BULLETIN OF THE

MADRAS GOVERNMENT MUSEUM

Edited by The Superintendent

THE ADICHANALLUR SKULLS

By:

S. ZUCKERMAN, M.A., M.R.C.S., L.R.C.P.

Demonstrator of Anatomy of University College, London and Research Anatomist to the Zoological Society of London

WITH NOTES BY

PROF. **G. ELLIOT SMITH,** F.R.S.

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Dr. R. Kannan, B.Com., M.B.A., C.A.I.I.B., B.L.,
M. Social Science (Birmingham), U.K., Ph.D., IAS,
Commissioner of Museums,

Government Museum,
Chennai - 600 008

PREFACE

The second edition of the book "The Adichanallur Skulls" by Prof. S. Zukerman and Prof. G. Elliot Smith was published in the year 1930. Since it has run out of stock, the need for reprinting this book was keenly felt, especially in view of the persistent demand for copies of this volume, both from the scholars and the students of Anthropology.

This book exposes the burial site at Adichanallur excavated by Mr. Alexander Rea of the Archaeological Department of the Madras Presidency and Mr. E. Thurston of Madras Museum. A brief account of the human remains was given in the first volume of the book: "Castes and Tribes of Southern India (1909)" by E. Thurston. He writes about two skulls of Adichanallur. The general features of human skulls are exposed in this book. The Australian Dravidian Relationship theory has been expounded as result of studying the Adichanallur skulls.

The Discovery Channel also subscribes to this theory of human migration in their programme 'The story of man' in their profile series.

2000 AD

(R. Kannan)

The Adichanallur Skulls.

By S. ZUCKERMAN, *University College, London.*

With notes by G. ELLIOT SMITH.

In the latter part of last century, Mr. A. Rea, of the Archæological Department of the Madras Presidency, excavated at a burial site at Adichanallur, in the Tinnevelly district, a number of earthenware urns containing human bones, including some fairly well preserved skulls. The human remains were handed over to Mr. E. Thurston of the Madras Museum, who gave a brief account of them in the first volume of his "Castes and Tribes of Southern India" (1909). He writes that "two of these skulls . . . are conspicuously prognathous . . . The measurements of six of the most perfect skulls from Adichanallur in the Madras Musem collection give the following results:—

Cephalic length cm.	Cephalic breadth cm.	Cephalic index
18·8	12·4	66
19·1	12·7	66·5
18·3	12·4	67·8
18	12·2	67·8
18	12·8	77·1
16·8	13·1	78·0"

The historical age of the Adichanallur remains is doubtful. Thurston quotes a statement of Monsieur L. Lapicque implying that they represent a Proto-Dravidian race, while he also quotes Dr. C. Macleane's opinion . . . "the sepulchral urns of Tinnevelly may be earlier than Dravidian, or they may be Dravidian." Rea's own views on the age of the remains are summarised by Professor G. Elliot Smith as follows:—"We have no unquestionable, but only circumstantial evidence of dates that can be variously interpreted. Speculations as to the age have ranged from 400 to 4,000 years old, and no one can disprove either assertion, but there seems to be a possibility that the site may even have been occupied during early Pandyan times, that is at least several centuries before the beginning of the Christian era."

Two of the skulls were sent to Professor G. Elliot Smith, who refers to them in the second edition of his "Essays on the Evolution of Man" (1927). These two skulls conform to "different racial types. One [pl. i, figs. 1, 2; iii, 7 of the present paper] of them is clearly and unmistakably Proto-Australian in type, and the second one [pl. ii, figs. 4, 5; iii, 6] conforms more nearly to the racial type that is known as Mediterranean,[1]

[1] It is not of pure Mediterranean type, the breadth of the cranium and the flattening of the occiput suggesting the possibility that it may be an example of the type I have called "Maritime Armenoid," a branch of the Alpine Race that is found as one of the ingredients of the racial mixture known as Dravidian—G. Elliot Smith.

which is so largely represented in the present population of India . . . Curiously enough, in one of the Indian skulls from Adichanallur we have precisely the same combination of characters as are found in the so-called Old Woman of Grimaldi (ii, 3). The cranial sutures show no trace whatever of closure; yet the molar series in the lower jaw had disappeared and the alveolar process has been absorbed" (p. 130 and 136).

Before a detailed study of the skulls had been made, the Australoid skull met with an accident and was broken into many pieces. These were reconstructed by Dr. J. Beattie who possessed photographs of the skull as a guide for his reconstruction. The fragments were so brittle that it was found necessary to impregnate them with size before they could be safely handled. Previous to this, several pieces had crumbled to dust. The bones of the base of the skull and the zygomatic arches were missing. The calvarium was almost complete and it was possible to reconstruct the face accurately. The photographs and a cast of this reconstruction, without the mandible, were available for study in the preparation of this report[1].

Adichanallur No. 1.

Pl. I figs. 1-2, III 7; text figs. 1 and 2.

General.

The form of this skull is shown in pl. i, 1, 2; iii, 7, and its Australoid affinities are revealed in text figs. 1 and 2, where contours of the Adichanallur skull are superimposed on type contours of the Australian skull.

The skull, probably that of an adult female, is hyperdolicocephalic and phaenozygous. The contour of the norma verticalis is an elongated ovoid, with the greatest width across the parietal bosses, which, however, are not prominent. The skull is of moderate height. The glabella and supra-orbital ridges are well marked, and the forehead is receding. The mastoid processes and muscular ridges are well developed. It is impossible to

[1] The condition of the two crania is shown in the photographs I had made when they arrived in England sixteen years ago (pl. i, ii, iii). The problems arising out of the interpretation of their features were so interesting that I postponed the writing of a report until I had seen the whole Adichanallur collection in the Madras Museum in 1914. Unfortunately the war prevented me from going to India and until 1919 I was occupied with other matters. During the journey from Manchester to London in 1919 a deplorable accident happened, and one of the skulls (pl. i, 1, 2; iii, 7) was broken into small pieces and the other (pl. ii, 5; iii, 6) was damaged.

Dr. John Beattie undertook the difficult and laborious task of restoration: but when he was in the midst of the preparation of his report, he was appointed Assistant Professor of Anatomy at the McGill University in Canada. Dr. S. Zuckerman then undertook the work and has made the best of a task of exceptional difficulty—G. Elliot Smith.

determine the condition of the cranial sutures, either in the photographs taken previous to the fragmentation or in the cast.

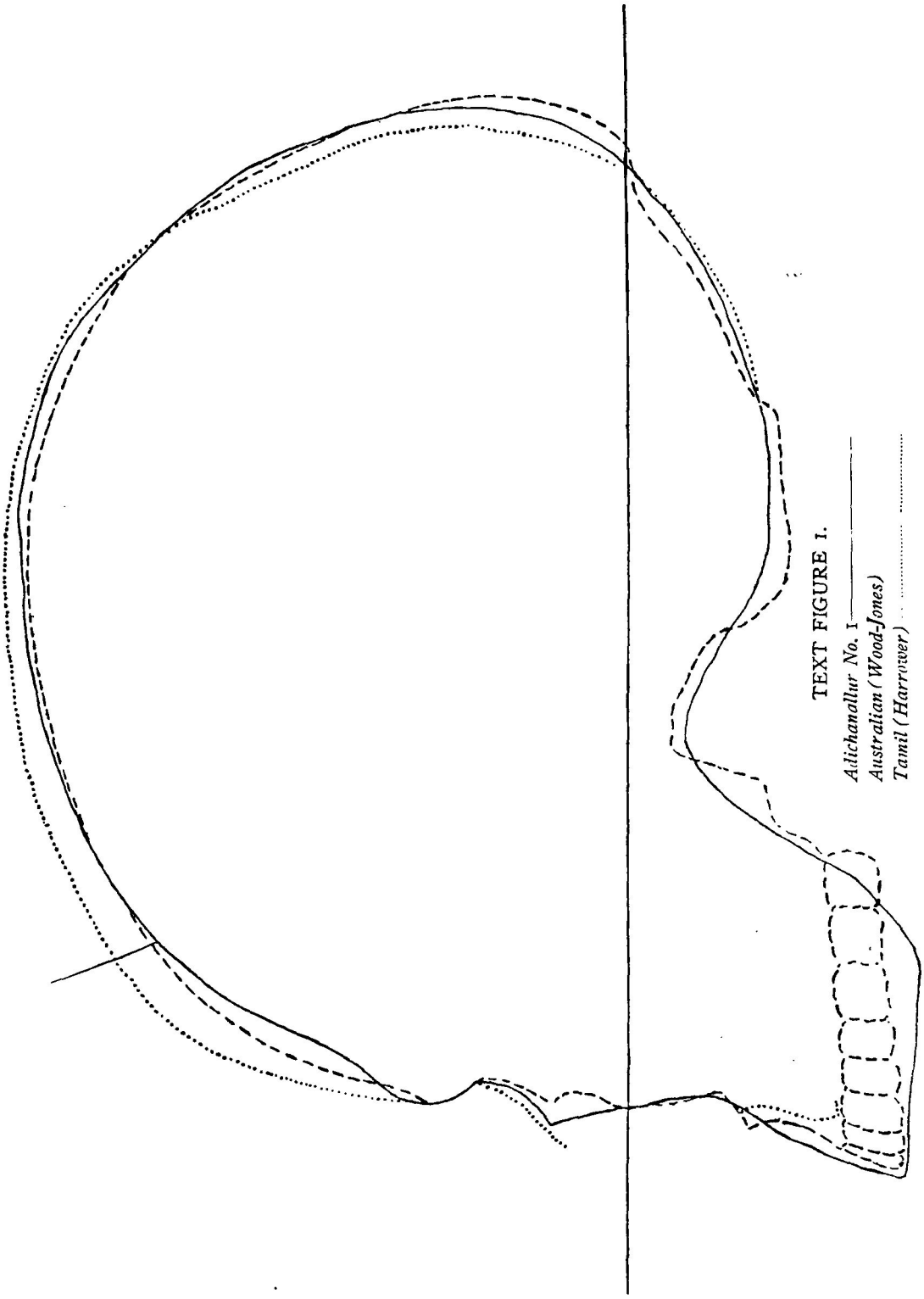
The fronto-nasal suture is depressed and the nasal bones are small. The face is broad across the malars and leptoprosopic. The orbits are mesoseme, and the nasal aperture is platyrhine. The face is somewhat prognathous. The teeth are small; the left second and third molars are missing. The dental arcade is almost parabolic, the width between the third molars being almost equal to the greatest palatal length. The skull is micro-cephalic.

