



AS-004138

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THE KANETS OF KULU AND LAHOU, PUNJAB:  
A STUDY IN CONTACT-METAMORPHISM.

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(PRESENTED MAY 1900, 1902. WITH PLATES VI-VIII.)

PUBLISHED BY THE  
Anthropological Institute of Great Britain and Ireland,  
3, HANOVER SQUARE, W.

THE KANETS OF KULU AND LAHOUL, PUNJAB: A STUDY IN  
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## I.—INTRODUCTION.

The intrusion of a foreign type into an already populated country results in, to use a geological simile, a series of "contact effects," whose nature and degree must necessarily depend on certain variable factors. The valuation of such ethnic contact-metamorphism has very seldom been subjected to quantitative analysis, and most studies in this direction, being based on political, linguistic or purely national variations, have failed to touch the question of racial modification due to ethnic fusion. In making a study of one such instance of contact-metamorphism, the writer assumes that the principle which forms the working philosophy of the comparative anatomist may be legitimately extended to ethnological problems—that similarity of organization and physical characters implies relationship by descent. Ethnologists, more than most students of natural history, have been slow to recognize this law, partly because our earlier ethnographic data were mainly those relating to language, manners and customs, all of which are, on account of their mutability, of subsidiary value for purposes of classification.

The people who form the subject of this note offer an instance to the point. Sir Alexander Cunningham<sup>1</sup> referred the ancient remains found in the present area of Kanet occupation to a people variously called *Mandas*, or *Mons*, or *Molang*,<sup>2</sup> and said all agreed that these people were the Kanets themselves, whom he consequently, on the basis of this similarity of name and imperfect correspondence in two or three words in their languages, identified with the Mundas of Eastern India, people who differ from the Kanets in physical characters to a degree not easy to parallel in India. Even the easy-going Kanet would resent, if he knew of it, this attempt to place him with the thick-lipped, platyrhine, stunted, black Munda of Chota Nagpur.

Dr. Oppert, using the same treacherous line of argument, first demolished the above conclusions, and then proposed one essentially similar and equally far from what is the probable truth. Dr. Oppert, in his work *On the Origin of Inhabitants of Bharatavarsa*,<sup>3</sup> derives the name Kanet from *Ku*, a mountain, and thence groups the Kanets with his Gaudian division of the Bharatas, along with a crowd of heterogeneous anthropological types, such as the Kurumbas, Kurubas, Kodugas (Gongas), Khonds, Kotas, Kurmais, etc.

<sup>1</sup> *Reports, Archaeological Surv., India*, vol. xiv, 125-126 (1882).

<sup>2</sup> According to Cooma de Kerosi, "the hill people who (well) next to the Tibetans are called by them by the general name of *Mon*." (*Journ. Asiatic Soc. Bengal*, 4, 122.)

<sup>3</sup> Pp. 913, 914.





This paper merely touches an internal question affecting the Kanets, and does not discuss the broader problem as to the relation of these people to the tribes of the Hindustan plains. Materials for the solution of this question will probably appear in the course of the ethnographic survey now being directed by Mr. H. H. Risley. But I think it necessary to take this opportunity of protesting against generalizations of the kind just quoted, in view of the fact that the Indian populations have recently been victimized in a similar way by a distinguished member of this Institute in two books which otherwise deserve respect for the valuable summary of ethnological and philological facts which they contain.<sup>1</sup>

In a general way we know that a pure-blooded type exhibits an uniformity amongst its subjects which contrasts with the great individual variations displayed by a recent racial blend. And we assume, on *à priori* grounds, that the average result of an ethnic cross will be intermediate in all points between the constituent races. But some characters are possibly more susceptible to metamorphism than others, and possibly in no case is there an arithmetical mean. The practical difficulty implied by this general complaint will be more apparent from an example within my own experience. In India the researches of Mr. Risley distinguished as long ago as 1890,<sup>2</sup> three distinct elements amongst the native populations, and subsequent observations, by the same distinguished authority and others, confirmed this analysis. But in 1898 I found, in the Coorgs, an isolated race which could not be relegated to either of the three previously recognized types, and whose origin, for lack of means to identify the constituents of a blend, I was compelled to leave an open question.<sup>3</sup> For the time the question of the origin of the Coorgs, and their relationship to the other known tribes, offered a special difficulty on account of their isolated position and unique characteristics amongst the people of South India. Amongst other features in which they differed from the previously measured tribes of Peninsular India, was their strong tendency to brachycephalism, a feature hitherto not recognized away from the Mongolian frontier zone.<sup>4</sup> Their geographical position and the absence

<sup>1</sup> *Ethnology*, 1st ed., 1896, p. 417, and *Man Past and Present*, 1899, pp. 557 to 560. The observance of linguistic characteristics as a leading feature in classification compels the author of these books to group, for instance, the Kolarian Oraons with Kashmiris, Punjabis, Gujaratis, Maharis, Hindus, Bengalis and Assamis, names which are of various racial values and suggestive of heterogeneous mixtures of essentially distinct types; whilst the Dravidas are made to include the Coorgs with the Gonds, the latter being a people physically similar to the Yeruvas, who, as I have shown elsewhere (*Journ. Asiatic Soc., Bengal*, lxx (iii), 1901, 59), are utterly distinct from the Coorgs. The Coorgs, as a matter of convenience, speak a form of the Dravidian language of South India, but do not resemble their neighbours physically.

<sup>2</sup> Risley: "The Study of Ethnology in India," *Journ. Anthropol. Inst.*, vol. xx, 235-263 (1890).

<sup>3</sup> Holland: "The Coorgs and Yeruvas, an ethnological contrast," *Journ. Asiatic Soc., Bengal* lxx (iii), 1901, 59-98.

<sup>4</sup> Messrs. Risley and Thurston have, during the past year, independently obtained measurements which show a noticeable degree of brachycephalism in the central part of the Indian Peninsula where the Mahradas have had great influence. The Mahravattas agree with the Coorgs in many points besides their warlike characteristics, and it is probable that the latter are but an extreme "outlier" of the former, so the origin of the two will now form a common problem.



of concomitant Mongoloid characters—an appreciable degree of platyopy, for instance—rendered it unlikely that the Coorgs were the result of any recent Mongoloid cross. One assumes that when Mongoloid blood is introduced and brachycephaly results, platyopy and other Mongoloid characters should simultaneously appear. To test this assumption was the object of the investigation recorded in this note. In the case of the Coorgs there was no reason for expecting evidence of Mongoloid blood, and their high degree of pro-opy agrees with that assumption. In the case of the Lahouli Kanets Mongoloid blood certainly has been introduced, and their naso-malar indices, being lower than those obtained on their Kulu caste equivalents, there is positive evidence that an increase of brachycephaly, due to the introduction of Mongolian blood, is accompanied at the same time by a tendency to platyopy and other peculiar Mongoloid characters.

All the caste Hindus in India are in reality the result of contact-metamorphism, and in consequence of the fact that they are the result of a comparatively recent blood mixture, they show a greater irregularity and internal variation in physical characters than we find amongst the pure-blooded jungle tribes. Strict endogamy in a caste tends to anneal the constituent elements and produce uniformity of type without affecting the average; so that analysis of the individual measurements should give us an index to the degree of annealing which has taken place. But the case which I have selected for study is slightly different to that of any well-defined caste in India. The Lahoul Kanets are suspected of including pure elements—pure Indians who have not been tainted with Tibetan blood, as well as Hinduized Tibetans who are not the result of intermarriage. The subjects measured show that this is probably true to a very small degree; most of them show a compound nature, whilst in a few the Indian characteristics are uniformly preserved, and in a still smaller proportion the pure Tibetan type is pronounced. I think this conclusion is reliable from the qualitative point of view; but my data are far too few to permit of a safe quantitative estimate. My anthropometric work was necessarily subordinated to the geological investigations for which I was primarily deputed for a short season to this part of the Himalayas; but so far as they go I think they show that such cases of anthropological contact-metamorphism would certainly repay a detailed survey, and I strongly recommend this branch of anthropology to those who may have the opportunity for research.

The general characters of the people of Kulu and Lahoul have been described by Captain A. F. P. Harcourt, who, in his *Himalayan districts of Kooloo, Lahoul and Spiti*, has given a very full and graphic account of the country and the people. His work and the observations by Sir Alfred Lyall will be found summarized in various gazetteers, and need not be repeated. I have attempted merely to supplement their ethnographic work by an anthropometric survey. For help to this end I am greatly indebted to Mr. H. H. Risley, Census Commissioner of India, who lent me a set of instruments, and to Captain and Mrs. Roe, who gave me invaluable help during the course of the work.

