as in

\* The Botanic names of these woods, which are here omitted for the sake of brevity, will be found in the Appendix, in a paper on the Vegetable products exhibited by Tasmania, by the Hon. W. Archer, M.H.A., F.L.S. Specimens of the leaves and blossoms, &c., can be referred to in an Herbarium in the Exhibition, prepared by James Boyd, Esq., Civil Commandant, Port Arthur.

all planks used in the Colony for ship-building, the heart is cut off, and the width of the plank shows the size of the tree—outside of the heart. To show the length of which Ship timber can be obtained, planks have been sent home of Blue Gum, measuring 90ft., and of Stringy Bark, measuring 80ft. in length, of equal width and soundness throughout.

Samples of other ship timber form the base of the Trophy—which is thus constructed—Five planks, (20ft. long) of Blue Gum, Stringy Bark, Blackwood, and Myrtle, the two former being fitted for ship-building, and the two latter for cabinet work, are first laid down. Placed across these, are ship's keel-pieces (10ft. long, squared) of Blue Gum, and Stringy Bark. Immediately on these lie, transversely, joists of Stringy Bark, covered with ordinary flooring boards of the same wood. The frame-work of the Pedestal placed on this floor is composed of Blue Gum, White Gum, and Stringy Bark. The joists, quartering and flooring boards of the Pedestal platform are also of Stringy Bark. The centre piece of the spiral staircase is formed of a spar of plain Huon Pine, the stairs being made of this free-working and almost imperishable wood. These samples will show what Tasmania can supply of plain timbers. Of large ship's knees—the want of which has even caused a modification of British naval architecture—an unlimited supply can be obtained from Tasmania, where the stumps of the large trees which might supply them are left to rot after the tree has been cut up. These are also shown, in the angles of the Pedestal frame, of various conditions as to seasoning. A large Blue Gum knee, and also a Blue Gum crook have been exposed to the open air nearly ten years, in the ship-yard of Mr. McGregor. In other angles of the frame are three very fine ship's knees from Tasman's Peninsula, exhibited by Mr. Boyd. There are also three smaller knees, a Blackwood crook (for curved bannister work), and a fine Huon Pine knee, in other angles of the Trophy. In the interior of the Pedestal are also some railway sleepers of Blue Gum and Stringy Bark and pieces of White Gum, or Gum-topped Stringy Bark, 12 x 6, 12 feet in length, contributed by Dr. Crowther, from Oyster Cove, and by Mr. James Boyd, from Tasman's Peninsula—together with some sleepers of Blue Gum and Peppermint shown by the Commissioners. The split palings and roofing shingles here displayed are also fine specimens, varying in length from 5 feet to 15 feet, and in breadth from 6 inches to 24 inches. These are specimens of the ordinary splitting qualities of Swamp Gum, which is very valuable for this purpose, but is never used for any other. A longitudinal section of the Swamp Gum plank from Port Arthur, exhibited by Mr. Boyd, will serve to show the extraordinary length and size of Tasmanian Timber. The plank from which this section was taken measured 230 feet in length. No available ship could be got to take it to London, whole. The section has consequently been divided into 20 feet lengths, in such a way that the brand cut across shall in each case bear evidence of the former connection of the pieces severed. These large specimens, and some others which could not be sent in time, prove that Tasman's Peninsula with its tramway and excellent harbour at Port Arthur, and its large forests of these valuable timbers—is well calculated for a timber supply station to the Imperial Dockyards in England. The finest specimens of ship's knees are all from Port Arthur, which, together with Dr. Crowther's establishment at Oyster Cove, have supplied nearly all the best shipping and railway timber now exhibited.

The attention of Railway Engineers is particularly invited to these durable woods, which it is believed can be supplied at a price which

would render their use much more economical than the softer woods which have so frequently to be renewed. By the estimate of the late Robert Stephenson 2,800,000 railway sleepers required renewing (in 1854) every year, out of the 36 millions of sleepers in use in Great Britain. A Blue Gum, or Stringy Bark, or Gum-topped Stringy Bark, or Peppermint wood sleeper, would, under the most trying circumstances, last from fifteen to twenty years, and under ordinary or favourable circumstances might last three times that period. The sleepers now in use require renewing, according to Mr. Stephenson, every twelve or fourteen years. It is estimated that this quantity requires the wood of 7,000 acres of English forest land annually, whilst better woods are growing in the wild lands of Tasmania as common as weeds.

Of Ornamental Woods the Trophy furnishes a great variety suited for cabinet work. The Myrtle tree (so-called) of which Tasmania contains immense forests, from its richness of tint and varied venation is well suited for this purpose. Other woods, as Blackwood, Muskwood, Huon Pine, Dogwood, Sassafras, Pinkwood, Native Laurel, She-oak, &c., offer a variety of selection in tint and figure, in which the ingenious cabinet-maker will find ample scope for tasteful innovation. The specimens of these woods exhibited by the Commissioners are the following:—

|                                                              | Specimens. |
|--------------------------------------------------------------|------------|
| Muskwood ( <i>Eurybia argophylla</i> )                       | 30         |
| Silver Wattle ( <i>Acacia dealbata</i> )                     | 24         |
| She-oak ( <i>Casuarina quadrivaleis</i> )                    | 25         |
| Native Cherry ( <i>Exocarpus cupressiformis</i> )            | 4          |
| Ironwood ( <i>Notela ligustrina</i> )                        | 8          |
| Dogwood ( <i>Befordia salicina</i> )                         | 8          |
| Sassafras root ( <i>Atherosperma moschata</i> )              | 10         |
| Native Laurel ( <i>Anopterus glandulosa</i> )                | 15         |
| Native Box ( <i>Bursaria spinosa</i> )                       | 6          |
| Stringy Bark Root ( <i>Eucalyptus gigantea</i> )             | 5          |
| Blackwood ( <i>Acacia melanoxylon</i> )                      | 30         |
| Gum Root ( <i>Eucalyptus globulus</i> )                      | 10         |
| Native Pear ( <i>Hakea lasiocarpa</i> )                      | 2          |
| Honeysuckle tree ( <i>Banksia Australis</i> )                | 6          |
| Pittosporum ( <i>Pittosporum bicolor</i> )                   | 10         |
| Prickly Wattle ( <i>Acacia verticillata</i> )                | 10         |
| He-oak ( <i>Casuarina suberosa</i> )                         | 3          |
| Huon Pine ( <i>Dacrydium Franklinii</i> ) (planks in cases). | 4          |

#### THE COAL-FIELDS OF TASMANIA.

Coal exists in nearly every part of Tasmania, of which a valuable collection has been made by Mr. C. Gould, Government Geologist, which will be found amongst the Tasmanian products. The main portion of the fuel used in Hobart Town is derived from Mines at New Town, in the close vicinity of the Capital, and from Tasman's Peninsula; but it is generally believed that Coal Beds of far greater value than those which have been worked, principally on account of their easy accessibility, exist in other parts of the Island. The series of specimens from Mount Nicholas will illustrate the Coal Bed to which public attention has recently been most particularly directed. The seam of Coal

which crops out at various points on the side of Mount Nicholas, locally known as the Killymoon Seam, overhanging Break o' Day Plains, at a height of about 500 feet—can be worked at an adit level, is distant nine miles from the Port of Falmouth, is highly bituminous, and it is believed is well suited for steam, gas, and domestic purposes. The same Seam crops out near Fingal and at various other parts, but the main Seam is that now illustrated by samples from different portions of it. This Coal Bed is estimated to occupy an area of about 14 miles, on the Northern side of the Break o' Day Plains. Various other portions of the Bed are equally accessible, but although they are mostly bituminous, they are inferior in thickness to the Killymoon Seam. Bituminous Coal samples are also furnished from the Coal Bed of the Douglas River and from Long Point, both on the East Coast. The Coal from both these Districts is good, and the Coal Bed from which they are taken is said to extend over an area of about 15 miles, and the seam at the Douglas River to be above eight feet thick. At Long Point it is 6 ft. 10 inches thick, very bituminous, and within an easy distance of the shipping place. This Coal is rapidly rising in public estimation, and a Company has just been formed to work it. Beds in the Mersey River have also been found, and, although limited in quantity, have been profitably worked, as they are easy of access. The coal is very bituminous, is used by the coasting steamers and in Launceston, and has been recently exported to Victoria.

The bituminous Coal from Hamilton is said to be very good. It lies about 40 feet deep, in a seam 4 ft. 6 in. thick, and has been used, and favourably reported on, by the Derwent steamers, from the shipping place of which, at New Norfolk, it is about 20 miles distant.

The anthracite Coal is abundant on the southern side of the Island, and specimens are exhibited from New Town, Tasman's Peninsula, Adventure Bay (Bruni Island), Three Hut Point in D'Entrecasteaux Channel. Four collieries are represented in the specimens from New Town, near Hobart Town. The Coal at Tasman's Peninsula has been worked for 25 years and largely used in Hobart Town. The seam is from 3 ft. 6 in. to 4 ft. 6 in. thick, is worked by a shaft 25 yards deep, and within about 100 yards of the water's edge.

The Coal formation on the South side of the Island extends round the mouth of the Huon to S. W. Cape, within which range many deposits have been discovered. With a supply so varied and extensive, some localities will probably be soon found to possess coal of first-rate character, easy of access. Private capital is seldom sufficiently in excess in the colonies to admit of its being relied on as the source of development of the mineral wealth which Tasmania doubtless possesses. The matter is one of national as well as colonial importance, now that steam vessels may be expected to take a very prominent part in any future maritime war, and the attention of the Colonial Government has of late been specially directed to it. The labours of Mr. Gould, the Government Geologist, have been almost concentrated on this matter recently, the Parliament have voted a sum of money for its investigation, and a Commission has just been gazetted (March, 1862) to take charge of experiments on, and the selection of some of the best specimens, easily and abundantly procurable, to be tested in bulk, by the Admiralty authorities in England.