Certain features have been over-emphasised in the reconstruction. The norma occipitalis of the reconstructed skull is pentagonal in outline, the parietals meeting at a well marked angle, and the greatest width is found across the upper part of the mastoid processes. The original bi-mastoid width was, however, less than the bi-mastoid width of the reconstructed skull, and the effect of this increase has been to diminish slightly the height of the skull and to exaggerate the pentagonal nature of the contour of the norma occipitalis. Another feature which the reconstruction exaggerates is the posterior part of the temporal crest. This appears in the cast as a wide ridge running upwards and slightly backwards from above the external auditory meatus. The ridge completely separates the temporal fossa from a well-marked depression above the superior nuchal line. This temporo-occipital depression may have been overemphasized in the reconstruction. There is also a marked degree of parieto-occipital flattening, but this does not appear to have been affected by the reconstruction. Both these depressed areas, as well as the pentagonal norma occiptalis, are primitive features.

For detailed analysis Adichanallur No. 1 has been compared with the Dravidian and the Australian skull. For data regarding Dravidian skulls, reference has been made mainly to Sir William Turner's monographs on Indian skulls (1901, 1906, 1913) and to Harrower's monograph based on a study of thirty-five authentic Tamil male skulls obtained in Singapore from the unclaimed bodies of coolies who had emigrated from Southern India (1926). For information about the Australian skull I have relied mainly on the data provided by Hrdlicka (1928) and Wood-Jones (1929).

Sex.

It is impossible to be certain of the sex of this skull. While the jaws and teeth are suggestively feminine, the general thickness of the bone, the relatively massive eyebrow ridges, and the mastoid processes suggest the opposite. In this Adichanallur No. 1 provides the same difficulty as do Australian and Tasmanian skulls. Hrdlicka (1928) writes that the "sexing of the Australian skull is not always easy, some of the females closely resembling males, and the same applies, though for the opposite reason (some of the males presenting rather female characters), to the South African blacks. It is no wonder that some of the older sex-identifications, particularly perhaps with the Tasmanians, were found to be erroneous." Wood-Jones (1929), too, found that



TEXT FIGURE 1.

Adichanallur No. 1 ———

Australian (Wood-Jones) ———

Tamil (Harrower) .....

problematical sex-identifications of Australian and Tasmanian skulls were of no value owing to their uncertainty. It is therefore almost impossible to state definitely the sex to which Adichanallur No. 1 belongs. Feminine sex characters, however, predominate.

Contours.

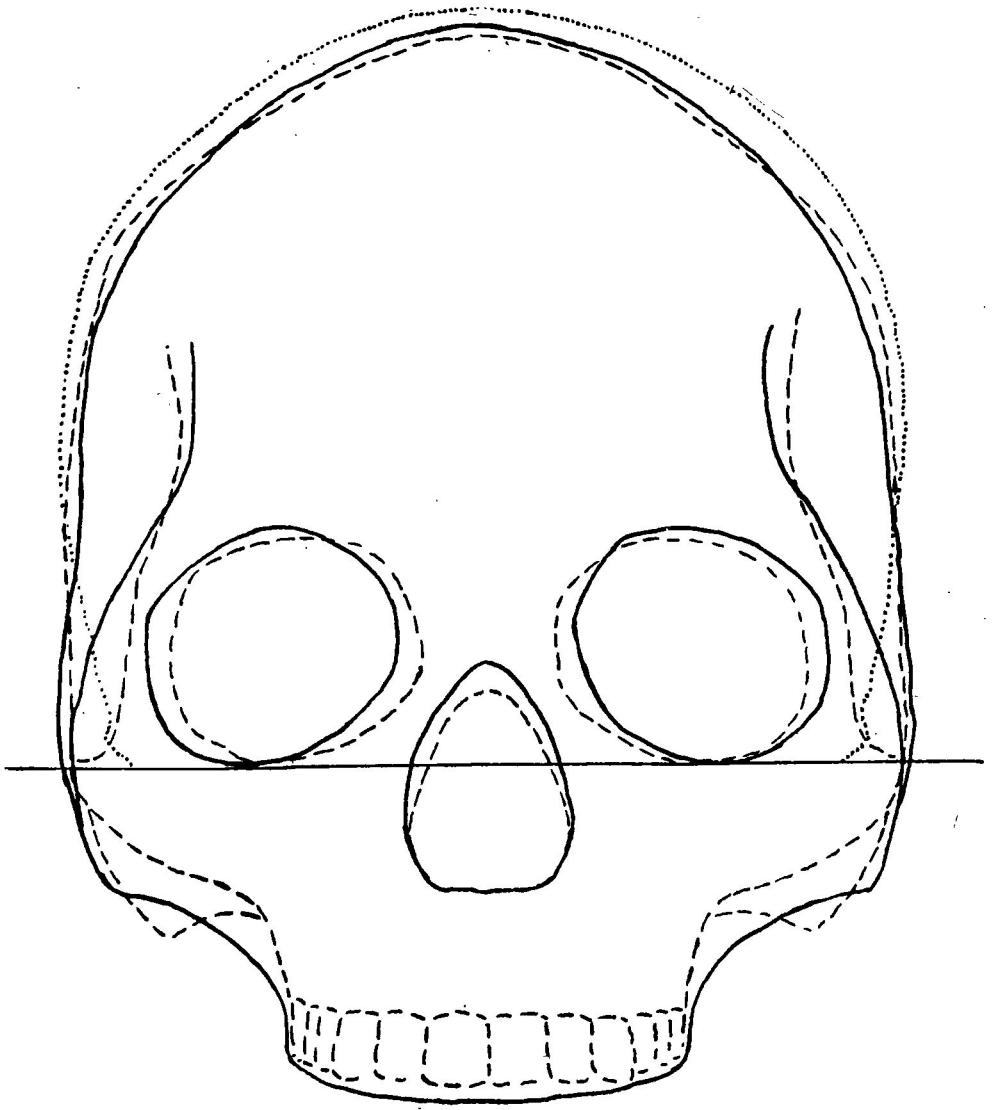
In text fig. 1 a profile contour of the Adichanallur skull has been superimposed on similar contours of the Tamil and Australian skulls.

The Adichanallur contour is the dioptograph tracing of the norma lateralis of the cast, corrected by reference to the scale photographs of the skull taken before the accident. The Australian contour is a tracing of the type contour constructed by Wood-Jones from measurements of skulls of both sexes. The Tamil contour is a tracing of the type contour constructed by Harrower from measurements of male skulls only. The three contours have been aligned along the Frankfurt horizontal, glabella on glabella.