It would be unwise to treat this problem as one of contact-metamorphism



without considering an assertion which might possibly be made, namely, that the Lahoulis are not the results of blood fusion at all, but are merely Tibetans who have become Hinduized. Such a conclusion can only be granted on the assumption that our ideas of caste exclusiveness are false, and it would be, moreover, contrary to what may now be seen in the way of intermarriage in this area. Although practically all castes in India have been modified and none are as pure as their claims pretend, it would be impossible for a whole tribe to identify themselves in this way by mere change of religion with a neighbouring caste, and even were such the case, intermarriage would begin at once and all the phenomena of metamorphism would take place. It is more likely that, as in other castes, the fusion has originated through the delinquencies of a few at the border, and has gradually extended under the circumstances rendered favourable by political and industrial unity. That the Lahoulis are the result of true fusion appears likely, too, from their measurements: all the Tibetans we know are much more brachycephalic, more platyopic and of a different skin colour; the number of distinctly Mongoloid faces one meets amongst Lahoul Kanets is also small, no more, in fact, than one would expect as the result of atavism.

## II.—CONDITIONS OF CONTACT.

Along the Himalayan frontier of India the dolichocephalic people of the plains meet the brachycephalic tribes who inhabit the highlands of Tibet. The roads through the passes permit a considerable amount of commercial intercourse, a commercial overlap from which no caste system could possibly exclude a certain degree of racial fusion. We have no exact ethnographic data so far for the people of this zone, but a general knowledge of them permits a very interesting generalization. Mr. Risley, in his well known work, *Tribes and Castes of Bengal*, and in his review of the subject before this Institute, in a paper which one admires from a literary, no less than from a scientific, point of view, has indicated a gradual fading out of dolichocephalism in corresponding castes when traced from the Punjab, south-eastwards, to Bengal. The high castes of the Punjab are most distinctly and uniformly dolichocephalic, whilst those in Bengal, even Brahmins with their index of 78·7, show a marked tendency to brachycephalism. His explanation, that the fair-complexioned foreigners, who called themselves by the name of Arya, and who invaded India by the north-west gate some four thousand years or less ago, succeeded in leaving more complete relics of their blood in the Punjab than in the provinces farther south-east, seems to agree, so far as that portion of his argument goes, with all later observations, as well as with the testimony of the Hindu classic writings. This part of Mr. Risley's conclusions may be re-stated in another form and with a corollary: the Mongoloid frontier, instead of being driven back to the Central Himalayas as in the Punjab, has retained its influence in Bengal to the southern foot-hills and even to the plains, where the Aryan impact was presumably less felt. And as a rider: the zone of "contact-products" between the two types is narrower in the



Punjab than in Bengal, or, in other words, the boundary line on an ethnographical map would be sharp in the former province, but impossible to demarcate with precision in Bengal. It is the narrower part of the zone where the contrasts are sharper, that I, as a geologist, should first select for a study of the effects of contact-metamorphism.

The people I have selected for study, the Kanets, are sufficiently numerous to have well established characteristics, and are not likely to be affected by small and accidental infusions of foreign blood; they are spread out along one of the great Central Asian trade routes, permitting commercial intercourse with the people of the interior. At the same time the two particular areas selected for comparative survey along this route are separated from one another by a strongly marked mountain ridge, which draws a sharp line between the Kanets of Kulu, who have free intercourse with the purer members of their own caste on the Indian side, and those of Lahoul, who are in communication with the Mongolian people of the interior. Between these two areas, there being a large intercourse during the summer, migrations have taken place freely; and, both being parts of an administrative unit, with similar systems of land tenure, there is an unusual opportunity for actual fusion. In studying such a case of modification near a frontier it is probably more instructive to select, as I have done, the type, or normal, subjects from as near the frontier as possible; for these are the nearest relatives to the people on the other side. If one measured, for instance, the Kanets of Simla district and compared them with those of Lahoul, the contrast would probably be very strong; but that would not test the proposition under consideration, as there is probably not a family in Lahoul that has immigrated directly from Shula. It was my aim to establish the characters of the Kanet type in Kulu, a place which physically resembles the natural home of this people, and contrast them with the essential characters of the Lahoulis, who, though neighbours, live in an area physically similar to that which forms the home of Mongolian peoples of the interior. The ridge between Kulu and Lahoul is a sharp physical boundary, the countries on opposite sides of this ridge being as dissimilar as they possibly could be, whilst with the two peoples under the same form of administration, intercourse is facilitated and racial fusion permitted. Thus, whilst the climate and physical features of Lahoul suit a Mongolian tribe, the political and social conditions are those congenial to the Kanets, and the conditions for fusion are ideal.

A short description of the two taluks, Kulu and Lahoul, will help to an understanding of the way in which contact-metamorphism is brought about and the degree to which it is possible. Both are under the charge of one Assistant-Commissioner, and for administrative purposes they are included in the Kangra district of the Punjab. In Lahoul the old rule of the Thákurs survives in a modified form by the appointment of the heir of Tara Chand, with powers similar to those of a Tahsildar in an ordinary British district. Lahoul has been under the sway of Kulu since the beginning of the eighteenth century, when it



was incorporated by Budh Singh, son of the Kulu Rāja, Jagat Singh, a contemporary of Shāh Jehān and Aurangzeb. Both came under British rule in 1846.

The two taluks are separated by a snowy range of peaks, rising often over 20,000 feet; and in one saddle, the Rotang pass, 13,326 feet, the main, practically the only, means of communication lies. This is the great trade route which passes from the Punjab through the valley of Kulu and thence by Lahoul to Ladakh and the Central Asian highlands. The ridge on which the Rotang pass lies separates two utterly distinct countries. On the one side we have the dreary desolate grandeur of Lahoul—deep gorges, with roaring rivers of muddy glacier water, precipitous, slippery, and slipping slopes of slates, schists, and granites, offering here and there, in a sheltered nook, a precarious foot-hold for a few miserable birches; a dreary country in which the continual din of the mountain torrents and the desolate slopes become absolutely depressing. Such is most of Lahoul, and it is only near the junction of the two main rivers, the Chandra and the Bagha, at an elevation a little below 10,000 feet, that one finds patches of cultivable land and room for a few small villages.

A single short march from the bed of the Chandra over the Rotang pass, and one enters quite a different scene, with a sense of relief only to be appreciated by one who has had a long spell of lonely camp life in Lahoul. In Kulu the higher slopes are clothed with forests of stately deodars, pines, and cedars, relieved by walnut, plane, and evergreen oak, whilst at lower levels fruit trees and flowering shrubs break the regularity of the cultivated terraces, and surround the clusters of picturesque homesteads, which in style of architecture remind one of a Swiss valley. The people honestly reflect the natural fertility of the valley: they form the most prosperous and apparently the happiest community of peasants I have met anywhere in India.

The people who in Lahoul live on the small amount of cultivable land available are, one would expect from the nature of the country and its severe climate, more likely to belong to the hardy Mongoloid tribes of the interior, than to be immigrants from such a luxurious valley as Kulu. Yet the land system, occupation and now the religion get their taint from Kulu, and the people of the zemindar class are pleased to identify themselves with the neighbouring Kanets, whose exclusiveness is not sufficiently rigid to resent this form of flattery. If you ask the Lahoulī ryot what his caste is, he invariably answers, "zemindar," and on cross-examination explains that he is practically the same as the Kulu zemindar in occupation, habits, and, finally, caste. It is here that one may say that in the divisions of caste, function plays a more prominent part than the racial idea. It is through similarity of occupation that their weak claim to the caste position occupied by the zemindars of Kulu is permitted, and, finally, by migration and intermarriage, made real. Some of the Lahoulī Kanets are not separated by many generations from people who were orthodox Buddhist Mongolians, but who have adopted the attenuated form of Hinduism which reaches Lahoul.

It is interesting to find that the claims based on similarity of occupation are



able to eclipse the pride of blood which so rigidly characterizes the high-caste Hindu where, in the Peninsula of India, he comes into direct contact with the less comely Kolarian. The differences of opinion which have been expressed on this question as to the nature of caste origin are probably more apparent than real, and the outcome of studying the problem from opposite phases of the same truth. By those who have studied the people in areas where the caste divisions are expressed by differences of occupation rather than physical features, community of function has been considered to be at the root of the caste system. In other areas, where the Hindus live side by side with the unmodified aborigines, as for instance in Behar and Chota Nagpur, distinctions of race appear to be maintained and accentuated amongst the castes. Both ideas may be locally true and both consistent with Mr. Risley's unassailable conclusion, that on the average the grades of caste correspond to ethnic differences, which only in degree mark off the high-caste Hindu from the black Kolarian. In the home of the Kanets the answer, "I am a zemindar" comes more promptly than "I am a Kanet"; in other words, occupation is the leading character of distinction, not descent. This fact comes out not only when one studies the relations of the Kanets as a whole, to the Mongolian families of Lahoul, it shows itself also in their subdivisions. In any group of Kanets the *Raos*, on invitation, will separate themselves from the *Khasias*, and, notwithstanding the claim of the latter to a superior Rajput descent, they will intermarry and eat together, whilst measurements, as might be expected, fail to show an average difference between the two subdivisions. That there was once a real distinction seems highly probable, but it now no longer persists except in the family names and traditions. In Spiti, I understand, the caste distinctions are even less carefully defined than in Kulu and Lahoul, and the so-called Kanets are said to be almost pure Tibetans.

