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Edited by
Bhabes Chandra Roy
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CONTRACEPTION AND CIVILIZATION

By S. S. SARKAR

Calcutta

Introduction

ALTHOUGH some form of prevention of birth has been known to man at various phases of culture, its knowledge was limited to the personal level. It was probably towards the middle of the 19th century when child labour was prohibited in England that a mass movement towards birth-control took shape. Aboriginal men took to plain infanticide when an unwanted child appeared. It was a rare event since the weaning mothers were protected from the husband's visits by social custom. And polygyny made the problem easier. Contraception appears to be an adjunct of monogamy, which with the growth of population has almost become universal. With the growth of civilization, companionship has been gradually increasing and amour has come to occupy a pre-eminent place. In families practising contraception, the wife is rarely an economic advantage. She is more valued as a companion and contraception is helpful in preserving its lengthy duration. This is plainly speaking the express purpose of contraception today.

The social scientist holds the position of an adviser in the matter of social welfare and he has found in contraception a

method to curb the growth of population. His argument is that the world's food resources are limited and unless the world's population is checked there is bound to be a catastrophe in the form of famine, pestilence and high child mortality. There is another school which however points out that this fear is unfounded, since the world's entire resources have not yet been tapped and modern science can produce many synthetic foodstuffs.

Contraceptive methods

Among the known contraceptive methods, the method of withdrawal or *coitus interruptus* appears to have been the earliest in practice. It was widely practised during the early stages of the birth-control movement in England and France, although present day experts are sceptical about the efficacy of this method. Then came various mechanical devices, with the details of which we are not concerned here, by which either the sperms were arrested and killed in the vaginal passage or the sperms were collected in a rubber receptacle and thrown away. Even this was not foolproof, a foreign object in the vaginal passage appeared to be a great hindrance to complete orgasm. In the meanwhile Ogino's researches on ovulation in women in Japan, closely followed by those of Knaus in Vienna, led to an almost accurate determination of the ovulation time, which was found to occur at the mid-period of a menstrual cycle. This led to the establishment of a fertile and a sterile period within the menstrual cycle and as such it was almost immediately applied for purposes of contraception. This entailed an accurate study of a woman's menstrual cycle for a certain length of time in order to find out her possible range of fertile period during which there should be no cohabitation. This method found a ready acceptance among literate peoples because of its natural basis, its lack of expense, and also probably because it ensured alternate periods of restraint and relaxation. The alternate periods of sterility and fertility in the life cycle of a woman appears to be also supported by recent researches on adolescent sterility. It owes its concept to a noted social anthropologist, Bronislaw

Malinowski. In course of his field work in Melanesia, Professor Malinowski noticed unrestricted pre-marital sexual licence among young men and women but there were practically no births of illegitimate children. He raised the question whether this could not be due to a sterile period during adolescence. This point was immediately taken up by the famous geneticist, Professor Crew, who demonstrated it in mice. Hartman established it among apes and it has also been found among cattle. Ashley-Montagu has made out a case for it in man in his book *Adolescent Sterility*. In an earlier issue of this journal (1953), Tulika Sen calculated the adolescent sterile periods of a few groups of Bengali women. Researches on this problem appear to show that there is also a sterile period (from lactation amenorrhoea or such other causes) between two pregnancies. It should be noted here that these fertile and sterile periods are almost personal in nature, and environment can cause a change in their manifestation.

The last of the most recent contraceptive methods is oral contraception. The earliest work on this method is due to Sanyal (1949) who showed the contraceptive properties of the common field pea (*Pisum sativum*)¹. The active substance is located in the oil of pea seeds which has now been synthesized into *m*-xylohydroquinone. This drug inhibits the peripheral action of progesterone and the consequent prevention of the nidation of the ovum. Sanyal has already tested this drug on about 800 Calcutta women with satisfactory results. The drug is administered orally in gelatine capsules twice each month on the 16th and 21st days of menstruation. The drug has no toxic effect on the human system, nor does it affect the subsequent fertility of the women.

In several successive communications, Sanyal has effectively met his critics. For instance, in his most recent paper (1956) he has supplied statistical data about the women taking part in this

¹ Mention should be made of Sieve's discovery (1952) of Phosphorylated Hesperidin, which is also orally administered. It inhibits the enzyme hyalurodiase which assists the spermatozoa to penetrate the gel surrounding the unfertilized ovum.

enquiry according to age groups and according to the parity of children. The statistical criterion is the pregnancy rate, which is especially important in evaluating the significance of birth-control as a factor causing decline in birth rate. Raymond Pearl (1939) proposed the following formula for computing pregnancy rates :

'Let M = the total period (in years) during which a woman engages in copulation, between puberty and the menopause (for practical purposes the duration of marriage within the same limits - that is, between puberty and the menopause) ; and

P_1 = duration of time (in years) she spends in the pregnant state, regardless of the manner of its termination (by term birth or abortion, etc.) ; and

T = number of times she becomes pregnant during the time-period M ; and

P_2 = duration of time (in years) she spends in the puerperal state ;

then $M - P_1 - P_2$ = duration (in years) of time spent free from pregnancy (and puerperium), and

$$\frac{100 T}{13(M - P_1 - P_2)} T = R_p = \text{pregnancy rate per 100 computed ovulations.}$$

On the basis of the above formula Pearl has given the following pregnancy rates for U. S. A. White and Negro women :

TABLE 1

Median pregnancy rates per 100 computed ovulations in women married once only, and without any gynaecological disease, and not practising contraception (after Pearl, 1939).

Age period at risk	N	Whites rate	N	Negroes rate
10-14	203	0.60 ± .71	147	0.69 ± 1.23
15-19	5,080	8.14 ± .26	1688	7.97 ± 0.45
20-24	6,605	8.34 ± .20	1608	8.37 ± 0.38
25-29	4,132	7.16 ± .21	883	7.25 ± 0.35
30-34	2,092	6.19 ± .25	378	6.89 ± 0.55
35-39	909	6.84 ± .41	122	8.44 ± 0.97
40 & over	229	7.27 ± 1.01	27	6.50 ± 2.15

Sanyal has given pregnancy rates per 100 couples per year, and there are certain differences between Pearl's method and his. For instance, Pearl has designated P_1 as the duration of time spent in pregnant state, howsoever it is terminated, whereas Sanyal has accounted variably for full-term pregnancies and miscarriages. We are of opinion that for the sake of uniformity Pearl's method of computation should better have been followed.

Oral contraception appears to be known in India as well. *Hing* (asafoetida), if taken in the size of a pea on the 3rd or 4th day of menstruation, is said to prevent conception. Then in southern Bengal, a few food-stuffs are prohibited during menstruation. For instance, menstruating women are forbidden to take coco-nut, radish, *til* (sesamum), *kul* (*Zizyphus jujuba*), powdered rice or cakes made of it and all varieties of *sak* (spinach, *Ipomoea*, etc). The effect of these fruits and vegetables on reproductive physiology is not known, but that they affect the uterine functions can be guessed from their prohibition. It might be that they aggravate the menstrual flow, and coco-nut is definitely associated with it. They are not abortifacients since pregnant women only avoid taking pineapples. The *boal* fish (*Wallagonia attu*) is also considered by some to be an abortifacient.

Fertility differential

It is extremely difficult to find out the relative influences of economic condition or other social factors on fertility, and although contraception is said to be of more benefit to the poorer classes, their high fertility in comparison with the other classes has not been thoroughly proved in this country. Pearl in an extensive survey of the problem in America has come to the following conclusion :

'...if it were not for the effect of contraceptive effort and the practice of criminal abortion together with correlated habits as to postponement of marriage, there would apparently be little or no significant differential fertility as between economic, educational or religious classes of urban American married couples.'

Even if the poorer classes possess a higher fertility than the rest, do they deserve any population check? And is only a check on the population growth enough to bring to them all the happinesses of the rich? To the writer it appears that it is the poor who provide the food of the rich and it is their toil which makes the cities worthy of enjoyment by the rich. The man-hole cleaners of the cities are all children. Teenagers, popularly known as 'boys', are specially desired for certain kinds of light manual work. In contrast to the popular idea of the high fertility of the poorer classes, it appears to the writer that some of the poorer occupational groups are gradually decreasing in number. Bengali sweepers, washermen, barbers, etc., are becoming fewer both in towns and villages. We have no knowledge of the fertility differentials of the various caste groups and any artificial tampering with the reproductive life of these people is likely to be hazardous. Even a small change in the sex-ratio may be disastrous. India has already a high masculinity, which is not a healthy sign from the demographic point of view. Prolonged propaganda on contraception is likely to lead to a will of not having children, and already this is manifest among women of the western countries. Poorer classes desire children not only as part of their man-power, which is normal in all human societies, but also in their urge for successful replacement. They cannot afford to live long like the rich, whom modern medicine and science have helped in acquiring a longer though wearier life. In the western countries the percentage of old men is far greater than percentage of young men below 20. The social consequences of contraception among the poorer classes should be thoroughly considered before such an experiment is launched on them.

The ethical aspect

It is probably true that contraception is likely to increase illegitimacy and criminal abortion. A certain proportion of the population will always misuse such a tool. A small enquiry by the present writer revealed that some women, a few with no children and a few with only one or two, had undergone ligation of the fallopian tube, thus risking no further

chances of maternity. Some of the operations were made by an improved surgical method in which the fallopian tube could be reached from the inguinal region. Similarly, a case of vasectomy is known of a husband who underwent it because of the lunacy of his wife. These two facts point to two questions ; firstly, in what direction contraceptive propaganda can lead to and secondly, whether the male has any responsibility in the matter of birth-control. Personally, the writer is of opinion that the male should have at least 50% responsibility in it and when permanent control is desired in a couple, the male should come forward,° because the surgery involved in him is less risky than that in the case of the female. In an issue of the *British Medical Journal* (May 14, 1955), it was said that injection of testosterone which induces sterility in the male cannot be used as a form of birth-control. It is difficult to find out why it should not be so. Researches on testicular recovery after long and short administrations of testosterone may lead to some results. At least time is ripe for the male to come forward ; he is less complicated biologically and is probably more amenable to reason and less emotional than the female.*

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* This paper was sent by the Editor, to Dr. S. N. Sanyal whose note is published below.

NOTE by Dr. S. N. SANJAL

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The factual statements and statistical data incorporated in the above article are of considerable value, even if the conclusions reached are open to modification. It may be mentioned that Shri Gopalswami, the Registrar General of India, came to a similar opinion regarding the incidence of improvident maternity (considering only the actual births and not miscarriages and still-births), which is higher in urban areas in comparison to villages.

It will however be incorrect to conclude that the actual pregnancy rate is lower in the rural areas. In villages a large number of conceptions terminate in abortion, miscarriage or still-birth of the foetus due to unhygienic practices of the ignorant and untrained midwives, which also accounts for the high mortality rates of mothers either during confinement or as a result of eclampsia and toxæmias of pregnancy. In this connection, some figures obtained from the report of the Registrar General are of great interest. The proportion of deaths of children in the lowest age-groups is alarmingly high in India when compared to U. S. A., U. K. and other progressive countries. In the age-group of children below 10 years, the death rate is as high as 50% in contrast to 5.3% in U. K. and 9.7% in U. S. A. The proportion of such children to the total population is 25% in India, 15.7% in U. K. and 19.6% in U. S. A. In cases of completed fertility, the child-loss index is 20 to 23%. The mortality rate of females in India is considerably higher than that of males in all but the oldest age-groups.

The author has sought to explain the progressive depopulation of the poorer working classes, such as washermen, sweepers and other labourers in rural areas on the basis of such statistical data. It would seem however that the importance of the social and economic factors has not been correctly appreciated in this regard. The upper and middle classes have largely left the villages and settled in towns. They provided work for these 'lower'

classes and helped in their subsistence. The lower class people left behind do much of their works themselves. Thus deprived of their means of livelihood, most of the working classes moved towards towns to earn their living, leaving their families at home in extreme poverty. In towns these men live in groups and many of them contract venereal infection from prostitutes. Naturally, when they go back to their native villages after years or months, a certain percentage infect their wives who may become sterile due to occlusion of the fallopian tube through gonorrhoeal infection. Those who remain fertile and conceive, suffer from repeated miscarriages due to syphilitic infection. Some of the remaining mothers die of pregnancy toxæmias and eclampsias due to lack of proper medical attention. Poverty and under-nourishment also take a higher toll among women who are thus becoming fewer in number in comparison with males who have a better chance of survival. It should be no wonder if these poor working classes become extinct after some generations.

There are 5 lacs of villages in India and the people of these villages comprise three-fourths of the entire population. If such Malthusian checks are not counteracted, the author's surmise would be quite justified. These natural checks will slow down or even stop the growth of population and no further contraceptive measure will be needed. In case contraceptive practices spread in villages, the combined effect may ultimately lead to a decline of population.

This picture would however be far from true. Eclampsia has rightly been recognized as an index of civilization. Only a little training, some anti-natal care, arrangement for trained midwives etc. can easily prevent eclampsia. If the people or their government fail to check it, they no doubt deserve gradual extinction. But will such a state of affairs be allowed to remain for ever in the free and progressive state of India? The answer is unequivocally in the negative and it is encouraging to note that in India and in West Bengal numerous health centres have already been started in villages. More are under construction or in the planning stage. It has already been decided by the Central Government and the constituent

states that everyone should be entitled to basic medical attention with special emphasis on maternity cases. A concrete instance from my personal experience may be given here. In a village health centre in the district of Murshidabad, there were 40 eclampsia cases in the first year with 32 deaths, but during the second year there were 20 cases only, out of which 4 proved fatal, two being due to excessive delay in hospitalization. During the first year the majority of the babies born did not survive, but during the second and subsequent years such deaths became progressively fewer.

At the present time in India, in spite of the extremely insanitary condition in villages, resulting in high mortality rates of mothers and babies, the total annual increase in the population remains very high indeed. It can be easily imagined what the condition will be when rural development, health schemes and other beneficial projects are given effect to. In the words of Harold Hurtley, the sudden application of accumulated experience of two centuries to the under-developed countries, is leading to a very rapid increase in population. In Ceylon, malaria has been wiped out by D. D. T. and the death rate fell from 22 to 12 per thousand population between 1945 and 1952. This increase amounts to 2.7% a year and at this rate the population of Ceylon will double itself in one generation. Contrary to the author's opinion, the rising growth in population will be scarcely affected by such Malthusian checks but will seriously jeopardize the success of all development projects. All schemes of growing more food, higher standards of living, increased employment and labour welfare will be frustrated by the ever-increasing number of people to be taken care of.

The problem will defy all solution until we fully grasp its magnitude and ramifications. Mere representation of data or statistical conclusions, however accurate, can never complete the picture and is a poor basis on which to build the science of demography. All planning for a future welfare state will be meaningless unless and until contraceptive measures become cheap, easy, safe and sure in villages as well as in cities.

The author of the above article has expressed the opinion that

the old formula of Raymond Pearl should be adhered to. There is an additional factor of puerperium which should be accounted for and eliminated from the months of use. In that case, the pregnancy rate, in the preclinic rate calculation becomes higher. Subsequent authors, with their years of experience, are of opinion that it is only certain that when a woman conceives, then only there is no possibility of exposure to the risk of pregnancy. If the involution is very rapid after parturition, and if ovulation takes place as early as within a month subsequent to parturition, as is found in some cases, there is a risk of pregnancy. The authorities of U.N.E.S.C.O. Population Service, also considering these facts, only eliminate $\frac{3}{4}$ of a year for live birth and still birth and $\frac{3}{8}$ of a year for miscarriage. If research workers in different areas calculate the pregnancy rate in different ways, it is sure to give rise to unnecessary anomalies and criticism. Raymond Pearl is the originator of the formula, but that is no reason why it should not be modified if there is justifiable reason for modification. Whelpton (1953) sticks to this old formula whereas others have tried to modify Pearl's formula by the introduction of another factor, namely, lactation which is supposed to give protection from pregnancy. This has not been accepted in general.

