

Notes and queries on anthropology : for the use of travellers and residents in uncivilized lands / drawn up by a committee appointed by the British Association for the Advancement of Science.

Contributors

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NOTES AND QUERIES

ANTHROPOLOGY.

FOR THE USE OF TRAVELLERS AND RESIDENTS

The Council of the Anthropological Institute of Great Britain and Ireland will be glad to receive any communications relating to the Queries contained in this Volume.

Communications to be addressed to the Secretary, 4 St. Martin's Lane, Trafalgar Square, London.

LONDON

PRINTED BY THE ANTHROPOLOGICAL INSTITUTE

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ON

ANTHROPOLOGY,

FOR THE USE OF TRAVELLERS AND RESIDENTS
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[Drawn up by a Committee appointed by the British Association for the Advancement of Science.]

LONDON :

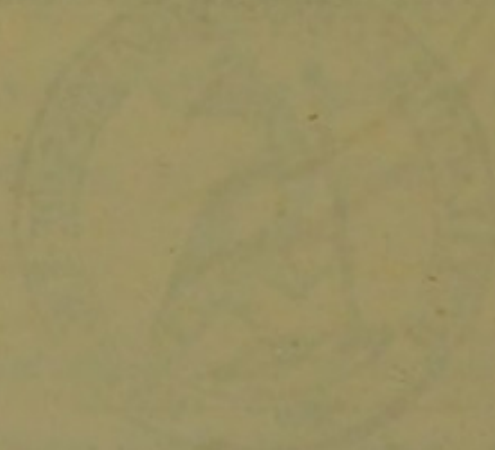
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1874.

NOTES AND QUERIES

ANTHROPOLOGY

FOR THE USE OF TRAVELLERS AND RESIDENTS
IN BRITISH INDIA



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P R E F A C E.

THESE Notes and Queries are published by the British Association for the Advancement of Science in pursuance of the following recommendation of the General Committee, passed at the Brighton Meeting in August 1872:—

“That Colonel Lane Fox, Dr. Beddoe, Mr. Franks, Mr. Francis Galton, Mr. E. W. Brabrook, Sir John Lubbock, Bart., Sir Walter Elliot, Mr. Clements R. Markham, and Mr. E. B. Tylor be a Committee for the purpose of preparing and publishing brief forms of instruction for travellers, ethnologists, and other anthropological observers; that Colonel Lane Fox be the Secretary, and that the sum of £25 be placed at their disposal for the purpose.”

At the Bradford Meeting, in September 1873, the recommendation was renewed and the grant increased to £50, with the view of covering all possible expenses and producing a work calculated to suffice for the use of travellers for some time to come.

Owing to the number of contributors, the publication

has been delayed longer than was anticipated. Some of the anthropologists who were asked to draw up the sections have been unable to do so, and others have failed to send in their contributions in due time. The result is that some few of the sections originally proposed are incomplete; and, rather than place them in less skilful hands, they have been for the present omitted, and the headings only inserted. It is hoped that these sections will be added in an Appendix at some future time.

The object of the work is to promote accurate anthropological observation on the part of travellers, and to enable those who are not anthropologists themselves to supply the information which is wanted for the scientific study of anthropology at home.

History has confined itself chiefly to the achievements of special races; but the anthropologist regards all races as equally worthy of a place in the records of human development. The more remote and unknown the race or tribe, the more valuable the evidence afforded of the study of its institutions, from the probability of their being less mixed with those of European origin.

Travellers have usually recorded only those customs of modern savages which they have chanced to observe; and, as a rule, they have observed chiefly those which their experience of civilized institutions has led them to look for. Nor are there wanting instances in which the information thus obtained has been lamentably distorted in order to

render it in harmony with preconceived ideas; owing to this and other causes, the imperfections of the anthropological record surpass those of other sciences, and false theories are often built upon imperfect bases of induction.

In attempting to trace the distribution of cognate arts and customs, the anthropologist is perpetually thwarted by the difficulty of distinguishing between positive and negative evidence, *i. e.* between non-existence and non-recorded existence; so that, to use the words of Mr. E. B. Tylor, it is "playing against the bank for a student to set up a claim to isolation for any art or custom, not knowing what evidence there may be against him buried in the ground or hidden in remote tribes."

The rapid extermination of savages at the present time, and the rapidity with which they are being reduced to the standard of European manners, renders it of urgent importance to correct these sources of error as soon as possible.

It is hoped that the questions contained in the following sections, each of which is the result of special study of the subject treated, may be a means of enabling the traveller to collect information without prejudice arising from his individual bias. To this end it is particularly requested that he will endeavour to answer the questions as fully as possible, not confining himself to a detailed account of those things which exist, but also, by special inquiries directed to the subject, endeavouring to determine the non-existence of others to which attention is drawn.

The following anthropologists, not being members of the Committee, have also contributed sections, viz.:—Sir T. Gore Browne, Professor George Busk, Mr. Hyde Clarke, Mr. C. Darwin, Dr. Barnard Davis, Mr. Carl Engel, Mr. John Evans, Mr. J. Park Harrison, and Mr. H. Howorth.

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NOTES AND QUERIES

ON

ANTHROPOLOGY,

FOR THE USE OF TRAVELLERS AND RESIDENTS IN
UNCIVILIZED LANDS.

PART I.

CONSTITUTION OF MAN.

NO. I.—MEASURING INSTRUMENTS.

By DR. BEDDOE, F.R.S.

A. The following are the instruments of precision recommended to be used by travellers who cannot burden themselves with much baggage:—

1. Callipers. Index-callipers, accurately graduated, not too slender or elastic, to measure any thing from 2 to 11 inches, or from 5 to 25 or (better) 30 centimetres.

2. Measuring-tapes of linen waxed or varnished, which is less liable to stretch than other materials. If not washable, several should be taken, as they are soon rendered illegible by the grease and filth of the subjects measured.

3. Jointed measure of wood, at least 1 yard or 1 metre in length (double the size better), graduated at least to quarter-inches or half-centimetres. In this a longitudinal groove, in which may slide the vertical limb of a square, for ascertaining

height from ground of several important points (see B. 6). Ring at end of measure, for hanging up.

4. Medical Thermometer, ranging up to 120° (to prevent risk of breakage by exposure to heat). It should have been kept for a few months and certified at Kew, and must be compared again with the same standard after return.

5. Seconds Watch.

6. Dotted papers, for testing distance and clearness of vision (see XIII. SENSES).

B. Where a larger outfit can be taken, or where the observer is stationary, the following instruments are more or less desirable:—

1. A set of photographic apparatus (see XCIX. PHOTOGRAPHY).

2. Two or three strips of lead, 50 centimetres long, 1 broad, and 2 millimetres thick, for taking contours; to be afterwards traced on drawing-paper (see IX. PHYSIOGNOMY).

3. Dynamometer. Traction appears to yield the best test. Broca recommends the dynamometer of Mathieu, of Paris, as cheap, portable, and efficient.

4. Box of water-colours. Useful for reproducing tints when the chromatic scale is not available, or for colouring photographs.

5. Either the goniometer of Broca or the craniometer of Busk. The former is more complete, but less portable.

6. Squares. (a) A carpenter's square, the horizontal branch graduated, the vertical branch running in the groove of the long measure, A. 3. (b) A smaller square, the longer limb of which may cross that of the large one (a) horizontally at a right angle. This longer limb should be graduated. Full description in Broca's instructions.

With the long measure and these two squares may easily be determined the height of any point in the body or limbs.

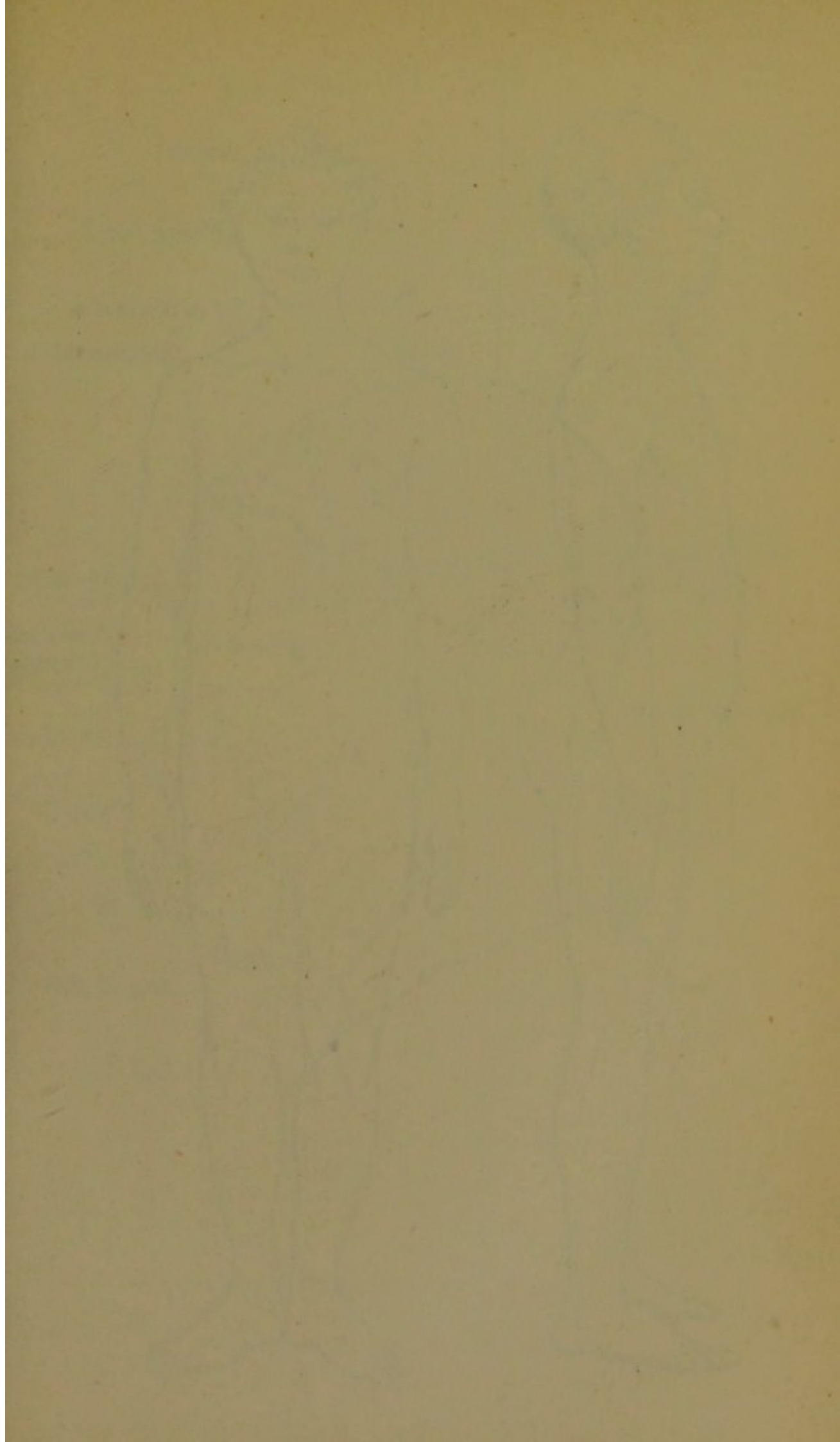
7. Plaster of Paris, for taking casts or moulds.

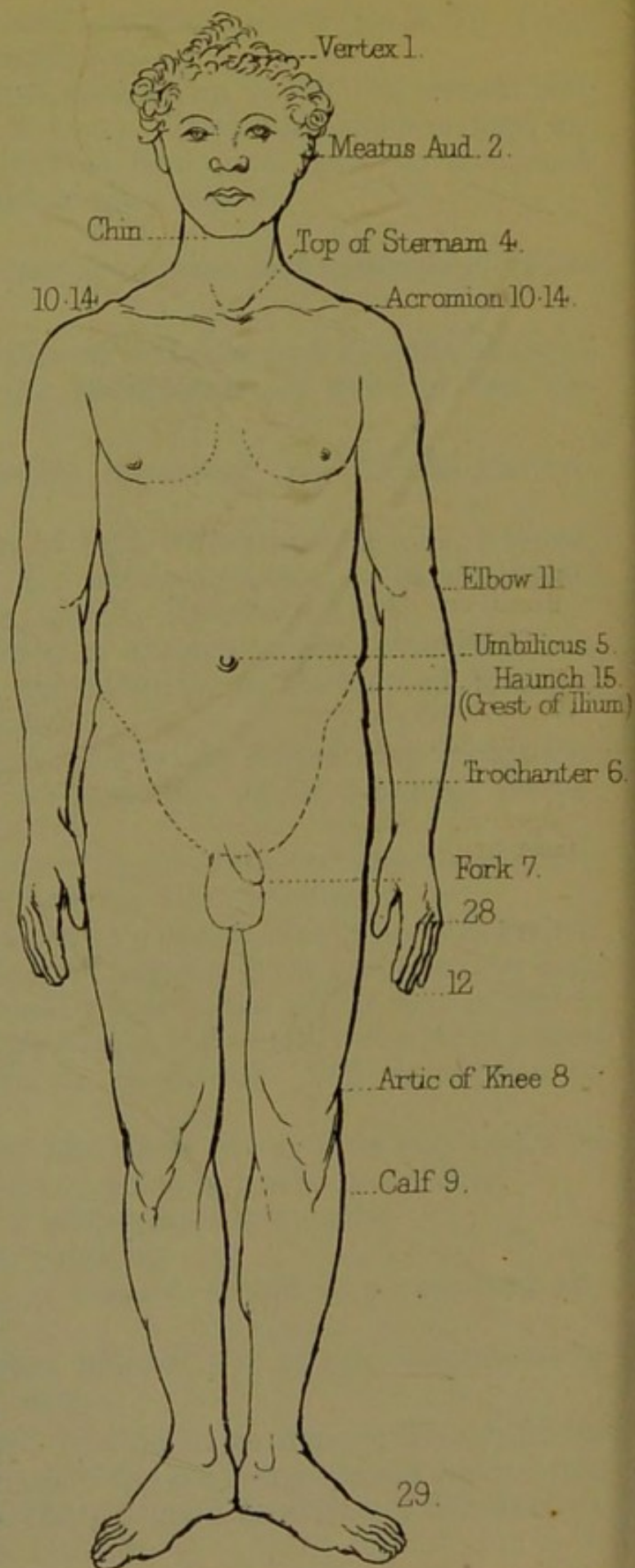
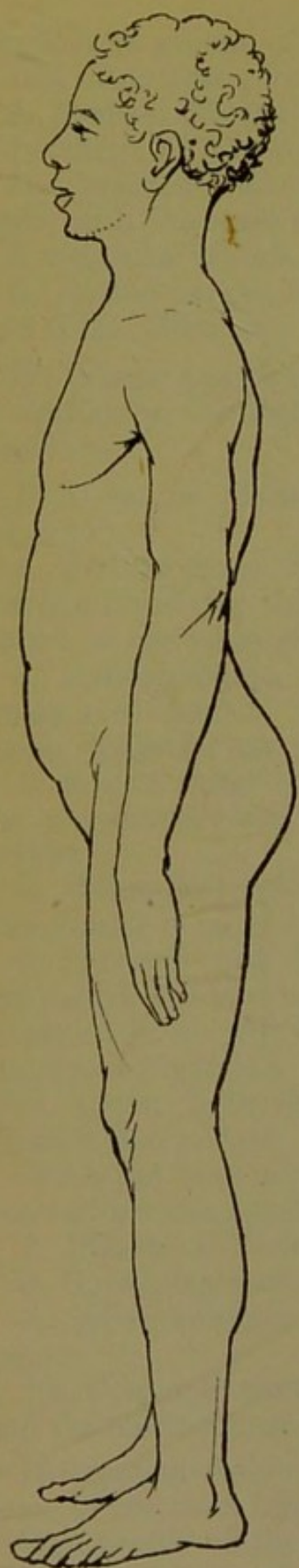
8. Spring-balance, for weighing.