### WHALE FISHERY.

This branch of Colonial Industry, which the Trophy is also intended to illustrate, has nearly regained the prominence in Tasmanian estimation which it occupied before the derangement of all industrial pursuits by the Gold Discoveries. The Fishing Ground of the Tasmanians reaches from their own shores to the Antarctic Regions—and is sufficiently well stocked to attract a large number of American Whale-ships, who frequently discharge, provision, and refit, at Hobart Town. There are now 25 vessels, with an aggregate tonnage of 5,746 tons, engaged in Whaling, from the Port of Hobart Town. The amount of Sperm Oil and Head Matter from the Southern Whale Fishery exported in 1861 amounted to 710 tons, worth about £85 per ton, or £60,350. The greater portion of Tasmanian-caught Oil is sent to England, via Melbourne, and thus appears amongst the Victorian exports. The number of whale-boats attached to these 25 vessels is 81 in use, and 131 including spare boats. The boats suspended from the Trophy are two such boats—perfectly fitted with all gear, except line and oars, as when starting to capture a whale. Nobody who has not experienced the capabilities of the Tasmanian Whale-boats, manned with a good crew, can form any just conception of their behaviour in a rough sea. Each boat, such as those exhibited, when fitted with line, oars, &c., complete, costs about £70. The 131 boats of the little Tasmanian Whaling fleet represent a capital of £1,750, and find employment for about 700 men. Specimens of the Oil of the Sperm Whale, Black Whale, Black Fish, Porpoise, &c., together with the Head Matter of the Whale, will be found in the Trophy. The jaws of the Sperm Whale forming the apex of the Trophy (from two of Dr. Crowther's ships) will give some notion of the size of the fish which the crews of these boats have to capture. One of the Whales to which those jaws belonged, produced £1,150 worth of Oil, and the other £900 worth. It is not a very unfrequent occurrence for a whale to bite asunder one of these boats, when it is approaching to harpoon him—an operation requiring considerable nerve, strength, and skill, in boat management. Dr. Crowther recently had two boats destroyed in this way, by the same fish.

Whaling ships are usually fitted out on what is called the "lay" or share system—by which every man connected with the venture profits in proportion to the extent of his risk, and his more or less onerous position among the crew. The owner risks the ship and the outfit for a cruise of twelve or thirteen months. The officers and crew risk their lives, their time, and their labour. A ship of 250 tons register, with three boats in wock, will be worth when fitted for sea, about £5,000. Should this vessel obtain 50 tons of Sperm Oil, worth say £4,000, at £80 per ton, this sum of £4,000 would be thus divided:—

|                                               | £     | s. | d. |
|-----------------------------------------------|-------|----|----|
| Share of Captain .....                        | 290   | 10 | 0  |
| First Mate .....                              | 187   | 8  | 0  |
| Second Mate .....                             | 80    | 0  | 0  |
| Ship-keeper .....                             | 31    | 0  | 0  |
| Cook .....                                    | 31    | 0  | 0  |
| Steward .....                                 | 31    | 0  | 0  |
| 3 Boat-steerers, £31 each .....               | 93    | 0  | 0  |
| 18 Men, £25 each .....                        | 450   | 0  | 0  |
|                                               | 1,193 | 18 | 0  |
| Outfit, provisions, &c .....                  | 1,500 | 0  | 0  |
| Owner's risk, and wear and tear of ship ..... | 1,306 | 2  | 0  |
| Total .....                                   | 4,000 | 0  | 0  |

This pursuit is not probably more remunerative to able seamen on the average than the common rate of wages, but to "ordinary" and "green" hands it is a good naval school, and offers the chance of something much better. Sixteen whales, yielding an aggregate of 1,400 barrels, or 140 tons of Sperm Oil, value £11,200—were recently taken in one day (December 7th, 1861), in the vicinity of the Chatham Islands, by American and Colonial Whalers. This single day's work would have averaged nearly three times the profit above stated to all engaged. On the other hand, in adverse seasons, Whalers occasionally (but very seldom) come home "clean," or altogether destitute of oil. Whale-fishing is sometimes attended with great hardship—but being looked on as a colossal aquatic sport, and combining the excitement of bold and perilous adventure with the contingency of a good prize, and promotion according to merit, it has always been a favourite pursuit with the young Tasmanians—from whom might be selected some of the smartest boatmen in the world. It may not improperly perhaps be mentioned, as an instance of the occasional demand in the emergencies of new communities, for business habits and self-reliance—that nine of the above twenty-five whalers belong to a lady,—who, having some years since succeeded to the Whaling business of her late husband, has subsequently conducted it with consummate skill—and it is gratifying to add, with commensurate success.

It would seem that the Southern Whale Fishery, now that the Whales have become more wild and shy, is destined to fall into the hands of the Tasmanians, from the favorable position of this island as regards the Southern Ocean. No Whaling ships now hail from Adelaide, Melbourne, or New Zealand. In 1860 twelve Whaling ships belonged to Sydney, of which only three are now engaged in the trade. The Americans have to incur the increased expenditure of provisions, &c., of six unprofitable months out of the voyage—three months in reaching the Whaling Ground, and three months in returning, and are consequently at great disadvantage as compared with Tasmania.

### MINERALS AND METALS.

The general character of the building stone of Tasmania may be ascertained from inspection of the series of illustrative specimens from different parts of the Island—which Mr. J. E. Calder, Surveyor-General of Tasmania, has been at great pains to collect. Tasmanian stone has been used in the erection of Public Buildings in Melbourne, as the best and most available in this part of the Globe. The church-fount, grindstones, &c., of the stone of Point Ventenot, Taylor's Bay, Bruny Island, will shew the qualities of the stone which was exported in 1860 to the value of £5,095, principally to Melbourne. Amongst the mineralogical collection, some black and white marble from the Florentine Valley and from Chudleigh, where it is burned for the common purposes of lime—show by their texture and polish that Tasmania is not without the means of ornamental architecture. The Topazes from the Islands in Bass's Straits, when properly mounted, show great clearness and brilliancy. Some specimens of Serpentine veined with Asbestos from the Asbestos Hills, are found to bear a high polish.

### GOLD.

The small portion of Tasmanian Gold exhibited has been collected by Mr. James Grant, of Fingal, within a few months, from the few diggers

who are surfacing and prospecting about Fingal. More Gold from that District is in the Hobart Town Banks, and might have been purchased for exhibition, but although, according to geographical and geological analogies, Tasmania *ought* to possess the precious metal in abundance—it has not yet been discovered in paying quantities, and the portion exhibited will give a fair notion of all the gold hitherto found. To stimulate exploration the Colonial Government has just offered a reward of £20,000 for the discovery of a payable Gold Field. Gold has been found, principally of the character of that exhibited, in many parts of the Island which are widely distant from each other. There are abundance of Quartz Reefs in the Fingal district more or less auriferous, some of which will probably eventually be found to pay for the crushing. Even if Gold should never be found in paying quantities in Tasmania she need entertain no mean jealousy of the superior auriferous productions of the neighbouring Colonies, as a fair portion of their Gold will probably ever find its way to Tasmania in exchange for products which Australia cannot produce. The prosperity of the Gold Colonies must be indirectly, if not directly, reflected on Tasmania, who is thus bound up in her material interests with their continued progress and success. Judging by the rate of production which has latterly prevailed, and the enormous extent of surface yet untried in the auriferous regions of Australia, it will be long before the supply of Gold shall be exhausted. But even Gold may be purchased too dearly. The discovery of a Gold Field attracts population only in proportion to the facility by which individuals may become rich; but if new Gold Fields are not continuously discovered—to keep up this standard of easy acquirement—the Gold-mining population soon over-run the average remunerating point, and the possession of a Gold Field may, in such case, prove rather “a mockery, a delusion, and a snare,” than an element of solid and enduring prosperity;—necessitating heavy taxes and extravagant expenditure—and entailing individual loss and public debt. Happily, both Australia and Tasmania possess, in unsettled Districts and undeveloped resources, ample means of employment, more profitable than Gold-digging—to which the surplus population of the Gold Fields may advantageously apply themselves. The Gold-miner, ever on the move, now at Ballarat, now at Port Curtis, now at Dunedin, feels little interest in anything beyond the canvas of his tent, or the bounds of his “claim”—which does not relate to Gold.

The average profit of Gold-mining will be shewn by the following comparison of the number of miners employed, with the Exports of Gold at different periods, from Victoria, the most productive Gold Country in the World,—and the amount which fell to the share of each individual miner. These returns are taken from the Official Statistics of Victoria:—

| Year. | Miners. | Gold Exported. | Each Miner. |
|-------|---------|----------------|-------------|
|       |         | £              | s. x. d.    |
| 1853  | 75,626  | 12,600,083     | 288 0 3     |
| 1857  | 132,167 | 11,646,113     | 99 12 4     |
| 1860  | 144,396 | 8,626,642      | 59 14 9½    |

A gold digging population wholly, is greatly dependent on the yield of the precious metal, and must always be a restless, irresponsible, and unsettled one. Some years since (1857) in Victoria no less than 140,892 persons out of a population of 410,766, or upwards of one-third, were living in

tents. In the election of 1860 in New South Wales, 3300 gold-miners were qualified to vote for the Western Gold District, of whom 398 only went to the poll. Within 25 years 543,261 persons (rather more than its present population) came into Victoria, and during the same period 264,390 persons, more than one-half the immigrants, went out of that Colony. That Victoria has managed to retain one-half of her visitors speaks well for the colony, which has given them profitable employment more lasting than gold-mining, and which can advantageously set to work any further number of diggers who may find themselves “redundant” in the more settled occupations of rural industry, which have recently experienced a healthful impulse in Victoria. That most important Colony seems to have a better chance of sound progress, now that the population is rapidly undergoing the process of sifting and settling, than it had probably at any former period. The result of the above table as to the individual yield of gold will hereafter be compared with the result of an equal amount of labour applied to Agriculture, Stock-keeping, and Horticulture.

#### OTHER METALS.

Galena and Copper Ore have been found in different parts of Tasmania but not hitherto in any considerable quantity. Iron ore abounds all over the Colony. At Ilfracombe, eight miles from the Tamar, there are immense masses of rich ore, similar to that now exhibited, which will doubtless, some day, prove highly advantageous to the colony, in connection with the vast coal-fields of the East Coast. It is said to be nearly identical with the Brown Hematite of Mittagong, in New South Wales, the working of which has recently been discontinued in consequence of the great expense of transporting it over some seventy miles of land carriage to the sea. A Tramway is already in operation at Ilfracombe from the vicinity of the ore to the water's edge, which circumstance may possibly enable these “hills of iron,” as they have been called, to be profitably worked, when the same description of ore, less favourably situated could not be made to pay.