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PHYSICAL CHARACTER OF THE RABHAS OF ASSAM¹

By BHUBAN M. DAS

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Introduction

THE Rabhas are one of the important plains tribes of Assam having a total numerical strength of 84,269 individuals (1941 Census). They are scattered throughout the districts of Goalpara, Kamrup and Darrang, the main concentration being in southern Goalpara.

Anthropometric data were collected during December 1954 by the author from among the Rabhas of the villages of Chotamatia and Habanggiri, Goalpara district.² The above two villages are situated at a distance of about 75 miles from Gauhati. One hundred adult male Rabhas were measured for sixteen somatometric characters. The somatoscopic data have already been published by the present author (1955). Waddell (1901) measured 12 male Rabhas only from Goalpara and Kamrup districts and published their averages, and this forms the only previous study on these people.

Analysis of somatometric data

The following measurements were taken: Height Vertex, Height Tragus, Sitting Height Vertex, Max. Head Length, Max. Head Breadth, Min. Frontal Diameter, Max. Bizygomatic Breadth, Nasal Height, Nasal Breadth, Nasal Depth, Total Facial Length, Upper Facial Length, External Orbital Breadth, Bi-orbito nasal Arc; Bigonial Breadth; Auricular Height of Head and Horizontal Circumference of Head. The Auricular Height has been obtained by subtracting Height

¹ Read before the Section of Anthropology & Archaeology, Indian Science Congress, 43rd Session, Agra, January 1956.

² The author is thankful to Sri Bhupen Goswami for his help in the field.

Tragus from Height Vertex. All these measurements were taken according to the method prescribed by Wilder.

The following indices have been worked out: Cephalic Index, Breadth-Height Index, Altitudinal Index, Facial Index, Upper Facial Index, Nasal Index and Orbito-nasal Index. In analysing the measurements and the indices, Martin's classification has been followed.

A. Measurements

Table I shows the different statistical constants :

TABLE I
Statistical constants of measurements

Measurements (in cm.)	Mean	Standard Deviation	Co-efficient of Variation	Max.	Min.
Height Vertex	162.45 ± .50	5.08 ± .35	3.13 ± .22	175.1	147.5
Sitting Ht. Vertex	86.43 ± .27	2.79 ± .19	3.23 ± .22	95.7	78.8
Max. Head Length	18.85 ± .05	.59 ± .04	3.13 ± .22	20.2	17.2
Max. Head Breadth	14.38 ± .04	.44 ± .03	3.10 ± .21	15.4	13.3
Min. Frontal Diameter	10.39 ± .04	.47 ± .03	4.62 ± .30	11.8	9.3
Max. Bizygomatic Breadth	13.58 ± .04	.49 ± .03	3.64 ± .25	14.6	12.2
Bigonial Breadth	10.21 ± .06	.62 ± .04	6.10 ± .43	11.5	8.0
Nasal Height	5.04 ± .02	.28 ± .01	5.57 ± .39	5.7	4.4
Nasal Breadth	3.95 ± .02	.28 ± .01	7.08 ± .50	4.8	3.3
Nasal Depth	1.47 ± .02	.22 ± .01	6.62 ± .40	2.0	1.0
Total Facial Length	11.71 ± .12	1.24 ± .08	9.78 ± .60	12.8	10.0
Upper Facial Length	6.91 ± .04	.40 ± .02	5.81 ± .41	7.8	6.0
Ext. Orbital Breadth	9.64 ± .04	.45 ± .03	4.66 ± .33	10.7	8.6
Bi-orbito nasal Arc	10.80 ± .05	.54 ± .03	5.01 ± .35	12.2	9.5
Auricular Ht.	12.52 ± .07	.79 ± .05	6.36 ± .44	14.1	10.4
Horizontal Circum- ference of Head	54.59 ± .15	1.50 ± .10	2.74 ± .19	57.4	51.0

B. Indices

Table II shows the statistical constants of the different indices :

TABLE II
Statistical constants of the indices

Indices	Max.	Min.	Mean	Standard Deviation	Co-efficient of Variation
Cephalic Index	83·1	67·5	76·38 ± ·31	3·18 ± ·22	4·16 ± ·29
Altitudinal Index	67·7	54·5	66·36 ± ·42	4·26 ± ·30	6·41 ± ·45
Breadth-Height Index	100·0	70·7	86·83 ± ·56	5·68 ± ·40	6·54 ± ·46
Total Facial Index	96·1	75·1	84·54 ± ·46	4·61 ± ·32	5·45 ± ·38
Upper Facial Index	59·0	43·1	50·97 ± ·34	3·44 ± ·24	5·75 ± ·47
Nasal Index	95·4	59·6	78·85 ± ·73	7·30 ± ·51	9·25 ± ·65
Orbito-nasal Index	121·0	105·1	112·09 ± ·29	2·97 ± ·21	2·65 ± ·18

C. Stature

The following table shows the percentage of different types of stature among the Rabhas :

Class	Range in cm.	Percentage
Very Short	130·0—149·9	1
Short	150·0—159·9	27
Below Medium	160·0—163·9	34
Medium	164·0—166·9	18
Above Medium	167·0—169·9	12
Tall	170·0—179·9	8

The average stature of the Rabhas is 162·45 ± ·50 cm., the maximum being 175·1 cm. and the minimum 147·5 cm. The highest concentration (34%) is found in the class of Below Medium stature. Next to it comes Short stature (27%). Medium, Above Medium and Tall are also present in 18%, 12% and 8% respectively. Very Short stature is observed only in 1%.

D. Indices

Cephalic Index : The mean cephalic index is $76.38 \pm .31$. The percentages of both the mesocephalic (47%) and the dolichocephalic (42%) elements are high. The percentage of brachycephaly is 8% only. The mean head length is $18.85 \pm .05$ cm., the maximum being 20.2 cm. and the minimum 17.2 cm. The mean head breadth is $14.38 \pm .04$ cm., the maximum being 15.4 cm. and the minimum 13.3 cm.

TABLE IV

Class	Percentage
Hyper-dolichocephalic ($\times - 69.9$)	3
Dolichocephalic (70.0—75.9)	42
Mesocephalic (76.0—80.9)	47
Brachycephalic (81.0—85.4)	8

Altitudinal Index : The mean altitudinal index is $66.36 \pm .42$. The hypsicephalic form predominates among the Rabhas (86%). Orthocephalic and chamaecephalic forms occur in 10% and 4% respectively. The mean head height is $12.52 \pm .07$ cm., the maximum being 14.1 cm. and the minimum 10.4 cm. The values of head length have been given above.

TABLE V

Class	Percentage
Chamaecephal ($\times - 57.6$)	4
Orthocephal (57.7—62.5)	10
Hypsicephal (62.6— \times)	86

Breadth-Height Index : The mean breadth-height index is $86.83 \pm .56$. Acrocephalic type of head occurs in the highest frequency (64%). Next to it comes Metriocephalic (27%). Tapeinocephalic type occurs in 9% only.

TABLE VI

Class	Percentage
Tapeinocephalic (\times - 78.9)	9
Metriocephalic (79.0 - 84.9)	27
Acrocephalic (85.0 - \times)	64

Nasal Index: The mean nasal index is $78.85 \pm .73$. The Rabhas show the mesorrhine form of nose in majority, the frequency being 65%. Platyrrhine nose has been observed in 22% while leptorrhine occurs in 13% cases only. The mean nasal length is $5.04 \pm .02$ cm., the maximum being 5.7 cm. and the minimum 4.4 cm. The mean nasal breadth is $3.95 \pm .02$ cm., the maximum being 4.8 cm. and the minimum 3.3 cm.

TABLE VII

Class	Percentage
Leptorrhine (55.0 - 69.9)	13
Mesorrhine (70.0 - 84.9)	65
Platyrrhine (85.0 - 99.9)	22

Total Facial Index: The mean total facial index is $84.54 \pm .46$. Both the euryprosopic (35%) and the mesoprosopic (32%) elements are predominant among the Rabhas. Leptoprosopic (21%) element is also not negligible. The mean total facial length is $11.71 \pm .12$ cm., the maximum being 12.8 cm. and the minimum 10.0 cm. The mean bizygomatic breadth is $13.58 \pm .04$ cm., the maximum being 14.6 cm., the minimum 12.2 cm.

TABLE VIII

Class	Percentage
Hyper-euryprosopic (\times - 78.9)	6
Euryprosopic (79.0 - 83.9)	35
Mesoprosopic (84.0 - 87.9)	32
Leptoprosopic (88.0 - 92.9)	21
Hyper-leptoprosopic (93.0 - \times)	6

Upper Facial Index : The average upper facial index is $50.97 \pm .34$. The majority of the Rabhas fall under the group mesene (52%). Euryene and leptene also occur significantly, 20% and 21% respectively. Hyper-leptene type of faces is observed only in 7% cases. The mean upper facial length is $6.91 \pm .04$ cm., the maximum being 7.8 cm. and the minimum 6.0 cm.

TABLE IX

Class		Percentage
Euryene	(43.0 - 47.9)	20
Mesene	(48.0 - 52.9)	52
Leptene	(53.0 - 56.9)	21
Hyper-leptene	(57.0 - x)	7

Orbito-nasal Index : The mean orbito-nasal index is $112.09 \pm .29$. Both the mesopic (43%) and the proopic (37%) forms are high. Platyopic element is present only in 20%. The mean orbito-nasal breadth is $9.64 \pm .04$ cm., the maximum being 10.7 cm. and the minimum 8.6 cm. The mean bi-orbito nasal arc is $10.80 \pm .05$ cm., the maximum being 12.2 cm., the minimum 9.5 cm.

TABLE X

Class		Percentage
Platyopic	(x - 109.9)	20
Mesopic	(110.0 - 112.9)	43
Proopic	(113.0 - x)	37

Comparison with Waddell's measurements

In Table XI measurements of the 12 Rabhas measured by Waddell have been given together with their mean values. It will be seen from the two sets of measurements that Waddell's means are always lower than those of the present writer except in the case of nasal breadth where the two surprisingly agree with one another. It is difficult to interpret this difference and coincidence from such a small data, since a large number of factors are involved and there is a gap of more than half a century between the dates of collection of the two data.

TABLE XI

Measurements (in mm.)	Waddell												Das			
	1	2	3	4	5	6	7	8	9	10	11	12	Mean	Maxi- mum	Mini- mum	Mean
Stature	1675	1646	1695	1592	1608	1612	1588	1540	1622	1612	1552	1528	1605	1751	1475	1624
Max. Length	180	190	186	187	180	188	171	170	174	197	175	188	182	202	172	188
Max. Head Breadth	145	144	139	149	144	143	140	135	139	146	143	143	142	154	133	143
Min. Frontal Diameter	107	102	101	102	101	102	103	98	99	105	97 ^c	100	102	119	93	103
Max. Bizygomatic Bd.	135	130	140	139	131	135	131	125	132	148	134	138	134	146	122	135
Nasal Height	41	41	49	47	37	47	44	46	43	42	43	46	43	57	44	50
Nasal Breadth	38	41	36	37	37	38	38	38	40	44	40	43	39	48	33	39

Summary

The Rabhas are mainly below medium in stature, mean stature being 162.4 cm. The mesocephalic and the dolicocephalic elements occur in almost equal frequencies. Mesorhiny occurs in highest percentage. The hypsicephalic head occurs in majority.

In somatoscopic characters the Rabha skin colour varies between light brown and dark brown in the majority of cases. They possess wavy hair and show scanty beard and moustache, straight forehead with medium height and medium breadth, medium lips with no eversion, oval chin with medium prominence, slightly prognathous face, obliquely set eyes with traces of epicanthic fold and marked or medium zygomatic arch.³

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³The author is indebted to Dr. S. S. Sarkar for his valuable suggestions in the preparation of this paper.

AN ANTHROPOMETRIC STUDY OF THE PLAINS MANDES (GAROS) OF ASSAM

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Introduction

THE Mandes (Garos) of Assam occupy primarily the hills (25°9'/26°1'N, 89°49'/91°2'E) which bear their name. They are also widely scattered over the districts of Goalpara and Kamrup in Assam. Their total numerical strength is 242,075 (1951 Census). During the winter of 1954-55 anthropometric data on the Mandes were collected by the second author in collaboration with Messrs T. C. Sharma and A. Das at Nishangram and Damra¹. This paper contains a survey of the physical characters of 100 male Garos based on 27 observations and 16 somatometric measurements. Waddell (1901) measured 34 Mandes of the Garo Hills and his results have been compared with those of the present authors.

Analysis of somatoscopic observations

The following somatoscopic characters were examined :

- (1) Hair : form, quantity ;
- (2) Beard & Moustache ;
- (3) Forehead ;
- (4) Eyes : form, opening, colour ;
- (5) Epicanthic Fold ;
- (6) Eye-brows ;
- (7) Supra-orbital Ridges ;
- (8) Nose : bridge, septum, depression of nasal root ;
- (9) Face : form, prognathism, gonial angles ;
- (10) Chin ;
- (11) Lips ;
- (12) Ear-lobes.

¹ These two villages are situated on the border of the Garo Hills district and Goalpara district about 74 miles S. W. of Gauhati. The Plains Garos are predominant in this region.

TABLE I

Analyses of Somatoscopic Observations

(A) *Character of Hair*¹

- (i) Form : Lissotrichous—81%, Cymotrichous—19%.
- (ii) Texture : Coarse—78%, Medium—22%.
- (iii) Quantity : Scanty—35%, Medium—65%.

(B) *Beard and Moustache*

- (i) Quantity : Scanty—95%, Absent 5%.

(C) *Forehead*

- (i) Height : Low—7%, Medium—75%, High—18%.
- (ii) Breadth : Narrow—42%, Medium—52%, Broad—6%.
- (iii) Slope : Straight—52%, Medium—35%, Receding—13%.

(D) *Character of Eye*

- (i) Slit : Form : Straight—15%, Oblique—85%.
Opening : Narrow—63%, Medium—37%.
- (ii) Colour : Dark-brown—82%, Light-brown—18%.
- (iii) Epicanthic fold : Absent—54%, Trace—46%.

(E) *Eye-brow*

- (i) Quantity : Thin—43%, Medium—56%, Thick—1%.
- (ii) Growth : Connected—2%, Separate—98%.

(F) *Supra-Orbital Ridges*

- (i) Prominence : Trace—42%, Moderate—58%.

(G) *Character of Nose*

- (i) Nasal Bridge : Straight—46%, Concave—35%, Convex—1%, Concavo-convex—18%.
- (ii) Nasal Septum : Horizontal—49%, Downward—2%, Upward—49%.
- (iii) Nasal Depression : Shallow—25%, Medium—64%, Deep—11%.

(H) *Character of Face*

- (i) Form : Oval—56%, Round—42%, Pentagonal—2%.
- (ii) Prognathism : Slight—58%, Medium—7%, Absent—35%.
- (iii) Gonial Angle : Sub-medium—10%, Medium—22%, Marked—68%.
- (iv) Malar Prominence : Slight—5%, Medium—52%, Marked—43%.
- (v) Chin : Form : Oval—63%, Round—31%, Square—6%.

Prominence : Receding—26%, Medium—69%, Marked—5%.

- (vi) Lips : Thickness : Thin—7%, Medium—91%, Thick—2%.

Eversion : Absent—63%, Slight—37%.

(I) *Character of Ear-lobe*

- (i) Size : Large—27%, Medium—59%, Small—14%.
- (ii) Attachment : Free—22%, Partly attached—40%, Attached—38%.

Analysis of somatometric measurements

The following measurements were taken on one hundred adult male persons : (1) Maximum Head Length, (2) Maximum Head Breadth, (3) Horizontal Circumference of Head, (4) Minimum Frontal Diameter, (5) Nasal Height, (6) Nasal Breadth, (7) Nasal Depth, (8) Bi-Orbito-nasal Arc, (9) Morphological Upper Facial Height, (10) Morphological Total Facial Height, (11) Maximum Bizygomatic Breadth, (12) Bigonial Breadth, (13) External Orbital Breadth, (14) Sitting Height Vertex, (15) Height Vertex and (16) Height Tragus.