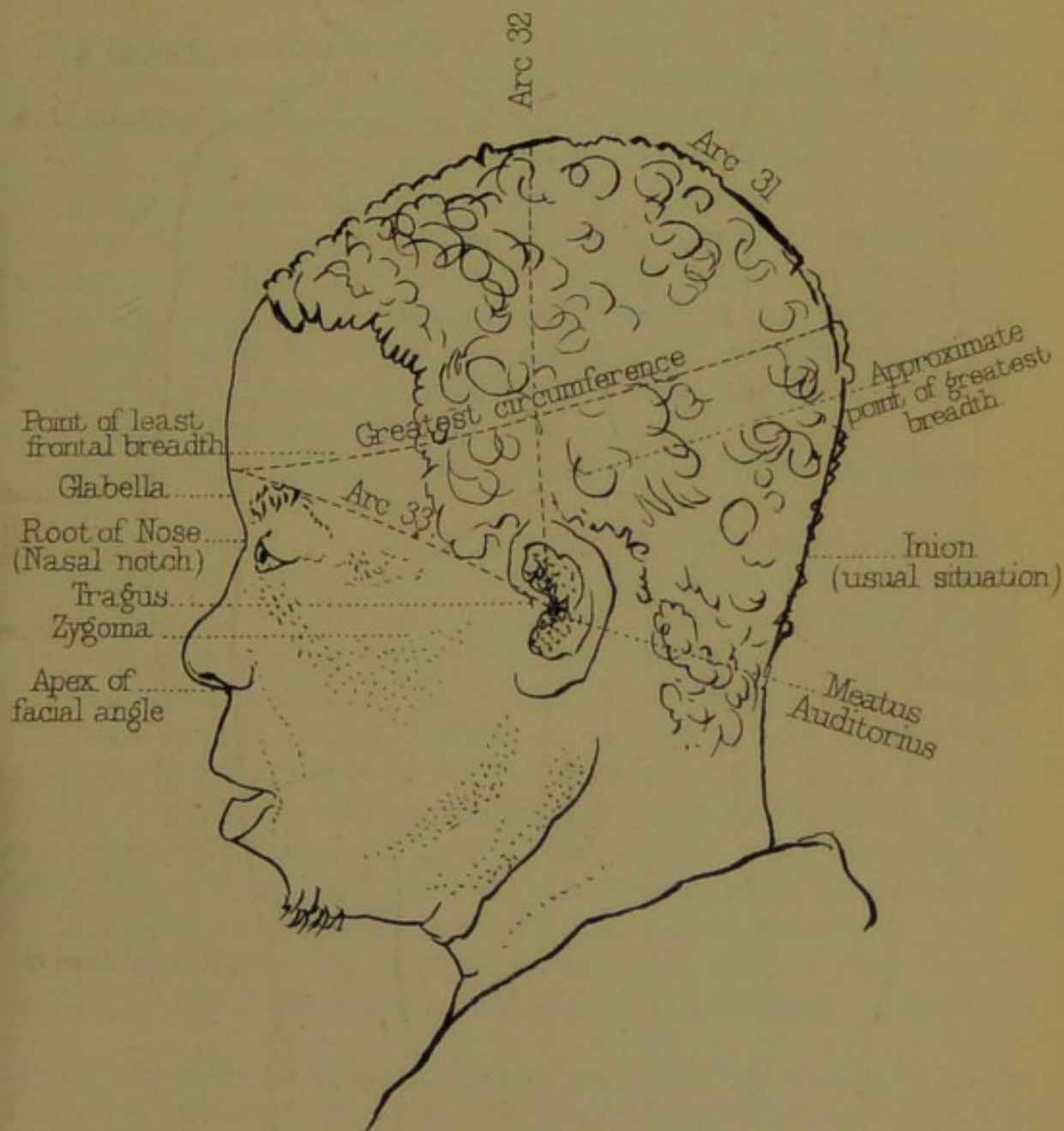
9. Sphygmometer (?). Useless, except to a practised observer.

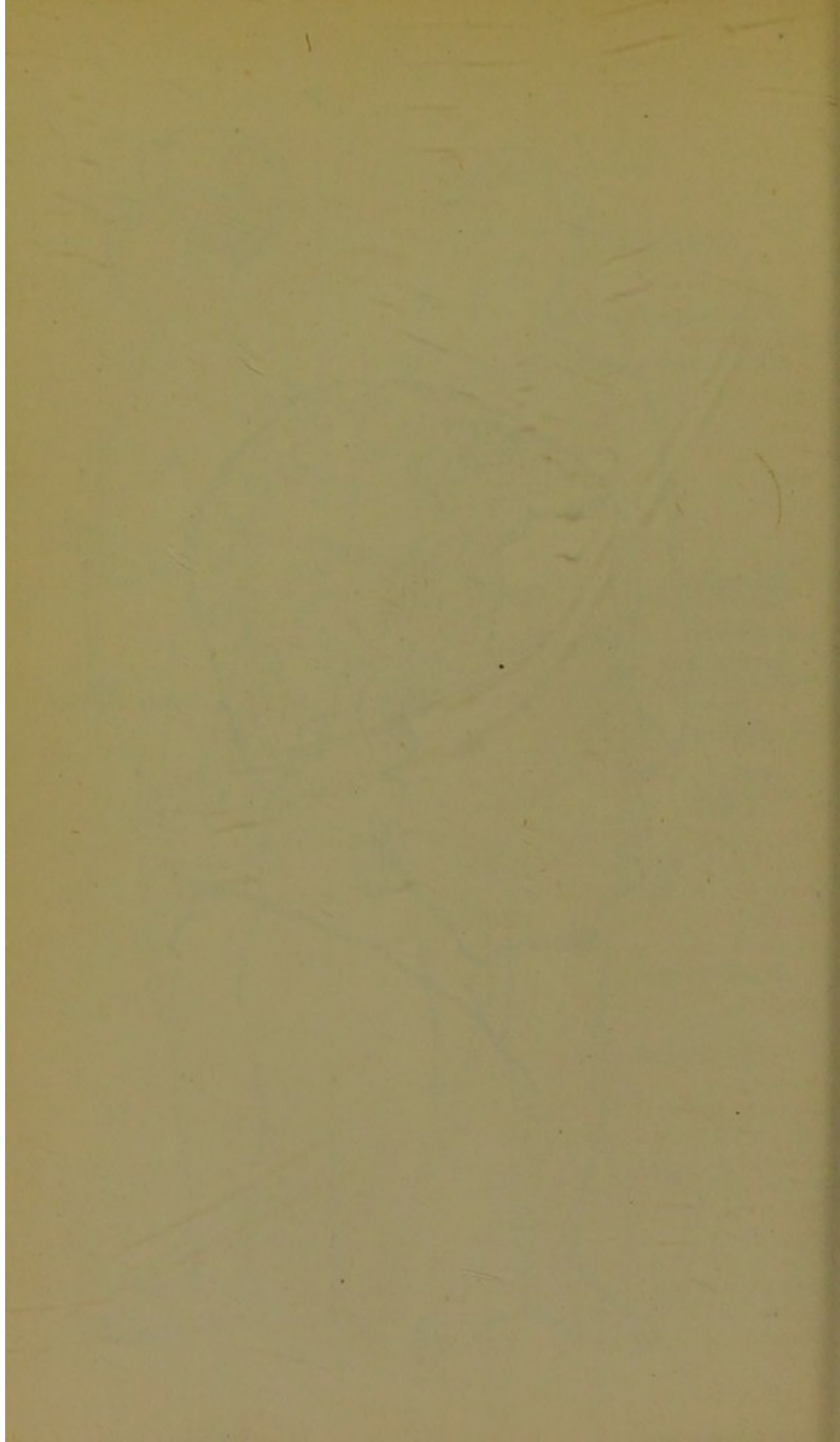
10. Common compasses, pointed, for minute measurement, and for testing sense of touch.

Instrument-makers will be invited to deposit for exhibition some of the more important of the above-mentioned instruments at the rooms of the Anthropological Institute, 4 St. Martin's Place, Trafalgar Square, London.









NO. II.—FORM AND SIZE.

By DR. BEDDOE, F.R.S.

The careful measurement of even two or three individuals may be of much use in determining the existence of peculiarities of form and proportion, such as prognathism (protrusion of muzzle); but in order to obtain trustworthy averages of stature &c., a much larger number of persons (twenty or more) must be measured. These should be of full age and growth (in this country from 23 years to 45 or 50 is the suitable period), but should not be picked for their size or beauty, but taken indiscriminately, with the view of getting a fair sample. There is usually much difficulty in obtaining measurements of women; but a Table of them would be very valuable.

The following are important points in the living subject:—

1. Height from ground of vertex; 2, of meatus auditorius (opening of ear); 3, of chin; 4, of top of sternum (breast-bone); 5, of umbilicus; 6, of upper part of trochanter (*i. e.* point where upper end of thigh-bone felt prominent under skin); 7, of fork; 8, of articulation of knee; 9, of largest part of calf; 10, of point of acromion (*i. e.* anterior point of shoulder, felt by carrying finger along collar-bone to its outer extremity); 11, of elbow; and 12, of point of mid finger (hanging vertically). All these best gotten with measuring-rod and square. So also 13, the height when sitting on ground; 14, the breadth of shoulders (*i. e.* between the acromia, see 10), and, 15, of haunches.

Circumference:—16, of chest at arm-pit, and in men, 17, at mamma*; 18, of haunches; and 19, of trochanters. Less im-

* In taking the chest-measurement the individual should be made to stand as upright as possible, with the shoulders back and the arms hanging loosely at the sides. The lower edge of the tape should touch the nipples; and the tape should be read off on the back between the bladebones. Care should be taken that the tape passes horizontally round the chest, as, if measured below the bladebones, the measurement may be reduced as much as 2 inches in some cases. In measuring, the man should be made to count ten slowly, or he should make a succession of sounds to prevent the lungs from being inflated; this will probably reduce the measurement about half an inch. It may be convenient to remember that 33 inches chest-measurement is the standard in the British army.

portant are circumference of:—20, neck; 21, waist; 22, thigh, maximum; 23, calf, ditto; 24, arm, ditto; 25, forearm, ditto, &c. 26. Fathom, or span, of outstretched arms. 27. Span of thumb and midfinger. 28. Length of thumb, from second joint to tip. 29. Length of foot.

All these gotten with measuring-tape, or, in 26 to 29, with graduated measure or callipers.

Head:—30. Greatest circumference from the glabella, or eminence above root of nose. 31. Arc from notch at root of nose to inion (occipital tuber, or small round eminence felt by passing finger up from nape of neck in mesial line). 32. Arc from tragus (immediately opposite and in front of meatus auditorius) to tragus, over top of head. 33. Arc from tragus to tragus, over superciliary ridges and glabella, or, more accurately, immediately above them.

The above taken with measuring-tape; the following with index-callipers. 30, 31, 32 impracticable where the hair is thick and coarse.

34. Greatest length from glabella backwards. 35. Ditto from the smooth spot immediately above glabella. 36. Length from glabella to inion (sometimes identical with 34, but always important). 37. Greatest breadth (fix the point tentatively, and note whether much above or behind the ear). 38. Greatest breadth of zygomata (posterior arches of cheek-bones). 39. Breadth from tragus to tragus (represents nearly the biauricular breadth). 40. Least frontal breadth (between frontal crests, just above external orbital epiphyses, *i. e.* just above external angle of eyebrow).

41. Length of face (root of nose to lower border of chin).

42. Greatest length of head from chin upwards and backwards.

43. The height of head from meatus auditorius to vertex, gotten already by subtraction of measurement 2 from 1.

44. Facial angle, important, gotten easily with Broca's goniometer, or calculated from the following data obtained with callipers. [39. Diameter from tragus to tragus.] 45. Distance from tragus to junction of nose and upper lip in middle line. 46. Ditto from tragus to smooth spot immediately above glabella. 47. Ditto from said spot to junction of nose and lip.

Skeletons and skulls &c.—These should, if possible, be brought to England, where they can be examined and measured by experts. Next to the cranium the pelvis, and next to it the humerus and tibia, are generally most interesting. With crania

the lower jaws and any loose fragments should, if possible, be secured. Write *at once* on crania &c. any important memoranda, as race, locality, sex, rank, and probable age.

When a *skull* cannot be brought away, it should be measured and described as follows:—

48. Greatest length from glabella; 49. Ditto from smooth spot above glabella. 50. Length from glabella toinion. 51. Greatest breadth (see above, 36). 52. Zygomatic breadth (see 37). 53. Biauricular breadth (from one auditory aperture to the other). 54. Least frontal breadth (see 40). 55. Vertical height, externally. 56. Facial angle. 57. Length of occipito-frontal arc, from root of nose to great foramen, divided into:— 58, frontal; 59, parietal; and 60, occipital portions. 61, 62, 63. Breadth respectively of these portions. 64. Length of face (41). 65. Weight of skull. 66. Capacity in ounces of fine sand or (better if possible) of water. 67. Setting of teeth, whether vertical or oblique.

Pelvis. Both the internal and external measurements are valuable, especially the smallest internal diameters (68, bilateral; and 69, antero-posterior) of the female pelvis.

70. Long bones &c. Is platycnemia observed, or the supra-condyloid process of the humerus, or any peculiarity in the coccyx, or great projection of the heel, or shortness of great toe?

71. Weight of body. If not weighed naked, state what allowance should be made for clothing.

72. Photographs. Two should be taken, one a full front face, the other a perfect profile (see figures). The body naked if possible. Annex scale of size, and indication of colour. Photographs of recent brains, upper or lateral surface, are valuable.

73. Plaster moulds. Of face, head, or any characteristically peculiar part, such as the buttocks in a Hottentot woman. Contour of head and face, to be taken with strips of lead above mentioned (I., B. 2), and plotted down on paper.

74. Features. Note whether the opening of the eye is horizontal or oblique; the brows arched, prominent, or otherwise; the nose aquiline, straight, concave, sinuous, long, thick, flat, broad-nostrilled, or otherwise; the mouth broad; the lips thick and protruding or otherwise; the chin angular, square, or round; the ears large, flat, projecting, simple, or elaborate; the ear-lobe distinct or absent.

For recording measurements, it is convenient, and saves time

and trouble, to have ready slips of paper, with numbers running vertically from 1 to 69. Others may be prepared containing only some of the more important numbers, *e. g.* 1, 5, either 7 or 13, 17, 18, 26; of the head, 30, 31, 34, 37, 44; of the skull, 48, 50, 51, 55, 56, 57. Or the first 29 may be taken, with 30, 31, 34, 37, 44.

Is any relation apparent between differences in form and size and the local, dietary, or other influences operating on the people? *e. g.* elevation of land, presence or absence of wood, moisture or dryness of air, abundance or scarcity of animal or vegetable food, use of fermented or distilled liquor or of narcotics.

NO. III.—ANATOMY AND PHYSIOLOGY.

By DR. BEDDOE, F.R.S.

Observations on temperature of body and on respiration, taken in very cold or very hot climates or in very elevated regions, would be valuable, but only if taken with extreme care. It is thought that the normal temperature is the same in all latitudes.

1. Take the temperature either under the tongue with the mouth closed, or under the axilla, the arm being closely pressed to the side, and the bulb left undisturbed for at least 5 minutes. The subject should be at rest in the shade, and should not have eaten just previously.

2. Pulse and respiration, rates of, at rest. State whether standing, sitting, or lying; state also period of the day, and adhere to the same hour if possible. The rate of breathing should be observed for at least 1 minute, and without the subject's being aware that he is under observation.

3. Do the people bear cold well? or bear exposure to direct rays of sun? Do they expose their heads to the sun uncovered? How do they bear privation of food, or drink, or sleep?