Commissioner Biggs, who was deputed to report on the resources of these Colonies in 1823, and whose report was printed by the House of Commons, thus writes on the iron ore of Ilfracombe:—

“At the distance of eight miles from Port Dalrymple (the Tamar) in “Van Dieman's Land, considerable quantities of iron ore have been discovered on the surface, which upon analysis in this country, have been found to consist of pure protoxide of iron (similar to the black iron ore of Sweden) and furnishing a very pure and malleable metal.”

#### PASTORAL, AGRICULTURAL AND HORTICULTURAL PRODUCTS.

Count Strzelecki in his excellent work on New South Wales and Van Dieman's Land, draws a comparison between the Agricultural capabilities of the two countries on scientific data, founded on the origin of their respective soils. Exploration and analysis had shown that the crystalline rocks (such as granite) as compared with the sedimentary rocks formed in the area of N. S. Wales a proportion of 3 to 1, whilst in Tasmania they were 7 to 1. Of rocks containing more than 60 per cent. of Silica as compared with rocks having less than 60 per cent., N. S. Wales has a proportion of 4·1 to 1, whilst in Tasmania the case is



reversed, the sixty per cent. rocks forming a proportion of only 1 to 3. Strzelecki traces this difference to volcanic agencies, which have been more prevalent in Tasmania than on the Australian Continent. He adds:—

"Indeed, the torn, rugged, furrowed, and contorted surface of the former colony bears ample witness to the formidable revolutions produced by the eruptive greenstone and basalt, overwhelming in succession different members of the series, which then composed the consolidated crust, and sweeping away and burying a vegetation, of which no living traces are now left on the island.

"But these changes have served only to render this island one of the most eligible spots on the face of the globe for the pursuits of agriculture: the irrupted greenstone yields an excellent soil, and the zigzag course of the chain of mountains forms naturally flat-bottomed valleys, between which rises a table-land about 3800 feet, enclosing in crateriform lakes five reservoirs of water, covering, if the surface were united, an area of 200 square miles, and capable of irrigating all the adjacent lands available to cultivation."

After describing the Pastoral character of N. S. Wales, Strzelecki states:—

"In Van Dieman's Land, the agricultural districts are superior in appearance to those of New South Wales. The details of farms and farming are better understood and defined, and the practical results are such, that no country reminds the traveller so much of the *old one* as Van Dieman's Land. There, the tasteful and comfortable mansions and cottages, surrounded by pleasure-grounds, gardens and orchards, the neat villages, and prominently placed churches, forming as it were the centres of cultivated plains, divided and subdivided by hedgerows, clipped or bushed, and through which an admirably constructed road winds across the island, are all objects which forcibly carry back the mind to similar scenes of rural beauty in England and Scotland."

Those observations, have been very much corroborated by subsequent experience. Van Dieman's Land was for many years subsequent to the settlement of South Australia "the granary of the Australias," and she has continued to export grain in considerable quantities both to Victoria and New South Wales.

The great forte of these Colonies lies in their Pastoral capabilities. The following table comparing the Live Stock with the Population of Victoria, New South Wales, and Tasmania, in 1860, will shew the number (fractions omitted) of Stock per individual in each Colony.

#### LIVE STOCK, 1860, TO EVERY HEAD OF THE POPULATION.

|             | Victoria. |             | N. S. Wales. |             | Tasmania. |             |
|-------------|-----------|-------------|--------------|-------------|-----------|-------------|
|             | Popl.     | Live Stock. | Popl.        | Live Stock. | Popl.     | Live Stock. |
| Horses..... | 7         | 1           | 1            | 1           | 4         | 1           |
| Cattle..... | 1         | 1           | 1            | 6           | 1         | 1           |
| Sheep.....  | 1         | 10          | 1            | 17          | 1         | 18          |

It will be seen by this Table that in 1860 Tasmania grew nearly double the quantity from a less number of acres than she produced in 1841.

In Victoria where Native Agriculture is greatly fostered and has recently greatly increased, the very best lands only are yet cultivated. New South

#### AGRICULTURAL PRODUCE, COMPARATIVE YIELD PER ACRE, OF TASMANIA, VICTORIA, AND NEW SOUTH WALES.

| Year.                | Wheat.  |           |           | Barley. |          |           | Oats.  |           |           | Potatoes. |        |           |
|----------------------|---------|-----------|-----------|---------|----------|-----------|--------|-----------|-----------|-----------|--------|-----------|
|                      | Acres.  | Bushels.  | Per Acre. | Acres.  | Bushels. | Per Acre. | Acres. | Bushels.  | Per Acre. | Acres.    | Tons.  | Per Acre. |
| Tasmania.<br>1841    | 63,734  | 881,318   | 13        | 9,010   | 167,458  | 18        | 16,471 | 220,786   | 14        | 4,185     | 14,108 | 3         |
| 1860                 | 66,450  | 1,415,896 | 21        | 6,238   | 126,605  | 20        | 30,303 | 926,418   | 30        | 7,621     | 33,889 | 4         |
| Victoria.<br>1860    | 107,003 | 2,296,157 | 21        | 4,102   | 98,433   | 24        | 20,167 | 2,538,627 | 28        | 27,622    | 48,967 | 1         |
| N. S. Wales.<br>1860 | 128,829 | 1,581,597 | 12        | 2,860   | 39,801   | 13        | 6,534  | 98,814    | 15        | 9,238     | 28,127 | 3         |

Wales, in Agricultural yield, is about equal to the point reached by Tasmania in 1841. There is, indeed, still scope for the industry of the more-exporting Colonies South Australia and Tasmania. In 1860 neither New South Wales nor Victoria grew half enough bread-stuffs for her own consumption.

#### COLONIAL STATISTICS.

The following table compiled from Official Public Documents will show the position of Tasmania, in some important particulars, as compared with the two neighbouring Colonies.

|                                    | Victoria.      | N. S. Wales.  | Tasmania.     | The Head of Population. |
|------------------------------------|----------------|---------------|---------------|-------------------------|
|                                    | £ s. d.        | £ s. d.       | £ s. d.       | £ s. d.                 |
| 1860                               |                |               |               |                         |
| Population                         | 548,412        | 348,546       | 87,775*       |                         |
| Public Debt                        | 12,136,015     | 3,830,230     | 392,560       | 4 8 9                   |
| Taxation                           | 2,958,972      | 1,880,508     | 286,937       | 3 3 9                   |
| Mortgages on Land, Wood, and Stock | 3,456,573      | 2,699,120     | 236,418       | 2 12 6                  |
| Savings Bank Deposits              | 484,519        | 557,659       | 222,107       | 2 9 4                   |
| Acres Cultivated                   | 358,727        | 260,798       | 218,315       | A. r. p. 2 2 0          |
| Acres Sown (1860)                  | 492,247        | 109,216       | 87,004        | 1 (nearly)              |
| Price per Acre                     | £ s. d. 1 6 11 | £ s. d. 1 9 0 | £ s. d. 1 4 2 |                         |

\* The Population of Tasmania by the Census of April, 1861, was 89,977.

#### CLIMATE, PUBLIC HEALTH.

An elaborate Article on the Meteorology and Sanitary Condition of Tasmania, by Dr. E. S. Hall, will be found in the Appendix.

#### NATIONAL SPORTS—THE CARNIVAL WEEK.

The genius of a people may generally be judged of by their public sports. The Tasmanians, in December last, offered a prize of £500 for a Champion horse race. To this attraction was added a £200 prize for a yacht race, and £100 for a whale-boat race. Various minor prizes brought up the sum total raised by public subscription to about £2,000, which prizes were thrown open to all competitors, and the public sports lasted a whole week, during which nearly all business was suspended. The interest in the contests of this "Carnival Week" was intense, for Tasmania possesses some of the best English racing blood; a little flotilla of private yachts may generally be seen moored off Hobart Town, and the whale-boat in rough water is to the young Tasmanian as the Desert Horse to the Arab. A clever Tasmanian journalist\* did no more than give expression to the genuine enthusiasm of the people when he thus wrote. "Horse-racing is traditionally, and by inveteracy of habit, an English sport, a national pastime; and we are ashamed of the Englishman who is ashamed of it. It has always been a popular sport amongst heroic people, but has never taken root so thoroughly in any national soil as in our own Old Home. \* \* \* There is another pastime quite as national, and quite as congenial to our habits. If an Englishman is at home on the back of a horse, he is equally so when floating on the waves, dashed by the spray, and tossed about by the rough winds of ocean. We came from a line of old Sea Kings; we are essentially a people of maritime enterprise; we are prouder of Britannia with her trident, than of the Lion and Unicorn. There is no air so pleasant to the nostrils of an Englishman as that laden with the odours of the sea."

The result of these spirited intercolonial contests was not discreditable to Tasmania. The Champion Turf Prize was won by Mr Henderson's "Mormon," a Victorian horse, but two Tasmanian horses "Shelagh" and "Panie," both owned by Mr. Blackwell, ran second and third—beating the best horses of New South Wales, South Australia, and Western Australia. In the Champion Sailing Match (prize £200,) for Yachts under 35 tons, two Tasmanian vessels, the "Maggie Laurie" (Ross), and the "Secret" (Chandler), came in first and second—the "Surprise" (belonging to the Sydney Yacht Club) being third. The Tasmanian Prize (£100), for whale-boats—similar to those suspended from the Tasmanian Trophy—was carried off by a fine picked crew from the Sydney boatmen (having a native Tasmanian coxswain) who pulled with light, broad, smooth-water paddles, instead of the heavy oars generally used in rough sea whaling. The following comments on these exciting contests deserve a wider promulgation.

"The reaction that has set in, in favor of open air and gymnastic exercises, which is a curious and interesting phase of the present-age civilization of the mother country, is still more marked in these colonies.

\*Mr. Bright, *Hobart Town Mercury*.