The following indices have been worked out : (1) Cephalic Index, (2) Altitudinal Index, (3) Breadth Height Index, (4) Nasal Index, (5) Upper Facial Index, (6) Total Facial Index.

The measurements were taken according to the technique described by Wilder. Martin's method has been followed in classifying the indices.

A. Measurements.

Table II shows the statistical constants, namely, Mean with Standard Error, Standard Deviation with Standard Error, Co-efficient of Variation with Standard Error, and the Range of Variation of the different somatometric characters.

B. Indices

Table III shows the statistical constants of the indices, namely, Mean with Standard Error, Standard Deviation with Standard Error, Co-efficient of Variation with Standard Error, and the Ranges of Variation of the different indices.

TABLE II
Statistical constants with their standard errors

Measurements	No.	Max.	Min.	Mean	Standard Deviation	Co-Efficient of Variation
Max. Head Length	100	20.0	17.3	18.72 ± .04	0.45 ± .03	2.40 ± .03
Max. Head Breadth	"	15.3	12.9	14.19 ± .05	0.49 ± .03	3.45 ± .24
Head Height	"	13.9	10.0	12.06 ± .10	1.01 ± .71	8.32 ± .58
Horz. Circum. Head	"	58.5	52.8	55.14 ± .12	1.21 ± .85	2.19 ± .15
Min. Frontal Diam.	"	11.1	9.4	10.48 ± .04	0.36 ± .02	3.32 ± .23
Nasal Height	"	5.7	3.9	4.78 ± .04	0.37 ± .03	7.74 ± .55
Nasal Breadth	"	4.5	3.1	3.94 ± .03	0.26 ± .02	6.59 ± .47
Nasal Depth	"	2.0	1.0	1.50 ± .02	0.17 ± .01	11.33 ± .08
Bi-Orbital nasal Arc	"	12.3	9.8	11.03 ± .05	0.54 ± .04	4.90 ± .34
Morph. Up. Fac. Ht.	"	8.3	5.2	6.59 ± .06	0.59 ± .04	8.80 ± .62
Morph. Total Fac. Ht.	"	12.9	10.2	11.44 ± .06	0.63 ± .04	5.50 ± .39
Max. Bizygo. Breadth	"	14.9	12.8	13.77 ± .04	0.41 ± .03	2.97 ± .21
Bigonial Breadth	"	11.7	8.5	10.08 ± .07	0.67 ± .05	6.64 ± .47
Ext. Orbital Breadth	"	10.9	8.9	10.07 ± .05	0.46 ± .03	4.56 ± .32
Sitting Height	"	90.4	69.2	83.80 ± .30	3.01 ± .21	3.59 ± .25
Stature	"	170.5	148.9	161.92 ± .40	4.08 ± .28	2.51 ± .17

TABLE III

Statistical constants of indices with their respective standard errors

Indices	No.	Max.	Min.	Mean	Standard Deviation	Co-Efficient of Variation
Cephalic Index	100	84.5	69.3	75.77 ± .30	3.01 ± .21	3.97 ± .28
Altitudinal Index	"	79.7	52.3	64.46 ± .57	5.73 ± .40	8.88 ± .63
Breadth-Ht. Index	"	101.5	71.2	85.32 ± .77	7.70 ± .54	9.02 ± .64
Nasal Index	"	97.5	63.3	82.36 ± .73	7.26 ± .51	8.81 ± .62
Morph. Up. Fac. Index	"	59.2	38.2	47.48 ± .38	3.83 ± .26	8.06 ± .57
Morph. Total Fac. Index	"	94.7	77.0	83.04 ± .48	4.95 ± .35	5.96 ± .42

C. Stature

The mean stature of the Mandes is 161.92 cm. \pm 0.40 with the range of variation falling between 170.5 and 148.9 cm. The distribution of the different types of body-height is shown in Table IV.

TABLE IV
Classification of Stature

Type	Range in cm.	Percentage
Very Short	130.0—149.9	3
Short	150.0—159.9	42
Below Medium	160.0—163.9	36
Medium	164.0—166.9	10
Above Medium	167.0—169.9	8
Tall	170.0—179.9	1

The Mandes are in majority short to below medium in stature. Only one tall individual occurs in the group. Medium and above medium statured groups are not insignificant (10% and 8% respectively).

Waddell found the stature of the Hill Garos to be short (61.77%) in the majority of cases. Below medium and medium statures occur in 29.41% and 5.88% respectively. Above medium stature occurs in 2.94% only. Very short or tall stature does not occur in his measurements.

D. Indices

Cephalic Index : Both dolichocephalic (47%) and mesocephalic (46%) elements are predominant among the Mandes. The mean cephalic index is $75.77 \pm .30$ with the maximum of 84.5 and minimum of 69.3. Table V shows the percentages of the different forms of heads.

TABLE V
Classification of Cephalic Index

Type	Range	Percentage
Hyper-dolichocephalic	$\times - 69.9$	3
Dolichocephalic	70.0—75.9	47
Mesocephalic	76.0—80.9	46
Brachycephalic	81.0—85.4	4

The percentages of hyper-dolichocephalic and brachycephalic types are 3 and 4 respectively.

Waddell's measurements on the Hill Garos show that mesocephaly (55.88%) appears in the majority while dolichocephaly occurs in 44.12% only.

Altitudinal Index: Hypsicephaly is found in the highest (58%) concentration among the Mandes. The mean altitudinal index is $64.46 \pm .57$ with a maximum of 79.7 and minimum of 52.3. Table VI shows the frequencies of different types.

TABLE VI
Classification of Altitudinal Index

Type	Range	Percentage
Chamaecephalic	$\times - 57.6$	11
Orthocephalic	57.7—62.5	31
Hypsicephalic	62.6— \times	58

Breadth-Height Index: Acrocephalic elements are in majority (48%) among the Mandes. The mean breadth-height index is $85.32 \pm .77$ with the maximum of 101.5 and the minimum of 71.2. Table VII shows the classification of the index.

TABLE VII
Classification of Breadth-Height Index

Type	Range	Percentage
Tapeinocephalic	$\times - 78.9$	22
Metriocephalic	79.0—84.9	30
Acrocephalic	85.0— \times	48

The metriocephalic and tapeinocephalic elements also occur in the high percentages of 30 and 22 respectively,

Nasal Index : Mesorrhine nose occurs most frequently (58%) among the Mandes. The mean nasal index is $82.36 \pm .73$ with the maximum of 97.5 and the minimum of 63.3. Table VIII below shows the percentages of the different types of nose.

TABLE VIII
Classification of Nasal Index

Type	Range	Percentage
Leptorrhine	55.0-69.9	5
Mesorrhine	70.0-84.9	58
Platyrrhine	85.0-99.9	37

Though mesorrhine nose occurs in the highest frequency, platyrrhine noses are also markedly present (37%). Leptorrhine type occurs among 5% only.

The nasal index calculated from Waddell's data on Hill Garos reveals a very high frequency of platyrrhiny (61.77%). Hyper-platyrrhiny also occurs in the high frequency of 35.29%. The percentage of mesorrhiny is 2.94 only, while leptorrhiny does not occur at all in his sample.

Upper Facial Index : The majority of the Mandes fall under the euryene group, the percentage being 44. The mean upper facial index is $47.48 \pm .38$ with the maximum of 59.2 and the minimum of 38.2. Table IX shows the classification of the index.

TABLE IX
Classification of Upper Facial Index

Type	Range	Percentage
Hyper-euryene	$\times - 42.9$	12
Euryene	43.0-47.9	44
Mesene	48.0-52.9	36
Leptene	53.0-56.9	7
Hyper-leptene	57.0- \times	1

Mesene type also occurs in the high frequency of 36%. The percentages of leptene and hyper-leptene are 7 and 1 respectively.

Total Facial length: Euryprosopic elements are seen in majority (39%) among the Mandes. The mean total facial index is $83.04 \pm .48$ with the maximum of 94.7 and the minimum of 77.0. Table X shows the percentage of different types.

TABLE X
Classification of Total Facial Index

Type	Range	Percentage
Hyper-euryprosopic	$x - 78.9$	23
Euryprosopic	79.0 - 83.9	39
Mesoprosopic	84.0 - 87.9	19
Leptoprosopic	88.0 - 92.9	18
Hyper-leptoprosopic	93.0 - x	1

Though the euryprosopic element is in majority, the mesoprosopic and the leptoprosopic types occur in almost equal percentages of 19 and 18 respectively.

Comparison with Waddell's data

Table XI shows the comparison of some of the important measurements and indices with those of Waddell. Waddell measured the Mandes of the Garo Hills, while the present data are from among the Plains Garos of Nishangram. From the table we find that the Hill Garos resemble the Plains Garos fairly in head-length and head-breadth and more particularly in the cephalic index. Both are dolichocephalic. They, on the other hand, differ considerably in nasal index and stature. Hill Garos have platyrrhine nose and short stature, whereas the Plains Garos possess mesorrhine nose and below medium stature. The Hill Garos also resemble the Plains Garos in respect of the following characters: minimum frontal diameter, external orbital breadth, bizygomatic breadth and bigonial breadth.

TABLE XI
Comparison with Waddell

Measurement (in mm.) and Indices	Pakrasi & Das (1953)			Waddell (1901)		
	Mean	Max.	Min.	Mean	Max.	Min.
Max. Head Length	187	200	173	183	193	174
Max. Head Breadth	142	153	129	139	150	134
Cephalic Index	75.77	84.5	69.3	75.9	80	71
Nasal Height	48	57	39	41	47	36
Nasal Breadth	39	45	31	39	43	35
Nasal Depth	15	20	10	24	31	21
Nasal Index	82.36	97.5	63.3	95.1	117	83
Bi-Orbitonasal Arc	110	123	98	114	128	106
Bi-Orbitonasal Index	109.55	117.3	100.9	117.7	119	102
External Orbital Breadth	101	109	89	102	117	97
Min. Frontal Diameter	105	111	94	103	111	97
Max. Bizygomatic Breadth	138	149	128	132	146	128
Bigonial Breadth	101	117	85	103	120	92
Sitting Height Vertex	838	904	692	813	887	758
Stature	1619	1705*	1489	1588	1679	1512

Summary

The majority of the Mandes (Garos) have black, coarse and straight hair. The eyes are generally narrow, oblique and dark brown in colour. The mongolian fold is absent in the majority of cases, but traces of it are found frequently among them. The face is generally oval, having medium prominence of zygoma and oval chin. Prognathism is slight. Lips are medium and with no eversion. The Mandes are generally a short-statured people, the mean stature being 161.92. They are on the whole a dolichocephalic, hypsicephalic, mesorrhine people.*

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PHYSICAL AFFINITY OF THE LODHAS OF MIDNAPORE

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THE Lodhas are an ex-criminal tribe of West Bengal. They mainly live in the jungle tracts of the district of Midnapore. The other tribal peoples living as their neighbours are the Santals, Mundas, Kharias and the Bhumijes. An attempt has been made in this paper to find out the somatic affinity of the Lodhas with the above peoples. For this purpose the earlier available anthropometric data have been utilized. Risley has provided anthropometric data for the Bhumijes, but the 't' test of significance could not be applied due to the absence of the statistical constants. Roy and Roy (1937) have provided the Kharia (Hill Kharia) measurements, while those of Bose (1932-33) and Sarkar (1954) have been utilized for the Mundas and Santals respectively.

The comparative anthropometric data are given in Table 11.

Lodha anthropometric data

Anthropometric measurements and somatic observations on 200 male and 50 female Lodhas were taken between October 1952 and June 1954 at the following places :

TABLE 1

Police station	Name of village	No. of males measured	No. of females measured
Jhargram	Radhanagar	4	
	Bagmuri	2	
	Mandipa	3	
Nayagram	Pathardahara	14	
	Tapabon	2	
	Darkhuli	3	
	Kadamdiha	28	
	Jamshal	8	
	Nayagram	6	
Sankrail	Balkisol	3	
Jamboni	Tetala	5	

Police station	Name of village	No. of males measured	No. of females measured
Narayangarh	Dhipur	22	
	Karangabari	25	14
	Mamansa	10	
	Metial	13	
	Birkar		26
	Daharpur		10
Kesiari	Kukai	38	
Dantan	Sankaridanga	7	
	Benadubi	7	
		200	50

The following observations were made: skin colour; eye colour and eye slits; eye-brows; supraorbital ridges; hair form, colour, texture and quantity; forehead; nasion depression, nasal bridges, nasal septum; prognathism; lips and chin.

TABLE 2
Skin colour

Scale (von Luschan)	Male		Female	
	No.	%	No.	%
22	9	4.5	1	2.0
26	1	0.5	0	0
29	39	19.5	15	30.0
30	94	47.0	26	52.0
31	49	24.5	7	14.0
32	8	4.0	1	2.0

The colour of the skin was observed on the inner side of the upper arm. The colour ranges from tawny white to dark, the majority being dark brown. The female Lodhas are of lighter shade ranging from yellowish brown to dark brown.

TABLE 3
Eye

Scale (Martin)		<i>Eye colour</i>			
1	12	6.0	6	12.0	
2	178	89.0	43	86.0	
3	10	5.0	1	2.0	
		<i>Eye slit (Canthus)</i>			
Straight	150	75.0	33	66.0	
Oblique	50	25.0	17	34.0	
		<i>Eyebrow</i>			
Scanty	38	19.5	16	32.0	
Medium	112	56.0	33	66.0	
Bushy	41	20.5	—	—	
Connected	9	4.5	1	2.0	

The colour of the eye in the male is dark brown in 89% cases. The lighter colour of the iris is marked in 5% cases whereas 6% are brown. In the case of the females, eye colour is dark brown to the extent of 86% and brown in 12%. The lighter colour of the female iris is 2% which is significantly smaller than in the males.

The eyeslit is horizontal in the majority of cases. It has been found in 75% and 66% among males and females respectively. Oblique slit is noticed in the frequency of 25% and 34% among males and females respectively.

The eyebrow is medium among males to the extent of 56%, reaching 66% among females. Bushy eyebrows are found among males (20·5%).

TABLE 4
Supraorbital ridges

	Male		Female	
	No.	%	No.	%
Imperceptible	14	7·0	9	18·0
Trace	124	62·0	39	78·0
Moderate	62	31·0	2	4·0

The supraorbital ridge is found in traces in the frequency of 62% and 78% among males and females respectively. Moderate supraorbital ridges are found in 31% and 4% among males and females respectively. Imperceptible supraorbital ridges occur in 7% of males and 18% of females.

TABLE 5

Scale (Fischer-Saller)	<i>Hair</i>					
	<i>Colour</i>		No.	%	No.	%
27	137	68·5	45	90·0
28	61	30·5	4	8·0
		<i>Form</i>				
...	Straight	—	—	—	—	
...	Wavy	200	100%	50	100	
		<i>Texture</i>				
...	Coarse	11	5·5	1	2·0	
...	Medium	142	71·0	33	66·0	
...	Fine	47	23·5	16	32·0	
		<i>Quantity</i>				
...	Scanty	11	5·5	—	—	
...	Medium	164	82·0	46	92·0	
...	Thick	25	12·5	4	8·0	

The colour of the hair is similar to No. 27 of Fischer-Saller scale in 68·5% cases in the males and in 90% of cases among the females. No. 28 is also not insignificant as it is found in 30·5% cases among males and 8% among females. From a study of the hair it is seen that the Lodhas are a wavy-haired people, almost 100% both in the case of males and females. Deep wavy hair is sometimes observed. The hair texture is medium ; 71% and 66% being present in males and females respectively.

The quantity of hair is also medium amongst 82% of the females.