4. Are the muscles generally deep red or pale? 5. Has the fat a strongly yellow tinge? 6. Are the mucous membranes (lining of mouth especially) stained with pigment? 7. Is the

skin naturally greasy, dry, smooth, or rough to the touch? hirsute, downy, or bare? 8. Have the teeth any peculiarity? *e. g.* are the canines longer or more prominent, or are there five or six tubercles on any of the posterior molars (as in some Negroes and Melanesians)? 9. Is the voice deep, hoarse, or shrill? 10. Are there any peculiarities of the excretory functions, such as habitual diarrhoea (as in Færoe), constipation or salivation, or alkalinity of urine, or abundance or absence of sensible perspiration. 11. Have the women plenty of milk? 12. Are labours easy? and what is the posture of accouchement? (See IV. DEVELOPMENT, and VIII. MOTIONS.)

NO. IV.—DEVELOPMENT AND DECAY.

By DR. BEDDOE, F.R.S.

1. What are the average and the extreme length of life observed or reported? 2. Are old people allowed to reach the natural term of life? or are they killed or allowed to starve? 3. If the age in years is not to be gotten, inquire how many generations may exist simultaneously, *e. g.* whether a man often sees his great grand-children. 4. At what ages, in the two sexes, do the maxima of stature and of bulk, or general physical development, seem to be attained? 5. Age of junction of epiphyses; 6, of closing of sutures (particularly of frontal suture); 7, of puberty (in males and in females); 8, of development of beard; and 9, of mammary glands (breasts). 10. About what age do women cease to menstruate? or what are the extremes of child-bearing age? 11. How long is suckling carried on? (See XVI. REPRODUCTION.) 12. Which teeth appear first? 13. Are children who do not observe the rule put to death? 14. Is there any thing else noticeable in the development of the teeth? At what age is the first dentition completed? 15. Is caries of teeth frequent? or, 16, are they worn down by hard or gritty food? or, 17, are they still perfect in aged people? 18. Does greyness or baldness occur? or is either frequent, whether in males or in females? (See V.)

No. V.—HAIR. By DR. BEDDOE, F.R.S.

1. Is the hair straight, slightly or much waved, curly or frizzly, or what is called woolly? 2. If curly or frizzled, is this due to nature or art? 3. Is it in great quantity? 4. What length does it attain, whether measured by the apparent distance between points and roots of the locks, or by stretching individual hairs? 5. Does it grow in separate tufts? or is it uniformly scattered over the hairy scalp? 6. Are the hairs coarse or fine in texture? round, flattened, or kidney-shaped in section?

7. Have the males any beard? If not, are they beardless by nature, or do they pluck out or otherwise destroy the beard?

8. Is the natural colour of the hair interfered with in any way? 9. Is there any colour which is preferred to others? (VI. COLOUR.)

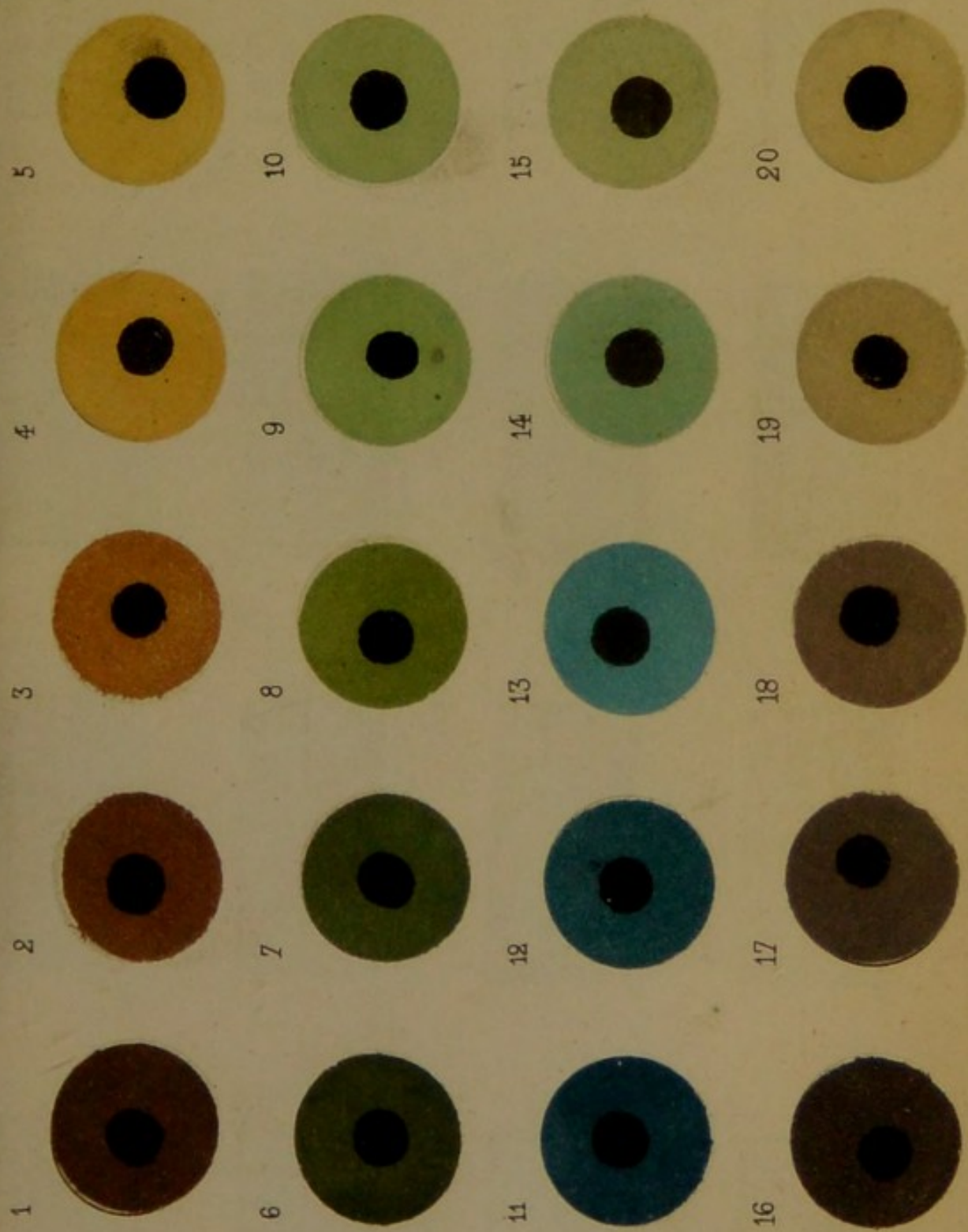
10. Obtain specimen-locks, if possible, of different ages, viz. (a) at birth, (b) between 1 and 2 years, (c) 2 and 4, (d) 4 and 8, (e) 8 and 16, (f) adult.

11. On what parts of the body does hair grow? at what age does it begin to grow on the different parts? and in what quantities? 12. What is the difference between male and female in this respect? 13. What difference is observed in the quality and colour of the hair on different parts of the body?

14. In what direction does the hair grow on different parts of the body, hands, arms, legs, &c.? 15. At what age do grey-ness and baldness appear? and in what parts first? (IV.)

No. VI.—COLOUR. By DR. BEDDOE, F.R.S.

Even educated men differ very widely as to the appreciation of colours and their nomenclature. Such a term as "olive," for example, is used by different observers to denote hues totally different from each other. Moreover, decided colours, such as bright red or yellow, or coal-black, are apt to attract the eye, and their frequency is likely to be overestimated. It is there-



Lith. Grandjean et Gascard, r. du Jardinnet, 12, Paris.

COLOUR-TYPES OF M. BROCA.

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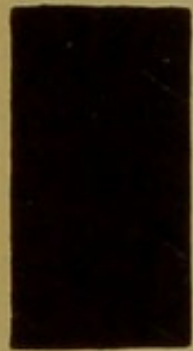
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COLOUR-TYPES OF . M. BROCA.

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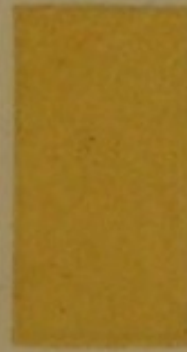
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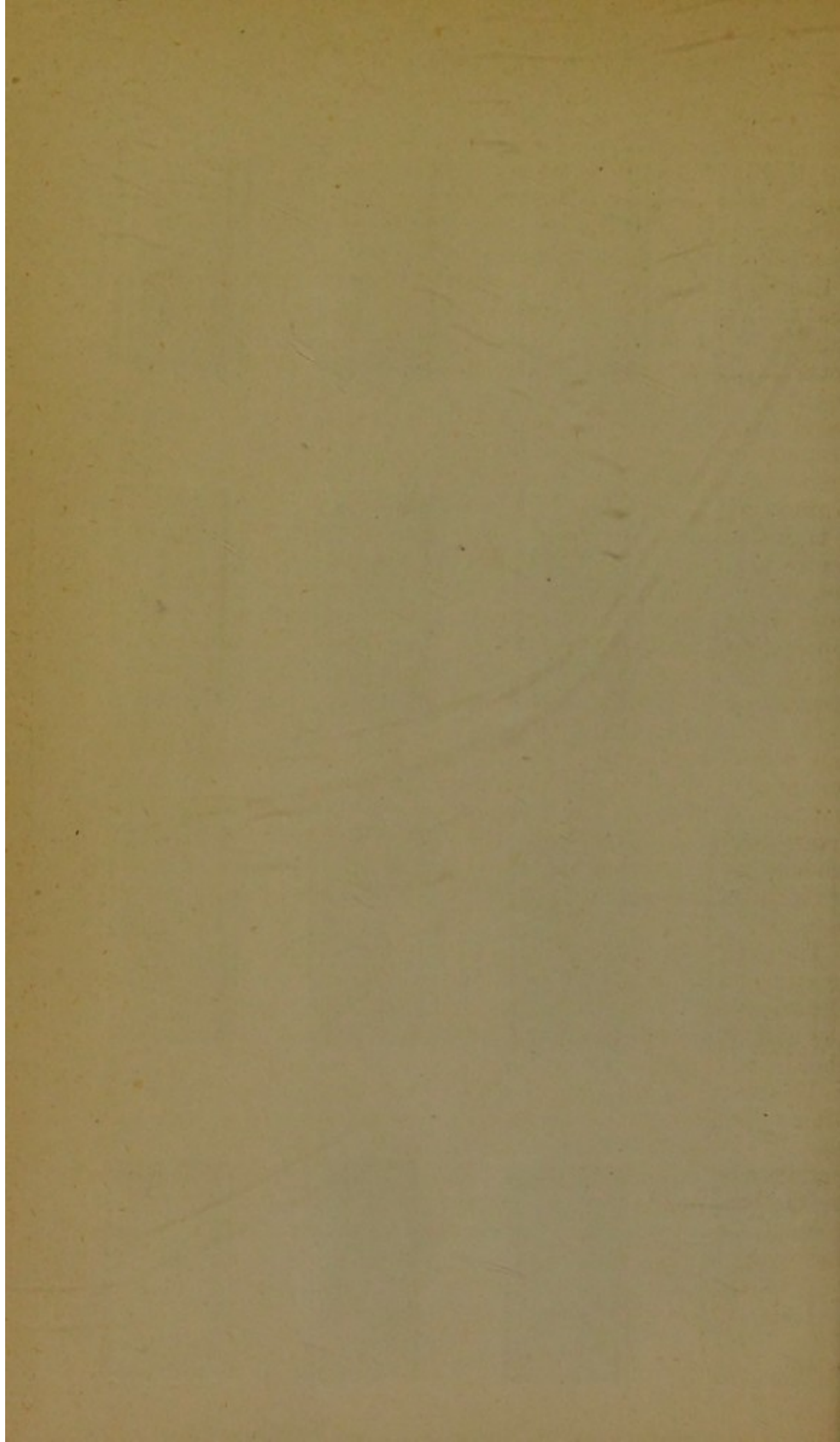


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fore most desirable that information as to the colour of skin, hair, and eyes should be collected in a systematic manner, by comparing those of every individual observed with the standard tables formed by M. Broca, and reproduced in this manual by his kind permission and assistance.

M. Broca divides the fundamental colours of the iris into 4, viz. blue, green, grey (dull violet), and orange, and each of these again into 5 tones or shades, making 20 in all. Eyes called black may, in his opinion, correspond with the darkest shade of any of the four—most often they are of the darkest orange (1). Hazel eyes belong to the orange series (2, 3, 4). Brown is a term applied also, according to M. Broca, to eyes of the orange series; probably most people would give it to the darker shades of green and violet-grey (7 and 17). Where the colour appears to be intermediate between two of the standards, set down both numbers, *e. g.* a lightish blue-green eye would be noted as 9-14. The colour of the whole iris is hardly ever uniform; where the inner circle differs very markedly from the peripheral one, the appropriate numbers for both may be set down. But in general the eye should be viewed at such a distance that minor variations may blend into one general hue.

The patches in the Tables denoting the colour of skin and hair respectively have not been separated, many of them being common to the two. The colours of hair are not so simple and flat as those of skin, and therefore are more difficult of determination by the Table. They are better appreciated in moderate shadow than in bright sunshine. Where the colour of the beard differs notably from that of the head-hair, it should be noted.

The skin usually differs much in colour where freely exposed to sun and air and where habitually protected by clothing. Observations should be made in double sets accordingly. Of the hair, the locks or strata least altered by sun and weather should be chosen for record.

The colour of the eye varies little with the advance of age after infancy; that of the hair, in many races, a great deal. In some Englishmen the latter continues to darken slightly up to middle age. It is best as a general rule to restrict observations on the hair to adults. A separate series of observations on the colour of the eyes, hair, and skin of new-born infants would, however, be very valuable.

1. Does the colour change much at different ages in regard

to (*a*) the hair, (*b*) the skin, and (*c*) the eyes? and, if so, give the index-numbers at different ages. 2. Do individuals of the same tribe or race differ widely or little in colour? 3. Do the varieties in the colour of the eyes correspond to those of the hair and skin? 4. Do coarse skins or hair differ in colour from fine ones? 5. Is the colour of the skin or hair in individuals of the same race affected permanently by (*a*) difference of altitude, (*b*) soil, (*c*) moisture of atmosphere, (*d*) shade, as in marshes, valleys, and woodlands, (*e*) diet, (*f*) habits, (*g*) exposure, or (*h*) disease? 6. Do dark skins bear exposure to heat better than fair skins? 7. Is there any peculiarity connected with colour which may tend to its survival in particular regions? 8. Do the chiefs or ruling families differ in colour from the inferior classes? 9. Is any particular colour more highly esteemed or disliked than others? 10. Are there any cases of abnormal colouring in individuals or in particular parts of the body? and if so, to what cause can they be attributed?

NO. VII.—ODOUR.

By DR. BEDDOE, F.R.S.

Many curious things are known or reported on this subject. Thus the Peruvians have different names for the scent of a Negro, an Indian, and a white man. The North-American Indians regard the smell of Jews as horribly offensive. The odour of Kaffirs is said not to be diminished by washing, but to be increased by muscular exertion.

1. Is there any notable peculiarity of odour attached to the persons of the tribe or people described? 2. Is it recognized as diagnostic by their neighbours, or by dogs or other animals? 3. Does it seem to depend on filthy habits and neglect of ablution, or on any favourite cosmetic or unguent, or on peculiarities of diet? or to be natural and constitutional? 4. Does it belong equally to both sexes and to all complexions (where these latter vary)? 5. Does it vary at different ages?

NO. VIII.—MOTIONS. By DR. BEDDOE, F.R.S.