There is surely some significance in the fact that the people of Australia, as a general rule, have the leisure and the means to take frequent holiday. Talk as we may about depression and poverty, it is impossible to witness the spectacle of a people wholly given up to enjoyment, not for a day, but during a week; not on one occasion, but on many throughout the year; without feeling that there is an essential difference between their condition and that of the classes corresponding to them in either of the three kingdoms. What impression must have been produced upon the mind of a stranger just arrived from one of the manufacturing or agricultural districts of England, as he saw yesterday from a steamer on the Derwent, the thousands of persons of all degrees who crowded the Domain, on no care intent but to enjoy fine weather and witness pleasant sights; who walked through the deserted streets of the city and saw warehouses and shops closed, and all the operations of industry suspended; and who learnt that it was the Friday of a week almost every previous day of which had been in some way devoted to the same task of pleasure seeking! He would surely conclude that he had come amongst a people with whom the conditions of life were easier, than with the struggling mechanics and laborers of lands where a half-holiday, enjoyed once or twice a year, has to be purchased by long pinching and over-work. No thoughtful mind can doubt that even in this colony, which is held to compare unfavorably with others in point of material prosperity, the severity of toil which leaves little opportunity of recreation is comparatively unknown.

"The time dedicated to public pastimes is a satisfactory proof of our practical interest in that physical education, which tends so much to the development of a true manliness of character."

Cricket has ever been a favourite game in Tasmania, which contains many settlers from the South of England, who talk warmly of the halcyon days of English pastime,

"When the good old Kent Eleven, full of hope and pluck, began  
The battle with All England—single-handed—man to man."

On the recent visit of the "All England Eleven" to Australia, that instinctive desire to try their mettle against superior odds, which is alike the most healthful attribute of competitive emulation, and the best guarantee for future excellence, urged the cricketers of Tasmania to invite them to a friendly match. They "came, saw, and conquered," as they did in every case, save one; but the Tasmanian Twenty-two made a higher score (250) than had been made by any other twenty-two of any other colony. One of their batsmen—Mr. Whitesides—made the highest score (50) of any single Australasian against All England, and a Tasmanian bowler (Mr. Spicer) brought down the wicket of the celebrated Cully, who is said not to have been previously bowled out for several years. The Englishmen expressed themselves pleased with their frank and hearty reception, with the truly English character of the Colony, with its resuscitating climate, and with the fair and manly play of their aspiring competitors.

Enough has been said of Tasmanian *manly* sports. A word is due to the amusements of the more retiring sex. The Whaling enterprise of Mr. Seal has been noticed as illustrative of the more stern occasional requirements of Colonial life—but a reference to the drawings of Mrs. Charles Meredith and Mrs. Allport, the embroidery of Mrs. Burgess, the *bouquets* of sea-weed and shell-work of Miss Collins and of Mrs. Cook, the wax fruit models of Mrs. Luckman, and the ornamental feather-work of Mrs. Crowther, *senr.*, all on purely Tasmanian subjects—will amply prove that

whilst cultivating business habits of practical utility, the fair Tasmanians by no means undervalue those pleasing and elegant accomplishments which diffuse an atmosphere of cheerfulness around the enjoyments of home, and elevate and purify the graceful amenities of social life. On the point of personal attractions the evidence of numerous, trustworthy, though not perhaps impartial, witnesses might be adduced. Colonel Munday thus writes ("The Antipodes," vol. 2) of a ball which he attended here at Government House:—"For an hour or two dancing was kept up exclusively by children, amongst whom were many beautiful specimens of rising Anglo-Saxons, for the rearing of whom the climate is evidently very favourable. The same must be said of human plants of more advanced growth. *I saw in five minutes, this night, more fair faces tinged with the English rose than I had seen in New South Wales in as many years.*"

An apology is due for the brevity with which many interesting points have necessarily been treated in this *brochure*. Had the occasion permitted a volume might have been written on many matters yet untouched. It is hoped, however, that this rapid sketch may convey some idea of the physical characteristics, the material resources, and the moving life and manners of Tasmania. Taken with the collection of Tasmanian Products, it will at least serve to show what a comparative handful of earnest and self-reliant men, with a fine climate and fine country can manage to do, in blending the free and lasting institutions of their forefathers with the energetic habits and improvements of a riper age.

GEORGE WHITING,

Secretary to the INTERNATIONAL EXHIBITION COMMISSION for Tasmania.

P.S.—Unavoidable circumstances compel the postponement till the next Edition of some remarks on the Wheat, Timber, and Wool of Tasmania, (which all gained Prizes at London and Paris in 1851 and 1855,) on Horticulture, Public Education, the Land Selling System, &c.

## APPENDIX.

### NOTES ON THE VEGETABLE PRODUCTS OF TASMANIA.

AT THE

### INTERNATIONAL EXHIBITION FOR 1862.

BY WILLIAM ARCHER, F.L.S.

#### TIMBER.

The principal timber trees of Tasmania, such as the Blue Gum, Stringy Bark, White Gum, or Gum-topped Stringy Bark, Swamp Gum, and Peppermint Tree, furnish a hard, close-grained, and strong timber, which is used in ship-building and house-building, and generally for all the purposes to which Oak is applied in England. Huon Pine is very durable, and is employed for boat-building, for which it is peculiarly adapted, and for house-fittings, &c. Blackwood makes excellent masts and spokes, cask staves, &c. Native Myrtle is valuable for house-fittings. Swamp Gum yields the finest palings and other split-stuff in the world. Sassafras affords timber for house-fittings, bench-screws, lasts, &c. Celery-topped Pine is chiefly used for masts and ship's spars. The different kinds of timber in the following list are arranged according to their value. The diameter of the trees is measured at the height of 4 feet from the ground.

**BLUE GUM.**—(*Eucalyptus Globulus*, Lab.)—The common name is derived from the bluish-gray color of the young plants. Diameter, 5 to 30 feet; average of those felled for use, 6 feet. Height, 150 to 350 feet; sp. grav. about .945 to 1.055. Abundant in the southern and south-western parts of the Island. Cut for house-building it sells at 8s. to 10s. per 100 superficial feet—for ship-building at 12s. to 14s.

**STRINGY BARK.**—(*Eucalyptus Gigantea*, Hook. fil.)—Common name taken from the coarse fibrous bark. Diameter, 4 to 24 feet; average of those sawn about 5½ feet. Height, 150 to 300 feet. Sp. grav. about .905. Abundant everywhere upon hilly ground. Price, the same as that of Blue Gum.

**SWAMP GUM.**—**WHITE GUM.**—(*Eucalyptus Viminalis*, Lab.)—Common names from its growing to perfection in humid situations—and from its gigantic white trunk. Diameter, 4 to 18 feet; average about 5½ feet. Height, 150 to 300 feet; sp. grav. about .885. Growing in forests with other kinds of *Eucalyptus*, in rather humid localities. A small variety called the Manna Tree, grows abundantly about Hobart Town and in other places, on dry ground. Price, for general purposes the same as that of Blue Gum; 5-feet palings, 6s. to 8s. per 100.

**GUM-TOPPED STRINGY BARK.** sometimes called **WHITE GUM.**—(*Eucalyptus Gigantea*, var.)—A tree resembling the Blue Gum in foliage, with rough bark similar to Stringy Bark towards the stem. It has been found recently that this wood possesses nearly all the properties of strength, solidity, and durability of the Blue Gum—whilst being straight-grained, it is much easier to work. It is very abundant about D'Entrecasteaux Channel. An old plank from the Hobart Town Wharf, which has been twenty years in use, may be seen in the Trophy. Price, about the same as Blue Gum.

**PEPPERMINT TREE.**—(*Eucalyptus corymbosa*, Lab.)—Common name from the odor of the leaves. Diameter, 3 to 8 feet; average about 4 feet. Height, 100 to 150 feet; sp. grav. about .895. The Peppermint Tree abounds throughout the Island, on gravelly and other poor soil. Price, about the same as that of Swamp Gum.

**HUON PINE.**—(*Dacrydium Franklinii*, Hook. fil.)—So-called because it was first discovered on the banks of the Huon River. Diameter, 3 to 8 feet; average about 4½ feet. Height, 50 to 120 feet; sp. grav. about .650. Abundant in portions of the south-western part of the Island. Price, about 16s. per 100 superficial feet, in the log.

**BLACKWOOD.**—(*Acacia Melanocephala*, Br.)—So called from the dark-brown color of the mature wood, which becomes black when washed with lime-water. In moist shaded localities the tree grows more rapidly, and the wood is of a much lighter color. Hence this variety is called "Lightwood," (in Hobart Town), to distinguish it from the other. Diameter, 1½ to 4 feet; average, about 2½ feet. Height, 60 to 130 feet. Sp. grav. about .885. Found throughout the Island, but not abundantly in any one locality. Price, about 12s. to 14s. per 100 feet super., in the log.

**NATIVE MYRTLE.**—(*Fagus Cunninghamii*, Hook.)—Common name from the fancied resemblance of its dark-green leaves to those of the myrtle. Diameter, 2 to 9 feet; average, about 5½ feet. Height, 60 to 180 feet. Sp. grav. about .795. The Native Myrtle exists in great abundance throughout the western half of the Island, growing in forests to a great size, in humid situations. Price, about 16s. per 100 feet super., in the log.

**CELERY-TOPPED PINE.**—(*Phyllocladus rhomboidalis*, Rich.)—So called from the fancied similarity in form of the upper part of the branchlets to celery. Diameter, 1½ to 2 feet; average, about 1½ feet. Height, 60 to 150 feet. Sp. grav. about .655. Rather common in damp forests in the southern parts of the Island, and in some sub-alpine localities.

#### ORNAMENTAL WOODS.

The different kinds of wood included in the following list are all in constant use for cabinet and fancy work. They are arranged according to their value. The finest specimens of Native Myrtle, Musk-wood, Huon Pine, and Black-wood, exhibit qualities of the highest excellence, both in tint and variety of venation.

**NATIVE MYRTLE.**—(*Fagus Cunninghamii*, Hook.)

**MUSK-WOOD.**—(*Eurphia Argophylla*, Cass.)—Named from the musky odor of the plant. Diameter, 6 to 15 inches—the butt enlarging towards the ground to 1½, and even 2½ feet. Height, 15 to 30 feet. Spec. grav. about .685. Abundant throughout the Island in damp localities.

**HUON PINE.**—(*Dacrydium Franklinii*, Hook. fil.)

**BLACKWOOD.**—(*Acacia Melanocephala*, Br.)

**SKE-OAK.**—(*Camaria quadrivalvis*, Lab.)—A portion of the common name is evidently derived from the resemblance of the markings to those of oak. Diameter, 1 to 1½ feet. Height, 20 to 30 feet. Spec. grav. about .845. Very common on dry stony hills, excepting in the north-western districts.