The three skulls are very nearly equal in length, Adichanallur No. 1 being intermediate between the other two. The Adichanallur contour, except for a slightly more inclined frontal slope, closely matches the Australian, and is almost completely different in form from the Tamil contour. The greater length of the Australian skull is not due to its prominent glabella and supraorbital ridges but to its greater occipital projection; for the glabella and supra-orbital ridges of the Adichanallur skull are, if anything, more prominent than those of the Australian type skull. The occipital projection is partly responsible for the marked nuchal plane of the Australian skull. This plane is not very distinct in either Adichanallur No. 1 or in the Tamil type skull. In both, the curve of the contour below the inion passes gradually into the curve above the inion. Virchow drew attention to the small occipital development of the Tamil skull in 1888, and Harrower (1926) also remarks upon it, inferring that there is a "decreased development of the occipital region of the brain." This is one of the few points in which the Adichanallur and Tamil skulls agree.

The auriculo-vertical height of the Australian is only slightly less than that of Adichanallur No. 1, the Tamil exceeding both. The frontal slope is steepest in the Tamil, and slightly better developed in the Australian than in the Adichanallur skull. It is in its highly developed frontal region that the Tamil skull differs so markedly from the other two. On the other hand, the well-developed glabella and supraorbital ridges of the Adichanallur skull tend to emphasize its lack of frontal development.

Judging from this contour diagram, the Australian and Adichanallur skulls are equally prognathous, both being far more prognathous than the Tamil. A similar opinion is gained when the contours are oriented, glabella on glabella, along a line passing through porion and nasion. These methods of indicating facial projection are, however, somewhat deceptive, and tend to disguise the more primitive appearance of the Adichanallur contour. When the contours are arranged on the Frankfurt horizontal, porion on porion, it is seen that relatively more of the Adichanallur contour is in front of a line drawn vertically to the Frankfurt horizontal from the porion than there is of either



TEXT FIGURE 2.

Adichanallur No. I ——————
Australian (Wood-Jones) - - - - - - - - -
Tamil (Harrower) .....

the Australian or Tamil contours. Moreover, the face of the Adichanallur skull is actually larger than that of either the Australian or Tamil skull.

In text fig. 2, norma facialis contours of the Tamil skull (a tracing of the type contour constructed by Harrower) and of the Australian skull (a tracing of the type contour constructed by Wood-Jones) have been superimposed upon the norma facialis contour of Adichanallur No. 1, prepared in the same way as the norma lateralis contour of Fig. 1. The three are aligned along the Frankfurt horizontal.

The Adichanallur contour corresponds more closely to the Australian than to the Tamil contour. Its cranium appears, however, to be somewhat more primitive than the Australian. It is widest across the mastoid region, gradually narrowing as it approaches the vortex. In the Australian skull, the bi-mastoid width is almost the same as the bi-parietal width; the side walls of the cranium are vertical, and the parietal bosses are not prominent. In the Tamil skull the parietal bosses are well developed and the bi-parietal width is the widest part of the transverse vertical contour, a condition similar to that found in the average European skull.

The smallest "minimum frontal diameter" is possessed by the Adichanallur skull, a feature adding to its primitive appearance. This diameter is about the same in the Tamil and Australian skulls.

The face is not included in the transverse vertical contour provided by Harrower. When viewed from the front, the face of the type Australian appears decidedly less massive than that of the Adichanallur skull. Its interorbital width, too, is smaller.

Dimensions.

The dimensions of Adichanallur No. 1 are given in Table 1 (pp. 21-23) side by side with dimensions of the Australian and Tamil skulls. The Adichanallur measurements were taken on the cast and have been corrected by reference to the scale photographs of the skull taken before the accident. This table provides only detail to text figs. 1 and 2. The estimated capacity of the Adichanallur skull—the mean of the two values obtained by using Lee's formula No. 10 for males and his formula No. 11 for females—is almost the same as the figure obtained in the same manner for the Australian (Wood-Jones). The Tamil exceeds both.

Indices.

Table 2, consisting of the cranial indices of the Adichanallur, Australian and Tamil skulls, shows clearly the correspondence of Adichanallur No. 1 to the Australian skull. The main indices of both the Adichanallur and the Australian skull differ greatly from those of the Tamil.

Adichanallur No. 2.

Pl. II figs. 4-5, III 6.

I have not had the opportunity of studying the second of the two Adichanallur skulls which were sent to England. My remarks are based on Professor G. Elliot Smith's notes

and on photographs of the norma lateralis and norma verticalis. Unfortunately the conclusions one may arrive at regarding the skull are limited, as the facial bones, including the nasals and malars, are missing.

Professor Elliot Smith's opinion on this skull has been quoted on page 1. He refers to it as of Mediterranean type and draws attention to the curious combination it exhibits of open cranial sutures and an edentulous lower jaw.

One cannot be certain of the sex of this skull; the probability is that it is female. The question of age is more easily answered. The open cranial sutures—there is no sign of occlusion in any—are certain evidence that the skull is that of an individual in the early twenties. The edentulous condition of the lower jaw in no way affects this opinion.

The skull is small and mesaticephalic. The contour of the norma verticalis is broadly ovoid; with the greatest width across the well-developed parietal bosses. The skull is cryptozygous. The forehead rises almost vertically, and both glabella and supra-orbital ridges are very poorly developed. The mastoid processes are of moderate size, and judging from the photographs the mascular markings on the skull are not well marked. The nuchal region merges gradually with the region above the inion, which too is not prominent. There is no indication of parieto-occipital flattening, or of the temporo-occipital depression that is so well marked in Adichanallur No. 1.

The maximum length of the skull is 168 mm., and the greatest breadth 131 mm. The cephalic index is 78. The auricular height is approximately 114.5 mm. The mean of the values obtained by using Lee's formula No. 10 for males and No. 11 for females for the estimation of the cranial capacity, is 1264 cc.

There can be little doubt about the identification of Adichanallur No. 2. Its characteristics are as definitely Dravidian as those of Adichanallur No. 1 are Australoid, corresponding in all essentials to Dravidian cranial features (*see* Turner's description, pp. 25, 26 and 27). Its dimensions, too, are well within the range of those of Dravidian skulls (see Tables 1 and 2).

The Australian-Dravidian Relationship.

It now becomes necessary to explain the association in the same burial site at Adichanallur of two skulls so different from each other as are Adichanallur No. 1 and Adichanallur No. 2. It is obvious that their completely different forms imply the presence of two racial stocks. This does not, however, necessarily mean that the two individuals to whom these skulls belonged were members of different tribes; there has been so much racial mixture in the Deccan that collections of skulls from almost any tribe will exhibit marked variation in cranial form. In this particular instance the one skull is as unmistakably Australian in form, as the other is Dravidian. The presence of an Australoid skull in Southern India demands explanation.

Anthropology has for a long while recognized that some relationship exists between the aboriginal inhabitants of Australia and those of the Deccan, but opinions about the

nature of the relationship have varied. In order to understand the significance of the occurrence of an Australoid skull in India, it will be necessary to enquire briefly into the existing theories concerning the Australian-Dravidian relationship, and to consider the evidence upon which they are based.

The first to associate the Australians with the Dravidians was probably Huxley. In his essay on "The Methods and Results of Ethnology," published in 1865, in which he introduced his well-known classification of human races, he describes the Australian as a pure type, and draws attention to the "Dravidian populations of Southern Hindostan," who "lead us back, physically as well as geographically, towards the Australians." In a later paper, published in 1869, he referred to the Indian problem in greater detail, describing the people of the Dekkan as "long headed, dark skinned and dark-eyed men, with black wavy hair, devoid of any inclination to woolliness. Not infrequently they exhibit prominent brow ridges. Examples of them are commonly seen in the coolies who work their way over to this country in Indiamen, and any one who has ever seen an Australian native will be struck with the resemblance between the two. They speak the languages known as Dravidian and where they have been left in their primitive condition are thorough savages. The rest of the population of Hindostan is allied in physical character and language either to the adjacent peoples in the north-west and the north-east, or exhibits evidence of being the result of the intermixing of such people with the Dravidians." In his paper on "The Geographical Distribution of the Chief Modifications of Mankind" published in 1870, he reaffirmed this opinion without introducing any fresh evidence. In this paper he also presented the view that the Ancient Egyptians formed part of his "Australoid" race, as well as suggesting that the Melanochroi—his dark European type—were the result of an Australoid-Xanthochroid (Nordic) cross.

According to Huxley, therefore, the Australians and Dravidians are pure races and form part of the same primitive stock. It should be noted, however, that in stating this view, Huxley appealed only to superficial similarities, such as hair, skin colour, stature, etc.