There is greater variety in the postures habitually assumed by different races of men than is generally known; thus the Tibetans are said to sleep, by preference, on an inclined plane with the face downwards. Nothing is more characteristic of the temperament than the carriage and motions of the body, and they should be closely observed. Should there be any peculiarity in the walk, it might be desirable to ascertain the average time and length of pace; this might be done by measuring off a piece of level ground over which the people are in the habit of walking, and counting the paces. It may be convenient to bear in mind that the regulation pace of the British infantry is 116 per minute, and the length 30 inches, making 96 yards 2 feet in a minute, and 3 miles 520 feet in an hour: this, however, is quicker and probably shorter than the pace of an average Englishman, and is never maintained on the line of march: probably the old regulation pace of 108 per minute is nearer the natural standard.

1. What is the habitual posture in sleep? 2. In standing at ease? 3. In micturition? 4. In the accouchement of women? 5. In riding? [Swimming?, see LXXXIX.] 6. Is the body well balanced in walking? 7. In riding, walking, or running, do they turn the toes in or out? 8. Is the foot firmly planted in walking? or do they walk on the heels or toes? (*Note.* This will in some degree depend on the manner in which they are shod.) 9. What is the average length of pace and cadence of the step in men? 10. In women? 11. Is the body erect and the leg straightened? or do they stand and move with the knee slightly bent? 12. Is the gait energetic or slouching? 13. How do they carry the head? When the head is in the customary position, what would be the line taken by a horizontal plane drawn through the meatus auditorius (opening of the ear)? 14. Do they swing the arm in walking? 15. Are the attitudes stiff or easy? 16. Does the arm hang habitually with the palm of the hand to the front, rear, or side? 17. In moving any heavy object, do they habitually pull or push? is power generally exerted from or towards the body? and what muscles do they chiefly employ? (*Note.* It has been found in some parts of India that the natives cannot use a European saw until the teeth are reversed so as to cut with a pulling motion.) 18. Do

they climb trees well? and have they any peculiar mode of doing this? 19. Have they much power of moving the ears, scalp, or features? 20. Can they shut one eye without closing the other? 21. Can they extend one finger without opening the hand? and do they habitually point with one finger or with the open hand? 22. Have they any tricks of sleight of hand? 23. Do they make much use of the feet in holding objects? and is the great toe in any degree opposable? 24. Are the joints generally stiff or pliable?

NO. IX.—PHYSIOGNOMY.

By C. DARWIN, Esq., F.R.S.

Observations on natives who have had little communication with Europeans would be of course the most valuable, though those made on any natives would be of much interest. General remarks on expression are of comparatively little value; and memory is so deceptive that it ought not to be trusted. A definite description of the countenance under any emotion or frame of mind, with a statement of the circumstances under which it occurred, would possess much value.

1. Is astonishment expressed by the eyes and mouth being opened wide, and by the eyebrows being raised? Are the open hands often raised high up, with the fingers widely separated, and the palms directed towards the person causing astonishment? Is the open mouth in some cases covered by the hand? or is the hand carried to some part of the head? 2. Does shame excite a blush when the colour of the skin allows it to be visible? and especially how low down the body does the blush extend? 3. When a man is indignant or defiant, does he frown, hold his body and head erect, square his shoulders and clench his fists? 4. When considering deeply on any subject, or trying to understand any puzzle, does he frown, or wrinkle the skin beneath the lower eyelids? 5. When in low spirits, are the corners of the mouth depressed, and the inner corner of the eyebrows raised by that muscle which the French call the "Grief muscle"? (The eyebrow in this state becomes slightly oblique, with a little

swelling at the inner end; and the forehead is transversely wrinkled in the middle part, but not across the whole breadth, as when the eyebrows are raised in surprise.) 6. When in good spirits do the eyes sparkle, with the skin a little wrinkled round and under them, and with the mouth a little drawn back at the corners? 7. When a man sneers or snarls at another, is the corner of the upper lip over the canine or eye tooth raised on the side facing the man whom he addresses? 8. Can a dogged or obstinate expression be recognized, which is chiefly shown by the mouth being firmly closed, a lowering brow, and a slight frown? 9. Is contempt expressed by a slight protrusion of the lips and by turning up the nose, with a slight expiration, or by the closure of the eyes, or by other gestures? 10. Is disgust shown by the lower lip being turned down, the upper lip slightly raised, with a sudden expiration, something like incipient vomiting, or like something spat out of the mouth? 11. Is extreme fear expressed in the same general manner as with Europeans? 12. Is laughter ever carried to such an extreme as to bring tears into the eyes? 13. When a man wishes to show that he cannot prevent something being done, or cannot himself do something, does he shrug his shoulders, turn inwards his elbows, extend outwards his hands and open the palms, with the eyebrows raised and mouth somewhat opened? 14. Do the children when sulky pout or greatly protrude the lips into a tubular form? Do they at the same time frown or utter any noise? 15. Can guilty, or sly, or jealous expressions be recognized? though I know not how these can be defined. 16. Is the head nodded vertically in affirmation, and shaken laterally in negation? or is the hand or finger so used?

NO. X.—PATHOLOGY.

By DR. BEDDOE, F.R.S.

Travellers who have had a medical education will be able to supply many queries beyond those given below, which are meant for the use of non-medical observers.

1. Does pulmonary consumption occur? This may be roughly defined as a slow wasting disease with cough and (usually) with

expectoration. Is it particularly prevalent in certain localities or under particular conditions of life?

2. Does toothache occur or facial neuralgia? or is caries in the teeth observed?

3. Do epileptic fits occur? and in what light are they regarded by the natives? Are there any idiots, maniacs, or lunatics among them? and can you form any idea of their proportionate number? Are they respected, or are they ill-treated or put to death?

4. Do the people appear to suffer from febrile diseases attributable to malaria or climate, such as ague or remittent fever? Do different tribes differ in their susceptibility to such fevers? and how do Europeans or people of mixed breed compare with them in this respect?

5. Is small-pox known, or any other of our common epidemics? Is the mortality from them great? How treated? (See XXIII.)

6. Are skin-diseases common? Describe the most prevalent, whether scaly, pustular, or ulcerative. Is any form of leprosy known? If so, describe it as minutely as possible? Is it believed to be contagious or hereditary?

7. Do any venereal diseases occur? and are they recognized as such? Is syphilis supposed to have been imported or indigenous? If the former, whence and when? and what evidence can be got on the subject?

8. Is any other disease known or supposed to have been imported, or to have notably increased of late?

9. Describe any other prevalent disease which may appear to you new or strange.

10. Is hunchback common, or lateral curvature of the spine? Are they observed more in one sex than in the other?

11. Have the natives much vital power? Do they struggle against disease, or do they readily succumb to it? 12. Compared with Europeans in the same country, do they seem to suffer more from diseases of inflammatory or of asthenic type? 13. Do they endure cold well? or heat, especially the direct rays of the sun?

14. Do they appear to suffer pain from injuries, and as acutely as Europeans? 15. Do wounds heal quickly, particularly wounds of the head or fractures of the skull?

NO. XI.—ABNORMALITIES.

By DR. BEDDOE, F.R.S.

These include *Natural* Deformities. For Deformations, or *Artificial* Deformities, see Part II., LXIII.

1. Do any such deformities occur, e. g. *steatopyga*, or excessive development of fat about the haunches and buttocks or about the labia? Any other natural peculiarity of the genital organs? Harelip, or cleft palate, or absence of teeth, or supernumerary teeth?

2. *Albinism*.—Is this common? Examine carefully any specimen that presents itself, and note carefully the colour of hair, irides, and skin: the irides are not always pink. How are albinos regarded and treated? Are they supposed to differ notably from other people in physical or moral constitution (in size, strength, hairiness, longevity, fecundity, intelligence, vivacity)? Do they breed among themselves? Is there any cause conjectured for the occurrence of albinism?

3. *Erythrism*, i. e. red hair occurring in the midst of a black-haired population, where there are no intermediate tints.

With what colour of skin and irides combined? What are the media or external conditions under which it seems to arise? Are its subjects more liable to cutaneous or other diseases than the black-haired?

4. *Polydactylism*.—Existence of supernumerary fingers, toes, &c.

5. Excessive hairiness of face or body (as in the well-known Siamese family), or total absence of hair.

6. "Darwin's point" in the ear.

7. Is there any evidence of the hereditary nature of any of these peculiarities?

8. *Prognathism* and obliquity of eye (the Kalmuk eye), when occurring sporadically among a people in whom they are not typical, may be mentioned under this head.

NO. XII.—PHYSICAL POWERS.

By DR. BEDDOE, F.R.S.

Strength, speed, endurance.

It is difficult to institute comparative tests of strength for Europeans or civilized men and savages or barbarians. "Knack" and custom or constant practice have so great an influence, that it is necessary to select as a test some action not habitually used by either party. The persons tested should be in the prime of life, and otherwise similarly circumstanced.

In countries where the women do most or much of the hard labour, their strength should be tested as well as that of the males: with a view to comparison, all trials should be timed, and the weights and distances carefully measured, and the previous condition or training of the individuals recorded.

M. Broca commends the traction-dynamometer of Mathieu. The force registered should be that put forth continuously during at least two seconds. The maximum got by a sudden jerk may, however, also be noted.

"Putting" or raising a heavy stone is a pretty good test.

Trials of speed should not be confined to short races. The American Indians in general, *e. g.*, are said to have more enduring speed than Europeans, though easily beaten by them in sudden bursts: with some other savages the case is reversed.

1. What is the weight of the burden which a native will carry? 2. How far will he carry it in one day? 3. For how many days in succession without suffering thereby? 4. What distance can a man walk in one day? 5. What distance can he ride in one day? 6. What distance can he run in one day? 7. In what time can he run an English mile of 1760 yards, or 2112 paces of 30 inches, on a level road or grass? 8. In what time can he walk ten or twenty miles on a fairly level road or grass? 9. In all trials of speed or endurance the temperature and the manner in which the individual is shod and clothed should be recorded, as also a general description of the ground traversed. 10. What weight can a man raise one foot from the ground, the handle being properly adjusted? 11. How long can he abstain from food or drink, without inconvenience, when in exercise? 12. Ditto when not in exercise?

NO. XIII.—SENSES. By DR. BEDDOE, F.R.S.

Sight and hearing are generally supposed to be more acute in persons belonging to tribes who have long dwelt in open countries and led a nomadic or insecure life. *Myopia* (short sight) is thought to be extremely rare among savages, who exercise the eye very little on minute objects, while their smell is more acute than fastidious. But exact data on these subjects are wanting.

For the testing of clearness of vision, the accompanying test-papers used in the army for recruiting purposes may be useful. Power of distant vision can only be tested by extemporized modes of comparison with that of Europeans. It has been noticed that amongst North-American Indians a small distant object on the prairies will be recognized by each individual at the same instant and give rise to a simultaneous exclamation from the whole party. The power of judging distance may be greatly improved by practice; but some men show far greater natural aptitude than others. In the case of native troops, when judging-distance practice is conducted according to the English method, the results of the practice should be recorded *. The existence of *Myopia*, where suspected, may be ascertained by the improvement gained by the use of biconcave (short-sighted) spectacles.

Hearing may be tested by means of a ticking watch brought gradually nearer to the ear. The experiment should be tried several times: it is one very liable to vitiation by the inter-

* The following are the rules for judging-distance practice; the object judged from is usually a group of two or three men; the number of answers and points obtained should be recorded. The value of the men's answers, by points, in the several classes is as follows:—

3rd class, or when judging distance between 100 and 300 yards	{	within 5 yards	3 points.
		„ 10 „	2 „
		„ 15 „	1 point.
2nd class, or when judging distance between 300 and 600 yards	{	within 20 yards	2 points.
		„ 30 „	1 point.
1st class, or when judging distance between 600 and 900 yards	{	within 30 yards	2 points.
		„ 40 „	1 point.

ference of the imagination.—Note the greatest distance at which the watch can be heard.

Touch.—Apply the points of an ordinary mathematical compass to different parts of the body, varying the interspace between them so as to ascertain the minimum distance, for each part of the surface tried, at which the two points cease to be felt as one.

Smell.—For this no positive rules can be given.—Note whether any particular odours are disliked or enjoyed. Can they distinguish individuals in the dark by smell, as is said to be the case with some races? Can fires be smelt at great distances?

1. At what distance can a man count the test-dots in conformity with the instructions on that head? The following questions may also be answered (but due allowance must be made for the state of the atmosphere, colour of object and background; and too much reliance must not be placed on the answers as a means of comparison with similar observations made in distant countries :—2. At what distance can he distinguish the form of a human figure moving? 3. At what distance can he distinguish a horseman.

Dots for Testing Eyesight.

The following are the test-dots employed for testing the sight of recruits in the British Army:—

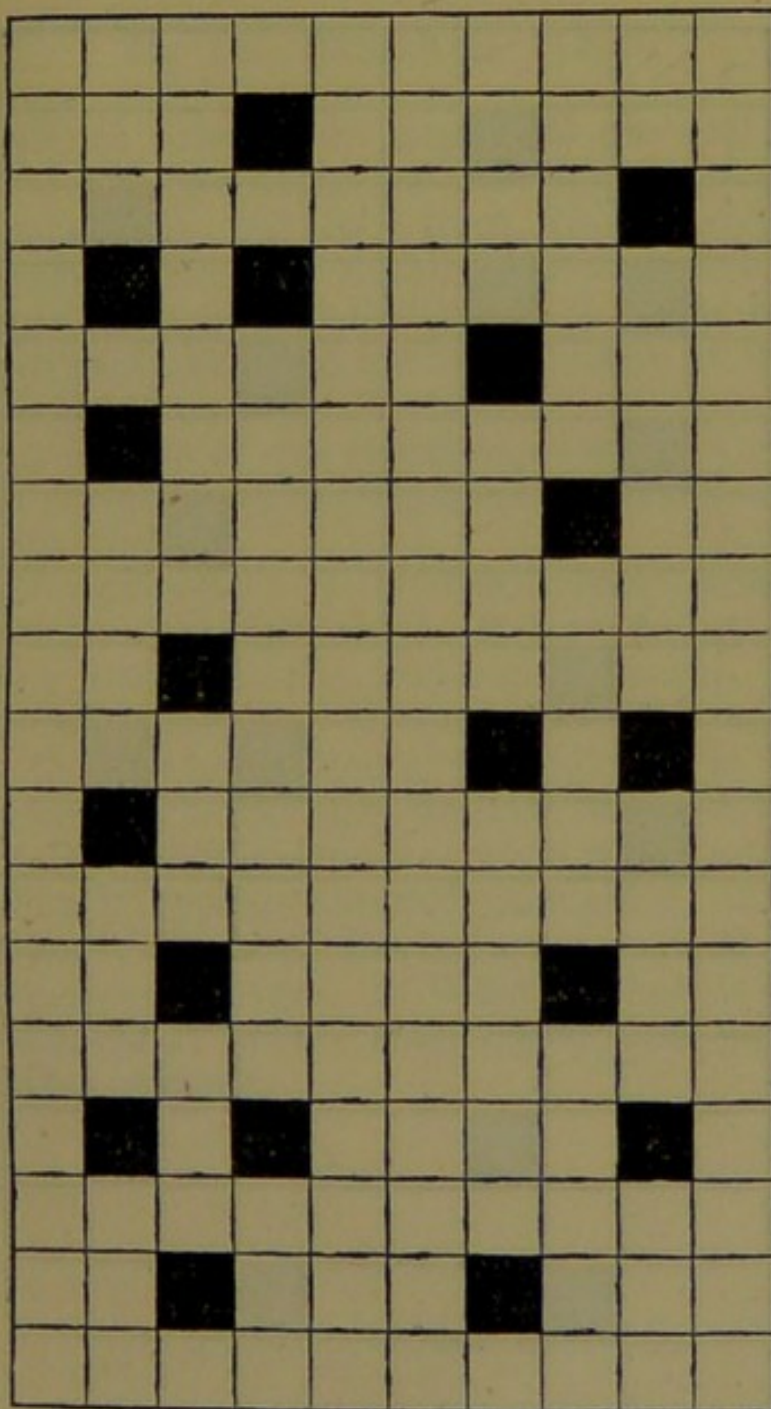
Each test-dot is $\frac{1}{8}$ inch square, and corresponds at a distance of 15 feet with the bull's-eye 2 feet square at 600 yards; required to be distinctly seen by every acceptable recruit.