TABLE 6

Forehead

Character	Male		Female	
	No.	%	No.	%
<i>Height</i>				
Low	25	12·5	16	32·0
Medium	160	80·0	27	54·0
High	15	7·5	7	14·0
<i>Breadth</i>				
Narrow	7	3·5	6	12·0
Medium	187	93·5	40	80·0
Broad	6	3·0	4	8·0
<i>Slope Backwards</i>				
None	168	84·0	46	92·0
Retreat or marked slope	16	8·0	3	6·0
Medium	16	8·0	1	2·0

The forehead both in the males and females is medium, the percentages being 80 and 54 respectively. It is also not uncommon to come across instances of low and high foreheads which vary from 12·5% in males to 32% in females in the case of the former and 7·5% in males to 14% in females in the case of the latter.

The breadth of the forehead is medium in both males and females.

Foreheads with marked slope are found to the extent of 8% in males and 6% in females.

TABLE 7

Nose

Character	Male		Female	
	No.	%	No.	%
<i>Nasion Depression</i>				
Shallow	77	38·5	30	60·0
Medium	39	19·5	10	20·0
Deep	84	42·0	10	20·0
<i>Nasal Profile</i>				
Straight	60	30·0	6	12·0
Concave	87	43·5	43	86·0
Convex	12	6·0	1	2·0
Concavo-convex	41	20·5	nil	nil
<i>Nasal Tip</i>				
Horizontal	116	58·0	35	70·0
Directed upward	21	10·5	12	24·0
Directed downward	63	31·5	3	6·0

The nasion depression in the males is deep among 42%, medium among 19·5 and shallow among 38·5%. In the females it is 60% shallow while the medium and deep depressions are 20% each. There is a prevalent tendency towards the nasal bridge being concave in 43·5%, while it is straight among 30% in the case of the males. Convex nose was found in the males to the extent of 6% only. In females 86% of the noses observed were found to be concave. The nasal septum is horizontal in 58% of the males whereas it is 70% in the females. Downward direction of the nasal septum occurs in the males to the extent of 31·5% and 6% in the case of females.

TABLE 8
Alveolar Prognathism

Character	Male		Female	
	No.	%	No.	%
Slight	71	35.5	20	40.0
None	129	64.5	30	60.0

Alveolar prognathism is absent in the males and females in 64.5% and 60% cases respectively. Slight prognathism is marked in 35.5% males and 40% females.

TABLE 9

Lips

Character	Male		Female	
	No.	%	No.	%
<i>Form</i>				
Thin	8	4.0	—	—
Medium	188	94.0	50	100
Thick*	4	2.0	—	—
<i>Eversion</i>				
Absent or nil	189	94.5	50	100
Slight	11	5.5	—	—

In general, the lips are medium in 94% among the males and 100% among females. Thin lips were observed in 4% of the male folk. The eversion is practically absent in females and is only slight (5.5%) in the case of males.

TABLE 10

Chin

Character	Male		Female	
	No.	%	No.	%
<i>Prominence</i>				
Prominent	72	36.0	39	78.0
Medium	128	64.0	11	22.0
<i>Form</i>				
Oval	142	71.0	42	84.0
Round	13	6.5	4	8.0
Square	31	15.5	3	6.0
Pointed	14	7.0	1	2.0

The chin is medium in 64% of the males and 22% of females, whereas the prominence of chin is seen in the males and females in 36% and 78% respectively. Oval form of chin occurs in the males to the extent of 71% and in the females it is 84%. Square form of chin is seen in 15.5% males and 6% females.

Summary of somatoscopic observations

It will be found from the preceding observations that both the male and the female Lodha possesses a dark brown (No. 30 of von Luschan's scale) skin colour as found on the inner side of the upper arm. The males show the next highest percentage of darker skin colour (No. 31) while the females show the next highest percentage of lighter skin colour (No. 29). In both the sexes the eye colour is predominantly dark brown (No. 3 of Martin Scale), while the males show a higher frequency of lighter iris than the females. Both the sexes have the highest frequency of straight eye-slit while the eyebrows are medium broad in both the sexes. The supraorbital ridges are present only in traces in both sexes.

The hair colour agrees with No. 27 of Fischer-Saller scale in both the sexes, though the males show a higher percentage of No. 28. Hair form is wavy, while both the texture and the quantity are medium.

The forehead shows medium height and breadth in both the sexes while there is no backward slope in the majority of the cases.

The nasal depression is deep in the male in the majority of cases, while in the females the preponderant form is shallow. Shallow depression occurs in males in the frequency next to deep. The nasal profile is concave in both the sexes though the females show it preponderantly. Among the males the straight nasal profile is found in about 1/3 of the cases, while the concavo-convex form occurs in about 1/5 of the cases. The tip of the nose is horizontal in both the

sexes, though its frequency is much higher among females than among males. It will be seen from the above data that the sexual difference is apparent in the nasal form. The female nose shows lesser variability than the male nose.

Slight alveolar prognathism is present in almost equal proportion in both the sexes.

The lips are medium in both the sexes while there is no eversion in either sex.

The females show a higher frequency of chin prominence than the males though both the sexes present its oval form predominantly.

Anthropometric measurements

Only adults of both sexes were measured according to the technique prescribed by Martin. The following anthropometric measurements were taken on 200 male and 50 female Lodhas :

Stature, head length, head breadth, bizygomatic breadth, bigonial breadth, nasal height, nasal breadth, auricular height, least frontal breadth, morphological facial length, morphological superior facial length, horizontal circumference of head, and sitting height vertex.

The Lodha anthropometric data have been compared with the Bhumij (Risely), Hill Kharia (Roy & Roy), Munda (Bose) and Santal (Sarkar). For purposes of comparison the 't' test of significance has been applied and the formula used is

$$T = \frac{M_1 - M_2}{\sqrt{(\sigma_1)^2 + (\sigma_2)^2}}$$

where M_1 and M_2 stand for the mean values of the two samples and σ_1 and σ_2 the standard error of the two mean values. The value of 3 has been taken as the standard of significance.

TABLE 11

Measurements of 200 Males in cm.

Measurement	Mean ± standard error	S. D.* ± standard error	C. V.* ± standard error
Max. head length	18.18 ± 0.05	0.66 ± 0.03	3.63 ± 0.18
Max. head breadth	13.79 ± 0.03	0.49 ± 0.02	3.55 ± 0.18
Least Frontal breadth	10.20 ± 0.03	0.47 ± 0.02	4.61 ± 0.23
Bizygomatic breadth	12.19 ± 0.04	0.58 ± 0.03	4.76 ± 0.24
Bigonial breadth	9.99 ± 0.04	0.54 ± 0.03	5.41 ± 0.27
Nasal height	4.52 ± 0.02	0.35 ± 0.02	7.74 ± 0.39
Nasal breadth	3.86 ± 0.02	0.28 ± 0.01	7.26 ± 0.36
Auricular height	11.93 ± 0.08	1.12 ± 0.06	9.39 ± 0.47
Morph. Facial length	10.59 ± 0.04	0.62 ± 0.03	5.85 ± 0.29
„ Sup. Facial length	5.91 ± 0.03	0.44 ± 0.02	7.44 ± 0.37
Hor. cir. of head	54.95 ± 0.10	1.47 ± 0.07	2.68 ± 0.13
Height vertex	159.13 ± 0.44	6.16 ± 0.31	3.87 ± 0.19
Sitting ht. vertex	76.77 ± 0.24	3.42 ± 0.17	4.46 ± 0.22

TABLE 12

Indexes

Cephalic index	76.06 ± 0.28	3.93 ± 0.20	5.17 ± 0.26
Altitudinal index	65.65 ± 0.48	6.80 ± 0.34	10.35 ± 0.52
Breadth-height. index	85.62 ± 0.59	8.40 ± 0.42	9.80 ± 0.49
Nasal index	85.50 ± 0.56	8.00 ± 0.40	9.35 ± 0.47
Upper Facial index	46.25 ± 0.28	3.95 ± 0.19	8.55 ± 0.42
Total Facial index	82.98 ± 0.37	5.20 ± 0.26	6.25 ± 0.31

* S. D. = Standard Deviation.

* C. V. = Co-efficient of variation.

TABLE 13

Measurements 50 Females in cm.

Measurement	Mean ± standard error	S. D. ± standard error	C. V. ± standard error
Maximum head length	17.34 ± 0.08	0.57 ± 0.06	3.29 ± 0.33
Maximum head breadth	13.65 ± 0.07	0.46 ± 0.05	3.37 ± 0.34
Least Frontal breadth	9.72 ± 0.06	0.42 ± 0.04	4.32 ± 0.43
Bizygomatic breadth	12.15 ± 0.05	0.35 ± 0.04	2.88 ± 0.29
Bigonial breadth	9.04 ± 0.09	0.67 ± 0.07	7.41 ± 0.74
Nasal height	4.14 ± 0.04	0.28 ± 0.03	6.67 ± 0.68
Nasal breadth	3.57 ± 0.04	0.25 ± 0.02	7.00 ± 0.70
Auricular height	11.58 ± 0.11	0.79 ± 0.08	6.82 ± 0.68
Morph. Facial length	9.93 ± 0.06	0.45 ± 0.04	4.53 ± 0.45
Morph. Superior Facial length	5.39 ± 0.14	0.39 ± 0.04	7.23 ± 0.72
Hor. circm. of head	53.89 ± 0.14	0.96 ± 0.10	1.28 ± 0.18
Ht. vertex	149.45 ± 0.96	6.80 ± 0.68	4.62 ± 0.46
Sitting height	75.89 ± 0.46	3.27 ± 0.33	4.31 ± 0.43

TABLE 14

Indexes

Cephalic index	78.40 ± 0.53	3.75 ± 0.37	4.82 ± 0.48
Altitudinal index	65.98 ± 0.68	4.85 ± 0.48	7.35 ± 0.73
Breadth-height index	84.69 ± 0.94	6.69 ± 0.67	7.91 ± 0.79
Nasal index	85.79 ± 0.96	6.81 ± 0.68	7.92 ± 0.79
Upper Facial index	43.52 ± 0.43	3.06 ± 0.31	7.03 ± 0.70
Total Facial index	82.49 ± 0.83	5.91 ± 0.59	7.15 ± 0.71

TABLE 15
't'-test of Significance : Difference of Means

Character	Kharia-Lodha		Munda-Lodha		Santal-Lodha	
	Diff.		Diff.		Diff.	
Max. head length	0'11	1'37	0'52	8'66	0'52	7'40
Max. head breadth	0'18	3'00	0'02	0'50	0'10	2'50
Head height	0'35	3'50	0'10	1'25	0'66	7'30
Least frontal breadth	0'18	3'60	0'01	0'33	0'08	2'00
Bigonial breadth	0'77	12'83	0'98	24'50	1'16	23'20
Bigonial breadth	0'89	14'83	0'04	0'80	0'05	1'00
Nasal height	0'07	1'75	0'32	10'67	0'35	8'75
Nasal breadth	0'05	1'66	0'16	5'33	0'07	2'30
Total facial height	0'09	—	0'59	11'80	0'88	17'60
Head circumference	—	—	1'51	11'62	2'28	8'40
Stature	3'03	6'90	0'98	2'20	0'47	1'06
Indexes						
Length-breadth index	1'37	3'70	1'72	5'37	2'21	5'80
Length-height index	1'31	2'18	1'25	2'35	1'31	2'47
Nasal index	3'14	2'90	2'21	3'11	7'04	8'90
Total facial index	0'20	2'80	1'92	4'17	2'86	5'39

TABLE 16

Comparative Study of Means with Standard Error of the Means of the Lodhas and others compared.
(Measurements in cm.)

Character	Bhumij (Risley etc.) (n=100)	Kharia (Roy & Roy) (n=70)	Munda (Bose) (n=250)	Lodha (Bhowmick) (n=200)	Santal (Sarkar)	No. of Sarkar's Santals.
Max. head length	18.59	18.29 ± 0.07	18.70 ± 0.04	18.18 ± 0.05	18.70 ± 0.05	(166)
Max. head breadth	13.96	13.61 ± 0.05	13.81 ± 0.03	13.79 ± 0.03	13.89 ± 0.03	(168)
Head height	12.53	11.58 ± 0.06	12.03 ± 0.04	11.93 ± 0.08	12.59 ± 0.05	(167)
Least fr. breadth	10.23	10.02 ± 0.04	10.19 ± 0.02	10.20 ± 0.03	10.12 ± 0.03	(168)
Bizygomatic br.	13.13	12.96 ± 0.05	*13.17 ± 0.02	13.19 ± 0.04	13.35 ± 0.03	(168)
Bigonial br.	—	9.10 ± 0.05	9.95 ± 0.03	9.99 ± 0.04	9.94 ± 0.04	(167)
Nasal height	4.67	4.45 ± 0.04	4.84 ± 0.02	4.52 ± 0.02	4.87 ± 0.03	(168)
Nasal breadth	4.04	3.91 ± 0.03	4.02 ± 0.02	3.86 ± 0.02	3.79 ± 0.02	(168)
Total facial height	—	10.68 ± 0.10	11.18 ± 0.03	10.59 ± 0.04	11.47 ± 0.04	(168)
Head circumference	—	—	53.44 ± 0.08	54.95 ± 0.10	52.67 ± 0.26	(32)
Stature	159.2	156.10 ± 0.06	158.15 ± 0.03	159.13 ± 0.44	159.60 ± 0.04	(168)
<i>Indices</i>						
Cephalic index	75.0	74.69 ± 0.25	74.34 ± 0.17	76.06 ± 0.28	73.85 ± 0.26	(166)
Altitudinal inx.	—	64.34 ± 0.37	64.40 ± 0.22	65.65 ± 0.48	66.90 ± 0.23	(167)
Nasal index	86.5	88.64 ± 0.83	83.29 ± 0.44	85.50 ± 0.56	78.46 ± 0.56	(168)
Total facial index	—	82.78 ± 0.62	84.90 ± 0.28	82.98 ± 0.37	85.84 ± 0.38	(166)

As there are no corresponding female anthropometric data the female Lodha data could not be compared.

The comparative anthropometric data of the different groups are given in Table 16. The values of *t* are given in Table 15.

TABLE 17

Stature

Character	Male		Female	
	No.	%	No.	%
Very Short (130·0–149·9)	12	6·0	27	54·0
Short (150·0–159·9)	98	49·0	20	40·0
Below Medium (160·0–163·9)	48	24·0	2	4·0
Medium (164·0–166·9)	27	13·5	1	2·0
Above Medium (167·0–169·9)	8	4·0	—	—
Tall (170·0–179·9)	5	2·5	—	—
Very Tall (180·0–199·9)	2	1·0	—	—

From the above table it is seen that 49% males and 40% females are short in stature while 13·5% males and 2% females are of medium height, 2·5% males are tall in stature. The mean stature of the male Lodha is $159·13 \pm 0·44$, the minimum being 142·0 cm. and the maximum 181·0 cm.

The Lodha women show the mean stature of $149·45 \pm 0·96$ cm., the minimum and the maximum varying between 139·0 and 165·0 cm. respectively. The mean stature of the Bhumij is 159·2 cm. while the same for the Kharia is $156·10 \pm 0·06$. The mean values for the Munda and the Santal are $158·15 \pm 0·03$ and $159·60 \pm 0·04$ respectively. This shows that the Lodha stature approaches that of the Bhumij and the Santal, the Kharia and the Munda being shorter than the Lodha. The Kharia shows the most marked difference. This is also confirmed by the values of the *t*. The Kharia-Lodha value is 6·90 as compared with 2·20 and 1·06 for Munda-Lodha and Santal-Lodha respectively. Stature is known to increase as a result of urbanization and the higher stature of the

Lodha in comparison with the Kharia appears to show the progressive urbanization of the Lodhas in contrast to the Kharia who is yet locked up in forest areas.

TABLE 18
Length-Breadth Index

Character	Male		Female	
	No	%	No.	%
Dolichocephal (x-75.9)	114	57.0	13	26.0
Mesocephal (76.0-80.9)	62	31.0	26	52.0
Brachycephal (81.0-85.4)	20	10.0	11	22.0
Hyper-Brachycephal (Over 85.5)	4	2.0	—	—

Table No. 18 shows that 57% males and 26% females are dolichocephalic, 31% males and 52% mesocephalic, while 10% males and 22% females are brachycephalic. The mean cephalic index of the male Lodha is 76.06 ± 0.28 . It varies between the minimum and the maximum of 68.0 and 88.0 respectively. The female mean value is 78.40 ± 0.53 , the range of variation being from 70.0 to 86.0.