**HE-OAK.**—(*Camaria suberosa*, Otto.)—Diameter, 9 to 15 inches. Height, 20 to 25 feet. Spec. grav. about .855. Common on stony hills.

**HONEYEUCKLE TREE.**—(*Banksia Australis*, Br.)—Named from the large quantity of honey in the flowers. Diameter, 1½ to 2½ feet. Height, 20 to 40 feet. Sp. grav. about .645. Abundant on sandy soil.

**DOGWOOD.**—(*Befordia velutina*, D.C.)—Diameter, 6 to 16 inches. Height, 15 to 25 feet. Sp. grav. about .985. Common of small size, but rare of large proportions.

**NATIVE LAUREL.**—(*Anopterus glandulosus*, Lab.)—So named from its laurel-like leaves. Diameter 6 to 10 inches. Height, 15 to 22 feet. Sp. grav. about .675. Tolerably abundant in some sub-alpine localities.

**BLUE GUM.**—(*Eucalyptus globulus*, Lab.)—Curly-grained variety.

**PEPPERMINT.**—(*Eucalyptus angustata*, Lab.)—Some specimens of this timber have a fine wavy marking.

#### USEFUL WOODS.

**SILVER WATTLE.**—(*Acacia dealbata*, Lindl.)—So called from the whiteness of the trunk, and the silvery green of the foliage. Used for cask staves and trestles. Diameter, 1½ to 2½ feet. Height, 60 to 120 feet. Sp. grav. about .795. Very common.

**IRON WOOD (Tasmanian).**—(*Natania ligustrina*, Vent.)—An exceedingly hard, close-grained wood, used for mallets, sheaves of blocks, turnery, &c. Diameter, 9 to 18 inches. Height, 20 to 35 feet. Sp. grav. about .965. Not uncommon.

**SWAMP TEA-TREE.**—(*Melaleuca ericifolia*, Sm.)—So called, probably, because the leaves of an allied plant (*Leptospermum lanigerum*, Sm) with similar bark, are said to have been used as a substitute for tea. Diameter, 9 to 20 inches. Height, 20 to 60 feet. Sp. grav. about .824. Used for turnery chiefly.

**NATIVE CHERRY.**—(*Eucarpus cupressiformis*, Lab.)—So named because the color of the fruit is similar to that of a Kentish Cherry. Diameter, 9 to 15 inches. Height 20 to 30 feet. Sp. grav. about .783. Used for tool handles, spokes, gunstocks, &c.

**WHITEWOOD.**—(*Pittosporum bicolor*, Hook.)—Wood white. Diameter, 8 to 13 inches. Height, 20 to 35 feet. Sp. grav. about .875. Used in turnery. Probably fits for wood engraving.

**NATIVE BOX.**—(*Bursaria spinosa*, Cav.)—The leaves are somewhat like those of the English Box. Diameter, 8 to 12 inches. Height, 15 to 25 feet. Sp. grav. about .825. Used for turnery.



PINK WOOD.—(*Begonia viciosa*,—*Croton viciosa*, Lab.)—Diameter, 6 to 10 inches. Height, 15 to 25 feet. Sp. grav. about .815. Used for sheaves of blocks, and for turnery.

NATIVE PEAR.—(*Hakea lissocarpa*, Br.)—The woody seed-vessel is somewhat pear-shaped. Diameter, 8 to 12 inches. Height, 29 to 30 feet. Sp. gravity about .675. Fit for turnery.

## SCENTED WOODS.

TONGA BEAN WOOD.—(*Alagia buxifolia*, Br.)—The odor is similar to that of the Tonga Bean (*Dipteryx odorata*). A straggling semi-side shrub, 3 to 5 inches in diameter.

NATIVE BOX.—(*Bursaria spinosa*, Cav.) The scent is pleasant but fleeting.

## TANNING BARK.

WATTLE BARK.—The bark of the Black Wattle (*Acacia mollissima*, Willd.), the Silver Wattle (*Acacia dealbata*, Lindl.), and the Blackwood Tree (*Acacia melanorhylon*, Br.). The first named yields the most valuable bark, and is common on dry stony hills.

## FIBRES.

CURAJONG.—(*Phapianthus sidioides*, Hook.)—The fibres of the bark are very strong. It is a large shrub, found chiefly on the southern side of the island, in ravines and shady places, and grows rapidly.

LYONSIA.—(*Lyonsia straminea*, Br.)—Fibres of the bark fine and strong. The Lyonsia is met with, rather sparingly, in dense thickets with its stems hanging like ropes among the trees.

BLUE GUM.—(*Eucalyptus Globulus*, Lab.)—The bark of this immense tree yields a fibre which may, probably, be found available for making the coarser kinds of paper.

STEINGY-BARK.—(*Eucalyptus Gigantea*, Hook. fil.)—The fibres of the bark are similar to those of the Blue-Gum bark, but are not so strong, or so fine.

FIBROUS GRASS.—(*Stipa Semi-Barbata*, Br.)—After the seed has ripened the upper part of the stem breaks up into fibre, which curls loosely and hangs down waving in the wind. The condition of the fibre at this time is undoubtedly far inferior to what it would be if rightly prepared. Common in some localities.

## GUM.

KINO.—This gum, which seems to have similar properties to those of the East Indian "kino," exudes from the woods of all the Tasmanian species of *Eucalyptus*.

WATTLE GUM, the gum of the Silver Wattle.—(*Acacia dealbata*, Lindl.), is exceedingly viscous, and, probably, quite as useful as Gum Arabic. The gum of the Black Wattle (*Acacia Mollissima*, Willd.), which is often mixed with the other, is very inferior to it, being far less viscous.

## SUNDRY PRODUCTS.

PRICKLY FERN TREE.—(*Alsophila Australis*, Br.)—This very handsome Fern Tree occasionally attains a height of 30 feet. It is not, by any means, so common as a Fern Tree as *Dicksonia antarctica* (Lab.).

PITH OF RUSHES.—This is the pith of the largest Tasmanian rush (*Juncus vaginatus*, Br.). It is not rare. This pith is made up, in Hobart Town, into bead-dresses.

GELATINOUS SEAWEED.—(*Gracilaria* sp.)—This Alga, which may, perhaps, be regarded as a variety of *G. confervoides* (Grev.), is occasionally used for making jelly. It abounds on the shores of Sloping (or Slopen) Islands, in Frederick Hendrick Bay.

NATIVE BREAD.—(*Mylitta Australis*, Berk.)—An insipid, under-ground fungus, which sends up no stem, and is generally met with by accident. When growing rapidly it sometimes causes the ground to crack, and may thus be discovered by a careful observer, as it probably was by the Aborigines, who used it as food.

## CLIMATE AND HEALTH OF TASMANIA

BY E. SWARBRECK HALL,

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"A sound body is better than immense revenues."

"There are no riches above the riches of the health of the body; and there is no pleasure above the joy of the heart."

"Better is a poor man who is sound and strong of constitution, than a rich man who is weak and afflicted with evils.—ECCLESIASTICUS."

THE space allotted to the elucidation of this subject in the Tasmanian Exhibition Pamphlet is too limited to permit me to do more than briefly allude to the endeavour of Medical Philosophers from the earliest ages—beginning with the father of Medicine himself, Hippocrates,—to establish on sound data, the intimate connection between climate and health. In all subsequent times the labourers in this interesting and important research have been many, but only within the last quarter of a century have the enquiries culminated in any remarkable success. From the date of the application of the science of numbers—statistics—to comical variations, and vital phenomena and disease, are the grand triumphs of modern hygiene to be dated. The facts and figures collected, arranged, expounded, and disseminated by the Registrar-General of England, and his numerous coadjutors of the medical profession, were the great levers which enabled sanitary reformers to effect their brave and bloodless victories. Dr. William Farr has been the "thaumaturgus"—the wonder-worker—of the age we live in; and the figures he has arrayed, and the centres of disease-breeding he has indicated, with the unsparring exposure of their origin in the neglect of Nature's own sanitary teachings, has opened an entirely new sphere for medical practice. The master-minds of the profession are now assuming the first duty of medical skill to be to prevent disease. The curative department is rapidly becoming a secondary branch in the exercise of medical science. Wherever these new principles—new at least comparatively to any extent in practice—have been fairly acted upon, human lives have been saved by thousands. We now scrutinize suspiciously every mortuary record where the deaths exceed a certain assumed normal standard. No longer can the unphilosophical *oi-jollis* safely mask their ignorance and attribute excessive mortality to recondite causes, or take shelter in vague generalities, and the untangible mystic influences of the weather.

Meteorologists, by the use of improved instruments and carefully conducted observations, with accurate long continued records scientifically tabulated, have given invaluable data for sanitarians to reason from, and to aid them in constructing their reforming operations.

Tasmania has had peculiar advantages over most other Colonies, from having been selected as one of the localities for a Magnetical and Meteorological Observatory, at the suggestion of the British Association. From 1841, when the observations were commenced in the immediate vicinity of Hobart Town by Sir James Ross, up to 1854, a continuous series of meteorological facts were registered. For eight years, out of the fourteen, hourly observations both by night and day were made by instruments and observers entitled to the highest confidence. Two large volumes of the records then made, have been edited by General Sabine, and printed, published and circulated. The third volume, now many years overdue, in which the peculiarities and advantages of the Tasmanian climate were promised to be elaborated by Professor Dove of Berlin, is yet wanting to complete this desideratum to meteorological science. To those in Tasmania who have long yearned for its appearance, the delay of publication has been a constant source of regret.

When the Ross-bank Observatory was closed, observations were continued by Mr. Francis Abbott at his private Observatory in an open garden in the central Valley of Hobart City, 37 feet above the sea level, and about quarter of a mile above tidal influence. The best instruments that the most esteemed London makers could furnish, have been used, and the results every month tabulated, and presented to the Royal Society and printed. When 1860 had completed a twenty years' continuous series of Meteorological records, Mr. Abbott zealously devoted much time in compiling and combining all the data into "40 Tables," which, under the patronage of

the Governor Sir H. E. F. Young, and the Council of the Royal Society, have been printed and published at the Government Printing Office, in a manner highly creditable to Tasmanian typography. Having lent my assistance in the preparation of this work, and being familiar with the subject from my twenty-eight years' residence in the Island, and constant study of meteorology in many parts of it, I shall, in this article, make use of Mr. Abbott's Tables as the ground work of my observations on the climatological division of my essay. Sir Thomas Maclear, in charge of the Observatory at the Cape of Good Hope, and so deservedly eminent as an Astronomer and a Meteorologist, in acknowledging the receipt of a copy of Mr. Abbott's work, pronounces it to be—"A standard of reference, leaving nothing to be desired for the climate of Tasmania."