Language has had something to do with the partial failure to keep the castes distinct, or, in other words, the languages show a composite character as the people do in blood. Pahāri, which is built up on a basework of Hindi and Urdū in Kulu, becomes distinctly tinged with Tibetan words in the upper part of the valley, and becomes a merely modified Tibetan in Lahoul. The names of the subjects measured show this: most of those measured in Lahoul gave Tibetan names. There are, however, quite distinct compound-dialects in the different villages of Lahoul, and if one made a more detailed ethnographic survey than was possible during my stay in the country, one would probably find a corresponding local variation in ethnic characters.

### III.—ANTHROPOMETRY.

A very reliable average for a well-defined caste can be obtained by measuring twenty-five subjects taken at random; but a larger number is desirable for purposes of analysis, especially in the case of castes into which strange blood has recently been imported. It was my intention to measure at least sixty of each caste, and though this was done in Kulu, there was no opportunity in Lahoul of getting more



than thirty subjects. I give, however, the individual measurements of all the subjects measured in the hope that the work may some day be continued, when a more complete examination can be made of the interesting results of this Indo-Tibetan cross. To attack the problem from a quantitative point of view would necessitate a survey on the Tibetan side of the frontier also. At present we have precise data of only one constituent of the cross, but we assume that the

TABLE I.  
*Individual Measurements of Lahoul Kanets.*

No.	Name.	Age.	Stature.	Span of arms.	Span $\times$ 100 Stature	Height sitting.	Height Sitting $\times$ 100 Stature	Height Kneeling.	Stature minus height kneeling.	Leg $\times$ 100 Stature	Cubit.	Cubit $\times$ 100 Stature	Left foot length.	Foot $\times$ 100 Stature
1	Serju ....	38	166	161	99	87	52.4	120	46	27.7	45.2	27.2	23.7	14.3
2	Bija Rām ...	28	171	174	102	88	51.5	126	45	26.3	46.9	27.4	24.6	14.4
3	Dārja ...	31	162	161	99	80	53.1	122	40	24.7	44.7	27.6	21.2	14.3
4	Tāgū ...	28	164	174	106	88	53.7	123	41	25.0	46.3	28.2	24.6	15.0
5	Santā ...	24	158	165	104	81	55.7	119	39	24.7	43.4	27.5	23.7	15.0
6	Kānga ...	32	163	164	101	86	52.8	124	39	23.9	43.3	26.6	23.4	14.4
7	Fāti ...	34	145	144	99	79	54.5	109	36	24.8	39.6	27.3	22.7	15.7
8	Tāk-tāk ...	40	161	166	103	81	50.3	116	45	27.9	45.6	28.3	25.1	15.6
9	Panna ...	26	165	162	98	91	55.2	124	41	24.8	43.6	26.4	24.8	15.0
10	Zangbo ...	21	162	166	103	83	51.2	121	41	25.3	44.2	27.3	24.1	14.9
11	Anū ...	29	164	170	104	86	52.4	119	45	27.4	47.4	28.9	24.1	14.7
12	Kyatūk ...	30	172	182	106	90	52.3	125	47	27.3	48.2	28.0	24.7	14.4
13	Palzū ...	24	163	166	102	87	53.4	122	41	25.2	45.0	27.6	25.4	15.6
14	Tauzen ...	38	164	169	103	83	50.6	119	45	27.4	45.4	27.7	24.3	14.8
15	Sūkh Rām ...	50	164	165	101	87	53.0	124	40	24.4	42.9	26.2	24.1	14.7
16	Labzang ...	27	160	164	102	84	52.5	119	41	25.6	44.3	27.7	23.9	14.9
17	Shoamrigzin ...	34	170	170	100	93	54.7	128	42	24.7	46.6	27.4	24.3	14.3
18	Padmātashi ...	25	148	163	110	79	53.4	111	27	25.0	42.4	28.6	22.7	15.3
19	Dandi ...	50	159	158	99	87	54.7	116	43	27.0	42.7	26.9	23.8	14.9
20	Kyatūk ...	33	161	168	104	85	52.8	120	41	25.5	44.9	27.9	24.6	15.3
21	Senso ...	41	153	158	103	81	52.9	111	42	27.5	42.3	27.6	22.6	14.8
22	Gangnand ...	35	159	163	102	87	54.7	120	39	24.5	43.5	27.4	23.1	14.5
23	Kātosaring ...	40	165	161	104	83	53.5	116	39	25.2	42.9	27.7	23.7	15.3
24	Gārū ...	37	168	174	104	98	52.4	125	48	25.6	46.8	27.7	25.7	15.3
25	Sūnamsaring ...	45	160	167	104	84	52.5	117	43	26.9	46.2	28.9	23.6	14.8
26	Namgal ...	43	159	160	100	87	54.7	121	38	23.9	43.9	27.6	21.1	13.2
27	Sūnamsangbo ...	50	165	173	105	87	52.7	120	45	27.3	46.3	28.4	24.1	14.8
28	Babja ...	31	159	164	103	85	54.1	118	41	25.5	43.3	27.2	23.9	15.0
29	Tandop ...	30	160	163	102	89	55.6	122	38	23.7	42.5	26.6	23.1	15.1
30	Gopāl ...	25	175	179	103	92	52.6	130	45	25.7	48.9	28.0	25.1	14.3

Tibetans are in general more brachycephalic, more platyopic, more leptorhine and shorter than the Kanets of Kulu. In all these four points the average Kanet of Lahoul differs from the average of Kulu; but neither approaches the typical Mongoloid, and it is consequently by no means certain that the Lahouli Kanet is, as he is often asserted to be on account of his language and religion, more Tibetan than Indian. So far as one is justified in drawing a conclusion from these results, Indian blood now predominates in Lahoul though it is quite distinctly diluted.

TABLE II.  
*Individual Measurements of Lahoul Kanets—(continued).*

No.	Name.	Cephalic.			Nasal.			Bi-malar breadth.	Naso-malar.		Facial angle.
		Length.	Breadth.	Index.	Length.	Breadth.	Index.		Breadth.	Index.	
1	Sarju ....	18.8	14.7	78.2	5.4	3.8	70.4	10.1	11.7	116	67
2	Bija Rām ....	18.9	14.5	76.7	5.0	3.7	74.0	10.0	11.4	114	65
3	Dārja ....	18.5	14.6	78.9	5.4	3.7	68.5	10.2	11.4	112	66
4	Tágá ....	19.0	14.8	77.9	5.2	3.5	67.3	10.7	11.7	109	62
5	Santá ....	19.2	14.7	76.6	5.2	3.5	67.3	10.1	11.3	112	66
6	Kúnga....	19.2	15.1	78.6	5.8	3.3	56.9	9.6	11.1	115	67
7	Fáti ....	19.1	14.8	77.5	4.8	3.4	70.8	9.7	10.5	109	65
8	Túk-túk ....	17.9	14.7	82.1	5.7	3.7	64.9	10.6	11.1	105	67
9	Panna ....	19.9	14.3	71.9	5.5	3.8	69.1	9.7	11.0	113	64
10	Zangho ....	19.1	14.5	75.9	5.6	3.2	57.1	9.8	10.9	111	66
11	Anú ....	19.6	14.9	76.0	5.9	3.6	61.0	9.6	10.5	109	67
12	Kyatúk ....	18.6	14.5	78.0	5.7	3.4	59.7	10.3	11.2	109	67
13	Palzú ....	18.6	14.9	80.1	5.1	3.6	70.6	9.9	11.2	113	64
14	Tauzan ....	18.4	14.2	77.2	5.6	3.9	69.6	9.5	10.7	113	62
15	Súkh Rām ....	18.1	14.6	80.7	5.4	3.9	72.2	9.4	10.1	107	67
16	Labzang ....	19.1	14.8	77.5	5.3	3.2	60.4	9.9	11.2	113	67
17	Sonamrigzin ....	19.5	14.7	75.4	5.7	3.3	57.9	10.4	11.2	108	65
18	Padmatashi ....	18.1	14.1	77.9	4.9	3.4	69.4	10.2	11.4	112	67
19	Dandú....	19.1	14.6	76.5	5.6	3.8	67.9	9.7	11.0	113	62
20	Kyatúk ....	19.4	15.4	79.4	5.7	3.6	63.2	10.3	11.8	115	68
21	Sanso ....	18.5	14.8	80.0	5.2	3.7	71.3	9.7	11.6	120	66
22	Gangband ....	18.6	14.1	76.8	4.7	3.4	72.3	9.9	10.4	105	67
23	Kútosaring ....	18.9	15.5	82.0	5.5	3.3	60.0	9.8	11.2	114	64
24	Gúrú ....	19.7	15.4	78.2	5.1	3.6	70.6	10.8	12.3	118	74
25	Sánamsaring ....	19.1	14.6	76.5	5.9	3.5	59.3	9.6	11.0	115	62
26	Naungial ....	19.2	14.9	77.6	5.2	3.3	63.5	9.7	10.6	109	72
27	Sónamzangho....	18.8	13.8	73.4	4.9	3.7	75.5	9.3	11.4	123	65
28	Rabgia ....	19.2	14.4	75.0	5.2	3.3	63.5	9.2	10.8	117	69
29	Tundop ....	19.4	14.5	74.7	4.9	3.7	75.5	9.7	11.4	117	66
30	Gopal ....	18.8	14.7	78.2	5.2	3.3	63.5	10.3	12.6	122	72