There appears to have been a general acceptance of Huxley's opinion regarding the resemblances between Australians and Dravidians.

Topinard writes (1894), that "before the present race of Australians there must have existed on their continent a race much inferior still . . . It is clear that the Australians might very well be the result of the cross between one race with smooth hair from some other place and a really Negro and autochtonous race. The opinions expressed by Mr. Huxley are in harmony with this hypothesis." He adds that "we are still in ignorance as to whether the present Australian race took its origin on the spot, . . . or whether, on the contrary, it was altogether constituted in Asia, or whether it is a cross race, and in that case, of what elements it is composed." The population of the Indian peninsula, according to Topinard, "is composed of three strata, namely, the Black, the Mongolian and the Aryan. The remnants of the first are at the

present time shut up in the mountains of Central India, under the name of Bhills, Mahairs, Ghonds and Khonds; and in the South under that of Yenadis, Maravers, Kurumbas, Veddahs, etc. Its primitive characters, apart from its black colour and low stature, are difficult to discover, but it is to be noticed that travellers do not speak of woolly hair in India. The second has spread over the plateaux of Central Asia by two lines of way, one to the north-east, the other to the north-west. The remnants of the first invasion are seen in the Dravidian or Tamul tribes, and those of the second in the Jahts. The third, more recent and more important as to quality than as to number, was the Aryan." The evidence adduced by Topinard in favour of these views is very scanty and superficial. The tribes with which he compared the Australian were the Bhills, Ghonds, Khonds, Maravers and Veddahs.

According to Flower and Lyddeker (1891), "Australia was originally peopled with frizzly-haired Melanesians" but "a strong infusion of some other race, probably a low form of Caucasian Melanochroi, such as that which still inhabits the interior of the southern parts of India, has spread throughout the land from the north-west, and produced a modification of the physical characters, especially of the hair. This influence did not extend across Bass's Straits into Tasmania, where . . . the Melanesian element remained in its purity." The same two authors state that the Dravidians and Veddahs belong to the Caucasian Melanochroi, Huxley's dark European type, but are "largely mixed with a Negrito element." These opinions are the same as those expressed in 1885 by Flower alone. In neither of the two works in which they appeared was any detailed evidence adduced in their support.

Statements regarding Australians and Dravidians in Keane's work "Ethnology" (1896) conflict somewhat with one another. He first suggests (p. 226) that a "fusion of Melanochroid Caucasic (South Indian) and Austral Negro blood" occurred "at a remote epoch in some now perhaps submerged Indo-Austral region." This, of course, implies acceptance of Huxley's idea of Dravidian-Australian similarity. Later, however (pp. 290–291), Keane recognizes a black sub-stratum, the pure Oceanic Negro, in Australia and Tasmania. This type became modified in Tasmania as a result of long isolation (a view suggested by Flower in 1885). In Australia, on the other hand, the primitive Negroid became modified mainly through mixture with immigrant Dravidian, and also with Papuans.

The absence of woolly hair in India leads Keane, while accepting De Quatrefages' view that an autochtonous negrito element forms "the sub-stratum of the Dravidian and other populations in India and along the southern slopes of the Himalayas," to consider "that the dark element in India would appear no longer to represent the original reddish-haired yellowish Negrito, but an intermediate form between that type and the Papuan, generally modified by later intruding Kolarian, Dravidian, and Aryan populations" (p. 255). The Dravidian invaders of Australia are to be regarded "not as of Mongolic stock, against which there are many objections, but as "Caucasian Melanochroi," such as are still represented in Southern India and Ceylon by the shaggy-haired and full-bearded

Todas and Veddahs" (p. 292). Later, however (p. 297), the Dravidians are classed as an example of "early Mongolo-Caucasic intermingling"; and later again (p. 417) Keane writes that the Dravidians, examples of whom are the Telingas (Telugus), Tamils, Kanarese, Malayalam, Kodagu, Oraons, Rajmahali and Gonds, "are usually regarded as a Mongoloid people, who entered India from the north-west . . . But at present the type cannot be called Mongolic; it scarcely differs from the average Hindu, except in some districts, where it has been somewhat modified by contact with the Kolarians and dark aborigines."

In a later work entitled "The World's Peoples" (1908), Keane reaffirmed most of these views, but distinguished from the true Dravidians, (*e.g.*, the Tamils, Telugus, Malayalams, etc.), the Pre-Dravidians, examples of whom are the Kotas, Irulas, Badagas, Kurumbas, Paniyans, Pulayas, Izhuvans, Parayas and Kaniyans. These tribes, though they talk a Dravidian language, often show marked Negroid characters. In the 1920 edition of Keane's "Man, Past and Present," edited by Haddon and Hingston Quiggin, the term Pre-Dravidian is "employed to include certain jungle tribes of South India, the Vedda of Ceylon, the Sakai of the southern Malay Peninsula, the basal element in certain tribes in the East India Archipelago and the main element in the Australians. Pre-Dravidian characters are coarse hair, more or less wavy or curly, a narrow head, a very broad nose, dark brown skin and short stature" (p. 422). The Pre-Dravidian jungle tribes of Southern India include the Kadir, Paniyan, Irula, Kurumba and Vedda. It is stated in this work that the Indian invaders of Australia "are regarded by some as belonging to the Dravidian, and by others, and with more probability, to the Pre-Dravidian race" (p. 428). The true Dravidian races are again said to be a blend of Caucasian and Mongolian elements. No fresh evidence supports the hypothesis of the Australian-Dravidian relationship in any of Keane's works.

In Deniker's classification (1900), the Australian and Dravidian figure in the same class. The Dravidian group consists of two sub-divisions, the Kolarians and the true Dravidians. Examples of the Kolarians are the Juang, Santals, and Munda; of the Dravidians, the Oraons, Gonds, Khonds in the North, and the Telugus, Kanarese, Malayalam, and Tamils in the South. Deniker distinguishes from these Southern Dravidians a "number of small tribes more or less uncivilized and animistic, having somatic types of considerable variety." Examples of these are the Kadir, Maravers, Paniyans, and certain tribes of the Nilgiri Hills, the Irulas, the Kurumbas, and the Todas amongst others. The Todas of Indo-Afghan stock, differ from the other tribes of the Nilgiri Hills. The Veddah, according to Deniker, "approximates nearest to the platyrhine variety of the Dravidian race, at the same time presenting certain peculiarities." The Australian, too, is connected by certain traits, prominent amongst which is wavy or frizzly hair with the Veddahs and with "certain of the Dravidian populations of India." Deniker does not support these views with detailed evidence.

Haddon's (1924) opinions on the Australians and Dravidians are the same as those expressed in the 1920 edition of Keane's "Man, Past and Present." The Australians are

classed with the "Sakai of the Malay Peninsula, the Veddas of Ceylon, and certain tribes of the Southern part of India in a group called Pre-Dravidian. The Pre-Dravidian Indian tribes are the Kadir, Kurumba, Paniyan, Irula, Bhil, Gond, Khand, and Oraon. "Dravidian" is a general term for the main population of the Deccan. They are mixed with other races in certain places, and many exhibit a marked Pre-Dravidian strain." While admitting that the presence of a Negroid element in the Deccan has not been established, Haddon creates the impression that the autochtonous element in Southern India is Negroid; and the best example of this original Negro type is, according to Haddon, the Kadir. "Mixture with Dravidians has modified the features of some of the Aborigines", however, so that types like the Kurumba, Bhill, Gond, and Khond are not pure Pre-Dravidian. "From a racial point of view the Kolarians can only be placed in the Pre-Dravidian group." Kolarian Pre-Dravidian tribes are the Juang, Korwa, Munda, Santal, Kharwar and Oraon. True Dravidian tribes, e.g., Tiyan, Nayar and Vellala, are those speaking Tamil, Telugu and Malayalam, and according to Haddon "there are many points of resemblance between the Dravidian and Mediterranean peoples which point to an ancient connexion between the two, perhaps due to a common origin." The view that the Australian forms part, with the Pre-Dravidian tribes of India, of the Pre-Dravidian group, naturally makes it unnecessary to postulate any Dravidian or Pre-Dravidian invasion of Australia. Haddon writes that "there is a general similarity in type throughout Australia, though subject to considerable variation. There is extremely little, if any, evidence of immigrant racial admixture . . . We may therefore conclude that since the arrival of the Australians there has been no distinct racial immigration into Australia."