Situated as Tasmania is in the temperate zone, between the 40th and 44th degrees of latitude, in the Southern Pacific, with an almost boundless extent of ocean on its Southern, Western, and Eastern aspects, and separated from the Australian Continent by a wide Strait, had not the Island enjoyed a highly salubrious climate, it must have arisen from local causes. On the contrary, its local topography tends much to enhance its geographical advantages. The Island has an undulating surface throughout; its highest mountains only attain a height exceeding 3,000 feet in two instances; the Country rises from all its shores gradually to its central water-shed, along which is arrayed a chain of lakes that give origin to the principal rivers of the Island. These rivers generally have a rapid fall, and marshes are entirely exceptional. Nevertheless, as in all Islands of this configuration, there is considerable variety in the meteorological phenomena in different localities. The Northern side of the Colony has a warmer and moister climate than the Southern, and the Western has a more stormy and rainy character than the Eastern shores. But allowing for these, and differences in altitude, Hobart Town exhibits a fair climatic type for the whole of Tasmania. There are no volcanoes, and I have never noted any symptoms of earthquakes, though others have observed slight shocks which they believed to originate in these causes.

The mean atmospheric pressure of the 20 years' records, is 29.808 inches. (The height of the Ross-bank Observatory above the sea level differing only a few feet from Mr. Abbott's). The extremes of annual means, were—Lowest, 29.696 for 1836; highest, 29.944 for 1860. April of all the months has the highest mean, 29.885; January the lowest, 29.715. The greatest pressure ever noted was 30.812 in July 1846; the smallest 28.518 in July 1857; the extreme divergence in the 20 years, being therefore 2.302 inches. The widest range in any twenty-four hours, 1 p.m. to 1 p.m., within the last eight years, from the present month of March 1862, was a rise of the barometer of +1.014 inches in January 1856. The extreme range during any month in the same period was 1.649 inches in May 1855.

As every variation of one inch in the Barometer indicates a difference of nearly half a ton of pressure on the adult human body, it is easy to understand that rapid and extensive fluctuations of pressure must have a marked influence on health. In my monthly "Health Reports" I have frequently demonstrated this influence, in its effects upon diseases of the brain, and the organs of circulation and respiration. A continued high atmospheric pressure when accompanied with a stagnant state of the air, is characteristic in this Island, as Mr. Glaisher has shown it to be in England, of an epidemic constitution of the air. It is a very unusual occurrence, nevertheless, in Tasmania, but was signally exemplified in June and July, 1860, when an epidemic influenza ravaged all the Australasian Colonies, and proved so destructive to aged and infirm people.

The mean temperature, deduced from the 20 years' observations, is 54.92 degrees. For the 14 years at Ross-bank Observatory only, the mean was 53.09. "The mean annual temperature from the result of eight years hourly observations, 1841 to 1848," Captain Kay, R.N., F.R.S., who had charge of the Observatory, states to be "53.48," and the "Mean Annual Temperature from observations with the max. and min. thermometers in 1849, '50, '51, '52—53.32 degrees." So close an approximation of the results have not been noticed at Mr. Abbott's Observatory. The means of the maxima and minima thermometers average about one degree higher than those of the observations, at 7 a.m., 1 p.m., and sunset. Sometimes, as in last month, they correspond within a few hundredths of a degree. Some observers here, and Mr. Abbott amongst them, are inclined to attribute the higher means since 1854 to the place of observation being within the influence of the warmer air in the City. I do not agree in this opinion, for I have remarked a similar increase in the temperature in places, not subject to such influences; and Sir Thomas Maclear's Tables for the Cape of Good Hope, support my view, that we are now subjected to one of the cycles of

higher temperature, which has been spoken of by Sir John Herschel. January has the hottest mean of any month in the year,—63.57. July has the coldest mean,—45.82. 1855 was the hottest year,—58.58, and the coldest was the very unusually wet year 1849, the mean temperature of which was only 50.98. The 20 years' range consequently was 7.60 degrees. The greatest mean for any month was 71.10 for January, 1856; the smallest was 42.57 for July 1841. The highest temperature in the shade for any day ever recorded was 105 degrees in January, 1849. In February, 1847, 100 was noted; in December of the same year, 103; in December, 1859, 102 was recorded. No other registers of 100 or upwards have been made. In the whole period of now 21 years, the thermometer has only risen to 90 and above 44 times. These have all occurred with North and North-West winds, coming from the arid continent of Australia, called hot-winds, but much mitigated in their force and heat by the happy insular position of Tasmania. Hot winds have been known to endure for three days in succession, but with a diminution of 20 to 30 degrees during the night. The usual duration, however, in this Island seldom exceeds 6 to 12 hours, and is succeeded by cool refreshing showers, with electrical discharges and thunder. The lowest shade temperature ever registered was singularly enough in the same year as the highest, 1849—it was in the month of July, and 29.4 degrees. But in the past 21 years the Thermometer sank to freezing point or below it, only 31 times. In 1861, the Minimum self-registering Thermometer never fell below 34. In England the cold of Winter is the most fatal to human life. In Tasmania the Winter season is the most genial and salubrious. Snow rarely falls in Hobart Town, and was never known to remain on the ground for 24 hours. In a small township on the summit of the Water-shed, where it intersects the Main-road of the Island, I have known it to remain three days, and nearly a foot in depth, but it was in the cold, wet, exceptional year of 1849. In Hobart Town ice rarely attains the thickness of a penny-piece, and only once do I remember it to have been thick enough in any of the settled districts of the interior to bear my weight. Agricultural operations, therefore, are scarcely ever suspended by the inclemency of the weather from this or other causes. The daily range of temperature is the only weak point, in the every other respect, generally delightful and salubrious climate of Tasmania. The 20 years' mean of daily range is 18.16 degrees, which, of course, greatly exceeds that of England. January, the hottest month, has also the widest daily range, 20.75 degrees. December, February, and March have all, also, a mean above 20 degrees. May, June, and July have nearly the same mean, 15.30 to 15.35 degrees. The year of greatest range was 1855—22.15 degrees. 1852 had the smallest mean—14.9 degrees. Of months, January exhibits the extreme mean of daily ranges, 1841 had 25.5, and 1856 and 1862, nearly the same. July 1849 had the smallest mean of any month on record, 8.7 degrees. The greatest range of the Thermometer that ever occurred in any 24 hours was 51.9 degrees in January, 1849; and in February, 1856, there was a day that had a range of 51 degrees. Of course the extremes of heat and cold are recorded from the self-registering maxima and minima Thermometers in the shade in the open air. Solar heat has only been registered since the commencement of 1856. The instrument used is self-registering, with the black-bulb Thermometer inclosed in a glass tube. The mean for the six years is 93 degrees. 1856 had 104, and 1858 only 89. January's mean is the highest—111. July the lowest, 76. January, 1856, mean was 127, being much higher than any other on record. June and July 1859, had the lowest—73. The greatest Solar intensity ever noted on any day was in February, 1857, 143, and the next 133, was one day in December, 1859. The day in February, 1857, referred to, was marked by many sudden deaths. It is remarkable that diseases of the "Brain and nervous system" give more deaths, in proportion to the total from all causes, in Tasmania, than in either Victoria or New South Wales. Count Strzelecki long since drew attention to the fact of the Solar-intensity being greater in this Island than even in New South Wales, owing to the greater transparency of the atmosphere in Tasmania. The haze which usually accompanies the intense heat on the continent of Australia very rarely exists in Tasmania. This unimpeded transmission of the Solar rays is beneficial in every way, and only becomes hurtful by the folly of people exposing the head to its direct influence, without covering, or with such as are ill calculated to afford the requisite protection.

Terrestrial radiation has been noted for the same period as Solar-intensity. The mean of the six years is 43.05. 1861 had a much higher mean, 43.81, than any of the five preceding years. The month of January has the highest mean—52.52, and July the lowest of five years, 34.53, which is also that of August, for the six, only in July 1859 and 1860 was the mean lower than in August, 1861. In every other month of 1861, except November, Terrestrial radiation was considerably above the previous five years' means. Mr. Abbott has



this thermometer placed on grass in his garden, clear of all reflected heat from buildings. The lowest reading for any night of the six years was 25° degrees in September 1857. The mean of the 20 years for the Wet-bulb thermometer is 49.95; 1855 had the greatest mean 51.75, 1844 the lowest 48.14; January mean is 56.38; July 43.12; Dew-Point mean for the 20 years is 45.34; 1861 had 47.49, and the opposite extreme, 45.83, was in 1844; January mean is 50.69, and July 39.83, being the highest and lowest means of months. The 20 years' mean for Elastic force of Vapour is 317; 1856, mean 347, was the highest; 1849, 288 was the lowest; January is 380; July 259; Humidity mean of 20 years is 74.75; the greatest mean of any year was 79 in 1849, 1853, 1854. Of months June has the highest mean, 83.1; December the lowest, 67. The Rain-fall mean of the 20 years is 21.52 inches, the greatest extreme being 1849 when 33.51 inches fell; and the lowest years fall was in 1843, when only 13.43 inches of rain was precipitated. The largest amount for any month was 10.16 inches in August 1858; February 1854 had 9.16 inches; November 1849, 8.94 inches; March 1854, 7.69 inches; September 1844, 7.14; July 1849, 5.99; October, 5.04 in 1861; April, 5.01 in 1856; January 1859, 4.61; May 1848, 4.38; June 1845, 4.27; December 1861, 3.29. The minima falls have ranged from 0.02 in March 1843 to 0.33, in November 1853. The means for the months beginning with the highest are as follows:—November 2.76, August 2.96, June 1.89, September 1.87, May 1.85, April 1.78, October 1.77, (but the heavy fall in 1861, now puts it on a par with August) July 1.73, March 1.52, January 1.50, February 1.47 (but raised by the heavy fall in 1851 to 1.68), December 1.32. The order and the averages differ greatly from those published by Captain Kay in the "Royal Society's Journal of papers and proceedings, January 1853," as the means of the twelve years, 1841, 1852, in fact every years' additional records has tended to approximate the means for the respective months.