TABLE III.  
*Individual Measurements of Kulu Kanets.*

No.	Name.	Age.	Stature.	Span of arms.	Span x 100 Stature.	Height sitting.	Height sitting x 100 Stature.	Height kneeling.	Stature minus height kneeling.	Leg x 100 Stature.	Cubit.	Cubit x 100 Stature.	Left foot length.	Foot x 100 Stature.
1	Primu	25	162	162	100	82	50.6	121	41	25.3	44.8	27.7	24.4	15.1
2	Sangtú	23	169	168	99	85	50.3	127	42	24.9	45.7	27.0	25.7	15.2
3	Maitú	48	165	165	100	85	51.5	122	43	26.1	44.4	26.9	25.2	15.3
4	Dhálú	22	172	172	100	90	52.3	129	43	25.0	45.8	26.6	25.5	14.8
5	Párm	40	162	167	103	86	53.1	121	41	25.3	44.6	27.5	23.3	14.4
6	Rám Dás	32	163	162	99	85	52.1	119	44	27.0	44.3	27.2	24.3	14.9
7	Ráp Dás	31	171	171	100	91	53.2	127	44	25.7	45.4	26.5	25.3	14.8
8	Harú	49	163	170	104	84	51.5	121	42	25.8	44.3	27.2	24.8	15.2
9	Tekú	25	160	169	106	83	51.9	119	41	25.6	44.8	28.0	23.5	14.7
10	Kálú	46	163	161	99	86	52.8	120	43	26.5	43.2	26.5	25.2	15.5
11	Rallú	21	168	175	104	88	52.4	125	43	25.6	46.5	27.7	25.4	15.2
12	Dianú	42	165	174	106	84	51.0	124	41	24.8	45.0	27.3	25.2	15.3
13	Repta Rám	44	173	173	100	91	52.6	128	45	26.0	46.8	27.1	27.2	15.7
14	Nathú	26	166	162	98	91	54.8	125	41	24.7	41.9	25.2	23.2	14.0
15	Raddi	20	166	171	103	83	50.0	120	46	27.7	44.9	27.0	24.7	14.9
16	Brim Dás	38	165	170	103	86	52.1	123	42	25.5	46.6	28.2	26.0	15.8
17	Siasú	36	159	164	103	84	52.8	118	41	25.8	43.3	27.2	25.2	15.3
18	Útmú	36	163	167	103	86	52.8	122	41	25.2	44.9	27.6	24.7	15.2
19	Gatanú	25	161	168	104	85	52.8	120	41	25.5	44.6	27.7	25.5	15.8
20	Khultú	31	170	167	98	89	52.4	126	44	25.9	46.3	26.6	24.8	14.6
21	Uddó	32	169	171	101	90	53.3	126	43	26.4	44.6	26.4	24.2	14.3
22	Paráú	40	169	173	102	91	53.8	127	42	24.9	46.3	27.4	24.3	14.7
23	Devi Rám	23	163	162	99	87	53.4	121	42	25.3	44.0	27.0	25.3	15.5
24	Matthi	44	169	179	106	89	52.6	125	44	26.0	47.3	28.3	26.3	16.6
25	Sullú	42	170	173	106	86	50.6	127	43	26.3	47.3	26.1	26.2	15.4
26	Nandú	30	160	166	104	83	55.0	121	39	24.4	44.0	28.1	24.3	15.2
27	Bika Rám	24	167	172	103	88	52.7	123	44	26.3	46.1	27.0	24.7	14.8
28	Badhe	26	162	164	101	87	53.7	120	42	26.0	44.3	27.3	25.1	15.6

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No.	Name.	Age.	Stature.	Span of arms.	Span × 100 Stature.	Height sitting.	Height sitting × 100 Stature.	Height kneeling.	Stature minus height kneeling.	Leg × 100 Stature.	Cubit.	Cubit × 100 Stature.	Left foot length.	Foot × 100 Stature.
29	Rám Dhan ....	31	166	170	102	86	51.6	123	43	25.9	45.5	27.4	24.4	14.7
30	Soárú ....	36	164	168	102	90	54.9	121	43	26.2	43.8	26.7	24.4	14.9
31	Tálú ....	30	166	166	100	89	53.6	124	42	25.3	44.9	27.0	24.6	14.8
32	Sangtú ....	35	167	172	103	86	51.5	124	43	25.7	46.1	27.6	24.7	14.8
33	Badi Rám ....	25	167	174	104	89	53.3	126	41	24.6	47.5	28.4	24.3	14.6
34	Shám Dás ....	22	166	167	101	88	53.0	123	43	25.9	44.9	27.0	24.9	15.0
35	Gupta Rám ....	38	176	182	103	91	51.7	131	45	25.6	49.2	28.0	25.0	14.2
36	Káli Rám ....	36	157	162	103	85	54.1	117	40	25.5	43.7	27.8	24.2	15.4
37	Rushú ....	37	169	175	104	88	52.1	126	43	25.4	46.0	27.2	24.4	14.4
38	Rashnú ....	40	163	166	102	84	51.5	121	42	25.8	43.7	26.8	24.1	14.8
39	Nesú ....	25	161	167	104	80	49.7	119	42	26.1	45.4	26.2	25.2	15.7
40	Nankú ....	26	163	172	106	86	52.8	124	39	29.9	45.0	27.6	23.6	14.5
41	Nathlú ....	30	159	163	102	87	54.7	119	40	25.2	42.8	26.9	24.9	15.6
42	Nátú ....	34	165	177	107	86	52.1	124	41	24.8	47.1	28.5	26.2	15.9
43	Nokú ....	27	169	171	101	84	49.7	126	43	25.4	45.7	27.0	25.1	14.9
44	Bikan Dás ....	37	166	169	102	86	51.8	124	42	25.3	45.2	27.2	25.3	15.2
45	Dhálú ....	47	156	158	101	80	51.3	116	40	25.6	42.5	27.2	24.4	15.6
46	Tálú ....	24	160	165	103	87	54.4	119	41	25.6	43.2	27.0	23.7	14.8
47	Damodar ....	24	165	175	106	85	51.5	122	43	26.1	45.7	27.7	24.8	15.0
48	Gauga Rám ....	32	163	175	107	86	52.8	122	41	25.2	46.4	28.5	25.1	15.4
49	Abhú ....	50	171	174	102	89	52.0	124	47	27.5	49.3	28.8	26.1	15.3
50	Ratni ....	33	162	170	105	82	50.6	118	44	27.2	46.1	28.5	25.1	15.5
51	Dadrú ....	38	164	174	106	87	53.0	124	40	24.4	44.7	27.3	24.7	15.1
52	Matthi ....	42	172	172	100	91	52.9	123	49	28.5	45.1	26.2	25.9	15.1
53	Dúlú Rám ....	27	160	166	104	83	51.9	119	41	25.6	43.4	27.1	24.1	15.1
54	Tálú ....	35	168	167	99	87	51.7	122	46	27.4	45.6	27.1	24.5	14.6
55	Sítha Rám ....	41	173	180	104	90	53.8	119	50	28.0	47.7	27.0	26.6	15.4
56	Mullo ....	43	170	180	109	82	48.2	120	47	27.6	50.3	29.6	27.4	16.1
57	Maghú ....	36	160	163	102	84	52.5	122	38	28.7	42.1	26.6	22.9	14.3
58	Nandú ....	30	172	176	102	99	54.1	128	44	25.6	46.2	26.9	26.2	16.2
59	Champi ....	29	164	161	98	86	52.4	121	43	26.2	44.1	26.9	25.5	15.6
60	Sáru ....	28	166	161	99	85	51.2	121	45	27.1	45.6	27.5	24.6	14.5