Haddon's views on the Australian-Dravidian relationship are essentially the same as Deniker's. Both distinguish amongst the mass of Dravidian peoples a Pre-Dravidian element, more marked in certain tribes than in others. The Australians are identified with the Pre-Dravidian group. This view, which may be considered to be the accepted view of Ethnology to-day, is in reality the same as that originally proposed by Huxley, with this exception, that Huxley did not distinguish two elements amongst the Dravidian peoples. This is not surprising in view of the limited data at his disposal. The main assumption upon which this hypothesis rests is that the Australian is a pure type.

The other opinions quoted, those of Topinard, Flower, and Keane, resemble each other and differ fundamentally from Huxley's by implying that the Australian is a mixed type. It is assumed that the modern Australian native is the result of a cross between a primitive negroid inhabitant of Australia and invading peoples, chiefly from India, and probably of Caucasian Melanochroid (Mediterranean) stock.

Opinions differ regarding the racial purity of the Australian. This problem, however, cannot be discussed here in detail. It will be sufficient to give Hrdlicka's opinion, based upon a study of a thousand Australian crania. "The Australians, while generally related are not of exactly the same type in all parts of the territory . . . Admixture (Papuan) and local variation are doubtless both involved in the observed differences of characters.

But these differences are so appreciable that anthropology will hardly be justified henceforth to refer merely to the "Australian." It is perhaps significant that Hrdlicka makes no reference to an infusion of Indian blood.

Apart from the somewhat problematical racial purity of the Australian, the hypothesis of a Pre-Dravidian racial stock, as postulated by Haddon, depends largely upon the recognition in Southern India of an Australian type amongst those tribes regarded as Pre-Dravidian. This presents two main difficulties. Firstly, authorities are not agreed about the tribes which are to be regarded as Pre-Dravidian. Topinard's black sub-stratum to the population of the Dekkan consists of the Bhills, Mahairs, Gonds, and Khonds in the north, and the Yenadis, Maravers, Kurumbas and Veddahs in the south. Presumably by "black sub-stratum" Topinard meant a Negro sub-stratum, corresponding to the Pre-Dravidian of Haddon. These he distinguished from the Dravidian or Tamil population. Keane also recognizes the distinction between Dravidian and Pre-Dravidian (this does not refer to his somewhat confused account in "Ethnology"). His examples of Pre-Dravidians are the Kotas, Irulas, Badagas, Kurumbas, Paruyans, Pulayas, Parayas and Kaniyans, of Dravidians, the Tamil, Telugu, and Malayalam. Deniker distinguishes the Kadir, Madaver, Paniyan, Irula and Kurumba, a group which he considered the more primitive, from the Oraons, Gonds, Khonds, Telugus, Kanarese, and Tamils, a group he calls Dravidian, and from the Juang, Santal, and Munda, a group he calls Kolarian. The Pre-Dravidians of Haddon are the Vedda, Kadir, Kurumba, Paniyan, Irula, Bhill, Gond, Khond, and Oraon. The Sakai of the Malay Peninsula are also included in this group. The Kolarians according to Haddon are also Pre-Dravidian tribes. Examples of them are the Juang, Korwa, Munda, Santal, Kharwar, and Oraon. True Dravidians are the Tamil, Telugu, and Malayalam. Haddon considers that the Kurumbas, Bhills, Gonds, and Khonds have some infusion of Dravidian blood.

It is obvious that there is no fixed opinion about the status of certain tribes. Deniker, for instance, includes the Kolarians with the Dravidians, distinguishing both from the Pre-Dravidians, while Haddon considers the Kolarians to be Pre-Dravidians.

This confusion is probably due to the absence of racial characters sufficiently fixed to afford a means of distinguishing between the two elements in the population. The distinction is usually made by an appeal to superficial characters, such as the type of hair, colour of skin, type of nose, and stature. In fact, the hypothesis of the Australian-Dravidian (or Pre-Dravidian) relationship is based entirely upon similarities of completely superficial characters. If, however, the population of the Dekkan consists of Dravidian and Pre-Dravidian groups, of supposedly different racial stocks, one should be able to recognize one from the other by an examination of their cranial characters. Moreover, if the hypothesis of a Pre-Dravidian racial stock is sound, one should be able to distinguish in the Pre-Dravidian group Australian or Negroid cranial characters.

It is necessary, therefore, to enquire into two questions:—(*a*) the possibility of dividing the tribes of the Deccan into two groups by means of their cranial characters; and (*b*) the possible resemblance of the cranial characters of either Dravidian or Pre-Dravidian tribes

to those of the Australians. For an answer to those two questions I shall rely almost entirely on Turner's four monographs on the "Craniology of the Peoples of the Empire of India."

Turner commences his second monograph (1901) with a classification of the peoples of Southern India. The Kolarians are, for philological reasons, distinguished from the Dravidians. The principal Kolarian tribes are the Santals, Mundas, Hos, Kols, Korwas, and the Bhills. The Dravidians are divided into a northern group consisting mainly of the Gonds, Tulus, Oraons, Kharwars, Mal-Paharias, and the Kandhs, and a southern group consisting mainly of the Telugu, Tamil, Kanarese and Malayalam.

Amongst the Gond, Oraon, Paharia, Kharwar, Nagesar, Korwar and Phuija, tribes belonging to the northern Dravidian group and representing the purest type of jungle people, the skull in the norma verticalis is elongated and ovoid, with vertical sides. The customary type is dolicocephalic. The forehead is only slightly receding, and the muscular ridges are not strong. The glabella and supra-orbital ridges are not prominent, nor is the nasion depressed. The skull is usually platyrhine, orthognathous, and microseme. With the exception of somewhat more marked supraorbital ridges and a more prominent glabella, two Tamil skulls, representing the southern Dravidian group, were of the same type. The average skull belonging to these tribes is microcephalic.

The skulls of the Munda, Bhumij and Turi tribes of the Kolarian group are essentially the same as those of the true Dravidians. Turner writes :—"If we compare the characters of the skull in the Dravidian with the Kolarian group, we shall find that they correspond in essential particulars. In both, the type of cranium in form and proportion was dolicocephalic; the anterior nares were platyrhine, or in the higher term of the mesorhine group; the presence of a leptorhine index was altogether exceptional; the upper jaw was usually orthognathous; only one of thirty-six skulls was prognathous; as a rule the orbit was low or microseme, the palato-alveolar arch was brachyuranic. In both groups the face was chamæprosopic, *i.e.*, the interzygomatic width was great in proportion to the length of the face. If we take the cranial capacities of the two groups together, the men have a mean 1,305 c.c., the women 1,157 c.c.

"Judging, therefore, from the characters of the skull, one would draw the conclusion that there is no difference of moment in the form and proportion of this part of the skeleton between the Dravidian and Kolarian types, and support is given to the view of their essential structural unity as advocated by Mr. Risley. For descriptive purposes both groups of skulls may be classed therefore as Dravidian."

In the same monograph Turner described nine Veddah skulls which had not been examined before. From a consideration of the data of sixty-seven other Veddah skulls provided by the literature and the nine he himself described, Turner concludes that the Veddah skull is of the same type as the Dravidian. "In both the crania were dolicocephalic in form and proportions; in both the height as a rule exceeded the breadth. The glabella and supra-orbital ridges did not strongly project, the forehead was not specially retreating, and in many specimens approached the vertical; the

occipital squama was usually convex, and projected behind the inion. The face was low in relation to the breadth; the nasion was seldom much depressed; the anterior nares were platyrhine or mesorhine, rarely leptorhine; the upper jaw was orthognathous, occasionally mesognathous, not prognathous; the orbits varied in the proportion of width and height; the palato-alveolar arch also varied, though the index seldom much exceeded 120, and the breadth was not greatly in excess of the length. The cranial capacity was microcephalic in both Veddahs and Dravidians, though the former were, on the whole, of smaller capacity than the latter. It is difficult, therefore, to lay down a series of characters in which the Veddah and Dravidian skulls differed from each other."

In his third monograph (1906), Turner describes a further series of Tamil skulls which corresponded to the Dravidian type of skull described in his second monograph. "In both series the crania were elongated and delicocephalic, an occasional skull having an index in the lower term of the mesaticephalic group; in both the nasal index was platyrhine or mesorhine, a leptorhine index being exceptional; in both the upper jaw was orthognathic, in the Tamils no skull was prognathous, and in the previous Dravidian series only one in thirty-six skulls had so high an index; in both the prevailing orbital index was low or microseme; in the previous series the mean maxillo-facial index was low or chamaeprosopic, in the Tamils the mean index was somewhat higher and mesoprosopic; the palato-maxillary arch, though with a wide variation in each series, was in the mean brachyuranic; in both the cranial capacity was below the European average. The cranial configuration in both series therefore closely corresponded, and testified to their racial affinities."