For the last seven years the number of days on which rain fell in each month has been recorded. The mean of the six years is 137.63, but 1861 had 167 rainy days, being eight days more than 1859 previously the highest. The mean for September is the greatest, 15.66 days; February the lowest 7.50 days. The rate at which rain falls is of the utmost importance both in the sanitary and agricultural aspect. For instance, in 1861 29.19 inches of rain fell on 167 days. All the months means, except March, June, August and November, were above the average. The rain never fell so heavily as to cause floods, and yet heavy enough to flush all drains and cleanse the surface. In other years more has fallen, but with less beneficial effect. In 1858 there fell an aggregate of 33.07 inches, but restricted to 129 days, and four months out of the twelve had 22½ inches of the total fall. Much of this caused heavy and destructive floods. 1858 was one of our most unhealthy years, 1861 one of the least so; not however that the rains only was the cause of this disparity. Nevertheless in my monthly analyses of health, I have always had to comment upon the beneficial effects of frequent moderate rain-falls, when such have occurred. In a climate like this their influence on health is much more marked than in England. Ere long, Hobart City will have the means of artificially imitating Nature's sanitary operations in this respect. Mr. Joseph N. Gale's engineering skill will soon supply us with an unlimited amount of the purest water from one of the finest "gathering-grounds" in the world, and then most of the evil effects of long continued droughts on a city population can be easily averted. The northern capital, Launceston, has been for some time reaping the benefit of a good and copious supply of water. The heaviest fall of rain ever noted in Hobart Town was on the 26th and 27th of February, 1854, when within thirty-four hours, 8.63 inches fell, doing great injury to life and property, 6½ inches of this rain was precipitated in thirteen out of the thirty-four hours; or at the rate of nearly half an inch per hour. I have however, recorded, short sharp showers, where it fell for a quarter of an hour, at the rate of one inch per hour. In the great rain-fall of August 1858, the rain was continuous from the afternoon of the 9th until that of the 13th, and there was measured from the rain-gauge 8.96 inches. Hail-storms are unfrequent in Tasmania. Snow rarely shows more in Hobart Town than as a coating on Mount Wellington (upwards of 4000 feet above us) during the winter months, and adding variety to the charming scenery by which this young city is encircled. In the midst of summer too, occasionally the mountain for a few hours puts on its wintry garment of snow.

Spontaneous evaporation has been recorded for five years past, but I do not feel confident in the accuracy of the means adopted to measure its amount. Of course in a climate with the air ever in motion, and plenty of sunshine and warmth, evaporation must, as the records show, greatly exceed condensation and precipitation.

The extent of cloudy sky has been registered for 21 years, and the mean is 5.65. The mid-winter month of July is the least cloudy. Often in the months of April, May, June, July, August, we have a week at a time, with a bright cloudless sky. This is the pleasantest season of the year, and a delightful contrast to the bleak pinching winters of the north. Oromonometrical records have been kept since April 1859. The annual mean is 6.87 by Schomburgk's chromatic scale, and by far exceeds any records for the adjoining Colonies, or those at home, which have fallen under my observation. Those months which have the greatest rain-fall, and the largest number and force of ocean winds, exhibit the greatest amount of free Ozone.

Atmospheric-Electricity has been registered for the last three years, but I am not altogether satisfied with the Electrometers. Negative electricity greatly preponderates, both in tension and frequency, and so far, I am inclined to think it is mostly associated with winds from the Australian Continent (N. and N.W.), deficiency of ozone, and an asthenic or typhoid type of disease. On the other hand, when the pure ozonised breezes from the sea prevail, health is at the highest, and the type of disease is sthenic or inflammatory, and positive electricity is in the ascendant. Though I treat of winds the last, I feel assured that scarcely any other atmospheric phenomena, more powerfully influence health. The prevailing character of aerial changes is that of moderate but almost incessant movement. I have contributed to Mr. Abbott's work, a four years calculation of averages, as to number and force of winds. The observations from which I compiled them, were recorded by Mr. Abbott daily at 7 a.m., 1 p.m., and sun-set. The annual average force of all the winds is, 703.69 lbs. (on Lind's wind-gauge scale), pressure to the square foot. October is the windiest month, and in succession follow December, November, September, January, February, March and April, May, August, July, June. Out of the 1090 observations annually, the four years means show, N.W., to prevail 279 times, with 207.11 lbs. of force; N., 222½ times, with 112.08 lbs. of force; S.E., 199½ times, with 90.90 lbs. of force; S.W., 97½ times with 76.22 lbs. of force; S., 89½ times, with 57.74 lbs. of force; W., 79½ times, with 122.67 lbs. of force, being therefore much the strongest winds we have; N.E., 67½ times, with 23.54 lbs. of force; and E., 60 times with the small force of 13.40 lbs. All but N. and N.W. are ocean winds, and come well charged with Ozone; saturated with it, if accompanied by rain from the S.E., S., and S.W. During the summer months a cool South-East sea-breeze may be expected to set in about 11 a.m., and is very bracing and refreshing. Sometimes it is chilling, when it suddenly overpowers an oppressive wind from the N.W., and those people grumble hard at the variable climate who do not dress judiciously. Light coloured woollen tweeds are the safest kind of garments here for all seasons. Such violent storms as I have seen in England, I have never noticed here. In the 1095 Wind Records, Calms were noticed at the hour of observation 291½ times, but such an event as a day of continuous calm is exceptional, and almost unknown. This Climate is a decidedly breezy and invigorating one, for after the hottest day we may calculate on having a cool night, as the daily range I have before alluded to testifies.

Invalids from India, China, and the hotter Colonies of Australia, if not past recovery, speedily rally in Tasmania, and the increased appetite for food is the first and most surprising change. With such clear skies, abundance of ozone, bracing sea breezes, the lamp of life burns quickly, as well as brightly, and demands a much more abundant and nutritious supply of food than suffices elsewhere. Food of the best and most varied kind is plentiful, and the actual consumption per individual greatly exceeds the highest European calculations. Tasmanians spend much of their time in the open air, and many of the diseases which afflict European communities are unknown. Others have a minimum of intensity. Over-crowded, ill ventilated, and badly victualled ships have at different times brought to this port dangerous types of fever, but the contagious emanations arising have speedily been neutralized by the disinfecting power of our highly ozonised air, and beyond a few who came directly in contact with the first sufferers landed, the disease has not spread. Even eruptive fevers, scarlatina, and measles, though frequently imported, and at times severe, have speedily worn themselves out, only re-appearing at long intervals and in mild type.

In 1854 measles were epidemic. At the beginning of last year we had another visitation, but so much was it mitigated in this island, that out of a population of about 25,000 persons in the Registration District of Hobart Town only 55 persons of all ages died of it. The children under seven years of age alone, and therefore all liable to the infection, amount to nearly 6000—but many above that age and adults were attacked, and some of the deaths were of these. The zymotic proportion of the deaths in Tasmania is greatly below that of the neighbouring Colonies and

England. The Tasmanian born are comparatively little subject to pulmonary consumption, except where the hereditary tendency is strong. The colony is not yet old enough to show what age the native born may attain to, but there is reason to think it will be high. Numerous instances of centenarians who have resided in the island from its first colonization, or other very long periods, have come under my notice.

Though adult males have always so much exceeded adult females in number, the increase of population, by excess of births over deaths, has been at a rate much greater than prevails in Europe. Last year the increase was about 2000 in a population of less than 90,000. The children of Tasmania are as plump and rosy as the finest specimens in England, and the rosy cheek does not disappear in adult life.

At the Census of 7th April, 1861, there were enumerated for all Tasmania:—

|                          | Males. | Females. | Total. |        |
|--------------------------|--------|----------|--------|--------|
| Under 1 year of age..... | 1,612  | 1,505    | 3,117  | 41,649 |
| Above 1 to 5 ".....      | 6,027  | 5,855    | 11,882 |        |
| " 5 to 10 ".....         | 5,545  | 5,563    | 11,108 |        |
| " 10 to 15 ".....        | 4,182  | 4,058    | 8,240  |        |
| " 15 to 20 ".....        | 17,366 | 16,931   | 34,347 | 44,162 |
| " 20 to 30 ".....        | 3,384  | 3,918    | 7,302  |        |
| " 30 to 40 ".....        | 5,965  | 7,157    | 13,122 |        |
| " 40 to 50 ".....        | 7,976  | 5,644    | 13,620 |        |
| " 50 to 60 ".....        | 7,322  | 3,769    | 11,091 | 4,166  |
| " 60 to 70 ".....        | 4,504  | 1,825    | 6,329  |        |
| " 70 to 80 ".....        | 2,270  | 822      | 3,092  |        |
| " 80 to 90 ".....        | 631    | 226      | 857    |        |
| " 90 to 100 and above    | 154    | 39       | 193    |        |
|                          | 21     | 3        | 24     |        |
|                          | 49,593 | 40,384   | 89,977 | 89,977 |
| Married .....            | 15,893 | 15,616   | 31,509 |        |
| Single .....             | 33,700 | 24,768   | 58,468 |        |

A slight examination of the foregoing table will show that one-half of the population is under 24 years of age. The total registered births in 1861 were 3,507, but the probable number of living births would be about 5,550. Still-births are not registered. The mortality tables for 1861 record died:—

|                          | Males. | Females. | Total. |
|--------------------------|--------|----------|--------|
| Under 1 year of age..... | 179    | 144      | 323    |
| Above 1 to 2 ".....      | 68     | 66       | 124    |
| " 2 to 3 ".....          | 24     | 29       | 53     |
| " 3 to 4 ".....          | 12     | 15       | 27     |
| " 4 to 5 ".....          | 20     | 20       | 40     |
| " 5 to 10 ".....         | 30     | 37       | 67     |
| " 10 to 20 ".....        | 36     | 26       | 62     |
| " 20 to 30 ".....        | 45     | 60       | 105    |
| " 30 to 40 ".....        | 89     | 62       | 151    |
| " 40 to 50 ".....        | 105    | 64       | 169    |
| " 50 to 60 ".....        | 103    | 43       | 146    |
| " 60 to 70 ".....        | 78     | 29       | 107    |
| " 70 to 80 ".....        | 45     | 15       | 60     |
| " 80 to 90 ".....        | 19     | 9        | 28     |
| " 90 to 100 ".....       | 3      | 0        | 3      |
| " 100 and above          | 0      | 2        | 2      |
| Age not known .....      | 9      | 3        | 12     |
|                          | 865    | 614      | 1479   |