TABLE IV.  
*Individual Measurements of Kulu Kanets—(continued.)*

No.	Name.	Cephalic.			Nasal.			Bi-malar breadth.	Naso-malar.		Facial angle.
		Length.	Breadth.	Index.	Length.	Breadth.	Index.		Breadth.	Index.	
1	Primú ... ..	19.0	14.6	76.8	4.8	3.7	77.1	11.1	13.0	117	70
2	Sangtú ... ..	18.7	13.6	72.7	5.1	3.4	66.7	10.4	11.2	108	72
3	Maitú ... ..	20.3	14.6	71.9	5.9	3.3	55.9	10.4	12.0	115	70
4	Dhólú ... ..	19.2	14.2	74.0	5.4	3.8	70.4	11.3	12.9	114	68
5	Parin ... ..	19.5	15.0	76.9	4.8	3.9	81.3	10.5	12.6	120	68
6	Rám Dás ... ..	19.8	14.2	71.7	5.2	4.4	84.6	10.8	12.7	117	69
7	Ráp Dás ... ..	18.9	14.8	78.3	5.2	3.8	73.1	9.9	11.3	114	68
8	Hazú ... ..	19.8	14.1	71.2	4.8	4.1	85.4	9.9	11.8	119	73
9	Tekú ... ..	18.8	14.6	77.7	4.8	3.7	77.1	9.9	12.1	122	76
10	Kálú ... ..	19.4	15.4	79.4	4.5	4.3	95.5	10.6	12.0	113	74
11	Ballú ... ..	18.3	13.6	74.3	5.3	3.7	69.8	9.9	10.8	109	65
12	Dianú ... ..	19.2	14.2	74.0	4.8	3.8	79.2	9.7	12.4	128	72
13	Repts Rám ... ..	20.4	14.6	71.6	5.5	3.7	67.3	8.8	11.4	120	73
14	Nothú ... ..	18.5	13.8	74.6	5.1	3.5	68.6	9.8	11.2	114	73
15	Raddi ... ..	19.5	14.3	73.3	5.1	3.5	68.6	10.7	12.8	119	71
16	Brim Dás ... ..	19.8	14.2	71.7	5.3	3.8	71.7	10.3	11.8	109	71
17	Sisú ... ..	18.9	13.7	72.5	5.1	3.4	66.7	10.6	11.8	111	74
18	Utunú ... ..	19.2	13.5	70.3	5.3	3.0	56.6	9.7	11.6	120	65
19	Gutamú ... ..	18.6	13.6	73.1	5.0	3.9	78.0	9.7	11.6	120	67
20	Khaltú ... ..	19.9	15.2	76.4	5.4	4.1	75.9	10.3	12.2	118	70
21	Uddú ... ..	18.7	14.3	76.5	4.9	3.8	77.6	9.4	10.8	115	72
22	Parú ... ..	18.9	14.4	76.2	5.6	3.9	69.6	9.9	11.2	113	68
23	Devi Rám ... ..	19.4	14.3	73.7	4.5	3.4	75.6	9.7	11.8	122	68
24	Matthi ... ..	19.3	13.8	71.5	5.3	3.6	67.9	9.9	11.8	116	67
25	Sitú ... ..	19.7	14.5	73.0	5.2	3.6	69.2	10.1	11.4	119	69
26	Nandú ... ..	19.3	14.5	75.1	4.9	3.7	75.5	9.3	10.8	116	67
27	Bika Rám ... ..	19.2	14.5	75.5	5.3	4.1	77.4	10.6	11.4	108	66
28	Badhr ... ..	19.4	14.4	74.3	4.7	3.8	80.9	10.2	11.8	116	70
29	Rám Dian ... ..	19.9	14.5	72.9	5.1	3.9	76.5	10.1	11.4	113	71

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No.	Name.	Cephalic.			Nasal.			Bi-malar breadth.	Naso-malar.		Facial angle.
		Length.	Breadth.	Index.	Length.	Breadth.	Index.		Breadth.	Index.	
30	Soárú ....	18.9	14.3	75.7	5.1	3.9	76.5	9.6	11.6	121	69
31	Túlú ....	19.4	13.8	71.1	4.9	3.9	79.6	10.0	11.6	116	66
32	Sangtú ....	19.9	14.3	71.9	5.1	3.6	70.6	10.3	11.8	115	69
33	Badi Rám ....	19.1	14.2	74.3	5.1	3.5	68.6	9.6	10.8	113	70
34	Shám Dás ....	18.5	14.0	75.7	5.1	4.2	82.4	10.2	12.2	120	75
35	Gupta Rám ....	19.8	14.5	73.2	5.5	3.9	70.9	10.5	11.8	112	72
36	Káli Rám ....	18.5	14.4	77.8	4.8	3.3	68.8	10.4	11.4	110	67
37	Rashú ....	18.5	13.8	74.6	5.4	4.1	75.9	10.2	11.3	111	65
38	Rashnú ....	19.5	15.0	76.9	5.3	4.0	75.5	11.1	12.4	112	66
39	Nesú ....	20.2	14.3	70.8	4.5	3.3	73.3	10.0	12.0	120	65
40	Nankú ....	19.3	13.2	68.4	4.6	3.4	73.9	10.1	11.7	116	68
41	Nathlú ....	19.1	14.2	74.3	4.6	3.5	76.1	9.4	10.6	113	71
42	Nátú ....	19.3	13.6	70.5	4.9	3.7	75.5	10.4	12.4	119	68
43	Nokú ....	19.2	14.6	76.0	5.0	3.9	78.0	9.9	12.2	123	68
44	Bikun Dás ....	20.4	14.6	71.6	5.7	4.1	71.9	10.1	11.2	111	67
45	Dhúlú ....	19.2	13.7	71.4	5.4	3.9	72.2	9.7	10.6	109	69
46	Túlú ....	19.1	13.9	72.8	4.6	3.6	78.3	10.1	10.8	107	67
47	Danodar ....	19.9	13.8	69.3	4.8	3.7	77.1	9.9	11.4	115	66
48	Ganga Rám ....	19.3	14.2	73.6	4.5	3.7	82.2	10.2	11.6	114	70
49	Ablú ....	19.1	14.2	74.3	5.2	3.9	75.0	10.1	11.8	117	68
50	Ratni ....	19.1	14.5	75.9	5.2	3.2	61.5	9.9	11.2	113	68
51	Dadrú ....	19.3	14.5	75.1	5.3	4.0	75.5				
52	Matthú ....	19.7	14.3	72.6	5.6	3.7	66.1				
53	Dúlú Rám ....	18.2	14.6	80.2	5.0	3.9	78.0				
54	Túlú ....	18.5	14.5	78.4	4.9	3.6	73.5				
55	Sítha Rám ....	18.4	13.9	75.5	4.8	3.8	79.2				
56	Mullú ....	18.6	13.7	73.7	5.3	3.5	66.0				
57	Maghú ....	18.9	13.8	73.4	5.2	3.5	67.8				
58	Nandú ....	20.2	14.6	72.2	5.0	3.9	78.0				
59	Champi ....	18.9	14.6	77.2	4.9	3.8	77.6				
60	Sarú ....	18.8	14.8	78.7	4.9	3.7	75.5				



TABLE V.  
*Summary of Measurements.*

	Kulu.			Lahoul.		
	Max.	Average.	Min.	Max.	Average.	Min.
	cm.	cm.	cm.	cm.	cm.	cm.
Stature ....	176	165.4	156	175	161.8	145
Span of arms ....	186	169.5	158	179	165.9	144
Span relative to stature (100) ....	169.4	102.5	97.6	110.1	102.5	98.2
Height, sitting ....	93	86.6	80	93	86.1	79
Height sitting relative to stature (100) ....	55.0	52.3	48.2	55.7	53.2	50.3
Height, kneeling ....	131	122.9	116	130	120.3	109
Stature minus height kneeling = leg ....	50	42.5	38	47	41.6	36
Leg relative to stature (100) ....	28.9	25.8	23.7	27.9	25.7	23.7
Left fore-arm (cubit) ....	50.3	45.3	41.9	48.9	44.7	39.6
Cubit relative to stature (100)....	29.6	27.3	25.2	28.9	27.6	26.2
Cephalic length (max. glabella-occipital) ....	20.4	19.2	18.1	19.9	18.9	17.9
" breadth (maximum)....	15.4	14.3	13.2	15.5	14.7	13.8
" index ....	81.2	74.3	68.4	82.1	77.5	71.9
Nasal length ....	5.9	5.06	4.5	5.9	5.3	4.7
" breadth ....	4.4	3.74	3.0	3.9	3.5	3.2
" index ....	65.5	74.1	55.9	75.5	66.4	56.9
Naso-malar, breadth ....	13.0	11.7	10.6	12.8	11.2	10.1
Bi-malar, breadth ....	11.3	10.1	8.8	10.8	9.9	9.2
Naso-malar index ....	129	115.5	107	123	112.9	105
Left foot, length....	27.4	24.9	22.9	25.7	24.1	22.6
Foot length relative to stature (100) ....	16.1	15.1	14.0	15.7	14.9	14.3
Facial angle ....	76°	69.4°	65°	74°	69.3°	62°