In his fourth monograph (1913), Turner refers to the Bhills, whose cranial characters he found to be essentially the same as those of the Dravidian tribes described in his earlier monographs.

Judging from Turner's evidence, therefore, there is no craniological justification for dividing the people of the Deccan into Pre-Dravidian and Dravidian groups. The Kolarians, the Veddahs and the northern Dravidian tribes, the "Pre-Dravidian" jungle people, present the same craniological characters as do the southern Dravidian group, or true Dravidians.

Turner compared the Dravidian type of skull with that of the Andamanese, and decided that they differed "in essential particulars." He writes therefore that "the direct evidence of either a past or a present Negrito population in India has yet to be obtained . . . Did we accept the view that a brachycephalic Negrito people preceded the Dravidians in the occupation of India, we could not, I consider, regard the latter, either in cranial configuration or external characters, as the direct descendants of the former."

Turner is equally emphatic about the Australian-Dravidian relationship. "Many ethnologists of great eminence have regarded the aborigines of Australia as closely associated with the Dravidians of India. Some also consider the Dravidians to be a

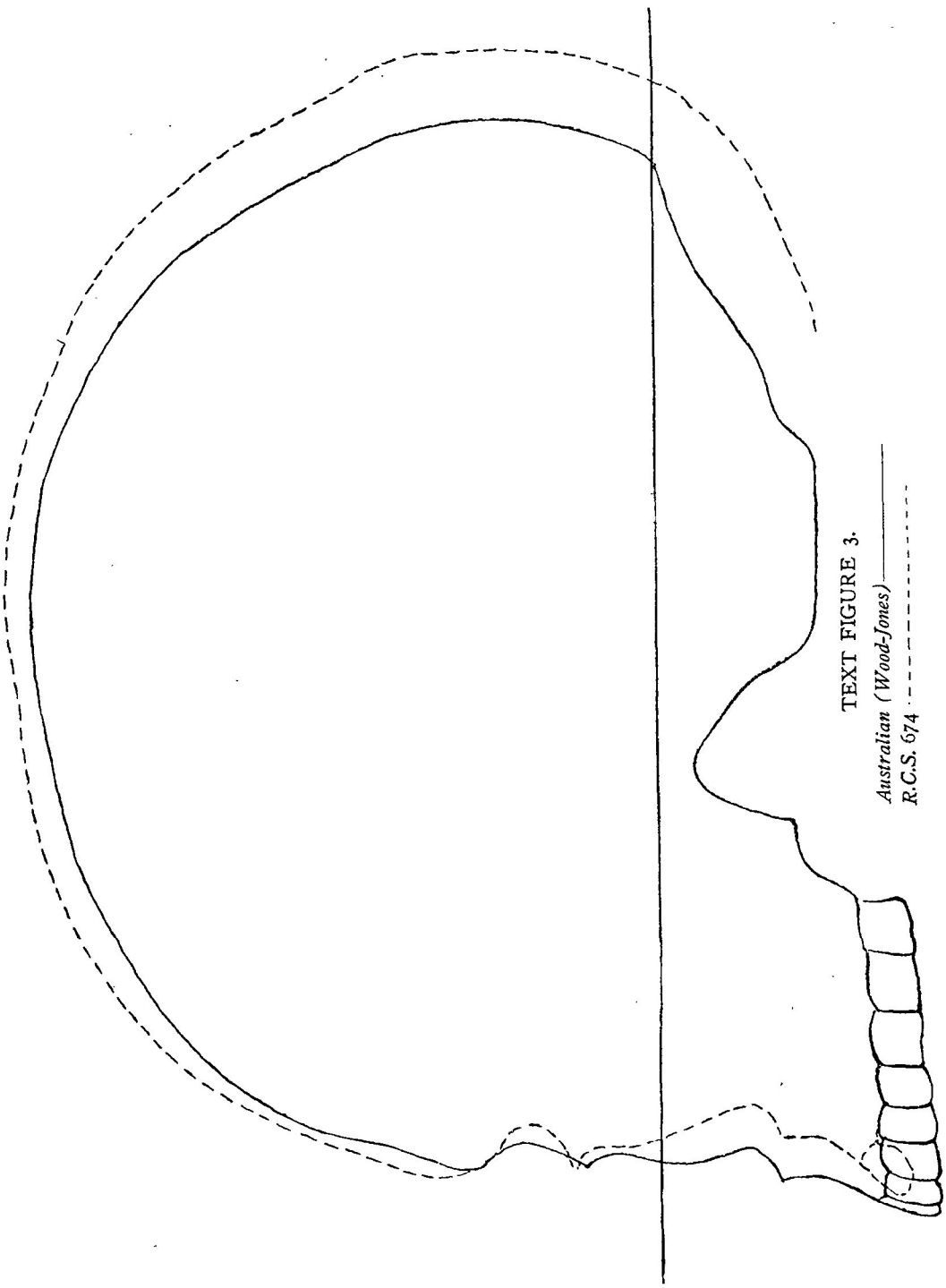
branch of the great Caucasian stock and affiliated therefore to Europeans. If these two hypotheses are to be regarded as sound, a relationship between the aboriginal Australian and the European would be established through the Dravidian people of India . . . Both Dravidians and Australians have dark skin approximating to black; dark eyes; black hair, either straight, wavy, or curly, but not wooly or frizzly; thick lips, low nose with wide nostrils; usually short stature, though the Australians are somewhat taller than the Dravidians." There is no need to quote Turner on the differences which exist between Australian and Dravidian crania, as these have already been indicated in text figures 1 and 2, and in Tables 1 and 2. Turner concludes that "by a careful comparison of Australian and Dravidian crania, there ought not to be much difficulty in distinguishing one from the other. The comparative study of the characters of the two series of crania has not led me to the conclusion that they can be adduced in support of the theory of the unity of the two people."

In Harrower's opinion the Tamil is a type, preserved in the purest possible state either because of necessity or from choice, representing the Dravidian peoples. "There is no craniometrical evidence to show any connexion with any European peoples, and few characteristics in common with other Asiatics."

Earlier in this paper reference was made to a statement of Virchow's regarding the Tamil skull. The source of this statement is his 1885 paper on the affinities of the Veddahs. I have not made further reference to this work, because it seems to me that the conclusions Virchow arrived at were far too dogmatic considering the small amount of material at his disposal. It might be worth while, however, to give his opinion on the question of a Veddah-Australian relationship. After denying any real affinity between the Veddah and the Andamanese, he writes that "even less analogy is found between Veddahs and Australians. We may certainly point out that the hair and even the beard is somewhat like that of the Veddahs; but one glance at the skull, and still more at the skeleton, of the Australian convinces us that here a great and unmistakable contrast exists." Such an opinion is obviously contrary to the hypothesis of a Pre-Dravidian racial stock which includes amongst others Australians and Veddahs.

In his introduction to the first volume of "Castes and Tribes of Southern India" (1909) Thurston discusses the Australian-Dravidian hypothesis, without, however, committing himself to any definite opinion. The jungle tribes of the Deccan are described as the "microscopic remnant of a Pre-Dravidian people" and it is to mixture with these Pre-Dravidian tribes that many of the other inhabitants of Southern India owe their high nasal index.

As craniological evidence in favour of the hypothesis of a Pre-Dravidian racial stock, Thurston cites a skull mentioned in Flower's osteological catalogue to the Museum of the Royal College of Surgeons (1879). The catalogue note regarding this skull, No. 674, is as follows:—"A skull marked 'Hindoo,' but with no further history: Male. It is remarkable for the prominence of the glabella, and other resemblances to some Australian skulls."



TEXT FIGURE 3.

Australian (Wood-Jones) ———

R.C.S. 674 - - - - - -

I have examined this skull, but do not agree that it exhibits specifically Australian characters. In almost any collection of skulls at least one specimen would be encountered showing a prominent glabella and well-developed brow ridges; these characteristics, however, even though coupled with marked dolicocephaly, are not of sufficient importance to warrant the descriptive term "Australian."

R.C.S. No. 674 is a very large skull, with a prominent glabella, well-developed brow-ridges, and strong muscular markings. The side walls of the cranium are vertical, the bi-mastoid width being almost the same as the bi-parietal. The roof of the cranium is somewhat flat. The skull is just cryptozygous. The nuchal plane is very distinct. The nasion is depressed, and the nasals are small. It exhibits a small degree of sub-nasal prognathism. The dimensions of this skull are as follows:—

Max. Ant. Post. diam. ...	198 mm.	Max. Trans. diam.	132 mm.
Auricular height ...	115 mm.	Bizyg. width	128 mm.
Basi-Breg. height ...	135 mm.	Bas.-Nas. diam.	98 mm.
Bas.-Prosth. diam. ..	96 mm.	Nas.-Prosth. diam.	65 mm.
Min. front. breadth ...	101 mm.	Nas. height	48 mm.
Nas. width	25 mm.	Orbital height	36 mm.
Orbital width	40 mm.	Cranial capacity	1,460 c.c.
Alv. length	54 mm.	Alv. width	65 mm.
Palatal length	43 mm.	Palatal breadth	42 mm.