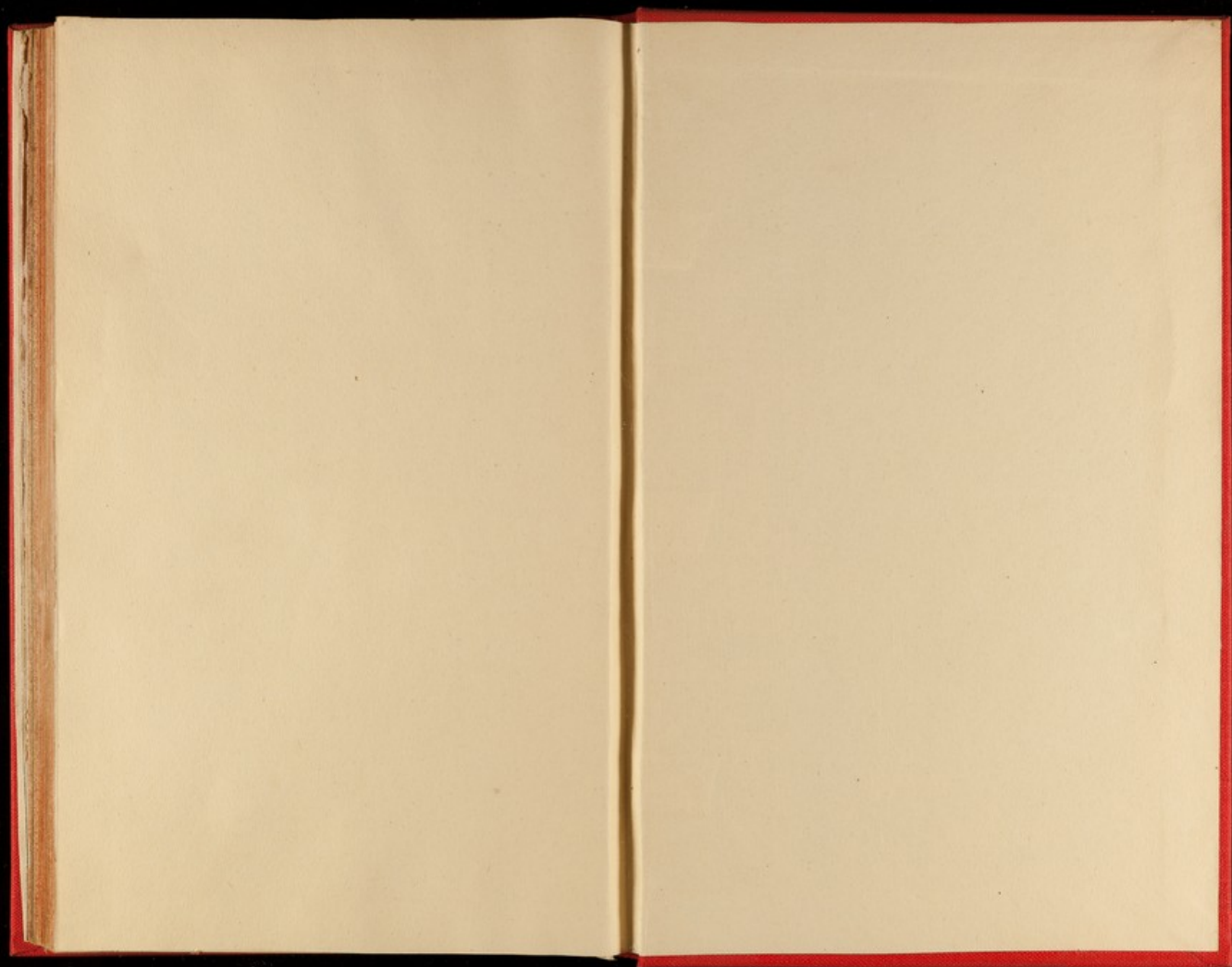
1479 deaths out of a population of 89,977 persons is at the rate of 16.43, or less than 3.61 per 1000, so that the mortality rate of all Tasmania is less than that of the 63 healthiest registration districts of England and Wales—17 per thousand—which the Registrar-General of England adopts as a normal standard for death rates. In the purely rural population of Tasmania, counting exclusive of those associated with the urban districts of Hobart Town and Launceston—53,657—the deaths in 1861 amounted only to 619—being at the rate of 11.53, or 11 per 1000. Glendale, in Northumberland, which has the smallest death rate in the English returns, has 15 per 1000. But even this contrast, favourable as it is to Tasmania, does not exhibit the whole superiority. For, though our population table when compared with that of England, has not as large a proportion of persons above 60 years of age, it has a much larger proportion of those under 15 years of age. Again, the smallest rate last year in any district of Tasmania was in that of Outlands, which in a population of 2,333 had only 17 deaths, being at the rate of only 7.28 per thousand, or less than half of the healthiest district in England. Outlands is in the centre of the island, and 1508 feet above the sea level. It is an axiom now in sanitary science that the rate of mortality in children, under five years of age, gives the most delicate and surest test of the salubrity of any climate. In England the death-rate under this age is 65.18 per 1000. In Tasmania not quite 38 per 1000, or 37.93. Did my limits permit I could for every disease in our mortuary records give the rate as compared with those in the English Tables. In an elaborate article on the Vital Statistics of Tasmania, published in the April number, 1858, of the *Australian Medical Journal*, I made such a contrast for 1855 between Hobart Town and London. The additional facts I have stored since that period have fully confirmed, and in many respects strengthened the very favourable report I then made of the natural salubrity of this island. I by no means wish to convey the impression that the laws of hygiene may, in this auspicious climate, be trifled with with impunity any more than in other countries. Indeed, I have frequently published indubitable proofs to the contrary. In this picturesque island and genial climate, it must be man's own fault if the best health, and the highest "chances of long life" are not attained. The meteorological, statistical, and sanitary facts I have compiled in this paper, briefly condensed as they necessarily are, give convincing proof of the correctness of the statement which concluded a paper of mine to the London Statistical Society some years ago, that few countries in the world, whose medico-vital statistics have been published, can equal this beautiful isle of the south-sea—young Tasmania—as an abode where the human race may dwell comfortably, healthily, and to a ripe old age, without deteriorating either physically or morally from the elevated position their British progenitors hold among the nations of the earth.

Hobart, Tasmania,  
March, 1862.

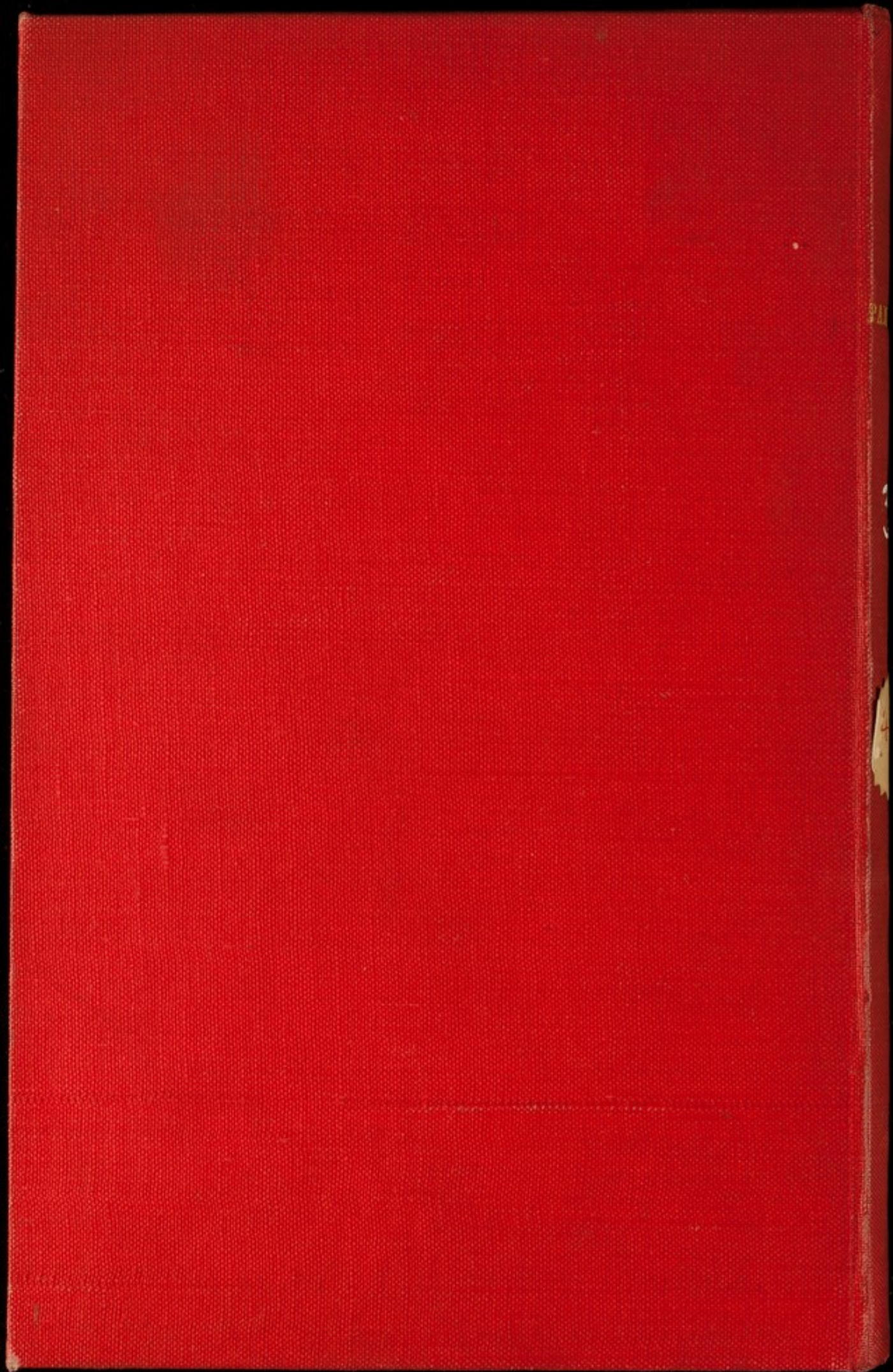
E. S. H.













PAMPHLETS

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