Both constituents of the Lahouli cross are, compared with the majority of Indian tribes, distinctly leptorhine. The lowest nasal indices recorded by Mr. Risley in his *Tribes and Castes* are of the Gujars of the Punjab and the Mongoloid Lepchas of the Darjeeling Hills. The effect of this cross would therefore tend to improve the nose by dilution of the "black" blood which forms a constituent of the ordinary Kanet; this the measurements show to be the case. In the head measurements, however, the constituent elements are derived

from opposite types, the Punjabi people being essentially dolichocephalic, whilst the Tibetans are presumably brachycephalic. Judging by the Tibetans of the Darjeeling area, where the cephalic index is always over 78.5 and averages 80.7 (Risley), the Tibetan blood in Lahoul must be subordinate to the Punjabi (Indian), the infusion being sufficient only to raise the average from 74.3 of the typical Kanet to 77.5 in the Lahouli. The average naso-malar index points to the same conclusion; Risley's average for the Mongoloid Darjeeling tribes is as low as 108.6, whilst for the Punjabi castes it is 116.0. The Kulu Kanets, with an average of 115.5, thus approach the Punjab average, whilst in Lahoul the average is lowered to 112.9. Risley gives 168.4 cm. as the average stature of the Punjab tribes, the Khatri and Aroras most nearly approaching the Kanets with 166.2 and 165.8 respectively. The Mongoloids of Darjeeling average 161.2, only just below that of the Lahoul Kanets. But this does not necessarily show a preponderance of Tibetan blood in Lahoul, as the "black" blood in the Kanets also tends to low stature, and its effect would supplement that of the Tibetan infusion. The other characters measured are of doubtful ethnological significance, though with further data they may prove to be of value for comparative purposes. The only point of possible value is the facial angle, in which there is insufficient variation in India to permit of its use as a prominent characteristic for classification. As far as the data go, however, the figures obtained in Kulu and Lahoul fall into line with what one would expect from previously recorded data. Thus, assuming again that Risley's Darjeeling tribes represent average Mongoloids, we find there is, compared with the high castes of India, a slight tendency to prognathism. The average for the Darjeeling area is 65.2; that for the Punjab 69.2. In the case of the Kanets the Kulu people, with 69.4, conform to the Punjab average, whilst the Lahoulis, with 66.3, are nearer the Mongoloid type, as they should be according to their assumed ancestry.

Although there is no doubt that the evidence of these six characteristics—cephalic, naso-malar and nasal indices, stature and facial angle—uniformly points to the presence of a large proportion of Tibetan blood in the Lahoul Kanets, we are unable to form a precise idea of the quantitative relations of the Indian to the Tibetan strain. Some day we shall probably obtain a coefficient for correlating the degree of alteration in such physical criteria with the proportion of blood mixture in a tribe of known origin.

#### IV.—DISCRIMINATION OF UNALTERED CONSTITUENTS FROM THE RESULTS OF ATAVISM.

##### *A. Analysis of Lahoulis with brachycephalic tendencies.*

Analysis of my measurements of the Coorgs and Yeruvyas pointed to the conclusion that atavistic tendencies on the part of individuals when shown in one particular physical feature were not maintained uniformly in all characters. The Coorgs, like all the higher castes of India, have absorbed a certain amount of "black" blood as a result of long intercourse with the Kolarian (Dravidian) races.



but a Coorg who shows such Kolarian taint in say a high nasal index seldom or never exhibits other aboriginal traits more than the average of his tribe.<sup>1</sup> I have applied the same system of analysis to my measurements of the Kanets in the Kulu-Lahoul "contact zone," and though it is desirable to have many more data than I possess for a satisfactory discussion of this subject, the results obtained are not without interest.

In the case of the Lahoulis, for instance, the application of this test shows that the population now contains very little of the unaltered Tibetan element, whilst there are apparently some individuals who uniformly tend toward the Indian type. So far as the history of the area goes this is the result which might be expected. The Kanets of Lahoul include a certain number of immigrant families from the Kulu side, and they have not been long enough in the country to have their blood tainted by intermarriage with those who have Tibetan blood. On the other hand, there are probably few Kanets in Lahoul who are the simple result of conversion from Tibetan families; the Tibetan blood in this caste must have been introduced gradually by intermarriage, and now shows itself diluting the Indian blood, affecting the average, but not appearing "neat" in many individuals. Had the Lahoul Kanets consisted of a simple mechanical mixture of Tibetan families with Indian families, one should be able to pick out a large proportion of distinctly Tibetan individuals from amongst those measured, and distinguish them from the purely Indian types. But as the result of actual fusion the individuals who show a Tibetan tendency in head measurements, show a leaning towards the Indian type in other characters.

In Table VI, we have the measurements of fifteen Lahouli Kanets who, by their head measurements, show a tendency to brachycephalism. Accepting this as a leading character to distinguish the Tibetan from the Indian type, we should expect, if these individuals were without Indian blood, that their naso-malar indices would be lower, and that they would be more leptorhine and shorter than the average. As a matter of fact, their naso-malar indices (column A) are slightly higher, their nasal indices slightly lower and their stature a little greater than the average. The differences are, however, very small and almost certainly accidental. The inference is that these fifteen individuals, who are more brachycephalic than the average, are on the whole quite normal in other respects. If we go a step further, and pick out from these fifteen individuals those who show a further Tibetan trait by possessing a lower naso-malar index than the average, we obtain seven subjects, who, in the other distinctive characters, namely, nasal index, stature and facial angle (columns C, F and G), actually show a slight tendency to the Indian side of the average, being slightly more platyrrhine, slightly taller and slightly more orthognathous. Still the differences are slight and almost certainly accidental. By going still a step further in the process of elimination, and selecting those who combine, with a tendency to brachycephalism and platyopy, a narrower nose than their fellows, we find that the three individuals who exhibit

<sup>1</sup> See *Journ. Asiatic Soc., Bengal*, lxx (ii), 1901, 20.

such a combination of Tibetan traits, instead of being shorter than the average, are distinctly taller (column E), and instead of being more prognathous are more orthognathous (column H). There are, therefore, certainly less than three individuals out of thirty who are uniformly Tibetan in character; but one of these (No. 8) is markedly so, being not only the most brachycephalic of the lot measured, but also the most platypic, and at the same time leptorhine and slightly shorter than the average. But even No. 8 is slightly more orthognathous than he should be if purely Tibetan. Another (No. 26) also shows a uniform tendency towards the Tibetan side of the average in all points except facial angle, in which respect he is distinctly orthognathous. It cannot be said with certainty, therefore, that there is a single Lahoul Kanet who is purely Tibetan in his bodily measurements.

TABLE VI.

*Measurements of Lahoul Kanets who are more brachycephalic, platypic and leptorhine than the average.*

No.	Name.	A	B	C	D	E	F	G	H
1	Sarju ....	116	70.4	—	166	—	—	—	—
3	Dúrja ...	112	68.5	68.5	162	—	162	65	—
4	Túgú ....	109	67.3	67.3	164	—	164	63	—
6	Kúnga ....	115	56.9	—	163	—	—	—	—
8	Túk-túk ....	105	64.9	64.9	161	161	161	67	67
12	Kyatúk ....	109	59.7	59.7	172	172	172	67	67
13	Palzú ....	113	70.6	—	163	—	—	—	—
15	Súkh Rám ...	107	72.2	72.2	164	—	164	67	—
18	Padmatashi ...	112	69.4	69.4	148	—	148	67	—
20	Kyatúk ....	115	63.2	—	161	—	—	—	—
21	Sanse ....	120	71.2	—	153	—	—	—	—
23	Kútosaring ...	114	60.0	—	155	—	—	—	—
24	Gúrú ...	118	70.6	—	168	—	—	—	—
26	Nangial ....	109	63.5	63.5	159	159	159	72	72
30	Gopal ....	122	63.5	—	175	—	—	—	—
Average	.....	113.0	66.1	66.5	162.2	164.0	162.9	66.7	66.3
Average for the whole tribe.	.....	112.9	66.4	66.4	161.8	161.8	161.8	66.3	66.3

A. Naso-malar indices of Lahoul Kanets who are more brachycephalic than the average of their compatriots.

B. Nasal indices of A.

C. Nasal indices of those who are more brachycephalic and at the same time have a lower naso-malar index (more platypic) than the average.



D. Statures of A.

E. Statures of the three Lahoul Kanets who are more brachycephalic, more platyrrhine and more leptorrhine than the average.

F. Statures of C.

G. Facial angles of C and F.

H. Facial angles of E.

*B. Analysis of Lahoulis with dolichocephalic tendencies.*

Turning now to the other half of the subjects (Table VII), who, by their head measurements, show a leaning to the Indian type, we find that the thirteen who are more dolichocephalic than the average are also more pro-opic, more platyrrhine and taller than the average (columns A, B, D). There is thus an uniform tendency towards the Indian type in all these characters, but the tendency is controlled by a certain amount of Tibetan blood amongst these thirteen. Eliminating a certain amount of this Tibetan strain by removing those who have lower naso-malar indices than the average, we get a residue who have a distinctly more platyrrhine nose (column C) and are slightly taller (column F), but these are nevertheless more prognathous than the people of the Punjab, and more like, in this respect, what the Tibetans probably are (column G). Adopting the final step in analysis by removing those who are leptorrhine, we have six individuals left who are quite distinctly taller than the average of their tribe (column E); still these are more prognathous (column H). Amongst these, four show pronounced Indian characteristics, and indicate with a fair degree of certainty that there is a considerable proportion of Kanet blood in Lahoul not appreciably diluted with the Tibetan. Apart from the weakness due to the limited number of data (and which it is well to repeatedly remark), there is another source of possible error in this system, due to the fact that amongst pure Tibetans there must be many instances of dolichocephaly possibly combined in the same individuals with pro-opy; but I doubt if such characteristics are ever combined with the other two characters, namely, a tendency to be platyrrhine and tall, such as one finds in the Hindu races of the outer Himalayas of the Punjab. Even if all four of these characters were found in pure Tibetans, one ought to be able to rely on the law of chance to exclude such rare specimens from the thirty subjects I selected at random. Even in these, however, the remarkable tendency towards prognathism in all four suggests Tibetan blood. However, the facial angle is a character too hystorical to be safely relied on as a criterion to race, and it must further be remembered that the Kulu Kanets contain a tendency to slight prognathism in their "black" blood. The conclusion which this defence prefaces is this:—Taking the people of Kulu as representatives of the Indian type, the Kanets of Lahoul are a contact-product due mainly to true fusion with their Tibetan neighbours, and are not in any great degree due to the Hinduizing of purely Tibetan families. It is frequently stated, and has become apparently a generally accepted conclusion in gazetteers, that the Lahoul Kanets are largely Tibetan in blood. On the whole my results dis-