The mean cephalic index of the Bhumij according to Risley is 75.0 while that of the Kharia according to Roy & Roy is 74.69 ± 0.25 , that of the Munda 74.34 ± 0.17 and that of the Santal 73.85 ± 0.26 . Thus the Lodha possesses the highest index of all. This is borne out by the values of t , since all the three groups show values higher than 3.

The Kharia-Lodha value of t for cephalic index is 3.70, but in the case of head length and head breadth, the values of t are 1.37 and 3.00 respectively.

In head length the Lodha (18.18 ± 0.05) and the Kharia (18.29 ± 0.07) agree very closely, which is also borne out by the value of t . The Munda (18.70 ± 0.04) and the Santal (18.70 ± 0.05) differ widely from the Lodha mean and the same appears to be the case in respect of the Bhumij (18.59) as well. In respect of head breadth however the Lodha (13.79 ± 0.03) differs widely from the Kharia (13.61 ± 0.05), while they

show a very close resemblance with the Munda (13.81 ± 0.03) and stand closer to the Santal (13.89 ± 0.03) than the Kharia. This appears to show that the Lodha head form is possibly very near the Kharia in head length and the Munda in head breadth. In head breadth, the four groups Kharia, Lodha, Munda and Santal appear to be closely related, while in head length the Lodha approaches the Kharia alone. The Lodha head length has probably undergone some modification, and this is also observed to a certain extent in the case of stature. It is difficult to attribute any definite reason for this change; both urbanization and hybridization may be responsible for this change. The Lodha shows a greater degree of urbanization than any of the above four groups. Further research along this line is however necessary before we can interpret the relative influences of hybridization and urbanization. The mean value for head circumference of the Lodha is 54.95 ± 0.10 and the same for the Munda is 53.44 ± 0.08 and that of the Santal 52.67 ± 0.26 . In head circumference none of the groups approaches the Lodha, as will be apparent from the values of *t*.

TABLE 19

Length-Height Index

Character	Male		Female	
	No.	%	No.	%
Chamaecephal ($\times - 57.6$)	22	11.0	1	2.0
Orthocephal ($57.7 - 62.5$)	44	22.0	9	18.0
Hypsicephal ($62.6 - \times$)	134	67.0	40	80.0

Both male and female Lodhas are hypsicephalic, the percentages being 67 and 80 respectively. The other two indices are found to occur in higher percentages among males than among females. The mean length-height index of the Kharia is 64.34 ± 0.37 , that of the Munda 64.40 ± 0.22 , that of the Santal 66.96 ± 0.23 compared with 65.65 ± 0.48 of the Lodha.

TABLE 20
Breadth-Height Index

Character	Male		Female	
	No.	%	No.	%
Tapeinocephal ($\times - 78.9$)	44	22.0	9	18.0
Metriocephal ($79.0 - 84.9$)	46	23.5	17	34.0
Acrocephal ($85.0 - \times$)	110	55.0	24	48.0

In breadth-height index the majority of the Lodhas, both male and female, are acrocephalic; their percentages being 55 and 48 respectively. The other two indices are found in almost equal frequency among the males while the females show more of metriocephaly than tapeinocephaly.

The head height of the Lodha is 11.93 ± 0.08 compared with 12.03 ± 0.04 of the Munda, 11.58 ± 0.06 of the Kharia and 12.59 ± 0.05 of the Santal. The Bhumij head height is 12.53. This shows that the Lodha stands closest to the Munda in respect of this character. In length-height index, however, the four groups Lodha, Kharia, Munda and Santal show a close affinity as will be evident from the values of t , which are lower than 3 in all cases in spite of the Lodha showing a significant difference in respect of head height with Kharia ($t = 3.50$) and the Santal ($t = 7.30$).

Length-height index is a better criterion of racial affinity than length-breadth index and the closest affinity with the Munda in respect of head height and the close affinity of the Lodha with the Kharia, the Munda and the Santal in respect of length-height index point to a relationship with the Mundari peoples. This point will be further discussed afterwards.

TABLE 21
Upper Facial Index

Character	Male		Female	
	No.	%	No.	%
Hypereuryne ($\times - 42.9$)	35	17.5	19	38.0
Euryene ($43.0 - 47.9$)	95	47.5	25	50.0
Mesene ($48.0 - 52.9$)	57	28.5	5	10.0
Leptene ($53.0 - 56.9$)	10	5.0	1	2.0
Hyperleptene ($57.0 - \times$)	3	1.5	—	—

Both the Lodha males and females have the highest percentage of broad faces. The females show broader faces than the males. The mean upper facial index of the Lodha males and females are 46.25 ± 0.28 and 43.52 ± 0.43 respectively.

TABLE 22

Total Facial Index

Character	Male		Female	
	No.	%	No.	%
Euryprosopic (79.00—83.9)	114	57.0	29	58.0
Mesoprosopic (84.0—87.9)	49	24.5	12	24.0
Leptoprosopic (88.0—92.9)	37	18.5	9	18.0

Both the male and female Lodhas have the highest percentage of flat faces. The total facial height of the Lodha male is 10.59 ± 0.04 as compared with 10.68 ± 0.10 for the Kharia, 11.18 ± 0.03 for the Munda and 11.47 ± 0.04 for the Santal. This shows that the Lodha possesses the shortest total facial height and approaches the Kharia in this character, as will be evident from the value of t as well.

The bizygomatic breadth of the Lodha is 12.19 ± 0.04 as compared with 13.13 of the Bhumij, 12.96 ± 0.05 for the Kharia, 13.17 ± 0.02 for the Munda and 13.35 ± 0.03 for the Santal. Similar to the total facial height this character of the face appears to be the smallest in the case of the Lodha. The difference in this character appears to be one of the highest of all as will be evident from the high values of t . The bizygomatic breadth of the Lodha is smaller than that of the Kharia; but the bigonial breadth of the former (9.99 ± 0.04) is greater than that of the latter (9.10 ± 0.05). The mean total facial index of the Lodha male is 82.98 ± 0.37 compared with 82.78 ± 0.62 of the Kharia, 84.90 ± 0.28 of the Munda and 85.84 ± 0.38 of the Santal.

TABLE 23

Nasal Index

Character	Male		Female	
	*No.	%	No.	%
Leptorrhine (55.0-69.9)	5	2.5	—	—
Mesorrhine (70.0-84.9)	81	40.5	19	38.0
Platyrrhine (85.0-99.9)	114	57.0	31	62.0

So far as nasal index is concerned, 2.5% males are leptorrhine while 40.5% males and 38% females are mesorrhine, 57% males and 62% females are platyrrhine.

The mean nasal index of the male Lodha is 85.50 ± 0.56 , the minimum being 65.0 and the maximum 102.0. The same for the female is 85.79 ± 0.96 , the minimum being 73.0 and the maximum 98.0.

The Bhumij nasal index shows a mean value of 86.5 while that of the Kharia is 88.64 ± 0.83 , that of the Munda 83.29 ± 0.44 and the same for the Santal 78.46 ± 0.56 . The value of *t* shows a significant difference between the Santal and the Lodha (8.90); whereas the same between the Kharia and the Munda is 2.90 and 3.11 respectively. This shows that the Lodha shows a closer affinity with the Munda and the Kharia. The closest affinity however appears to be with the Kharia, as will be evident from the relative values of the nasal height and nasal breadth.

The Lodha males have mean nasal height of 4.52 ± 0.02 as compared with 4.67 for the Bhumij, 4.45 ± 0.04 for the Kharia, 4.84 ± 0.02 for the Munda and 4.87 ± 0.03 for the Santal. Thus in nasal height the Lodha stands closer to the Kharia than any of the above groups. The same is also true of nasal breadth. The mean nasal breadth of the Lodha is 3.86 ± 0.02 as compared with 4.04 for the Bhumij, 3.91 ± 0.03 for the Kharia, 4.02 ± 0.02 for the Munda, and 3.79 ± 0.02 for the Santal. The values of *t* for the Kharia-Lodha nasal characters also bear it out.

Conclusion

It will be seen from the above remarks that the Lodhas show a close affinity with the Kharias in respect of head length, head breadth ($t = 3.00$), nasal height, nasal breadth, total facial height, length-height index, nasal index and total facial index; while the affinity with the Munda is seen in respect of head breadth, head height, least frontal breadth, bigonial breadth, stature and length-height index. The affinity with the Santal is seen in respect of head breadth, least frontal breadth, bigonial breadth, nasal breadth, stature and length-height index. Thus the four tribes show a common affinity in respect of the head breadth and length-height index, which means that all the four peoples possess some common elements in the head form and the differentiation in head length has brought about the present difference in the form of the head. Whether the head length has undergone any modification or is due to a particular racial strain is difficult to interpret. The Munda head form occupies an intermediate position between the Kharia-Lodha forming the lower scale and the Bhumij-Santal forming the upper scale. The Lodha shows lower mean values in the majority of the characters than the Munda-Bhumij-Santal group and some of the values are further lower in the case of the Kharia. The close affinity between the Lodha and the Kharia is evidenced by the significantly lower values of t in 8 out of 15 characters, which appear to show that the Lodha and the Kharia are close congeners. The greatest difference lies in the facial region. The Lodha possesses a larger bigonial breadth than the Kharia, whereas the bizygomatic breadth is much greater in the latter than in the former. This change in the facial contour is difficult to interpret. The strong development of the lower jaw may be attributed to change in Lodha food habits, but this change should have influenced the maxillary pillars as well. The influence of hybridization cannot also be ruled out.

The frequency of disharmonic faces among the Lodha may here be mentioned. They show 27.5% of dolichocephaly with euryprosopy and 2% of brachycephaly with leptoprosopy.

TABLE 22

*Comparative Study of Means with Standard Error of Means
of the Lodha, Veddah and Kharia.*

S. N.	Character	Veddah	Lodha	Kharia
1	Max. head length	18'22±0'14	18'18±0'05	18'29±0'07
2	Max. head breadth	13'28±0'11	13'79±0'03	13'61±0'05
3	Head height	12'29±0'17	11'93±0'08	11'58±0'06
4	Least fr. breadth	10'31±0'11	10'20±0'03	10'02±0'04
5	Bizygom. breadth	11'74±0'13	12'19±0'04	12'96±0'05
6	Bigonial breadth	9'37±0'15	9'99±0'04	9'10±0'05
7	Nasal height	4'75±0'11	4'52±0'02	4'45±0'05
8	Nasal breadth	3'65±0'05	3'86±0'02	3'91±0'03
9	Total facial height	10'66±0'05	10'59±0'04	10'68±0'10
10	Hd. circumference	15'18±1'01	54'95±0'10	—
11	Stature	152'54±0'12	159'13±0'44	156'10±0'06

TABLE 23

Test of Significance : Difference of Means and Values of t.

S. N.	Character	Lodha-Veddah		Kharia-Veddah	
		Diff.	t Value	Diff.	Value
1	Max. head length	0'04	0'28	0'07	0'44
2	Max. head breadth	0'51	4'63	0'33	2'75
3	Head height	0'36	2'00	0'71	3'94
4	Least fr. breadth	0'11	1'00	0'29	2'63
5	Bizygom. breadth	0'45	3'46	1'22	9'38
6	Bigonial breadth	0'62	4'13	0'27	1'80
7	Nasal height	0'23	2'09	0'30	2'54
8	Nasal breadth	0'21	4'20	0'26	5'20
9	Total facial ht.	0'07	1'16	0'02	0'18
10	Hd. circumference	1'77	6'04	—	—
11	Stature	6'59	14'97	3'56	27'38
<i>Indexs</i>					
1	Length-breadth index	3'40	4'65	2'03	2'81
2	Length-height index	2'03	2'07	3'34	3'59
3	Nasal index	8'34	4'29	11'48	5'44
4	Total facial index	8'39	6'82	8'59	6'45

The next point of interest is the low metric values of the Lodha-Kharia group in comparison with the Munda-Santal group. Some of the characters, e.g., head length, head height, least frontal breadth, nasal height and total facial

height of the Lodha show a lower mean than even the Veddah (Sarkar 1954). The only exception is in the bigonial breadth of the Lodha which is slightly higher than in the Munda-Santal group. The Lodha occupies an intermediate position between the Munda and the Santal in stature. We have already tried to account for this condition of the stature.

It is difficult to interpret the above fact and only a few possible suggestions can be made here before further researches along these lines bring forth the correct answer. For this purpose the Lodha and the Kharia data have been compared with the Veddah data of Osman Hill (Sarkar 1954).

Table 22 shows the comparative mean values of the Veddah, Lodha and the Kharia, while Table 23 shows the difference of the means and their corresponding values of t .

Table 23 clearly shows that the Kharia is closely related to the Veddah in more characters than the Lodha. The greatest difference is seen in stature ($t=27.38$) and the next value of 9.38 is seen in the case of bizygomatic breadth. It is interesting, however, that the Veddah possesses a higher mean head height than both the Kharia and the Lodha, and whether the increase in the statures of the latter two is related to the decrease in their head heights is a matter of detailed enquiry. There is a general agreement in head form, while the Kharia agrees with the Veddah in both the length and breadth of the head, the Lodha agrees with the latter in length and height. It is worthwhile pointing out that the difference in head breadth between the Lodha and the Veddah is almost of the same magnitude as that in the case of head height between the Kharia and the Veddah. The importance of L-A index has been mentioned already. Among the groups compared here, only the Veddah and the Lodha agree very closely not only in L-H index but also in both the head length and head height. No other group shows this triple agreement. This triple agreement is again seen in the head length, head breadth and length-breadth index of the Kharia and the Veddah. In head length too, only the Kharia-Lodha-Veddah groups show an unitary agreement. It is therefore not out of place to assign the Kharia-Lodha head within the Veddah head form. The

Mundari groups, although showing an agreement in L-H index are very far removed in head length. The agreement in head breadth appears to have occurred later, though nothing conclusive can be said at present. The three groups agree with one another in the form of the frontal bone, while the difference in the bizygomatic breadth is greater between the Veddah and the Lodha. The Kharia however agrees with the Veddah in respect of bigonial breadth, while the Lodha stands apart in this character. This point has already been discussed.

In nasal height the three groups are closely related to one another, as will be evident from the values of t , while the Mundari groups are further removed. The differences in nasal breadth are again noteworthy and show an inverse relationship with the Veddah. While the nasal length of the Kharia and Lodha has decreased from that of the Veddah, the nasal breadth of the former two groups has undergone an increase. The agreement in total facial height again supports the close relationship between the three groups.

It will therefore be seen that the Kharia-Lodha group shows closer resemblance with the Veddah in respect of some basic characters, such as head form, least frontal breadth, nasal length and total facial length than the Mundari groups. The basic stratum of the Kharia-Lodha group appears therefore to be Veddid, and the changes they have undergone in stature and other characters, such as bizygomatic breadth etc., appear to be due to other factors. The greatest probability is intermixture with Mundari peoples. A submerged Veddid element has long been suspected among the central Indian aborigines and Sarkar (1954) is of opinion that the Veddids were at one time widespread over eastern India. The Kharia appears to show more of the Veddid type than the Lodha who is more acculturated than the former.*

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SNAKE WORSHIP AMONG THE NAYARS OF SOUTH INDIA

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NO species of animal has impressed mankind to the same extent as the snake apparently has. Startling indeed is its power of sudden appearance and disappearance ; and its gliding motion, without appendages, gives it an eerie quality. The lightning suddenness of its bite and the tragic consequences, coupled with its amazing swiftness, place the snake in a category of its own. Above all its habit of casting off its skin periodically endows it with a supposed immortality which becomes the cause of its extreme veneration. Snake worship is very widespread in the world and is attended by varying rites and ceremonies. In India, where many species of snakes abound, the cult is very widespread. Perhaps due to the variety of species and the consequent danger and damage involved, snake worship in India may have had a local origin, though J. Tod traces its origin to a Central Asian tribe called Tak.¹

It is significant that in the very rude and low cultures, among tribes like the Veddahs and Andamanese, and to some extent among the Australians, snake worship is not found. The Australians do have totemic clans named after snakes, but no special veneration is paid to snakes as such. In West Africa, on the other hand, among the Dahomey tribe the monster python Dahu Sio is worshipped as a great god, and is propitiated for favourable weather, for oracles and for wealth. Even in the Palaeolithic period snakes were held in esteem, judging from the carved snake figures on the batons de commandement, and also during Mesolithic period as evinced by snake paintings on the painted pebbles of Mas-d-Azil.