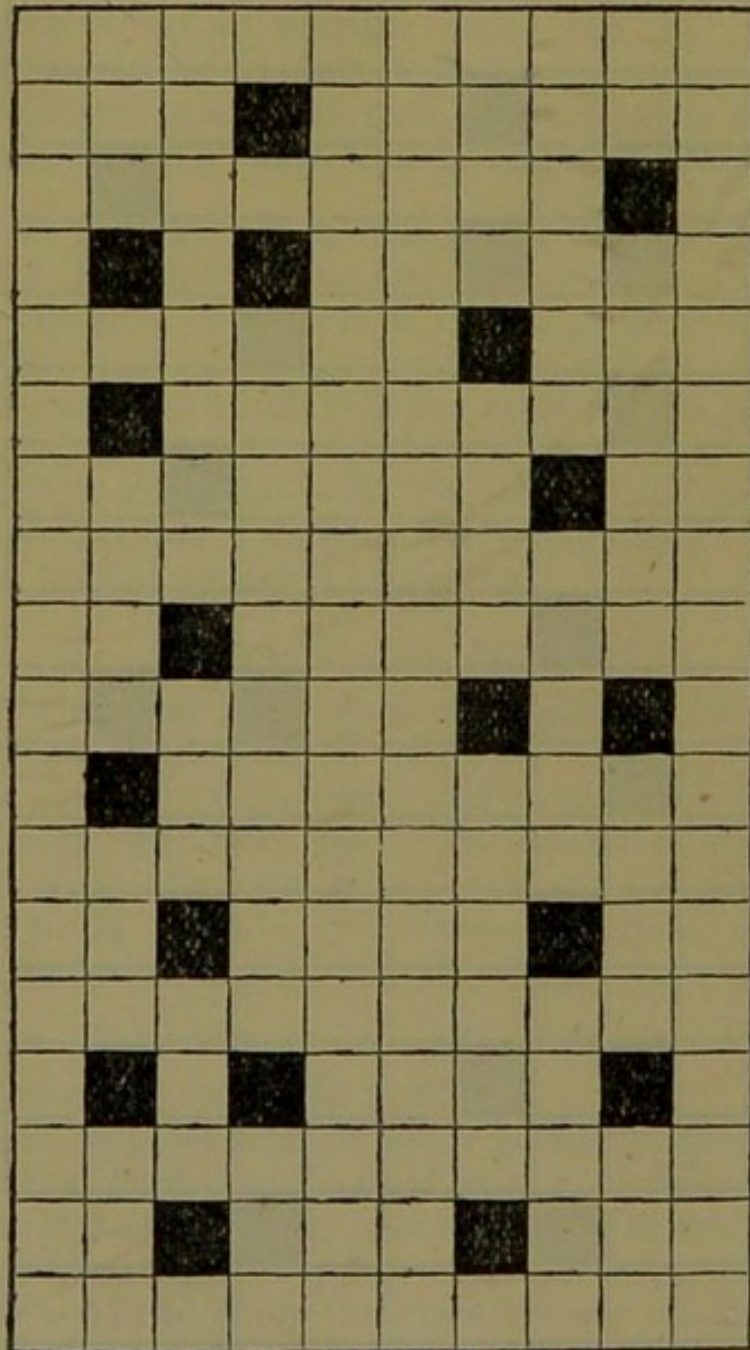
With *perfectly* acute vision these test-dots ought to be clearly visible in full daylight at 19 yards.

Directions for using the Test-dots.

1. Measure off 15 feet with precision.
2. Hold the test-dot card or paper perfectly upright in front of the man, and *let it face the light so as to be fully illuminated*.
3. Expose some of the dots (not more than seven or eight at a time) by covering the remainder with a card or a piece of paper, and desire the man to name their number and relative positions.
4. Vary the groups frequently to provide against deception; by using a covering card with a square portion cut out of one corner, six different groups of dots may be exposed without exceeding the number of dots above mentioned. The test-dots should be kept perfectly clean.

THOMAS LONGMORE, D.I.Gl.,
Professor of Military Surgery.





NO. XIV.—HEREDITY.

By DR. BEDDOE, F.R.S.

With regard to original or congenital physical and mental qualities, it is not the existence and importance of heredity that is questionable, but its extent, limits, and conditions. Acquired physical traits are usually, if not always, intransmissible, but the existence of exceptions to the rule has been asserted. As regards acquired mental qualities little inquiry has hitherto been made.

Where any system of castes exists, or where the intercourse of the sexes is rigidly regulated, there is much room for observations of this kind.

Examine, for example :—1. How far stature, strength, beauty descend in the families of the chiefs. 2. How far intellectual ability or cunning in those of the priests and wizards. 3. Whether albinism, erythrism, or other abnormalities (XI.) are thus transmitted, and to what proportion of the children in a family, or if not to children, whether they are ever transmitted to grandchildren. 4. Whether instances occur in which a tribal mark or something like it appears naturally in a child. 5. Whether a natural aptitude for a particular art appears in the children of a caste who practise that art. 6. Whether there is any power of resistance to malarial poison transmitted from parent to child in certain tribes or clans.

Further Notes on the same Subject.

By FRANCIS GALTON, F.R.S.

The nature of man appears to be as plastic as that of any domestic animal, and equally to admit of differentiation. The inquiries of a traveller might often show the directions in which the tendency to a spontaneous establishment of new breeds is most common ; but he must distinguish with the utmost care between *natural* and *acquired* gifts, by seeking appropriate cases and investigating them thoroughly. Children of savage races educated in the houses of missionaries, quite away

from their own people, deserve close study, to see how far the natural character, apart from the traditions &c. of their race, persists in showing itself. Also the children of foreign slaves who are bred up by barbarians. The large families of polygamatous parentage afford good studies for heredity. Among the hereditary characteristics of a race which admit of precise testing, are:—Acuteness of sight. Delicacy of hearing. Aptitude to music. Neatness in handicrafts, and taste in design. Love of pursuits connected with the water: thus the South-Sea Islanders swim well in early childhood; is this really a natural or is it wholly an acquired faculty? Power of path-finding: the stories told of this gift are mostly gross exaggerations, but the subject deserves careful measurement; an ingenious traveller having a theodolite and skilled in its use, could make many experiments, which would give valuable results. Power of sustaining hunger and thirst. Craving for particular kinds of narcotics and drinks. Recuperative power after accidents, and strength to withstand severe shocks and mutilations. Immunity from, or liability to, particular diseases. Psychological peculiarities, as:—the inherent gifts of ruling races; the early check of the development of the mind; excessive powers of imagination, as shown in hearing unreal voices, seeing fancied apparitions; also the convulsionary habits of wizards. Half-castes deserve careful study. It is not easy to suggest beforehand what inquiries should be made. The traveller should be ever on the watch, and when an appropriate case presents itself to his notice, he should investigate it with great care. Those who confuse the effects of nature and of nurture, give information that is of very little use.

No. XV.—CROSSES. By DR. BEDDOE, F.R.S.

The principal moot points on this subject have reference to either:—

- (a) the fecundity of mongrels, or
- (b) the physical or mental improvement or deterioration produced by crossing, or
- (c) the points, if any, derived preferentially from either race or sex.

The following is M. Broca's method of indicating the racial position of mongrels or mestizos:—

Pure Races.....	A	and	B	[(Mulatto).
First Cross.....		A B		Mestizo of first blood
First Return Cross } (Quadroon)		A^2B or B^2A		Do. of second blood.
Second Return Cross } (Octoroon)		A^3B or B^3A		Do. of third blood.
Third Return Cross...	A^4B	or	B^4A	Do. of fourth blood.
Return to pure race	A	or	B

The offspring of an octoroon and a mulatto, for example, would be designated thus, $A^3B + AB$; and the same principle would be applied to cases where three races were crossed.

Another and a simpler, and perhaps preferable, method, consists in indicating the shares of the several races by fractions. Thus the result of a union between a quadroon and a zambo (half negro, half Indian) would be represented thus, $A\frac{3}{8}B\frac{3}{8}C\frac{1}{4}$, a quadroon being $A\frac{3}{4}B\frac{1}{4}$, a zambo $B\frac{1}{2}C\frac{1}{2}$.

1. Are connexions between the races under consideration likely to be frequent? 2. Is the mulatto or mongrel population numerous in proportion to the supposed number of unions? 3. Are individuals of the two races more or less fruitful in their unions among themselves than in crossed unions? (The Polynesians are said to be *less* so, the Australians much *more* so; but the latter, probably, usually destroy the mulatto infants.) 4. Are inverse crosses (male of inferior with female of superior race) equally fruitful with direct ones? 5. Are the children of the first cross as strong, viable, and long-lived as those of pure blood in the same country? and do they yield as few examples of blindness, idiocy, &c.? 6. What is the relative degree of their fruitfulness among themselves and in their crosses with the pure blood? 7. Do they continue fruitful among themselves, without being reinforced with crosses of pure blood? The Liplappens (Dutch-Javan mestizos) are said in the third generation to yield only females, and these sterile; but the pure Dutch race is also said to become speedily sterile in Java. 8. Do the products of the first cross resemble most the male or the female parent? and is there any difference between those of the direct and of the inverse cross? 9. How many return crosses restore apparent purity of blood? and what characteris-

tic marks of the cross remain longest (hair, eyes, nails, &c.) ? 10. What is the intellectual and moral position of mixed breeds between races, one of which is greatly superior to the other ? (Social conditions may interfere with this problem ; a despised and helot race can hardly maintain a high moral standard.) 11. Does a mixed breed develop any new and special aptitudes or talents ? or is it superior in any respect to *both* its constituent stocks ? 12. Can any direct cause be alleged for sterility where prevalent, *e. g.* physical unsuitability, frequency of prostitution or of abortion, &c. ?

NO. XVI.—REPRODUCTION.

By DR. BEDDOE, F.R.S.

1. What is the average age of both sexes at marriage ? 2. What is the average number of a family ? how many boys and girls ? 3. If it can be done on a sufficient scale, ascertain the whole number of boys and girls respectively born in a certain area or portion of a tribe (this is especially desirable where polygamy or polyandry exists) ? 4. What is the greatest number observed in one family ? 5. How many are known to have been born from one mother ? and of these how many grew up ? 6. Do twins or triplets ever occur ? if so, how are they regarded ? are some or all of them put to death ?

7. Are there any other restraints on population ? (see LIII., LIV.). 8. Is barrenness common in women ? or is want of virile power complained of by men ? 9. Are drugs or other contrivances used to increase or limit reproduction (LIV.) ? 10. Do births occur out of wedlock ? When they do, what becomes of the children ? 11. Do large families occur chiefly among the upper or the lower classes or castes ? 12. Does population appear to be increasing or decreasing, judging not only by report, but by extent of occupied land, size of cemeteries, ruins of villages or forts, &c. ? 13. Can the ratio of births and deaths in a community of known population be obtained ? 14. What is the proportion of violent deaths ?

NO. XVII.—PSYCHOLOGY.

By DR. BEDDOE, F.R.S.

Under this head may be included inquiries respecting the degrees of quickness of perception, the power of reasoning, learning, and generalizing, of fixing the attention, of memory, of perseverance, exhibited by the tribes or races observed. It would not be possible to lay down precise tests for the use of the investigator.

The power of forming abstract ideas seems to be extremely limited in the lowest races. The faculty of attention is apt to be easily wearied. The memory may be keen with regard to particular classes of objects or events, but in other respects almost a blank. The power of drawing a map of the neighbouring country varies immensely, and may be tested with advantage. (The Esquimaux seem to equal or surpass most Europeans on this point.)

Acquaintance with the languages of neighbouring tribes should be noted where met with, and its extent ascertained. Perseverance may be estimated by the skill displayed and success attained in hunting, carving, and other occupations. The degrees of curiosity manifested respecting objects new to the people, and of imagination and intelligence as to their probable or explained uses, should be taken note of.

Any observations on the sequence of ideas in the minds of savages who have not come in contact with Europeans would be extremely valuable.

Care should be taken to ascertain whether the slight progress made by savages in acquiring habits of civilized life arises from incapacity or from the influence of acquired habits, customs, and modes of thought which are antagonistic to progress. Particular notice should therefore be taken, on the one hand, of the effect of European customs when introduced amongst savages and exposed to contact with native surroundings; and, on the other hand, of the influence of culture upon natives of the same race who have been removed at an early age from native surroundings and brought up in European schools. It is to the latter that the following questions chiefly refer.

1. Are they precocious or otherwise? 2. If the former, is intelligence maintained? or is there any definite age, or level of attainments, at which Europeans habitually excel them? 3. Is the memory generally good or only in particular branches? and if the latter, is it shown in matters in which the intellects of their parents have been cultivated in the savage state (see XIV. HEREDITY)? 4. Do they show perseverance in their studies? 5. As compared with Europeans, are they proficient in:—*(a)* arithmetic, *(b)* languages, *(c)* drawing, *(d)* reading, *(e)* science, *(f)* religion, *(g)* trade, *(h)* mechanics? 6. Are they honest? 7. Truthful? 8. Affectionate? 9. Courageous? 10. Have they good powers of reasoning? 11. Generalizing? 12. After being educated, do they evince a desire to return to the savage state? 13. In the construction of their tools, weapons, and other arts do they appear to act automatically or with intelligence? 14. Do they show strong power of will? 15. Imagination? 16. Is the speech voluble? 17. In conversation, drawing, &c., do the same ideas constantly repeat themselves? 18. Are they subject to strong emotions? 19. Illusions? 20. Much affected by dreams? 21. Somnambulism? 22. Unconscious cerebration? 23. Trances? 24. Insanity? (see X.).

PART II.

C U L T U R E.

NO. XVIII.—HISTORY.

By E. B. TYLOR, Esq., F.R.S.

While remembering that all ancient history and tradition, and especially that of savage tribes and barbaric nations, is in large measure fabulous, travellers will do well to take down oral legends and procure written documents where they exist. Beside the mention of really historical events and persons, much may be learnt from details thus incidentally given as to relations with other people, manners and customs, arts, &c. Even the evidently mythical parts, as showing connexion with the legends of other nations, may afford important evidence as to the history of the tribe or nation which possesses them. It is desirable to have such documents in the exact words of the narrator or scribe, with verbatim translations. Care should be taken as far as possible to distinguish really native matter from that obtained from foreigners, such as the borrowed Hindu legends repeated by the hill-tribes of India, or the ideas which so many tribes have taken up from the Bible or the Koran.

1. What means exist of preserving the memory of past events? 2. Do the old people habitually relate them, as at feasts? are they handed down in songs or chants? have such repetitions any religious character? are they specially attended to by any class, as of priests or bards? 3. Is picture-writing used as a record, or any other method, such as the use of beads or knotted cords? 4. Do written records of any sort exist? and if so, are such records held sacred? 5. Have they any definite chronology? and is there evidence to how many years back they remember or record known events, such as visits from Europeans, &c.?

6. What account do they give of themselves, and their connexion with other nations, wars, alliances, &c.? 7. What names does the tribe, nation, or race go by? and which are native names used by themselves, and which terms given by other people? 8. Do they trace their descent from a first

ancestor or chief, or several? Do they derive their name from his? and does it appear that he is an eponymic personage, invented to account for the existence of the tribe or race? 9. Do families trace their descent from a single ancestor? and does he appear to be real or mythic?