The main indices fall into the following groups:—

Dolicocephaly	66·6	Orthognathous	98
Megacephalic	1,460 c.c.	Mesorhine	52·1
Megaseme	90	Leptoprosopic	51

These figures place the skull in the class which Duckworth calls "Eurasiatic, subdivision A" (1904). The type contour for this class, which Duckworth figures, is almost identical with the norma lateralis contour of this so-called Australoid skull, whose dimensions and indices are, however, completely different from those of the average Australian skull. In text fig. 3 a norma lateralis contour of R.C.S. No. 674 has been superimposed on Wood-Jones' type Australian contour. The differences are obvious.

It is clear that this skull provides no evidence in favour of the Australian-Dravidian hypothesis.

Thurston mentions another skull, in the collection of the Madras Museum, which he apparently considers to possess Australian characters; but the only data he provides for consideration are prominent superciliary ridges, a cephalic index of 75, a nasal index of 42·8, and the dimensions concerned in these indices. These, however, are non-specific features.

Considering that the average Australian skull is prognathous, Thurston's remarks on the facial projection of Indian skulls are significant. He writes:—"I am unable to

subscribe to the prognathism of the Dravidian tribes of Southern India, or of the jungle people, though aberrant examples thereof are contained in the collection of skulls at the Madras Museum . . . the inhabitants of Southern India may be classified as orthognathous."

It is clear that craniological evidence derived from the present populations of the Dekkan does not support the hypothesis of a Pre-Dravidian racial stock whose representatives are, amongst others, the Australians, the jungle tribes of Southern India, and the Veddahs of Ceylon. It is difficult, however, to decide whether craniological evidence is a fundamental criterion of race; if it were, the hypothesis of a common stock for the jungle people of the Dekkan and the aboriginals of Australia would be untenable. Nevertheless, while it is noteworthy that the hypothesis was formulated originally, and is now held, in spite of the lack of craniological support, it is possible that the uniformity of cranial characters in Southern India is due mainly to racial mixture, and that even those tribes considered to be pure representatives of the aboriginal inhabitants have mixed sufficiently with the Dravidian invaders from the north-west so as to lose, almost entirely, their original cranial characters.

It is therefore perhaps remarkable that the Adichanallur skulls provide evidence in favour of the Pre-Dravidian theory. Of the six Adichanallur skulls mentioned by Thurston, four are sub-dolicocephalic and two are mesaticephalic; two of the six are prognathous. One of the two prognathous skulls is the sub-dolicocephalic Australoid skull described in this paper as Adichanallur No. 1. Thurston's account does not indicate whether the second prognathous skull is also dolicocephalic and whether it is similar in form to the first. Without this knowledge, one cannot regard it as evidence, additional to Adichanallur No. 1, indicating the presence of an Australoid aboriginal in the Dekkan.

One cannot exclude the possibility, however, without at least mentioning it, of the occurrence in any series of skulls, for instance a collection of South African crania, of a specimen exhibiting Australian characters. There is therefore a danger lest too much stress is laid upon Adichanallur No. 1 as evidence in favour of the hypothesis of the Pre-Dravidian racial stock.

Regarded on its face value, however, Adichanallur No. 1 provides support for the view that the aboriginal inhabitant of Southern India was similar to the present day Australian native. It therefore upholds Huxley's interpretation of the Australian-Dravidian relationship, which is embodied to-day in the conception of a Pre-Dravidian racial stock comprising the Australians, the Sakai, the Veddahs, and the jungle tribes of Southern India. The evidence of the skull does not support the alternative interpretation (see p. 12) that the present Australian native is the result of a cross between an aboriginal Australian and invading Indians. If anything, it is against such an interpretation.

The presence of a Dravidian skull in the Adichanallur remains (Adichanallur No. 2) implies that mixture with invading peoples from the north had occurred before the time

of the burial. This means that the Adichanallur remains could not be earlier than Dravidian.

It is believed that primitive man made his way to Australia from Asia, probably from India. This hypothesis explains the occurrence between Australia and India, *e.g.*, Ceylon, the Malay Peninsula, and the East India Archipelago, of peoples of Pre-Dravidian stock. In the Talgai skull, and possibly in the Wadjak remains, however, there is evidence that the first inhabitants of Australia were of a more primitive type than the modern Australian native. Unless the Pre-Dravidian hypothesis is entirely fallacious, this implies that the Australoid inhabitant of Tinnevelly, whose skull has been described in this paper, was not the most primitive type of Indian, but that he too, like the Australian, was the descendent of a Talgai-like race.

I wish to express my thanks to Professor G. Elliot Smith, F.R.S., for his advice on several points regarding the Adichanallur skulls; to Professor Sir Arthur Keith, F.R.S., for permission to avail myself of Indian material in the Royal College of Surgeons; and to Mr. F. Bond of the Zoological Society of London for preparing the necessary photographs.

TABLE I.

	Adichanallur No. 1.	Australian. (Hrdlicka, except where otherwise stated).	Tamil. (Harrower) (Males only).
Max. Ant. Post. diameter	183	189·1 ♂.	179·6
		173–210 ♂.	163–191
		179·4 ♀.	
		163–192 ♀.	
Max. Trans. diameter	124	132·2 ♂.	131·5 ♂.
		116–146 ♂.	119·5–144
		127·6 ♀.	
		116–144 ♀.	
Basion-Bregma height	128 (approx.)	133·6 ♂.	136·28
		116–150 ♂.	122·5–148
		127·4 ♀.	
		113–140 ♀.	
Auriculo-vertex height	112	111	116·3
		(Wood-Jones)	109·5–130
Minimum frontal breadth	90	24	95·17
		(Wood-Jones).	86·5–104
Bizyg. width	128	135·8 ♂.	127·8
		120–150 ♂.	116–138·3
		124·8 ♀.	
		111–139 ♀.	
Basion-Nasion diameter	100 (approx.).	103 ♂.	101·5
		92–115 ♂.	89–113
		97·4 ♀.	
		89–107 ♀.	
Basion-Prosthion diameter... ...	107 (approx.).	106·6 ♂.	96·4
		92–123 ♂.	88–107·5
		101·4 ♀.	
		88–113 ♀.	
Nasion-Prosthion diameter ...	70	69·6 ♂.	64·8
		57–86 ♂.	55·5–73·5
		64·8 ♀.	
		55–76 ♀.	
Nasal height	50 (approx.)	48·8 ♂.	49·4
		38–58 ♂.	39·5–55·5
		45·6 ♀.	
		35–53 ♀.	

	Adichanallur No. 1.	Australian (Hrdlicka, except where otherwise stated).	Tamil. (*Harrower*) (Males only).
Nasal width	27	27·3 ♂. 22 33·5 ♂. 25·7 ♀. 21–32 ♀.	24·6. 21–29.
Orbital breadth	40 (approx.)	38·9 ♂. 35·2–46·2 ♂ 37·5 ♀. 33·5–41 ♀.	39·6. 36·5–42·5.
Orbital height	35 (approx.)	33·4 ♂. 26–39·8 ♂. 33 ♀. 29–38 ♀.	32·3. 26–39
Interorbital breadth	27·5	21·5 (Wood-Jones).	
Alveolar length	53 (approx.)	61·9 ♂. 55–72 ♂. 58·5 ♀. 50–68 ♀.	
Alveolar breadth	65 (approx.)	68·1 ♂. 60–80 ♂. 63·3 ♀. 56–70 ♀.	
Cranial capacity	1,268·2 c.c. (Mean of male and female).	1,290·09. (Mean of male and female—Wood-Jones).	1,350·28 c.c. 1,085–1,770.

TABLE II.

Indices.