E. W. Hopkins observes that in the Vedic Age snake worship was widely prevalent in India, and references are made

to Abibuduya, the serpent of the deep. Further, an inscription at Banavasi in Kanara in South India, records the erection of a cobra stone in the middle of the 1st century A.D.

In Chamba district the 'golden snake' is offered milk.² In Bengal the snake goddess Manasa is worshipped widely, and this is supposed to give protection from snake-bite. Manasa is represented by an earthen pot with vermilion marks. Among the Meithies of Manipur the snake is believed to be the manifestation of a dead ancestor and is accordingly venerated and worshipped. A cult of the snake god is found among the Khasis of Assam, which however is diminishing now-a-days. Among the Khasis a mythical snake called U Thlen is worshipped and is propitiated by the offering of human blood.³ It is believed that the Thlen attaches itself to homes and families and is the bestower of wealth, prosperity, fame and well-being to its hosts. However, it needs regular and periodic propitiation by the offering of human blood, and in the event of its being neglected it brings disease, ill luck and ruin to the unlucky family which has angered it.

In South India and particularly among the Nayars the worship of snakes is an established cult. Snake groves or *kavus*, which are clumps of wild trees festooned with creepers, abound in plenty, usually near the homes of Malayali Hindus. These groves are called *vishathum kavu* (poison shrine) or *nagakotta* (snake shrine). Usually a block of granite is carved into the shape of a cobra's head, called *chitra kutta kalu* and is consecrated at the spot.

In Quilon district, Travancore, near Haripad is a big snake worship centre in the form of the Manarsalil temple. One of the important snake shrines is called *bernie kavu* situated in Chenganur taluk of the Quilon district. In Trivandrum is the great temple of Padmanabha Swami and here one of the important deities worshipped is Ananta, the mighty serpent, upon whose great coils Lord Vishnu reclines on the ocean of milk.⁴ Further, in Tirunelveli a temple dedicated to Shankar and the goddess Gomiti called Sankaranianar Koil has a snake mound where worship is offered to serpents in the hope that chronic stomach ailments will be cured by propitiating the

deity. Besides these, there are innumerable private snake shrines, particularly in pious households.

All diseases or misfortunes are due to the neglect of snakes. Leprosy, itches, sterility of women and deaths due to poison, are attributed to the anger of snake gods. The remedy for snake-bite lies in the propitiation of serpents through worship at the snake shrine. If no such shrine exists, then a diligent search is made and a 'snake stone' is dug up from the vicinity. Thereafter this accidental find of the snake stone is duly consecrated and worshipped, and all the erstwhile troubles are attributed to the inadvertent neglect of the sacred stone. The person dying of snake-bite is taboo, because his body is supposed to be occupied thereafter by the snake god, and it needs to be disposed of in a special manner with particular reverence and specific rituals.

Among the Nayars of South India snake worship assumes unique importance. It is popularly believed that in early times a Pambakattu Nambutiri brahmin brought the serpents with him and left them in their present abode. He however promised to return one day but never did. Strangely enough, in Travancore, a Pambakattu Nambutiri family still resides and is not permitted to enter the Manarsalil temple for fear that the snakes might leave the area and follow the brahmin to his abode. In a special ceremony called *kavu muttam* or the shifting of the snake shrines from one place to another in the compound of the house—if accidentally the shrine is awkwardly situated in a plot of land where construction is to begin—the Pambakattu Nambutiri is called specially to do the necessary shifting ceremony. He purifies the new area and transfers the shrine to the newly consecrated spot, to the accompaniment of sacred incantations. Thereafter there is feasting and the brahmin is paid money and is presented with a set of new clothes. This is in striking coincidence with the legend of origin, and lends credence to the story of the origin of snake worship, particularly in Manarsalil temple in Quilon, as being connected with Pambakattu Nambutiri brahmins.

The plans of snake shrines have much in common, though some are small and some big. The Manarsalil temple

is surrounded by a series of concentric circles as it were, on the outside is a wide road where fairs are held and much commerce goes on on festive days. The low castes cannot go beyond this outer fringe. Lodged within, is the garden where the snakes are to be seen in their natural habitat. In this area is a sacred tank, the water of which is rather dirty due to falling vegetation, but which is reputed to be medicinal in property. Here too is a very large vessel into which milk is poured by the priest so that the snakes might be well fed. Within this belt of vegetation and bushes is the shrine itself. There is a verandah with a central hall called *mandapa* with an open space in front, and in the centre is the platform where the snake deities are enshrined. There are two images here, one of Nag Raj with five heads and the other, of a serpent with only one head. This is the inner sanctuary where only the priest enters. In Manarsalil temple a virgin priestess conducts the most sacred rites and is considered to be the guardian of the serpents.

A similar position pertains among the Meitheids of Manipur, where a priestess looks after the serpent god called Pak-hangba.⁵ Near the verandah is a sacred well from which water is drawn as offering to the deities and is afterwards distributed to the devotees as holy water. It is believed that only pious people can see the snakes in the forest and the wicked cannot. The devotee considers himself blessed if he is able to catch a glimpse of the snake while on his way to the temple.

The common private snake shrine in Travancore lies within the compound of the house, often near the boundary, and away from the main building, in order to best preserve its sanctity and to avoid accidental pollution by inadvertent trespass by some members of the family. The abode of the snake god is called *sarpha kavu*, and this is usually a raised patch of land surrounded by bushes and trees. In the foliage there must be a plant yielding milky sap and in the absence of such a plant, one is planted near the shrine. The trees near the shrine are never cut and the area in the vicinity of the *sarpha kavu* is kept very clean. Often granite images of many-headed snakes with spreading

hoods are placed in the shrine, and no insect or rat or other animal is killed in the consecrated spot. Even broken bits of snake images are worshipped and they are set up in a row. No image or snake-stone is permitted to fall down, as that is considered to be inauspicious. On the inner surface of the hood of the snake is carved a seated female figure.

These sacred snakes are supposed to be different from the ordinary serpents. They are given the status of benign family deities and are presumed to possess strange powers and the attribute of gods. They are revered and they deign to live only under ceremonially pure conditions and surroundings, accepting only vegetarian offerings and abhorring animal sacrifice. In contrast mention may be made of the Thlen of the Khasis which demands human blood as offering. In the event however of their abode being polluted, e. g., by a menstruating woman, the serpents are angered, and unless propitiated may cause disease or harm to the offender. The sacred serpent called *sarpam* is supposed to be small, about 6 to 18 inches in length and is golden in colour. It is highly poisonous but ordinarily does not do any harm. If properly propitiated it guards the family and brings good luck and prosperity; but if neglected, insulted, or otherwise uncared for, it causes skin disease, leprosy or loss of sight. Such a punishment is visited on the offender or on his near relatives. As a consequence certain taboos are attached to the shrines and no menstruating or pregnant woman may come within six yards of the shrine, nor should anyone enter it without taking a bath.

The actual worship or *puja* is conducted either once or twice a year. The priest cooks rice in milk and adds pieces of ripe plantain to it, with a few flowering heads of the sacred *tulsi* plant dropped in towards the end. The offering is cooked on a special oven near the *sarpa kavu* in a bell-metal vessel. Thereafter, the priest pours some water over the snake idols to ceremonially bathe them and places a bunch of areca-nut palm in efflorescence on the head of the image in a diagonal fashion. The idol is then anointed with turmeric powder and basil leaves and flower petals are

showered. on it, and it is often garlanded. Incantations and *mantras* are recited by the priest during the ceremony.

Bell-metal oil lamps are lit in front of the images and their number is usually 3, 5 or 7. In each lamp there are 5 to 7 wicks pointing in different directions. Only coco-nut oil or *ghee* is used in these ceremonial lamps. In front of these lamps are placed three banana leaves with the cut end of the leaf facing the image and the tip pointing away from it, facing north or east. On one of the leaves some uncooked rice is placed and a husked coco-nut is kept over it, while in the other leaf unhusked paddy is heaped with a coco-nut placed on it. The eyes of the coco-nut are away from the snake idol and are towards the tip of the banana leaf. On the third leaf are placed a few small bananas of a special variety called *kadali*, because *kadali* is referred to in the Vedas.

The boiled rice offering is then placed near the shrine and some money is offered to the idol by dropping it in the oil of the lamp. These preparations are offered to the snake god who is supposed to partake of them. Thereafter the *prasad* or the offering is distributed among the members of the family, and the priest gets half of it. The *prasad* must not be eaten by a crow or dog as this is a bad omen. After the worship, the contents of the leaves are given to the priest who therefore takes great pains to see that this particular ceremony is well conducted.

Once a month or once every three months, low caste Hindus called Pulluvans visit the houses which have snake shrines. Usually they come on Tuesdays or Fridays, and they sing songs in praise of the snake gods. This is done in a rather crude manner to the accompaniment of crude single-stringed instruments called *veena kunju*. For this invocation, an oil lamp is lit before the shrine, and the above-mentioned three banana leaves and their respective contents are placed before the image of the serpent. Usually a woman accompanies the male singer and joins in the chorus, playing the while upon a crude drum. After the praise has been adequately rendered, the ceremony is brought to a close, and the musician gets his share of money and materials. This ceremony is meant to propitiate and

please the serpent god and to flatter him so that he may bear the welfare of the host in mind, and guard the family against disease, misfortune and harm accruing from human or supernatural agencies.

There are three important ceremonies in connection with serpent worship called *sarpa yaga*, *sarpa tulal* and *sarpa preeti*. They are conducted either at home or in the temple, usually on Sundays, since it is held that the serpents are most powerful and lenient on that day and are in a benign mood for granting favours.

Sarpa preeti is conducted in the house whenever misfortune occurs. The astrologer is consulted who decrees that a curse is upon the house and the serpents are angry. Thereupon elaborate worship is conducted with much ritual, and propitiation of the angered deities is effected and normalcy returns.

Sarpa tulal is a form of divine cure of the afflicted. The unfortunate victims of leprosy, mental or other diseases gather to worship the serpent gods praying for a cure. The priest conducts the worship and the afflicted go into a trance-like state and dance in religious fervour. Thereafter the priest throws consecrated turmeric powder on their heads and faces. The devotee feels blessed and cures are believed to occur.

Sarpa yaga is an annual festival in which many families jointly contribute to hold the ceremony. It is held usually for the collective prosperity of the village and lasts for two or three days. The afflicted and diseased persons dance in a trance for a long time and are given coco-nut water by the priest. At the end of the *puja* the priest sprinkles turmeric powder over the heads of the devotees and pours out holy water thrice in the palm of their hands.

One of the special attributes of snakes is their power over disease. The snake deities are specifically importuned for the prevention of skin diseases, stomach disorders, mental disturbances and for sterility. Leucoderma and leprosy are specially regarded as due to the curse of snakes who might have been angered by some unwitting disrespect shown towards them, or by accidental misdemeanour on the part of the inadvertent devotee. Of particular impor-

tance is the ritual conducted in the case of barren women who seek divine intercession of the serpent gods. The afflicted couple come on a Sunday morning to the snake temple after a purificatory bath and after putting on new garments. They request the priest to conduct a propitiatory *pūja* and offer flour to the deity. Thereafter, a bronze plate on which the name of the person is carved is placed inverted at a spot. After a year when they have been blessed with a child, they repair to the temple once more to offer thanks for the boon granted. The child is helped to lift the bronze plate and under it a small serpent is observed signifying that all is well. In the event of there being no snake underneath, it is taken as a bad omen predicting the death of the child. If even after ten years no child is born to the couple, the unretrieved bronze plate is discarded, on the presumption that the deity has not seen fit to grant the wishes of the devotees.

There is also a class of pious people who have through their devotion to, and worship of, the snake deity, acquired the art of curing victims of snake-bite. They are called *sarpa vaidyas* and cases of snake-bite are brought to them for treatment. The man chants certain magical formulae and tears a betel leaf in front of a pot of milk. The serpent is supposed to come out of hiding and to withdraw the venom, thus effecting a gradual cure.

But modern trends are contrariwise, and a gradual decline is discernible in the ritual of snake worship in a large majority of households which have snake shrines. Less emphasis is paid to the traditional worship of the serpent, and what little propitiation is done is more or less symbolic. Makeshift arrangements are often made, and worship by proxy is offered by the priest, in the absence of the family members, who merely pay a fixed sum to the priest for his labours, and thereby absolve themselves of the guilt of neglecting the snake gods.

Apart from simplification of the ritual of snake worship, yet another symptom of the decay of the cult appears to be the reduced importance that is given to the upkeep of the existing snake shrines. Many erstwhile sacred shrines are in a dilapidated condition. Perhaps in future, snake worship itself might become a thing of the past.

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- ² Ibbetson & Maclagan : *Glossary of Tribes and Castes of Punjab & N. W. F. P.*, 149.
- ³ Gurdon : *The Khasis*, 98-102.
- ⁴ Dubois & Beauchamps : *Hindu Manners, Customs and Ceremonies*, 641.
- ⁵ Hodson : *The Meitheids*, 110.

MISCELLANEOUS NOTES

Repairing bone specimens

Transparent celluloid solution has been found to be suitable for the repair of broken pieces of bone. The solution is to be prepared as follows :

Amyl acetate—20 c.c.

Celluloid strip—5 gms. in weight.

A transparent celluloid sheet is cut into thin strips. They are placed in a wide-mouthed glass bottle and amyl acetate is poured into it. The bottle is corked tightly. The celluloid begins to dissolve. The bottle is shaken thoroughly and is allowed to stand in a cool place for 24 hours. After that on examination it will be found that the celluloid has been partly dissolved and a uniform thick emulsion of transparent colour stands at the bottom. The bottle is shaken and is kept in an inverted position. It will be found that the undissolved jelly-like substance gradually descends, displacing the dissolved solution. This is done 5 or 6 times and it is left for another 36 hours. After that the bottle is taken out and examined, when it is found that a transparent thick solution of celluloid has formed. According to necessity it may be thinned by adding more amyl acetate.

In the Museum Method Laboratory of the Department of Anthropology, Calcutta University, five bone specimens were treated in the following manner.

Stage I

Edges of the broken bones were allowed to rub together or crumble and they were kept intact, so as to give direct points of contact.

Stage II

All fragments of a single bone were marked with some numbers to meet side by side.

EXPERIMENTAL DATA

Name of the Specimen	Condition	Reagent used	Date of treatment	Date of observation	Remarks
1 Skeleton of Loris	13th and 14th vertebrae dislocated from vertebral column.	Celluloid dissolved in Arryl acetate 5gm. in 20c.c.	12-8-'55	20-8-'55 24-8-'55	Securedly united and no mark of joining found.
2 "	Scapula and humerus detached from scapula and humerus broken into two.	"	12-8-'55	20-8-'55 24-8-'55	" "
3 Skull of Loris	Mandible broken into two halves (longitudinally from the middle of incisors).	"	3-3-'54	12-6-'54 18-10-'55 12-8-'55	" " " "
4 Canine teeth of the upper jaw of skull of Gorilla	Loose, separated from socket.	"	3-3-'54	8-3-'54 24-8-'55	" " " "
5 2 upper and 2 lower canine teeth of baboon skull	"	"	9-10-'54	19-1-'55	"

Stage III

The pieces to be joined were thoroughly cleaned and precaution was taken so that the fragments did not break up. They were then dried.