10. Do the people believe themselves indigenes in their land, or to have come from elsewhere? 11. Do they consider other tribes, related to them by language, as having branched off from them, or *vice versâ*, or all from some other national source? 12. What have they to say of former migrations? 13. Do they believe their nation was once poorer and smaller, and has increased and improved, or that their ancestors were a greater and wiser and happier nation than themselves? 14. What do they say as to the invention of their arts, the origin of their customs and laws, &c.? 15. What are their traditions of national heroes? do they seem historical or mythic? 16. What have they to say as to the introduction and changes of their religion, invention of new ceremonies, &c.? 17. Have they traditions to account for monuments, such as old graves, mounds, sites of villages, &c., in their district? 18. Any traditions of great floods?

NO. XIX.—ARCHÆOLOGY.

By COL. A. LANE FOX.

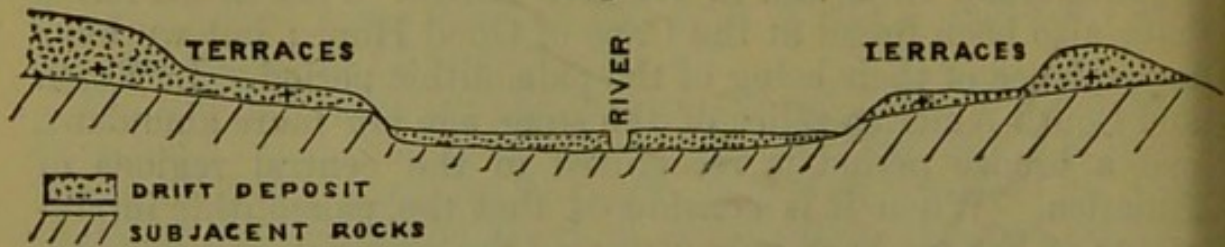
Much information is wanted respecting the archæology of savage and barbarous countries. Most of the stone implements received from Australia and the Pacific islands are of recent manufacture, and no evidence has yet come to hand to throw light on the origin and duration of the stone period of culture in those regions. In New Zealand, however, something has been effected in this direction by discoveries in ancient deposits. In Japan, evidence of a stone age corresponding in its forms to our neolithic period has been discovered, but no trace of a bronze age. From China we have received specimens of both stone and bronze implements; but detailed evidence on the subject is wanting. From the Asiatic islands a few stone and bronze implements have been received. In Birmah stone and bronze implements have been discovered. In India three periods have been recognized, corresponding to our palæolithic, neolithic, and bronze periods; but comparatively little is known

is yet respecting them. From Central and Northern Asia information is wanted respecting both stone and bronze implements. Stone implements of neolithic forms have been found at the Cape of Good Hope and in Western Africa. Palæolithic forms have also been found at the Cape of Good Hope; but we have no evidence of their being of the palæolithic period. In North and South America relics of the stone age are more abundant, and a bronze period is recognized in the central regions of America. When it is considered that the palæolithic implements of Europe have only attracted the attention of archæologists during the last fifteen years, it is not surprising that in uncultivated countries so little should be known of the relics that are hidden beneath the soil. It is very desirable that, when opportunity offers, the river-drifts and cave-deposits should be examined for the relics of a past age, and that the attention of travellers should be directed to the *débris* scattered on the surface and in the surface-soils turned up by cultivation for the vestiges of a more advanced stone period. The ancient tombs and tumuli should also be examined, and their relics preserved whenever it can be done without offending the superstitions of the people.

Palæolithic Period (River-drift).—1. Notice any evidence that may exist of the erosion of valleys by their rivers. 2. Do terraces exist on the sides of the valleys? how many, at what heights above the existing rivers, and at what distances from their present courses? 3. Do such terraces and drift-deposits consist of gravel, sand, or other alluvial matter? and are the deposits stratified as if by the action of running water? 4. Are the materials all derived from the present area of drainage? 5. Do they contain freshwater or marine shells, human or other animal remains, or stone implements? if so, preserve them carefully. 6. Label each specimen with the locality at once, and give sections to scale showing the exact depth beneath the surface at which the remains were found: note the thickness of the various stratified layers above them, and obtain as nearly as possible the height above the existing river. 7. What is the growth of timber upon the terraces? and is there any marked difference in the flora of the different terraces? 8. What is the excavating-power of the river at the present time, as shown by the damage caused by floods? how high do the floods of the river rise at present? is the present bed of the river rising or sinking? 9. Should opportunity occur, look for implements chiefly at the bottom of the gravels between the

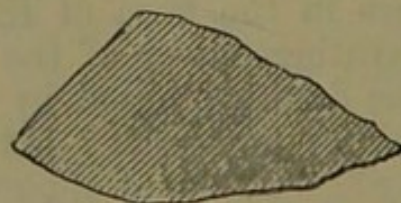
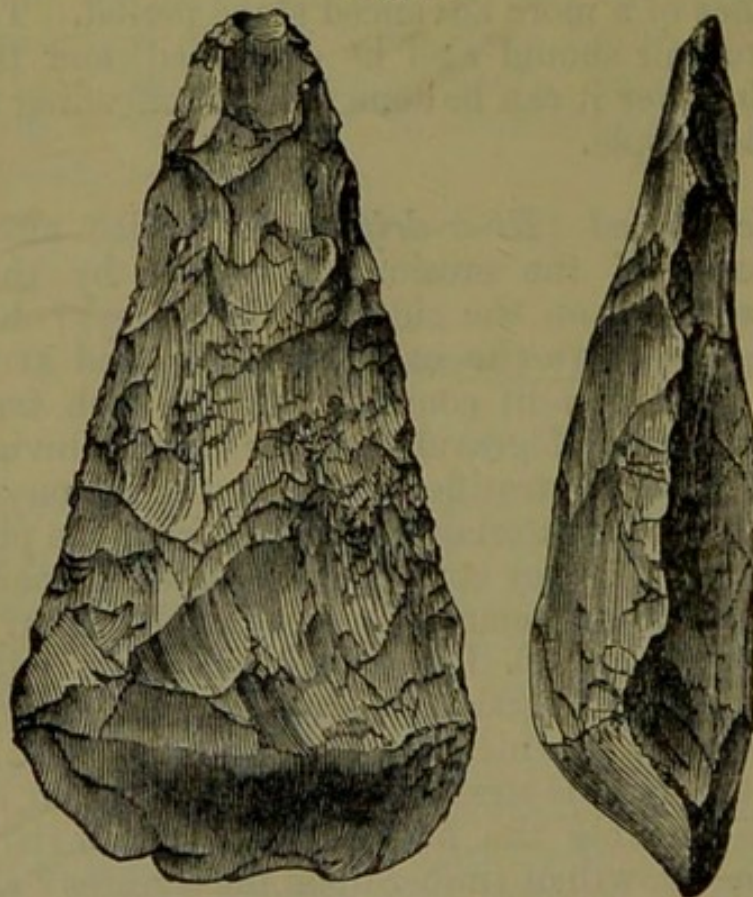
river-drift and the subjacent rocks, in the positions shown by a + in the following imaginary section across a valley.

Fig. 1.



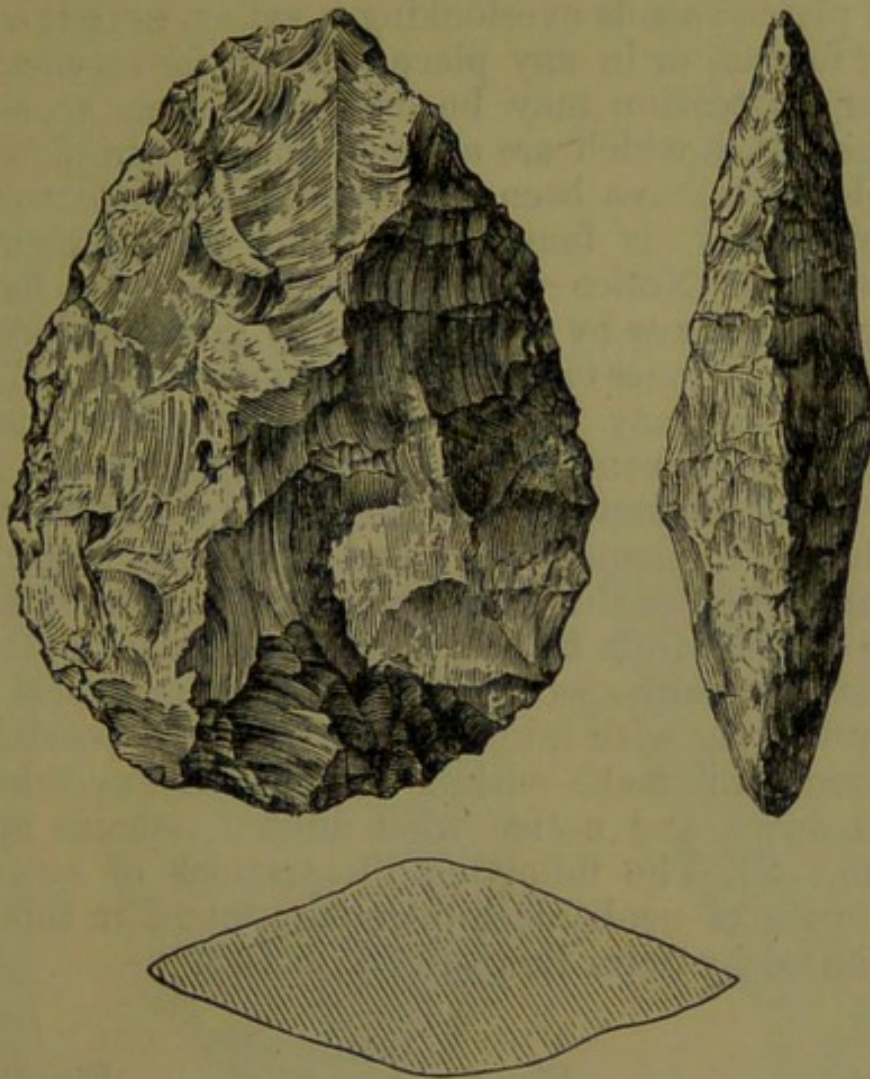
10. The following, amongst many varieties, are the two principal types which have been found in Europe, in the drift-gravels, associated with the remains of elephant, rhinoceros, hippopotamus, and other extinct animals: these illustrations are contributed by John Evans, Esq., F.R.S.

Fig. 2.



TONGUE-SHAPED.

Fig. 3.



OVAL.

Caves.—11. Examine the floors of caves by cuttings from the surface as far as the solid rock; take sections of the deposits and note the relics discovered in each stratum. In limestone caverns, note the thickness of any stalagmite coating upon or beneath the floors. 12. It must be remembered that strata representing vast periods of time may be represented by deposits only a few feet or even inches in thickness, and that a very false impression might be conveyed by any error in labelling or describing the position of the specimens. Animal remains should be preserved for examination at home, and for submission to a comparative anatomist, especially if the traveller is not one himself. 13. Note the elevation of the mouths of the caverns above the existing watercourses, and give plans and sections when practicable.

Neolithic (Surface) Period.—14. Implements of neolithic

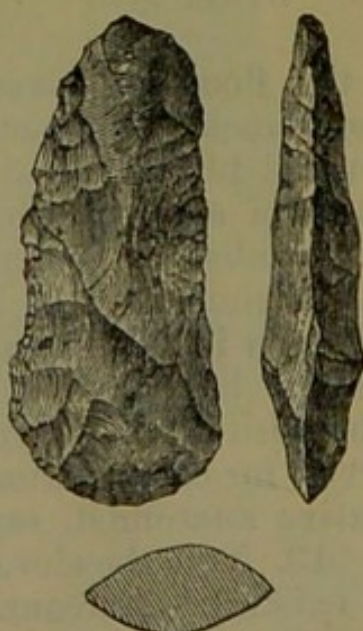
type are likely to be found in soil turned up by cultivation, or where the surface has been removed by rains, on the borders of plateau-lands overlooking a valley, near the margins of ancient forests, or in any place suitable for an encampment near water: attention may be drawn to such spots by observing the flakes which are always abundant in places where stone implements have been fabricated. 15. Note what class of pottery, if any, is found with flakes and implements on the surface. 16. Notice whether the implements have been formed by chipping or by grinding; if by grinding, look for the concave rubbing-stones on which they were ground. 17. Notice any evidence that may exist of metal having been used at the same time or subsequently to the stone implements. 18. Preserve any bone implements or other relics found on the spot. 19. Should any implements be found with holes bored through them, notice whether the holes are cylindrical or enlarged towards the outside, from having been bored from the two sides. 20. Preserve as many specimens as possible, and *label them all at once*, by writing with ink upon the stones if possible; take measurements and make outline drawings of any that cannot be carried away, and notice what animal remains are found with them. 21. The following illustrations of some of the principal types of neolithic implements found in this country are contributed by John Evans, Esq., F.R.S.

Fig. 4.



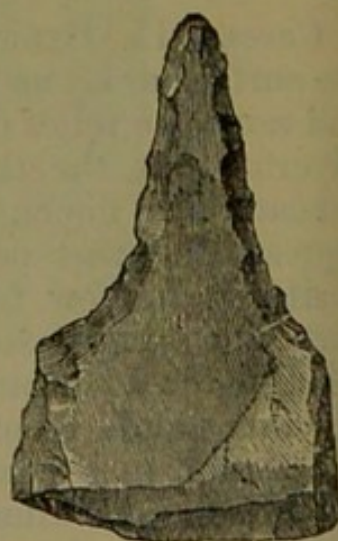
FLAKE.

Fig. 5.



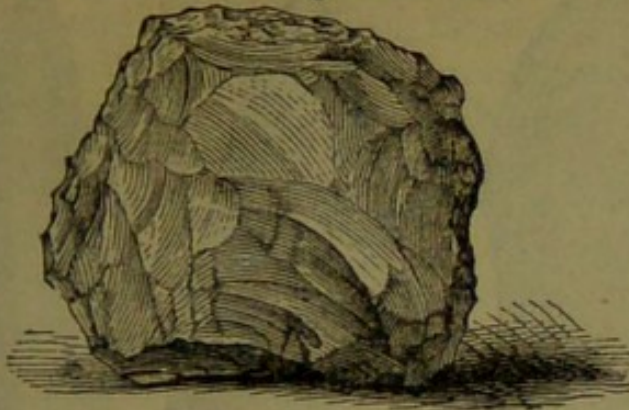
CHIPPED CELT.

Fig. 6.



FLINT-BORER.

Fig. 7.



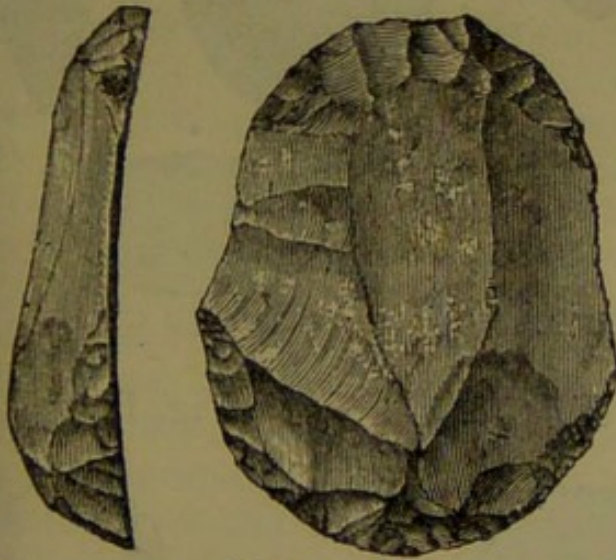
FLINT HAMMER-STONE.

Fig. 8.