	Adichanallur No. 1.	Australian.	Tamil. (Males only).
Cephalic index	67·8	69·9 ♂. 57·7–77·9 ♂. 71·1 ♀. 63·2–81·4 ♀.	73·45 66·31–78·24

	Adichanallur No. 1.	Australian.	Tamil. (Males only).
Height index	70	70·7 ♂. 71 ♀. (From mean measurements.)	76·21 70·89–82·22
Gnathic index	107	103·5 ♂. 104·1 ♀. (From mean measurements.)	94·55 87·80–106·06
Upper facial index	54 7	51·2 ♂. 41·3–62·4 ♂. 52 ♀. 42·6–62·5 ♀.	50·7 56·84–79·89
Orbital index	87·5	85·9 ♂. 65–103·5 ♂. 88 ♀. 76·3–100 ♀.	81·34 65–92
Nasal index	54	56 ♂. 45·1–75 ♂. 56·4 ♀. 44·9–74·4 ♀.	51·64 45·37–59·30
Mean height index	83·4	83·2 ♂. 69·9–94·7 ♂. 83·1 ♀. 73·4–93·9 ♀	87·6 (From mean measurements.)
Palatal index...	123	110 ♂. 94·1–128·9 ♂. 108·2 ♀. 94–125·9 ♀.	

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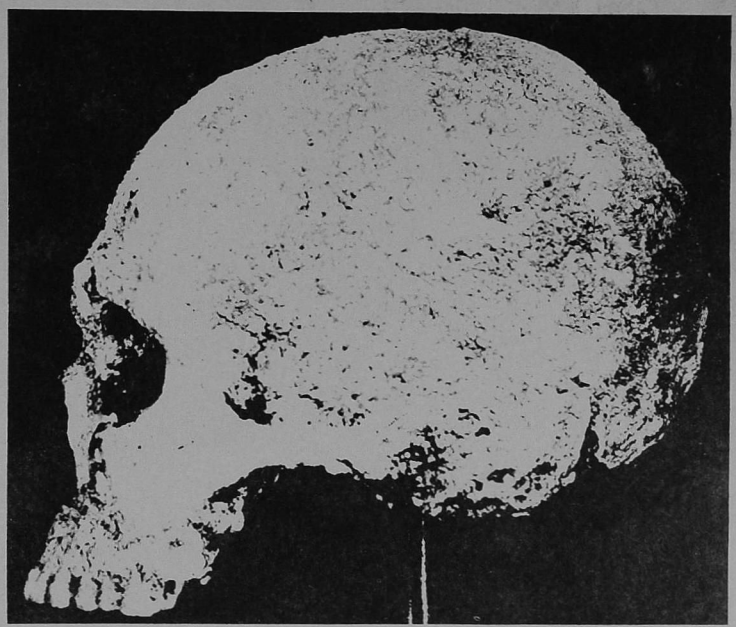
PLATE I.

FIG. 1.—*Adichanallur, No. I.*

„ 2.—*Adichanallur, No. I.*

PLATE I.



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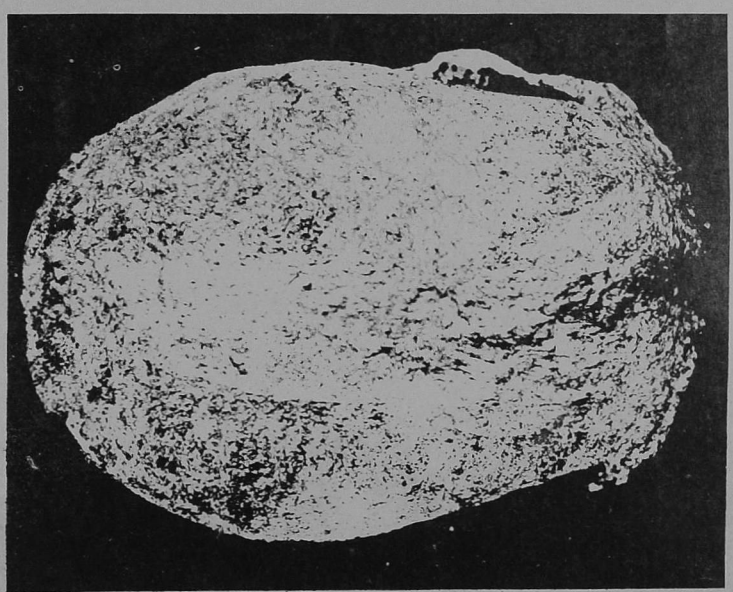


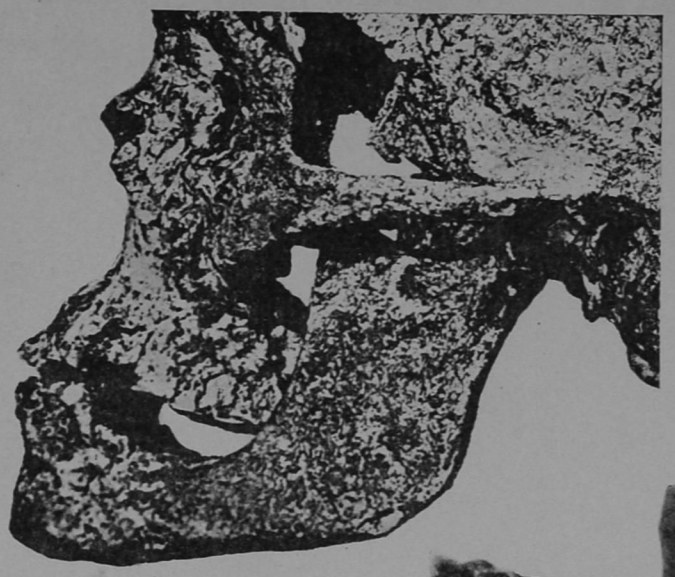
2

PLATE II.

FIG. 3.—*So-called "old woman" of Grimaldi for comparison with the jaw of Adichanallur, No. II.*

„ 4.—*Adichanallur No. II, mandible.*

„ 5.—*Adichanallur No. II, norma lateralis.*



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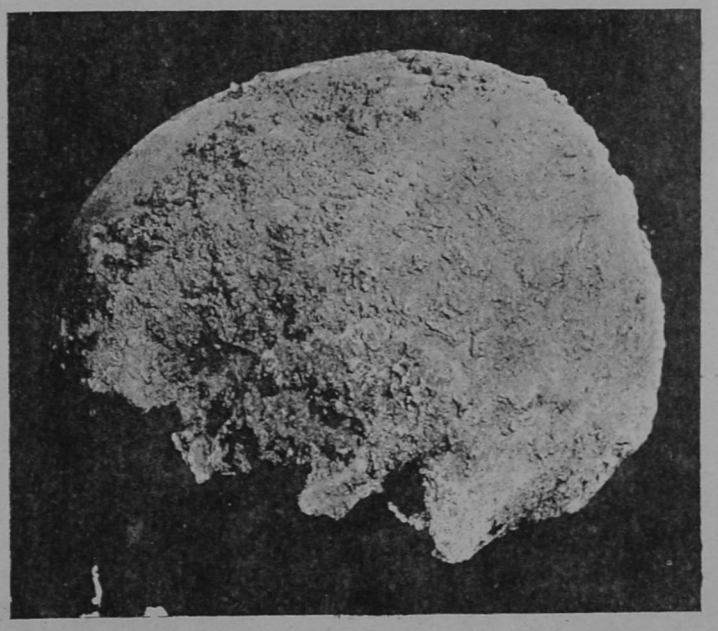

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PLATE III.

FIG. 6.—*Adichanallur No. II, norma verticalis.*

„ 7.—*Adichanallur No. I, norma frontalis.*

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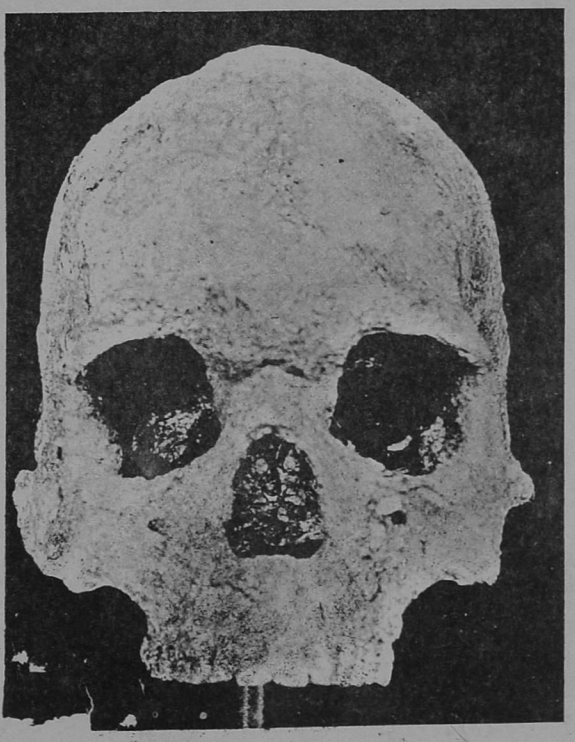

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