Stage IV

A thick coat of the solution was then applied on the edges of the broken pieces. They were allowed to dry for 2 to 3 minutes. Then the broken edges were brought together to meet side by side, thoroughly opposed. They were held lightly by tying with a cotton string. After about half an hour the hold was removed and the broken pieces were found securely united, leaving no mark of joining. Being a transparent solution it neither stained nor left any objectionable mark on the specimens.

Stage V

Finally a thin coat of the same solution was applied on the joined surface like varnish.

Calcutta University

T. C. Bagchi

BOOK REVIEWS

Report of the Seminar on Casteism and Removal of Untouchability.
HELD IN DELHI, SEPT. 26 TO OCT. 2, 1955. *Published by the Indian Conference of Social Work, 6/A Cooperage, Bombay 1.*

A seminar on casteism and untouchability was held in Delhi last year under the chairmanship of Prof. M. N. Srinivas of the Baroda University. There were altogether 36 delegates and 6 observers. Among the distinguished people who addressed the meeting were Mrs. Hansa Mehta, Dr. S. Radhakrishnan, Jagjivan Ram, Govinda Ballabh Pant, Kaka Kalelkar, L. M. Shrikant. Among social scientists were Profs. Iravati Karve, V. K. R. V. Rao, P. H. Prabhu and others. The book under review contains verbatim reports of their speeches as well as a very useful appendix containing a summary of work done for the removal of untouchability by the state governments and by non-official organizations like the Harijan Sevak Sangh.

On the whole the seminar proved to be a useful one. One of the findings of the seminar was that the main attack against caste must be carried on in the field of education, this being naturally supplemented by an effort to raise the economic and social status of the depressed classes. The recommendations were carefully thought out, sober and practical; and it would be well if the official and non-official agencies concerned try to guide the future course of their action by the findings of this body of capable and earnest social workers and social scientists. The main purpose of the seminar was practical, not academic, although as is apparent from some of the speeches that a plea was made out for the promotion of what is mis-called academic research, because such research of the right kind can alone form the foundation of an effective course of action in future.

This will be borne out by an observation which the reviewer wishes to make with regard to a kind of sentiment expressed and a historical view quite frequently subscribed to by some of the more important participants in the seminar itself. Everybody seems to have agreed that caste is an obnoxious thing, anti-social in outlook, and that loyalty to caste inhibits the growth of national-

ism. The complaint was repeatedly made that all reform movements against caste, beginning from the time of the Buddha to the twentieth century, did not succeed in loosening its roots, but ended by adding one more to the number of existing castes. So much so that populations who embraced Islam or Christianity in order to escape from the rigours of caste eventually succumbed to its temptations. Such a complaint has also been made previously by historians and social reformers. But the question remains unanswered as to where caste derives its main strength from. To put all the blame upon the 'conservative nature' of Hinduism or to say that the Theory of Karma and the educational machinery designed by the brahmins was so effective even when they had no political hold that it corrupted the minds of men for centuries, and even those who were outside their direct control, is to practically beg the question, or to ascribe a degree of power and authority to brahminical methods in past times which ought to be the envy of even modern totalitarian states, armed as the latter are by much more effective, mechanical methods of influencing the minds of men.

Indians are capable of change and have changed from time to time in the past. Through a historical accident in modern times, West Bengal has gone through more changes than many other states in India. The percentage of literacy in Bengal is not high enough to explain the changing attitude of the so-called lower castes towards the status assigned to them by orthodoxy. Detailed enquires about the changing attitude towards caste rules, whether they be in the direction of reinforcement or rejection, and their correlation with changing economic position, would be a fruitful line of sociological enquiry. In many cases in Bengal, castes have developed their own assemblies in course of the last fifty years. These are trying to bring about internal reforms. It would be worth while investigating how these conscious efforts of reform are related to the changing occupational pattern of the caste and to educational progress or stagnation. And such purely 'academic' research may give us the clue as to the real source of strength of the caste system which has succeeded in the past and even now in defeating all efforts of reform. When one knows the nature of the disease, one is better able to deal with it. An eagerness to act, and to get rid of an obnoxious thing is all right in its own place ; but the reformer must be equipped with the knowledge which can

only be gained by detailed and painstaking scientific investigation before well-intentioned desires can become really effective.

The seminar was successful in so far as it brought together men of varied interests and led to the formulation of practical recommendations. Its labours would be doubly crowned by success if it leads to the initiation of researches of the right kind in relation to social and psychological problems which are deeply tied up with the urgent task of reorganizing the social and economic life of India in our own day.

N. K. Bose

Changing Lapps. By Gutorm Gjessing. Published for the Department of Anthropology, The London School of Economics and Political Science. Houghton Street, Aldych, London, WC 2. 1954. Pp.67.

The author presents to us in this booklet a careful study of the changes which are taking place in the culture of the Lapps. He has given, for instance, a detailed picture of how a revivalistic movement among them drew its elements partly from Christian beliefs and partly from their more ancient tribal magical customs. It is interesting to observe how the different value-systems came into conflict with one another, and eventually became welded into one.

In regard to the economic life of the Lapps, one very significant fact has been brought to light. It has been demonstrated how the extreme dependence of the tribe on reindeer pastoralism is itself a matter of recent growth brought about through contact with prosperous neighbours with whom they have now entered into a kind of symbiotic relationship. When the Lapps lived in greater isolation, their economy was of a more diversified kind, partly bound up with fishing and partly with activities connected with the forest or the reindeer. This is apparently parallel to what has happened in the case of the nomadic Birhors of Bihar and Orissa, whose extreme dependence on the jungle now appears to be not a carry-over from the past, but a new development which has taken place after they came into conflict with the encroaching hordes of farmers from Bihar into their original habitat.

N. K. Bose

Culture and Human Fertility. By *Frank Lorimer and Meyer Fortes, K. A. Busia, Audrey I. Richards, Priscilla Reining, Georgio Mortara.* UNESCO, 1954. 4.50 dollars. Pp. 509.

There have been few enquiries on the relationship between culture and fertility, and as such the present volume has come out as a most welcome study, more so because a group of specialists have co-operated in its production. Lorimer has rightly pointed out that any 'surviving culture must be compatible with effective reproduction'. Culture was so long thought to be 'irrelevant' to fertility by Malthusians. In his able introduction, covering the first six chapters of the book, Lorimer has very well succeeded in showing that the basic pattern for the replacement of generations 'may be profoundly modified in different cultures'. Some stable cultures tend to promote a very high level of fertility without any attempt at limiting it, while in some societies the practice of restricting fertility is very strong, whereas in others, cultural conditions may be ambivalent either towards 'the restraint or re-inforcement of biological factors conducive to reproduction'. Lorimer has suggested a 'closer integration of cultural and demographic studies'. The reviewer realized this approach some years ago, as will be evident from the papers published by him and his students in this journal from 1944 onwards. A similar survey is also being carried on in Orissa since 1953 under the aegis of the Government of Orissa, while in Assam a private survey is being conducted by a lady student of the present reviewer. Tulika Sen's study published in this journal (1953) showed difference between the reproductive lives of high caste and low caste women in Bengal. Unfortunately, excepting for the study now being conducted in Orissa, all the studies were carried out by individuals who depended on their private resources, and naturally such work has its limitations. The results have yet to be supplemented by able sociologists on the cultural front.

To come back to the review again. Lorimer has rightly pointed out that the extremely complex nature of human fertility has received practically no attention from medical men, biologists and demographers. There is practically no data on the frequency of coitus, although Raymond Pearl showed a method of studying it. The same might be said with regard to the possible selection of mates by reference to the fecundity of the family in question.

Nothing definite is known of the frequency of barrenness in this country. Lorimer has published some data with regard to India, in which it is seen that the proportion of women who never became pregnant is 5·3% among the Hindus of three areas in Bengal, the samples being from one rural area and two urban centres in Calcutta. A group of Calcutta Muslims showed the same frequency to be 10·5%. Lucknow and Kanpur showed 4·4% while the same for Mysore areas was 5·4%. Lorimer, following the experience of Meyer Fortes among the Ashanti of the Gold Coast, appears to hold that like the Ashanti women the Indian women also concealed their disability of bearing children. Among the Ashanti women, the child is almost a compulsory factor in the sense that they must have a child either through wedlock or outside it or by adoption, and Ashanti society allows it. It is not possible to have a legitimate child out of wedlock in Bengal and a barren woman is too well known. No field worker can miss her.

Lorimer has pointed out that there is no basis for assuming an approximately equal genetic capacity for reproduction in all human populations. We do not know as yet whether the unusually high fertility in some populations is a deviation in the biological capacity from the general or an 'unusually positive response to social conditions conducive to maximum fertility'. Lorimer suggests the possibility of a genetic factor in it. At the same time, the influence of environment is apparent as can be seen in the appreciably high sterility in urban populations—at least in the U. S. A. Fertility is also complicated by a third factor, namely, psychological conditions. Among relatively stable populations, where cultural conditions are conducive to fertility, six to about eight live births per woman of completed fertility appears to be usual, and the variations in fecundity are possibly due to variation in genetic factors.

The authors have shown variation in fertility in the four major categories of kinship systems, which are: simple cognatic with emphasis on the nuclear family, patrilineal, matrilineal and a residual category of intermediate and complex kinship systems. Both the matrilineal and the patrilineal kinship systems tend to generate strong motivations for high fertility, although the patriarchal societies of Africa show two culturally prescribed modes for the control of fertility. They are, (1) cultural prohibi-

tion on inducing pregnancy in a nursing mother, and (2) postponement of marriage of young men with special provisions for incomplete sexual intercourse. There is also a minor fertility check in which the parents consider it improper to bear children after a son is married, and the authors have mentioned the prevalence of this custom in Africa and China. This check appears to be in vogue in Bengal also, and even now it is looked upon derisively. There is no relation between polygyny and fertility—it is just an 'instrument of demographic expansion and cultural assimilation'. Marginal societies lacking corporate kinship groups, like the Bushman, Hottentot, etc., on the other hand, due to limited resources, have developed cultural devices tending to check the growth of population. Infanticide is common and abortions are increasing among the Hottentot. The Pacific Islands, on the other hand, show demographic contrasts. Some show elaborate cultural devices for the control of fertility and some show ambivalent attitudes towards fertility.

Acute social disorganization leads to sharp declines of fertility, as will be evident from the African studies in the latter part of the book. The Baganda show a high incidence of physiological sterility, and both the Baganda and the Bahaya are undergoing a great confusion in their social and political lives. A positive association has been found between altitude and fertility in Tanganyika where an unusually high fertility is found in the Batutsi and the population of Ruanda-Urundi. The impact of changed conditions has reduced the fertility of the Tswana of Bechuanaland where previously the cultural conditions were conducive to high fertility. All these facts show that the 'disorganization of traditional social structures and related value system under the impact of outside forces' result in frequent avoidance of child-bearing or sterility or both. Lorimer has advanced a hypothesis 'that this trend is essentially a biological phenomenon, released by cultural indifference to fertility'. Micronesia also gives the same picture. Since Rivers observed the depopulation of Melanesia, there has been some rapid natural increase, and this Lorimer interprets as 'successive aspects of the process of acute social disorganization and chronic accommodation to external forces'. In the Americas, hybridization affected greatly the genetic constitution of the peoples and the mestizos

are more, prolific in reproduction than the Indians. The cultural conflicts have acquired accommodation, and high levels of fertility are apparent.

Fertility differentials are also conditioned by cultural conditions in the various stable agrarian civilizations. The functions of kinship systems in tribal societies of Western Europe in pre-Roman times lacking the corporate kinship groups stood in contrast to the structure of feudal society in medieval Europe. In the former, families or corporate lineage groups formed the primary element of social organization. With the growth of Christianity the nuclear family became the primary unit of social organization. In Asiatic societies, large cohesive families were 'source of prestige, collective economic security and deep emotional security'. They had positive motives for high fertility, but Lorimer is of opinion that 'fertility in most Asiatic countries is appreciably below procreative capacity'. Lorimer cites the example of the prohibition of widow remarriage in India and a similar attitude against it in China. In agrarian Western Europe, 'major economic obstacles to marriage for large elements of the population' seemed to have definite influence on fertility. The implicit emphasis on the nuclear family made the husband responsible for the support of the wife and children, which is not apparent to the same degree in Asiatic societies. Lorimer writes, 'it is hardly an exaggeration to say that it is the mainspring of the limitation of fertility in Western European society'.

In discussing the influence of religion on fertility, it appears that Islam gives strong and unequivocal emphasis on high fertility. Buddhism appears to hold a neutral attitude except in societies like Japan. Christianity, on the other hand, has fairly direct relation to fertility and this appears to have a dual aspect, positive and negative. The negative aspect is correlated with the rise of Protestantism which eventually led to the widespread limitation of fertility. The positive value is associated with the Catholics.

Cultural conditions also affect the demographic transition, which is defined as the shift from high mortality and high fertility to moderate mortality and moderate fertility as a result of the development of science and technology. Europe was prepared with the methods of fertility control at the beginning of the industrial

era. England and France, however, offer contrary problems which are difficult to explain. Although England led in industrialization, the general decline of fertility in England did not begin earlier than in central and northern Europe. And in France fertility began to decline some 70-100 years earlier than in any other European country. In England, the industrial revolution brought about a basic transformation of English economy some 50 years before the beginning of the general decline in fertility. Then followed the Factory Act of 1833 which prohibited the employment of minor children. Thus the earlier social forces which found expression largely in prolonged postponement or avoidance of marriage led to the methods of controlling fertility within marriage. This was accompanied by an increase in the employment of women. In France, the decline of fertility has been wholly a function of increasing control within marriage. Lorimer offers an hypothesis of this distinctive character of demographic transition in France. He thinks that this is due to distinctive changes in personal relations, attitudes and values, i.e., in the cultural aspects of its social life. Industrialization on a large scale is however not responsible for a trend towards increased control of fertility; neither does mechanization in non-industrial society automatically bring in a trend towards increased control of fertility. American attitudes favour the restriction of the size of families, and parenthood is treated as a 'major goal'. Soviet Russia having very high general level of fertility before World War I shows many changes due to shift of cultural conditions, and these are conducive to the decline of fertility. Social changes in Japan towards the end of the 19th century and afterwards were responsible for the postponement of marriage and control of fertility within marriage. The Japanese do not sharply differentiate between abortion and contraception. Brazil however does not show any demographic transition. A high proportion of children is born outside institutionally recognized marriage.

In conclusion, Lorimer has put forward a valuable opinion, which according to him, is the 'powerful obstacle in the modern world to the rational ordering of personal behaviour influencing population trends'. The powerful obstacle is due to the *cultural inertia* resulting from the 'breakdown of social institutions and the disorganization of personal relations' which 'tend to leave elemental

impulses toward procreation relatively unrestrained'. Lorimer recommends studies of each and every society for these social and demographic trends and he has given a right lead in this direction. The book will remain a landmark in social and demographic research and both Professor Lorimer and the UNESCO deserve our best congratulations for bringing out such a publication.

The last four parts of the book cover the field data, in which Professor Meyer Fortes and his colleagues describe the demographic trends of the matrilineal Ashanti, while K. A. Ausia deals with the social conditions in relation to human fertility in the Gold Coast. Audrey Richards and Priscilla Reining report on the fertility surveys in Baganda and Bahaya while Giorgio Mortara contributes a detailed account of Brazilian demography.

S. S. Sarkar

The Track of Man. By Henry Field. Doubleday and Company, Inc. Garden City, New York, 1953. Price 5.75 dollars. Pp. 441 + 26 illustrations and 2 maps.

The present book is written more or less in the form of an autobiography; and general readers as well as students of anthropology will find in it much that is of absorbing interest. Dr. Field spent his early days in Eton and Oxford, and then made hazardous journeys through the deserts of the Middle East. The story of these journeys, as well as an account of the manners and customs of the people of Iraq and Arabia form a welcome contrast to the conditions of life in post-war Germany, or in Russia under the rule of Stalin.