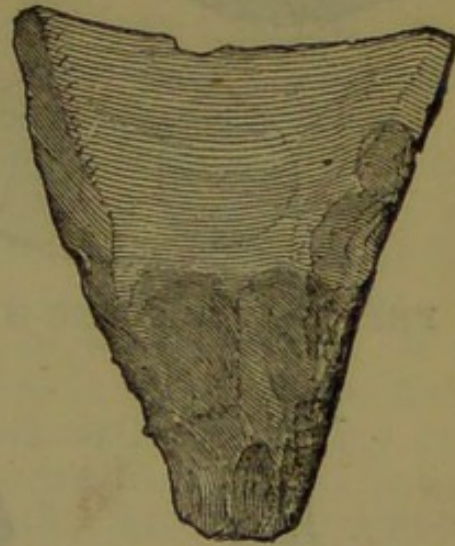
CORE.

Fig. 9.



SCRAPER.

Fig. 10.



CHISEL-SHAPED ARROW-HEAD.

Fig. 11.

TRIANGULAR
ARROW-HEAD.

Fig. 12.

LEAF-SHAPED
ARROW-HEAD.

Fig. 13.

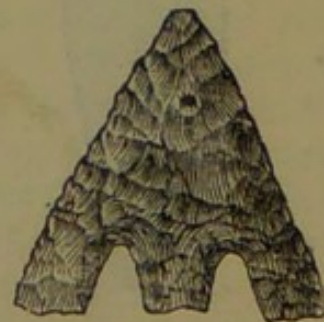
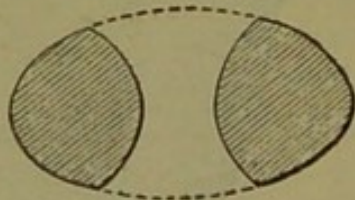
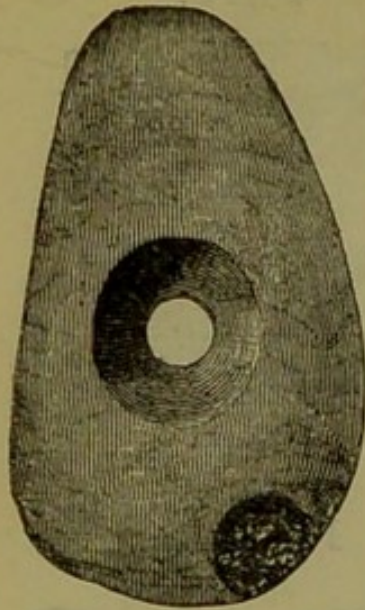
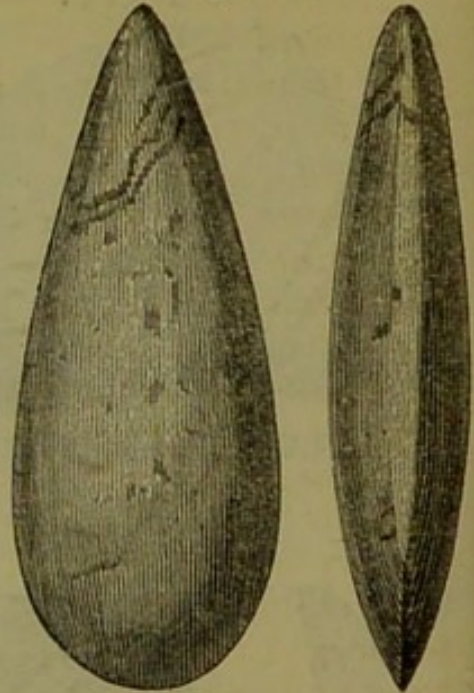
BARBED
ARROW-HEAD.

Fig. 14.



PERFORATED STONE HAMMER.

Fig. 15.



GROUND CELT.

Fig. 16.



FLAKE.

Fig. 17.



FLINT SAW.

Fig. 18.

LOZENGE-SHAPED
ARROW-HEAD.

22. The traveller before starting should make himself thoroughly acquainted with these forms, and also with the appearance of stone flakes, bulbs of percussion, facets, &c., and he should be able to distinguish the drift-types from the surface-types as they are known in this country.

Megalithic Monuments.—23. Dig between the uprights of megalithic monuments to ascertain if they have been used as burial-places, taking care not to overturn the stones. 24. Take plans, marking the uprights in lines and the cap-stones in dotted lines, noting the compass-bearings, and be particular in stating that they are compass-bearings, when such is the case, and not true bearings. 25. Are holes bored in the uprights? and are there any superstitious observances in the country connected with these or similar holes? 26. Note the topographical position, whether situated on hill-tops, on the terraces of river-valleys, and so forth. 27. Note the age of any trees growing within or upon these or similar monuments. 28. Is there any evidence of the stones having formerly been covered by a tumulus? 29. Describe all the varieties that exist, and ascertain, if possible, whether the varieties of form are due to original design or to subsequent dilapidations. 30. What is the greatest observed size of single stones? Is the stone used found close to hand, or has it been brought from a distance? 31. Are they ever daubed with red or any other colouring-matter? 32. Recount any traditions of the inhabitants respecting these monuments. 33. Are votive offerings still made at these monuments? and have the superstitions connected with them been incorporated into the religion of the period?

Tumuli.—*Burial-places.*—34. Take sections of the surface of tumuli, when possible, before excavating them; drive in a peg in some spot where it is not likely to be covered by the excavated material, and let this be a standard of reference for the levels of all objects discovered in the tumulus. 35. Cut a trench from the outside towards the centre at least one half the width of the tumulus, throwing back the earth; be careful to reach the undisturbed soil everywhere; look out for holes in the undisturbed soil, and examine their contents carefully; when the central interment is reached, dig downwards over it from the top. 36. Note the levels of any layers of charcoal that may occur, also animal remains. 37. If the tumulus has been used as a place of interment subsequently to its original construction, distinguish carefully the primary from the secondary interments. 38. For relics deposited with the

dead (see LXII.). 39. Take the compass-bearings of all interments, preserve the skulls, if possible, with the lower jaws, and even any fragments of skulls, and measure the bones (II.).

Ancient Intrenchments.—40. (XLII. WAR.) Cut into the ditches of ancient intrenchments in search of any relics which may have accumulated at the bottom and become silted over.

Lake Habitations.—41. Examine small islands near the shores of lakes or rivers, to see if they have been inhabited at a former period; see if piles of wood have been driven in round the margin, and whether there has been a communication with the shore by means of a causeway; preserve all relics found on or beneath the surface, and make a plan of the locality.

Inscriptions.—42. (LXXXVI.)

Ancient Habitations.—43. Examine the floors of ancient habitations, as far as the undisturbed soil, for the relics of a past age; take plans (LXXVI. HABITATIONS).

NO. XX.—ETYMOLOGY.

By E. B. TYLOR, Esq., F.R.S.

Local names, as of mountains, rivers, towns, &c., afford important evidence as to previous inhabitants of a district, as in the familiar case of Keltic local names in England. Well-known geographical names, belonging to the actual language of some little-known tribe, are also interesting to philologists as easily remembered examples of their language and its structure; while the rapid extinction of many languages leaves local names as their principal relics. It is therefore desirable to draw up a full geographical list for each district, with the etymology of each name stated carefully when known.

1. What words, such as hill, river, rock, wood, &c., enter into the composition of local names, corresponding to such English forms as *Black-down*, *Sand-wich*, *Bex-hill*?

2. Are the names of rivers, mountains, villages, &c. mostly intelligible to the present inhabitants, and belonging to the language at present spoken in the district? 3. Do any words show old but still intelligible forms of the present language?

4. Are there local names not intelligible in or belonging to the

present language? if so, is it known to what language they belong and what they signify?

5. What are the names given to

<i>a.</i> Men?	<i>i.</i> Wells or Springs?
<i>b.</i> Women?	<i>k.</i> Hills?
<i>c.</i> Families?	<i>l.</i> Rocks?
<i>d.</i> Tribes?	<i>m.</i> Mounds?
<i>e.</i> Animals?	<i>n.</i> Caves?
<i>f.</i> Gods?	<i>o.</i> Ruins?
<i>g.</i> Towns?	<i>p.</i> Islands?
<i>h.</i> Rivers?	<i>q.</i> Tombs?

NO. XXI.—ASTRONOMY.

By F. GALTON, Esq., F.R.S.

Divisions of the Year.—There are two celestial phenomena by which they may be effected:—(1) The solar method, by noting the group of stars which rise just before the sun, or set just after him and in his immediate neighbourhood; this suffices to fix the time to within 10 days. (2) The lunar method, by counting the number of new moons and reckoning the odd parts of the first and last lunation; this may suffice to fix the time even to a day; but the lunar year of 13 complete months is not of the same length as the solar year, to which the seasons conform; and therefore each method has an advantage and a disadvantage, and the two cannot be used together except by some clumsy compromise. 1. Inquire into the plan used for dividing the year, as regards (*a*) seasons and crops, (*b*) sun, (*c*) moon. 2. Is the difficulty of combining solar and lunar years recognized? 3. If so, is it met or avoided, and how? 4. Are there names for the phases of each lunation? and for how many phases?

Division of the Day.—There is a difficulty in using the height of the sun as a means to divide the day, because at the same hour it stands at different heights at different periods of the year, whether the hour be reckoned from midday or from sunrise or sunset. The difference of its bearing at sunset and sunrise is always considerable, but greatest within the polar circles, where it varies the whole way from N. to S. Near midsummer it momen-

tarily dips below the horizon towards the pole, and near midwinter it momentarily emerges above the horizon, opposite to the pole. 5. Is the fact of the variation of the sun's position at the same hour known and regarded when using it to divide time or to steer courses? 6. Is the property of the sundial known? viz. that the shadow of a fixed rod sloping towards the pole, always falls in the same direction at the same hour all the year through. 7. How is the day divided, by the position of sun or the length or direction of its shadow? 8. How as regards other means of division of the day? 9. Of short periods of time, as a walk two "pipes" (tobacco-smoking) long? 10. Are there names for any of the points of the compass? are these derived from prevalent winds, or from what?

Steering Courses by Sun and Stars.—For sun see last Par. The same star (not planet) has always the same bearing at the same altitude; but the bearing of the star, unless it be near one of the poles of the sky, changes considerably during the night, and its position in the sky differs at the same hour on different nights. To a traveller in equatorial regions, the equatorial stars, as Orion, are always either E. or W. of him unless exactly over his head. 11. When courses are steered by the stars, are these facts recognized? and how are they met?

NO. XXII.—ARITHMETIC.

By E. B. TYLOR, Esq., F.R.S.

The use of fingers and toes in counting, as well as of pebbles, sticks, &c., should be carefully noticed; also cases in which the numerals of the language only extend to a very low limit—for instance, not beyond 3 or 5. All examples which illustrate the formation of numerals by words describing the act of counting fingers and toes should be carefully sought; for example, the appearance of words meaning "hand" for 5, "man" for 20. Compound numerals capable of being analyzed into the constituent numbers should be sought for, such as a word for 7, meaning five-two. The numeration should be examined to show how it turns on reckoning by fives, tens, and twenties, which are the almost universal systems of the world, derived from the primitive practice of counting on the fingers. It

should be ascertained how far the numeral words now used are borrowed from other people. In the further development of arithmetic, it should be noticed how far the four simplest rules are understood, and by what mental or written processes they are actually worked out. The system of figures or cipher used by a nation, and the rules of their higher arithmetic, often show from what people they must have been obtained, thus throwing light on the later history of their civilization.

1. Do people generally count on fingers and toes, and in a particular order, beginning with one particular finger?
2. Do they use pebbles, heaps of grains, &c. as aids to counting?
3. What names have they for numbers? up to how many?
4. Does any particular number stand as an indefinite expression for "many"?
5. Do any of the numerals show that they originally referred to counting by fingers and toes, such words as "hand" for 5, "hands and feet," or "man," for 20, "two on the feet" for 12?
6. Have any of the lower numerals a meaning besides that of the numbers they signify?
7. Does numeration go by fives, tens, or twenties (quinary, decimal, vigesimal)? or, for instance, does such a numeral as fourteen signify $10+4$? or is there a term for 65 like threescore-and-five, *i. e.* $3 \times 20 + 5$?
8. Are any numerals, especially high ones, borrowed from a foreign language?
9. How far are addition, subtraction, multiplication, and division understood?
10. Are they done mentally, or with the aid of counter or abacus?
11. What is the exact process carried on by the reckoner's mind?
12. Does trade, barter, taxation, &c. involve any complex calculation?
13. Are any figures or ciphers in use? and how used?
14. Any higher arithmetic?

NO. XXIII.—MEDICINE.

By DR. BARNARD DAVIS, F.R.S.

1. What are the diseases suffered by the natives?
2. Give the native names and the ordinary English names.
3. Which of these diseases prevail most?
4. What are considered to be the causes of the particular prevalence of any of these diseases which do most prevail?
5. It would be of much interest to describe briefly the chief symptoms and course of any of these

diseases which are *peculiar* to the natives. 6. What is the treatment employed against these diseases? 7. Do they use native vegetables, *i. e.* simples or other remedies, or both? 8. Is there any prescribed method of collecting, preparing, or administering these remedies? 9. What are the names of the simples, native or botanical, or both? and what are the names of other remedies, if there are such remedies? 10. What are the doses in which they are administered? and how frequently, and the mode of administration? 11. What is the limit of administration, or the sign by which it is decided to cease the exhibition? 12. What are the effects of these remedies? 13. Do the diseases or the remedies produce any lastingly injurious effects? 14. Are there other remedies resorted to besides the exhibition of simples? If so, describe them as accurately as you are able. 15. Describe any superstitions relating to diseases. 16. Describe any charms employed or any superstitious ceremonies observed in sickness. 17. Any peculiar implements used in the practice of these charms. 18. Do his friends wait upon the sick man and attend to his wishes and wants? 19. Is he laid upon a bed of any kind? 20. On his recovery, are there any ceremonies of purification or otherwise attended to?

21. Have you learned any thing as to the methods observed during labour and childbirth? 22. Do particular persons attend the woman in labour, or who attends her? 23. In cases of difficult labour, what measures are resorted to? 24. Do difficult cases occur rarely, or more or less frequently?

25. If the natives carry bones on their persons of dead relatives, or other objects of this kind, try to ascertain *precisely* what is their object in so doing, whether (*a*) out of respect for the dead, (*b*) as memorials and marks of affection, (*c*) whether as amulets to avert sickness or other evils, (*d*) whether as fetishes, (*e*) as charms, or (*f*) magical means of communicating with unseen talismans or powers, (*g*) whether such objects so borne are ever used as remedies for sickness.

26. Are any measures of a sanitary nature observed to preserve the health of villages or of individual persons? If so, describe them?

No. XXIV.—FOOD. By A. W. FRANKS, Esq., F.R.S.

Articles of Food.—1. What are the substances chiefly used as food? 2. What are the principal varieties of fish, flesh, fowl, vegetables, and fruit so employed? and are they derived from wild or domesticated animals, and from wild or cultivated plants? 3. Are corn or any other cereal, bark, or other substances made into bread? 4. Is any pith so employed, or any roots, such as cassava, &c.? 5. Is milk in use? and from what animal is it obtained? 6. Are any preparations of milk employed, such as curds, butter, cheese, &c.? 7. For what class of food is there a marked preference? and are there any especial delicacies? 8. Is marrow much sought after? and how is it extracted? 9. Is blood utilized as an article of food? and how is it prepared? 10. Are any kinds of food, usually eaten elsewhere, forbidden for religious or sanitary reasons? 11. Are there any seasons during which the use of special articles of food is forbidden? and does it depend on custom, taboo, or special enactment? Are the seasons fixed or dependent on the will of the chief or the priesthood? 12. Are such restrictions due to the desire to increase the stock of such article of food, or to superstitious or sanitary causes? 13. Is the use of certain articles of food restricted to men, women, or children, or to chiefs and persons of rank? 14. Are individuals or families prevented from eating certain animals and plants for superstitious reasons, such, for instance, as their being the totems of the individuals or family? 15. Are there any storehouses for food? and are they public or private property? How are they constructed? and how protected from the ravages of animals? Are they the property of individuals, families, or villages? 16. In seasons of scarcity or famine are any unusual substances used as food, such as bark, clay, &c.? 17. When going long journeys or undergoing hard labour, is any kind of substance of a peculiarly invigorating nature eaten? 18. Are any oils used in cooking? are they expressed from vegetable or animal substances? and how are they made? 19. Are any, and what, spices in use? and are they native or imported? 20. Is salt used? and whence is it obtained? or sugar, honey, or other sweetening substance? 21. Are any whets to the appetite in use? 22. Is there any marked difference in the food of the chiefs or rich men and that of the poorer classes? 23. Is the eating of earth known? what is the nature of the earth? and what effect has it on those who eat it?