agree with this conclusion; but they cannot be safely used as a *quantitative* index to the mixture, first, because we have no precise data as to the physical characters of the purely Tibetan tribes immediately beyond the border, and our reasoning is consequently based on analogy with the Tibetans of the Darjeeling area; and secondly, because we are not quite sure of the total absence of Tibetan blood from the Kulu Kanets. Had opportunity occurred I would have measured the Kanets of the Sutlej valley in order to test the second question; but that must be left now until opportunity occurs in the future. The determination of the physical characters of a mixture of known proportions is of the greatest possible importance, but the opportunities for safely gauging the elements of the mixture must be very rare indeed.

TABLE VII.

*Measurements of Lahoul Kanets who are more dolichocephalic, pro-opic and platyrrhine than the average.*

No.	Name.	A.	B.	C.	D.	E.	F.	G.	H.
2	Bija Ratu ....	114	74.0	74.0	171	171	171	65	65
5	Santá ....	112	67.3	—	158	—	—	—	—
9	Panna ....	113	69.1	69.1	165	165	165	64	64
10	Zangho ....	111	57.1	—	162	—	—	—	—
11	Anú ....	109	61.0	—	164	—	—	—	—
14	Tauzan ....	113	69.6	69.6	164	164	164	62	62
17	Sunamrigzin ...	108	57.9	—	170	—	—	—	—
19	Dandú ....	113	67.9	67.9	159	159	159	62	62
22	Ganguand ....	105	72.3	—	159	—	—	—	—
25	Súnamsaring	115	59.3	59.3	160	—	160	62	—
27	Súnanzangho	123	75.5	75.5	165	165	165	65	65
28	Rabgia ....	117	63.5	63.5	159	—	159	60	—
29	Tundop ....	117	75.5	75.5	160	160	160	66	66
		113.7	66.9	62.3	162.8	164.0	162.9	64.4	64.0
Average for the whole tribe. }		112.9	66.4	66.4	161.8	161.8	161.8	66.3	66.3

A. Naso-malar indices of Lahoul Kanets who are more dolichocephalic than the average.

B. Nasal indices of A.

C. Nasal indices of those who are more dolichocephalic and at the same time more pro-opic than the average.

D. Statures of A and C.

E. Statures of the six Lahoul Kanets who are more dolichocephalic, more pro-opic and more platyrrhine than the average.

F. Statures of C.

G. Facial angles of C and F.

H. Facial angles of E.



*C. Analysis of Kulu Kanets who show brachycephalic tendencies.*

By similarly analyzing the Kulu measurements we find that there is not a single individual that combines the Tibetan characters sufficiently to conform to the Lahoul average, and that those who, in head measurements, are on the brachycephalic side of the average for their tribe, are in other characters more Indian than the average. Table VIII shows the measurements of twenty-five who are less dolichocephalic than the average of fifty. Columns A, B, and D show that these twenty-five are slightly more pro-opic, more platyrrhine and taller than the average, instead of the reverse; and, by adopting the process of elimination, as in the case of the Lahoulis, we obtain eight subjects who, whilst they are less dolichocephalic and at the same time more platyopic and leptorrhine than their compatriots, are nevertheless taller.

TABLE VIII.—*Measurements of Kulu Kanets who are more brachycephalic, platyopic and leptorrhine than the average.*

No.	Name.	A.	B.	C.	D.	E.
1	Primú ....	117	77.1	—	162	—
4	Dhálú ....	114	70.4	70.4	172	172
5	Parm ....	120	81.3	—	162	—
7	Ráp Dás ....	114	73.1	73.1	171	171
9	Tekú ....	122	77.1	—	160	—
10	Kálú ....	113	95.5	95.5	163	—
11	Rallú ....	109	69.8	69.8	168	168
12	Dianú ....	128	79.2	—	165	—
14	Nuthú ....	114	68.6	68.6	166	166
20	Khaltú ....	118	75.9	—	170	—
21	Uddú ....	115	77.6	77.6	169	—
22	Parsú ....	113	69.6	69.6	169	169
26	Nandú ....	116	75.5	—	160	—
27	Bjka Rám ....	108	77.4	77.4	167	—
28	Badhr ....	116	80.9	—	162	—
30	Sóárú ....	121	76.5	—	164	—
33	Badi Rám ....	113	68.6	68.6	167	167
34	Shám Dás ....	120	82.4	—	166	—
36	Káli Rám ....	110	68.8	68.8	167	167
37	Rushú ....	111	75.9	75.9	169	—
38	Rashnú ....	112	75.5	75.5	163	—
41	Nathú ....	113	76.1	76.1	159	—
43	Nokú ....	123	78.0	—	160	—
49	Ablú ....	117	75.0	—	171	—
50	Ratni ....	113	61.5	—	162	162
Average ....	...	115.6	75.5	73.5	165.3	166.5
Average of 50 ....	...	115.5	74.1	74.1	165.1	165.1

- A. Naso-malar indices of the Kulu Kanets who are more brachycephalic than the average of fifty (73.8).
- B. Nasal indices of A.
- C. Nasal indices of those who are more brachycephalic and at the same time have a lower naso-malar index (more platyopic) than the average.
- D. Statures of A and B.
- E. Statures of those who are more brachycephalic, more platyopic and more leptorhine than the average of their compatriots.

*D. Analysis of Kulu Kanets with dolichocephalic tendencies.*

Examination of the subjects who in all three characteristics—cephalic, nasal and naso-malar indices—range on the Indian side of the average, shows that in stature they are shorter, instead of taller, than the mean (Table IX). Only one subject, No. 31, is distinctly Indian in all four points, and he is not markedly so. There is, therefore, no evidence of mechanical mingling amongst the Kulu Kanets. If they are the result of a mixture of Tibetan with Indian blood, the fusion is now real, and as a caste they have a right to be regarded as having a definite blood value. In this respect they differ from the Lahoul Kanets who are not yet—to use a metallurgical term—thoroughly annealed. Their irregularities will tone down as intermarriage proceeds, and in time, if the caste system is maintained, the Lahoul Kanet blood will be a definite compound of Tibetan and Indian in each individual: there will be no subjects who uniformly show Tibetan or who uniformly show Indian characters.

TABLE IX.

*Measurements of Kulu Kanets who are more dolichocephalic, pro-opic and platyrhine than the average.*

No.	Name.	A.	B.	C.	D.	E.
2	Sangtá ....	108	68.7	—	169	—
3	Maitá ....	115	55.9	—	165	—
6	Rām Dās ....	117	84.6	84.6	163	163
8	Harā ....	110	85.4	85.4	163	163
13	Repta Rām ....	129	67.3	67.3	173	—
15	Raddi ....	119	68.6	68.6	166	—
16	Brim Dās ....	109	71.7	—	165	—
17	Sisā ....	111	66.7	—	159	—
18	Utnā ....	120	56.6	56.6	163	—
19	Gutanā ....	120	78.0	78.0	161	161
23	Devī Rām ....	122	75.6	75.6	163	163
24	Matthi ....	119	67.9	67.9	169	—
25	Sittā ....	118	69.2	—	170	—
29	Rām Dān ....	143	76.5	—	166	—



TABLE IX—*continued.*

No.	Name.	A.	B.	C.	D.	E.
31	Tálú ....	116	79·6	79·6	166	166
32	Sangtú ...	115	70·6	—	167	—
33	Gupta Rám ....	112	70·9	—	176	—
39	Nesú ....	120	73·3	73·3	161	—
40	Nankú....	116	73·9	73·9	163	—
42	Nátú ....	119	75·5	75·5	165	165
44	Bikan Dás ....	111	71·9	—	166	—
45	Dhálú ....	109	72·2	—	156	—
46	Tálú ....	107	78·3	—	160	—
47	Damodar ....	115	77·1	—	165	—
48	Ganga Rám ....	114	82·2	—	163	—
Average ....	....	115·5	72·6	73·9	164·9	163·5
Average 750	....	115·5	74·1	74·1	165·1	165·1

A. Naso-malar indices of Kulu Kanets who are more dolichocephalic than the average.

B. Nasal indices of A.

C. Nasal indices of those who are more dolichocephalic and at the same time have a higher naso-malar index (more pro-opic) than the average.