Students of anthropology will find the story of Dr. Field's contacts with eminent scientists of absorbing interest. These include people like L. H. Dudley Buxton, Henry Balfour, R. R. Marrett, Arthur Keith, Howard Carter, Gertrude Bell, Stephen Langdon, Abbe Breuil and Earnest Mackay. The author's personal narrative of expeditions in Iraq, Iran, Arabia, Faiyum, Syria, North Sudan or Kenya introduce us to experiences which are not available in text-books.

The book deserves to be in the library of every anthropologist.

G. S. Ray

Untouchability in the Far East. By *Herbert Passin*, Tokyo. *Monumenta Nipponica*, Sophia University, Chiyoda-Ku, Tokyo. Vol. XI, No. 3, 1955. Pp. 21.

This is an excellent account of the custom of untouchability as it is in vogue in the stratified societies of Japan, Korea and Tibet. The author has analysed their common features, and shown how the concept of ceremonial pollution associated with blood, death and dirt have given rise to rules which mark off one occupational group from another. In spite of a stratified society in China, untouchability does not seem to have developed there, and Mr. Passin gives certain plausible reasons for this special development.

To social anthropologists, the book raises one important question, namely, how far the custom of untouchability in the countries in question are historically related to one another. Apparently there seems to be much in common between its manifestation in the three countries and in India, where also, the same concept of ceremonial impurity is in vogue. It would be worth while pursuing this question a little further.

Efforts have been made in Japan in particular to remove this social taint. Yet we are told how and why the reforms have not succeeded to an adequate extent.

We recommend the booklet strongly to those who are interested in the problem of caste in India, as well as to workers in the field of social reform who are specially concerned with the problem of the untouchables in our country.

N. K. Bose

La Version Mon du Nārada-Jātaka. By *Pierre Dupont*. Published by *Ecole Française d'Extrême-Orient*, Saigon, 1954. Pp. 281.

The number of edited texts in Mon is very small. The present volume will therefore be all the more welcome as it fills a real need. After a short introduction, which contains mainly some observations on the nature of Mon grammar, its phonetics and transcription, the author has divided his work into three parts : first, the Mon text of the Narada-Jataka, then a French translation, accompanied by many notes, and finally a Mon-Pali glossary, covering all the words of the present text. A model publication, for which the author deserves unqualified praise.

C. Bulcke, S. J.

Les Sectes Bouddhiques du Petit Vehicule. By *Andre Barreau*. Published by *Ecole Francaise d'Extreme Orient, Saigon, 1955*. Pp. 310.

Besides the two volumes of M. N. Dutt on *Early Monastic Buddhism* (Calcutta 1941 and 1945), comparatively little has been published on the Hinayana sects. The volume under review contains therefore much that is new, covering as it does all the sects of the Hinayana. Up to now too much exclusive attention has been paid to the Theravadis or Sarvastivadis. The work of Barreau will enable us to get a better perspective. The first part gives a survey of the various sects, their genesis and mutual relations. The second part then proceeds to deal with each of the 34 sects in turn, and gives for each one of them, as far as possible, the date of its appearance, its diffusion and characteristic doctrines. Three appendices deal with the classification of the controverses, the doctrinal affinities of the various sects and the origin of Mahayana. A work of great erudition which marks a milestone in the study of Hinayana.

C. Bulcke, s. j.

L'Art du Laos. By *Henri Parmentier*. Published by *Ecole Francaise d'Extreme Orient, Hanoi, 1954*. Two volumes in 8 vo. Pp. 360 + 120 and 61 charts.

The former head of the Archaeological Survey of the Ecole Francaise d'Extreme Orient, Monsieur Henri Parmentier, has done much for the spread the knowledge of Indo-Chinese art and its relations with India. We need only mention here his *L'Art Khmer Primitif* (1927, two volumes), *L'Art Khmer Classique* (1939, two vols.) and his *L'Art Architectural Hindou dans l'Inde et en Extreme Orient* (1948). The present work is edited posthumously by his widow, Madame Jeanne Leuba-Parmentier. All lovers of art and all students of the relations between India and Indo-China will be grateful for these two volumes. The second volume contains 146 illustrations and 61 large charts. The first volume gives us the text and also a complete alphabetical index which makes references easy.

After a short geographical introduction, the author gives a detailed inventory of roughly 150 pages of all the monuments in

Laos. In the next chapter he examines the general characteristics of Laotian temples: the Vat (hall of worship), the annexes, the furniture, the images of Buddha, and the materials used in construction. The fourth chapter studies the historical relations with the neighbouring countries from the point of view of art; the next is devoted to the That, the Indo-Chinese stupa. In a last chapter the author gives us his conclusions, all of which are very carefully formulated and based on extensive observations.

This volume is therefore altogether indispensable to all students of Indo-Chinese civilization.

C. Bulcke, s. j.

Croyances et Pratiques Religieuses des Vietnamiens. By L. Cadiere. Published by Ecole Francaise d'Extreme Orient. Saigon, 1955. Pp. 343.

The book under review is the second volume of a larger work, entitled *Croyances et Pratiques religieuses des Vietnamiens*, to be published in three volumes. The first volume appeared at Hanoi, in 1944, under the title *Croyances et Pratiques religieuses des Annamites*. The present volume was in the press at Hanoi when the Japanese invasion stopped the work. It contains little that has not been published earlier, either in the *Bulletin de l'Ecole Francaise d'Extreme Orient* or in the *Bulletin des Amis du vieux Hue*.

The author has been publishing ethnographical studies on Indo-China for the last sixty years, and is one of the pioneers of Annamite studies. Although some of the chapters contain material published in the beginning of the century, the book still remains useful. As a matter of fact some features must now have changed completely, and the descriptive material has thus become all the more precious. The five chapters are of unequal length; the first describes the beliefs and religious practices of the people around Hue, in particular the worship of stones, and covers close on to 200 pages. Elsewhere we find beliefs, customs and legends of other parts of the country; the chapter on the customs and beliefs connected with children is of great interest. What strikes the reader most is the love the author has for the people whose customs and beliefs he describes. Having spent decades as a missionary in Indo-China, his knowledge is very wide indeed. The author is reported to have

said formerly : 'I have understood the Annamites, because I have studied all that concerns them. I have studied their language their beliefs, their religious practices, their morals, their customs... I am convinced that they are intensely religious. ... I have studied and understood them ; that's why I love them because of their keen intelligence ; I love them, because of their moral virtues.....I love them because of their character...I love them because of their misfortunes'.

C. Bulcke, s. j.

Bulletin De L'Ecole Francaise d'Extreme Orient. Saigon.
Vol. 44. Fasc. 2 (1954).

Several articles in this number are of great value. The first gives us the titles and colophons of 67 Tibetan non-canonical works, followed by various indices facilitating reference. The second analyses at length the contents of the *Yogācārabhūmi* of Saṅgharakṣa, belonging to the Sarvāstivādī school of Kashmir. This handbook of meditation was translated into Chinese as early as the end of the 2nd cent. A. D. and exercised great influence in China. The article on Nestorian seals found in China will interest many. Indianists will like to read the long commentary of Paul Mus on the First Brāhmana of the fifth chapter in the Bṛhad-āraṇyaka Upaniṣad, on Brahman the inexhaustible.

Vol. 46. Fasc. 2 (1954).

Two contributions arrest our attention. The first is a posthumous work of Henri Maspero, covering over sixty pages, which attempts to give a picture of China at the end of the Chang dynasty, i.e., roundabout 1000 B. C. The second is even longer, nearly 150 pages and deals with Śāriputra, the great disciple of Buddha, and his role in the history of Buddhism and the evolution of the Abhidharma. Philologists will appreciate two articles about Indo-Chinese linguistics.

Vol. 47. Fasc. 1 (1955).

Besides a short obituary notice of the eminent orientalist R. Grousset (1885-1952), this number contains two contributions only. The first covers nearly three hundred pages and is the continuation of L. C. Damai's valuable work on Indonesian epigraphy. The first part appeared in an earlier issue of the same journal (Vol. 46, pp. 20-103).

The second article by Guy Morechand analyses the economic and social characteristic of central Viet-nam maritime fishing ; it consists of 60 pages of text, 27 plates and three maps.

Vol. 47. Fasc. 2 (1955).

This number opens with an article consecrated to the memory of another great orientalist, Jules Bloch (1880-1953), followed by a bibliography of his work. Four long articles arrest our attention. A translation of the old annals of Vietnam, of Chinese origin, covering three centuries, beginning in 206 B. C. ; this is accompanied by the photographic reproduction of the text. H. Maspero's T'eng-French vocabulary (some thirty pages), along with some texts and a French-T'eng vocabulary will be of great value to those who study Khmer languages. The same remark applies to Antomarchi's text and translation of the Rhade epic song, entitled *Klei Khan Kdam Yi*. Anthropologists and ethnologists will welcome G. Morechand's contribution on Indo-Chinese shamanism.

C. Bulcke, s. j.

Jewish Thought as a Factor in Civilization. *By Leon Roth. UNESCO : Paris, 1954. Rs. 2. Pp. 64.*

The context of this booklet is that Christianity itself is based on Judaism. Monotheism and the moral thoughts of the western world can be traced to the Hebrew teachings. The writer contends that ethics is related to monotheism because a single God implies a single standard.

J. Sarma

The Ecumenical Movement and the Racial Problem. *By W. A. Visser 'T Hooft. UNESCO : Paris, 1954. Rs. 2. Pp. 70.*

Churches act according to the racial feelings of the community although they preach that all men are equal in the sight of God. In the United States, Negroes and Whites have different congregations although belonging to the same denomination of the church. In South Africa also the racially segregated churches are found. The Bantus converted to Christianity have separate churches for themselves and have no contact with the white congregations. The church councils wish for less racial discrimination in the churches

of South Africa. The author goes on to discuss the part the church can play in eliminating race prejudice. In the United States churches have played an active part in the education of the Negro and in anti-prejudice movements.

J. Sarma

Racial Equality and the Law. By *Morroe Berger*. UNESCO : Paris, 1954. Rs. 3. Pp. 76.

This booklet offers a study of laws in the United States which were introduced with the intention of reducing racial discrimination. Corrective legislation has been going on steadily since 1930, and has grown by leaps and bounds since the war. With the help of all the government and private activities in improving group relations, it is found that in almost every significant economic and social characteristic that we can measure—including length of life, education, employment and income—our Negro citizens, as a whole, are less well off than our white citizens. The second is that in almost every characteristic the differences between the two groups have narrowed in recent years'. (p. 16).

The Negro citizens feel discrimination in economic activities to their greater disadvantage than discrimination 'in social spheres'.

The author concludes that law has helped the people of the United States in combating many of the effects of race prejudice.

J. Sarma

Men against Ignorance. UNESCO : Paris, 1953. Rs. 3.

A selection of articles written by four newspaper men have been presented in this booklet. The writers have visited Asia, Latin America and West Africa and write on certain selected places of these continents. The articles offer short sketches of the existing educational conditions, and the difficulties faced by the educationalists in the practice of new methods of mass education. The help offered by the UNESCO in overcoming some of these difficulties is particularly mentioned.

J. Sarma

Primitive India : EXPEDITION 'TORTOISE' 1950-52, AFRICA, MIDDLE EAST, INDIA. *Translated from the French of Vitold de Golish by Nadine Peppard—George G. Harrap & Co. Ltd. London, Toronto, Wellington and Sydney. Price Rs. 30.*

The book under review is a book embodying the life and customs of the Bondos, Gadabas, Kanis and Todas in beautiful 80 full page photographs in black and white and in colour taken by the author, V. D. Golish and his fellow members of the expedition, namely, P. Rambach and Francois Herbert-Stevens in course of their sojourn through India lasting for a short time. The photographs taken by the respective members have been mentioned in the acknowledgments. As the reader follows the author and his companions in their travel through the wild tracts of southern and central India inhabited by these tribes, he feels as if he is brought in actual contact with the sceneries and the people photographed by them. The author gives a short description of each of the four tribes followed by the photograph of the tribe describing their life and custom with notes on the plates at pages 47 to 52. So the book may well be called 'Ethnography of Bondos, Gadabas, Kanis and Todas in Pictures'.

Students of anthropology in India will heartily welcome this book.

B. C. Roy

Environment, Tools and Man. By D. A. E. Garrod. Cambridge University Press, 1946. Pp. 30.

In her inaugural address as Disney Professor of Archaeology Professor Garrod emphasizes a certain point for which archaeologists should feel rightly grateful to her. There has grown up a tendency among prehistorians to deal too much with the anatomical peculiarities of tools left by ancient men. They are likely to lose sight of the wood for the trees. For, after all, tools are of use only in so far as they reveal to us the *life* of man. Miss Garrod says that for this reconstruction we must lay under contribution all that the physiographer, the paleobotanist and the paleontologist have to say with regard to the physical and organic surroundings of ancient man. A knowledge of modern stone- or bone-using tribes, their technique and the function of different

tools should also supply us with necessary materials. And with all these before us, using our scientifically trained imagination, we shall be able to reconstruct ancient man's life with some degree of confidence.

In course of her address, Professor Garrod refers to Professor Gordon Childe, and complains that even he has, in one of his more recent books, somewhat lowered the role played by mankind in relation to nature. Man, according to her, is the conqueror of nature, his will dominates the scene, rather than his life being dominated by nature. This is a point where the reviewer feels more in sympathy with Childe's views than with those of Professor Garrod. For, after all, what does 'conquest' imply? It means no more than this that through more careful observation of nature's working, man is able to play upon certain subtler forces or combination of forces and succeeds in turning them to his own advantage. Nowhere does he transgress, or anyhow go beyond, nature's laws. His will resolves itself into nothing more than a freedom of choice; and even that for purposes which are biologically determined. Over his own biological needs, which form the mainspring of his behaviour, both in its personal aspect and its crystallized aspect which means culture, he has hardly any choice at all. After all, it is nature's own laws which operate in the object as well as the subject.

Barring this aspect of the lecture, one would heartily agree with the rest of Professor Garrod's plea for a more wholesome and complete use of imagination in the workshop of the archæologist.

N. K. Bose

The University Teaching of Social Sciences : Sociology, Social Psychology and Anthropology. *Reports prepared by Pierre de Bie, Claude Levi-Strauss, Joseph Nuttin and Eugene Jacobson.* UNESCO. 1954. Price 10/6 sh. ; 1'75 dollars ; 500 fr.

The joint authors have presented useful reports on the position of the three social sciences named above in the University curricula of different countries. The observations made by M. Levi-Strauss for instance afford much food for thought. We are living today in an age when the social sciences are passing through a period of

critical transition. There was a time when social scientists aimed at an objectivity which would place sociology on a par with sciences like physics or chemistry. Although such an aim has not been entirely forsaken, yet social scientists have come to realize more and more that any science concerned with man cannot be entirely divorced from considerations of value. This process of reevaluation is proceeding apace, and it has helped to create an objectivity of outlook in sociology which lies on a different plane from that possible in the mathematical sciences.

The factual summaries cover many countries like Australia, Germany, Egypt, India or Mexico. One notices some striking inaccuracies in regard to India ; but these can, of course, be set right easily in any future edition. As it is, the book will prove very helpful to social scientists all over the world.

N. K. Bose

Scientific Research in British Universities 1953-54. London : Her Majesty's Stationery Office, 1954. Ten shillings net. Pp. v + 522.

This useful handbook gives a detailed account of researches carried on in the British Universities during 1953-54. The price of the publication is very reasonable ; and one feels that if similar hand-books are made available for other countries, it would greatly help scientific workers all over the world in many ways.

N. K. Bose

Upajati Katha. By Minendra Nath Basu and Probodh Kumar Bhowmick. Grantha Samaj, Calcutta. Rupee One annas eight. Pp. 80.

This small book in Bengali contains a brief account of the following tribes : Andamanese, Birhor, Toda, Ho, Oraon, Komkuki, Garo and Naga. Presumably this has been written for Intermediate students as well as for general readers. The language is simple and crisp, the descriptions faithful, and we hope it will serve to promote an increasing interest among young students regarding India's tribal population.

N. K. Bose

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