D. Statures of A and B.

E. Statures of those who are more dolichocephalic, more pro-opic and more platyrrhine than the average.

#### V.—DEGREE OF VARIATION.

The degree of variation within a caste can be expressed roughly by determining the smallest number which gives a stationary average. Thus in the case of the sixty Kulu Kanets, if we determine the average of the odd number subjects, we find they agree to the first place of decimals with the average of the even numbers. By dividing the subjects into three groups of twenty each, taken at random, the averages begin to show divergences approaching an integer in the indices. One assumes, therefore, that thirty subjects taken at random may be trusted to give a close approximation to the true average for this tribe, whilst twenty would fail to do so. But I find, on attempting to obtain a frequency curve, that unless a very large modulus is employed, the curves for groups of thirty amongst the Kulu Kanets are not identical in form, and on testing the figures published by Mr. Risley for the aboriginal tribes of Chota Nagpur, where one would expect less variation than in the evidently composite Kanets, it requires at least fifty subjects with a modulus of five in nasal indices to obtain curves showing an approach to similarity in form. I do not think,

therefore, that anything would be gained by drawing curves for thirty Kanets; such curves, unless the modulus is inconveniently great, would almost certainly differ seriously from those which would be obtained by measuring a larger number, and it is probable that uniformity of curve could only be obtained by measuring at least 100 subjects. I give as an example, to show how the two types overlap, the frequency curves for cephalic indices; but it must be distinctly understood that in this figure (Fig. 1) the curve for the Lahoul Kanets is based only on thirty measurements, and is therefore only an approximation to the truth. Whilst the averages given may be regarded as accurate to within 0.2 in each index, I consider it unwise to strain the figures to any greater extent by expressing the results graphically; by such means one would be liable to substitute precision for accuracy. The degree of variation may, however, be judged roughly by arranging the measurements in the form of tables as follows:—

TABLE X.—*Nasal Index.*

Modulus 5.				Number of Subjects.		
Nasal indices.				Kulu.		Lahoul.
				Odd Nos.	Even Nos.	
56—60	...	...	...	1	1	6
61—65	...	...	...	—	1	7
66—70	...	...	...	7	8	8
71—75	...	...	...	6	9	7
76—80	...	...	...	15	5	2
81—85	...	...	...	1	5	—
86—90	...	...	...	—	—	—
91—95	...	...	...	—	1	—
Totals	...	...	...	30	30	30

TABLE XI.—*Cephalic Index.*

Modulus 2.				Number of Subjects.		
Cephalic indices.				Kulu.		Lahoul.
				Odd Nos.	Even Nos.	
68 and 69	...	...	...	1	1	—
70 " 71	...	...	...	3	4	—
72 " 73	...	...	...	8	8	2
74 " 75	...	...	...	10	7	3
76 " 77	...	...	...	5	6	8
78 " 79	...	...	...	2	4	12
80 " 81	...	...	...	1	—	3
82 " 83	...	...	...	—	—	2
Totals	...	...	...	30	30	30



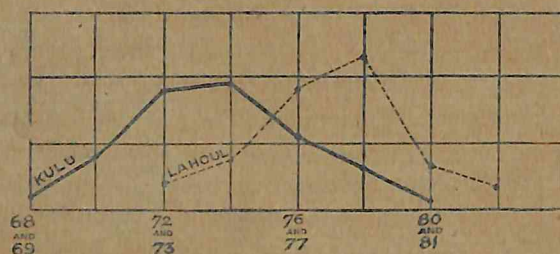


TABLE XII.  
*Stature.*

Modulus 5.				Number of Subjects.		
Stature in cm.				Kulu.		Lahoul.
				Odd Nos.	Even Nos.	
145—150	...	...	...	—	—	2
151—155	...	...	...	—	—	2
156—160	...	...	...	6	3	8
161—165	...	...	...	9	13	12
166—170	...	...	...	10	11	3
171—175	...	...	...	4	3	3
176—180	...	...	...	1	—	—
Totals	...	...	...	30	30	30

These tables (X, XI, XII) show that, in the case of the nasal index, cephalic index and stature, the curves would, when "smoothed" by adopting a modulus of 5, of 2 and of 5 respectively, be dissimilar in the case of groups of thirty Kulu Kanets, and that in the matter of the nasal index the Kulu results would, moreover, give a discontinuous curve, showing that thirty subjects selected at random would be utterly insufficient for an analysis of the Kulu characteristics. The tables also show that, notwithstanding the known composite character of the Lahoulis, they give more uniform results than the Kulu people. There is, I think, a simple explanation for this in the fact that the Kanet is not a very exclusive caste, admitting the introduction of people from lower castes by processes which have been described by Mr. Risley for other castes in Hindustan. This test, the evidence of the averages when compared with other Punjab castes, and one's knowledge of the habits of the Kanets, agree in pointing to a large infusion of low-caste "black" blood. But for this fact there would not be such a unique chance of obtaining the perfect contact zone which exists in Lahoul; for if the Kanets were more exclusive they would not so readily permit the



introduction of Tibetan blood at the contact of the two peoples. The noticeable imperfections of my work are not without their value; they show that a discriminating analysis by the graphic method is of little value in composite tribes unless the subjects examined number at least one hundred. Before making this statement I drew curves for many of the results recorded by Mr. Risley in his *Tribes and Castes of Bengal*, and found that, by using the moduli above referred to, similar curves were never obtained by dividing each of his groups of one hundred into two fifties; the only approach to uniformity occurs in the case of the aboriginal tribes, in which the blood constituents have had many generations for annealing, with few chances for the introduction of a strange taint.

#### VI.—SUMMARY OF CONCLUSIONS.

The objects of the investigation described in this paper are:—

- (1) To determine the physical characteristics of the Kanet caste in Kulu, and
- (2) To examine the nature and degree of physical modification due to contact with Tibetan tribes in the neighbouring taluk of Lahoul.

The results of the first object are stated in the summary of measurements on p. 109. The second investigation points to the following conclusions:—

The averages obtained for the Kanets of Lahoul are the result, not of measuring a number of Tibetan subjects mechanically mingled with Indians, but of true blood fusion, resulting in a modification of the Kulu Kanet type in the following particulars:—

- (a) Decrease of dolichocephaly by 4.1 per cent. on the Kulu average index.
- (b) Decrease of nasal index by 10.4 per cent.
- (c) Decrease of naso-malar index by 2.3 per cent.
- (d) Decrease of stature by 2.9 per cent.
- (e) Decrease of facial angle by 4.7 per cent.

We have no precise data as to the physical characters of the Tibetan tribes who have contributed to this composite type, but assuming that they are similar to the Mongoloid people measured by Mr. Risley in the Darjeeling area, the results are in general agreement with what might be expected, *a priori*, from the infusion of Tibetan (Mongoloid) blood into the Kanet caste. But we are unable to state:—

- (f) Whether the percentage depreciation in each characteristic has the same value, or whether one feature has been more affected than another by crossing, and
- (g) Whether the mixture contains an excess of one or of the other constituent.

These two negative results, due first to a want of quantitative correlation between physical criteria, and secondly, to absence of precise data concerning one



of the constituent elements of the cross, suggest interesting lines for further research. To make such an investigation effective it is necessary to possess precise data concerning the physical characteristics of both constituents of the cross, and to measure at least one hundred subjects of the latter taken at random from evenly distributed localities within the area of their distinct predominance.

#### VII.—EXPLANATION OF PLATES.

The photographs reproduced in Plates VI, VII and VIII illustrate representative types of the two varieties of Kanets. Plate VI shows a group of Kulu Kanet males, whilst Plates VII and VIII are portraits of Lahoul Kanets. The Mongoloid caste of countenance so frequently noticeable in the Lahouli is accentuated by the frequent inability to display a full beard. The man on the left of the group in Plate VIII, who stated his age to be thirty-nine, is a typical example, being able to grow only a few hairs on the chin. In Kulu the men almost invariably shave their chins and cheeks, but are generally able to show a thick growth. With the exception of the straw shoe the men in both areas follow in general a common style of dress: those in Lahoul, however, are less addicted to ornament through deficiency of means. The straw shoe in Lahoul is more elaborate than that of Kulu, being shaped like a slipper with plaits covering the toes and with a distinct heel-piece. The Kulu straw shoe is a mere sandal with a strand over the foot and on the inner side of the big toe to keep it from falling off. The other articles of dress have been described in detail by Captain Harcourt.<sup>1</sup> On account of their peculiarity of dress I have included three women with one of the Lahoul groups.

<sup>1</sup> *Op. cit.*, p. 137.

JOURNAL OF THE ANTHROPOLOGICAL INSTITUTE, Vol. XXXII. Plate VI



Collotype by H. KILHNMANN & Co

Photo by T. H. HOLLAND

Kanets of Kulu





Gillographs by H. KLEINMANN & Co

Photo by T. H. HOLLAND

Kanets of Lahoul

Photo by T. H. HOLLAND





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