Fire.—24. How is fire obtained? 25. Is it made when required, or is it kept burning? 26. What are the instruments employed in kindling a light? 27. Are there any special superstitions or ceremonies connected with fire, or any traditions as to its origin? (See LXXVII.)

Mode of Cooking.—28. Are any articles of food other than milk, vegetables, and fruit used raw? and are any kinds of fish, flesh, or fowl so used? 29. Is the food preferred high or fresh? 30. Is any mode of preparation by smoking, salting, or drying in the sun employed? and if so, is the food consumed without further preparation? 31. Are roasting or broiling, baking, boiling, stewing, or frying in use? and what are the methods adopted in each? 32. In roasting or broiling, are spits or other utensils employed? 33. In baking, are the ovens simply pits in the earth, or built up? are they permanent, or constructed for the occasion? are they lined with leaves? and are hot stones placed with the food? 34. Are any vegetables cooked with the meat? 35. Are hollow trees, ant-hills, or such like used as ovens? 36. In frying, what grease or oil is preferred? 37. In boiling, is the use of hot stones known? 38. What are the forms and materials of the cooking-vessels and implements? and are they cleaned after use? 39. Are rings of clay or other material employed to keep the cooking-vessels upright? 40. Are any vessels suspended over the fire? and how are they hung? 41. Are broths and stews made with vegetables? is any kind of farinaceous pudding known? 42. Is the cooking carried on in the dwelling-house or in a separate building? 43. Is it performed exclusively by men or women? and are there any ceremonies or superstitions connected with it? 44. Is the food for men and women cooked together or separately? 45. When cooks are a separate class, do they rank high or low in the community? 46. Do the natives prefer the meat slightly or well cooked? 47. What kind of rubbers or instruments are used in converting the grain into flour? 48. Is it made into bread or cakes? and how? 49. Is any leaven, yeast, or similar substance employed? 50. When poisonous plants or animals killed by poison are used as food, how are the noxious qualities extracted? 51. Is there any mode of preserving fruit or vegetables by cooking it with sugar, fermenting it, pickling, &c.? 52. Are there any traditions as to the origin of the art of cooking? 53. Are there in the country any ancient heaps of refuse or kitchen-middens, containing shells, bones, &c.? and what do they contain? 54. Do the present inhabitants form such heaps? and do they adjoin their permanent habitations? or are they at

a distance near a spot where there is a supply of food, such as shell-fish &c.?

Manufacture of Drinks.—55. What drinks are chiefly in use? and what are their native names? 56. Is beer known? from what grains is it made? 57. Is the grain used raw or malted? if the latter, how is it turned into malt? 58. Are any ingredients employed, such as hops, to flavour the beer or make it keep? 59. Describe the mode of brewing and fermenting; how is the fermentation checked? 60. How is the beer stored? and how long will it keep? 61. What are the utensils used in making, storing, and serving out the beer. 62. Is beer-making a distinct vocation, or does each family brew for itself? 63. Is any wine made? 64. Is it prepared from the juice of fruits, the sap of trees, or any other substance? 65. How is it made and stored? and how long will it keep? 66. Are any drinks made by mixing substances with water, such as mead, kava, or chicha? 67. Are any ardent spirits known? are they of native manufacture or imported? 68. If native, from what substances are they made? and how? 69. Describe the still and other appliances. 70. Is any flavouring employed? 71. Whence was the art of distilling imported? 72. Are any infused drinks known, such as tea, coffee, or any substitute for them? 73. Are they of native growth or imported? 74. Is the substance simply infused or boiled? 75. Are any drinks known, not coming specially under any of these heads?

Meals.—76. Are meals at set times, or dependent on the accidental supply of food or individual inclination? 77. Are they common to a household or village, or does each person eat separately? 78. Does all the household eat together, or is there a distinction of ranks, sexes, or ages? 79. Is there any particular sequence in the order of the dishes? 80. Are there any ceremonies used at the commencement of meals, such as offerings to the divinities &c., or any religious rites connected with them? 81. Are there any great feasts held? and if so, on what occasions? 82. Are there any drinking-festivals, such as the kava-drinking in the South Seas? 83. Are there any attentions paid to invited guests or strangers? 84. Is the food ready cut up, or does each help himself? 85. Is there any order observed in helping the persons present or in giving drink? 86. What are the implements used at meals? and what are their native names? 87. Are there any peculiarities in the mode of eating or drinking? 88. Are men and women allowed to have their meals together? and if not together, are they allowed to have them in the same room or building?

Comparison of Native Dietary with Laws of Diet.

By Dr. BEDDOE, F.R.S.

Certain laws are pretty generally recognized by scientific men and students of hygiene—*e. g.* that a perfect dietary should contain fat, albuminoid or nitrogenous matter (lean meat, casein, vegetable gluten, &c.), and carbohydrates (starch, sugar, &c.); that the last-mentioned may, however, be dispensed with without much evil, but that the first must be consumed in notable quantity; that fat should bear a larger proportion to the other constituents of diet in cold than in warm climates, and that nitrogenized food is required in larger proportion by those who lead active and laborious lives; that the entire absence of certain acids and salts of potash, found plentifully in many vegetables, induces scurvy; that it is better to divide the daily ration into two or three meals than to consume it at once. It is asserted, however, that whole tribes disregard these rules with apparent impunity; that some, for example, live almost wholly on lean meat, others on roots like the cassava, almost devoid of nitrogen.

89. Is the food mainly animal or vegetable, nitrogenous, fatty, or starchy and saccharine? Can the proportions of these elements of diet be estimated? 90. Do great differences in this respect prevail among neighbouring tribes? and do these differences coincide with diversities of physical type? 91. Is there any alimentary principle, which, being absent or scarce in the dietary of the people, is eagerly sought and hungered for by them? 92. Does any apparent perversion of appetite prevail, such as that for "eating dirt" in the West Indies? 93. Is common salt, or any other mineral substance, used or relished? 94. How many meals are commonly eaten in the day? and what appears to be the average quantity of food consumed by an adult?

95. What stimulants or exhilarants or narcotics are in use among the people? and to what extent? 96. Are any substances of this nature used which are not known in Europe? if so, note carefully their mode of use and supposed or observed effects on health, and on capacity for abstinence or labour.

97. Are there any prevalent diseases attributed or attributable to the dietary, *e. g.* scurvy from want of fresh vegetables or potash salts, ophthalmia from defect of nitrogen (as in a pure rice diet), gangrene &c. from use of diseased grain, paralysis from too much pulse, leprosy or skin-disease from too much fish or fish-oil, consumption from scantiness or poverty of food, especially poverty in fat? 98. Does the quality or quantity of food consumed vary much with the seasons? and do such variations affect the health and condition of the people?

No. XXV.—CANNIBALISM.

By A. W. FRANKS, Esq., F.R.S.

1. Does cannibalism prevail? 2. If it no longer prevails, are there any traditions as to its once having been known? 3. Is it frequent or exceptional? 4. Are any reasons assigned for it? 5. Is it the result of a craving for animal food, or to show victory over a deceased foe, or for the purpose of acquiring part of the valour of the person eaten? 6. Are the victims generally men, women, or children? 7. Are they enemies slain in war, captives taken in war or by deceit, or slaves, or other persons selected for the purpose? 8. Are any special ceremonies observed in cannibal feasts? 9. What parts of the body are eaten? 10. What is done with the bones? 11. Are any of them used for implements or ornaments? 12. Is any religious idea connected with it? and are the victims considered sacrifices to the gods? 13. Has the cooked human flesh any name of its own? 14. Is it prepared in the usual cooking-places, or are there special cooking-places set apart or constructed for the purpose? 15. Are any special vessels or implements used for cannibal feasts (Fiji)? 16. Is the use of human food confined to any class or sex? 17. Does it form part of the regular food of the people?

No. XXVI.—NARCOTICS.

By A. W. FRANKS, Esq., F.R.S.

1. What narcotics are there in use? 2. Are they derived from native substances or imported? 3. Are they smoked, chewed, taken as snuff, or in any other form? 4. What kind of tobacco is grown? what is its native name? has the latter any connexion with surrounding languages? and is there any tradition as to its being imported? 5. How is the tobacco prepared for smoking? 6. Are cigars known? and how are they made? 7. What are the forms of the tobacco-pipes? 8. Are the bowls of clay, stone, bone, wood, or other materials? 9. Of what are the stems composed? and are there any mouth-pieces? 10. In case of necessity is a hole in the ground ever used as a pipe (South Africa), or a piece of wood hollowed out, with a hole in the bottom (Siberia)? 11. Are narghelis or water-pipes in use? 12. Are the pipes smoked out by individuals, or are they passed from one to another? 13. Are any pipes known

with a large single bowl and two or more stems for various smokers (North America)? 14. Are any other substances used as a substitute for tobacco? 15. Are any ceremonies connected with smoking? 16. Is any substance smoked to increase the strength of men (North America)? 17. Are tobacco, betel, or any other substance chewed? 18. In betel-chewing, what are the ingredients mixed with the betel? 19. What are the forms of the implements to contain betel, &c., and of the spoon, chopper, &c. employed in connexion with it? 20. Are smoking, chewing, &c. carried on to excess or not? and what is the effect on the health of the people?

NO. XXVII.—CRIMES. By E. BRABROOK, Esq.

Even the rudest communities have something approaching an unwritten criminal code. The administration of justice readily conforms itself to system, and unconsciously crime and punishment fall into relation with each other. Inquiry will be made under this head as to what acts are regarded as criminal (α) against person, (β) against property, (γ) against the state, (δ) against religion; and the reasons why they are so regarded. The procedure in the administration of justice, and the punishments inflicted, will come under head XXXV.

(α) 1. *Homicide*. Whether considered criminal at all? under what circumstances excusable? 2. *Suicide*. Whether considered criminal or praiseworthy? 3. *Maiming*. 4. *Rape*. 5. *Abduction*. 6. *Seduction*. 7. *Abuse of children*. 8. *Assault*. 9. *Adultery*. Are all these offences which may be revenged by the party injured? or must he appeal to the chief or others for redress? or are they or any of them looked upon as mere venial offences? 10. *Unnatural offences*. Does any sense of criminality attach to these? Under each head of crime, inquire as to the extent to which it prevails.

(β) 11. *Arson*. 12. *Trespass*. 13. *Theft*. 14. *Fraud*. Are these recognized as offences against the community, or only against the person injured?

(γ) 15. The *crimen læsæ majestatis*, including treason, rebellion, and all offences against the chief of the state. Are his dignity and person protected by any special sanction?

(δ) 16. Offences against the persons of priests or the ceremonies of religion. 17. Dissent from the prevailing religion. 18. Are either or both of these esteemed criminal? and in what degree? 19. Does there exist a criminal class? 20. Does Thuggism prevail, or any organized system of crime? if so, give statistics.

No. XXVIII.—MORALS. By E. B. TYLOR, Esq., F.R.S.

The imperfection of our accounts of morals among savage and barbarous peoples is in a great measure due to travellers supposing the particular system of morals in which they themselves were educated to be the absolute system; thus they have merely approved or condemned what corresponded with or opposed their own notions, but have scarcely ever appreciated the fact that every tribe has its own system of morality, based on its own principles of right and wrong. It is necessary to place ourselves at the point of view of the particular tribe, to understand its moral scheme. The leading ideas to be borne in mind are especially the following:—That every tribe makes a distinction between right and wrong, but hardly two tribes exactly agree on what acts are right and what wrong; in fact there is hardly any act considered wicked and abominable by some men, that is not somewhere or other looked on as harmless or virtuous, *e. g.* infanticide, treachery, &c. Next, that in all peoples, civilized or not, there exists an ideal high standard of morals, while public opinion tolerates or approves a lower practical standard: it is desirable to obtain a definition of both. Also the moral standard varies from age to age, as our own has changed in the last thousand years; all records of such variations are important. Lastly, the moral standard differs, as between members of a family, members of a nation, or tribe, or alliance, and aliens and enemies; among many nations it may be held right and even glorious to cheat, plunder, illuse, or even murder a stranger, or foreigner, or one of another religion, but wrong to act thus towards a kinsman, fellow-citizen, or co-religionist.

1. What words are used to express right and wrong, virtuous and vicious? 2. Do terms such as good and bad also denote this distinction when a man is described as good or bad? what characters correspond to this description? 3. Are there well-known precepts as to what acts are right or wrong? are these taught to children, or inculcated in any ceremonial act by elders or priests? 4. Do popular legends &c. set up heroic ideals of virtue? 5. What is the practical judgment of public opinion as to what conduct is admirable and glorious? what is required of every man on pain of public disapprobation? and what conduct is held wicked, vile, despicable? 6. What distinction is drawn between

punishable crimes and wrong acts only to be visited by public reprobation? 7. What acts of oppression or cruelty may be done by the father in his family or the chief in his tribe, without its being any one's place to condemn him? 8. What acts are considered wrong when done against a tribesman, but right when done against an alien (*e. g.* theft, deceit, &c.)? 9. Is any moral code ascribed to an ancient lawgiver, hero, or deity? 10. Is religious influence brought to bear on moral conduct? are gods or spirits considered to punish certain acts by afflicting the doer or his family? 11. Is any moral or immoral conduct considered to affect the state of a man's soul after death?

12. Is it wrong to do harm to the person or property of a non-tribesman or member of a hostile tribe? are there exceptional cases? 13. Is wanton ill-treatment of wives, children, and slaves wrong? and who may protest? 14. Is hospitality inculcated toward tribesmen or all men? is it wicked to refuse it and mean to stint it? 15. Is giving away or sharing of food and other property a duty or a virtuous act? what is the notion of liberality and generosity? 16. Is covetousness condemned? and is the accumulation of property regarded as an avaricious act? 17. Is it wrong to steal from one's friends and tribesmen? 18. Is it wrong to rob strangers? 19. Is cheating approved or condemned? and what difference does it make whether the person cheated is a friend or stranger? 20. Is lying wrong in itself, or under particular circumstances? 21. Is the breaking of solemn engagements or oaths condemned? and what is the usual judgment as to treachery? 22. Is abstemiousness in eating, and temperance in, or abstinence from, use of intoxicating drink approved? 23. Are gluttony, laziness, dirtiness, gossiping, tale-bearing, &c. condemned? 24. Is reverence to the aged a duty or virtue? and is its neglect condemned?

25. Is general courtesy and kindness inculcated and rudeness condemned? 26. What are the rules of right and wrong as to unchastity in either sex before marriage? 27. After marriage, are acts of unchastity offences which public opinion takes account of as wrong? 28. Is adultery a personal injury, or an offence against morals, or both? 29. How does public opinion judge of unnatural crimes? 30. Is selfishness considered a vice? 31. How is cowardice judged of? 32. Are bravery, ferocity, tenacity of revenge, endurance of pain and hardship, and other warlike qualities looked on as the chief virtues? 33. How are such warlike virtues accounted of in comparison with the milder virtues of kindness, generosity, &c.?

NO. XXIX.—COVENANTS, OATHS, ORDEALS.

By E. B. TYLOR, Esq., F.R.S.

Solemn covenants are made by all nations; oaths and ordeals are rare among the lower tribes, and worthy of careful study when they occur. The question of principle usually involved in them is this, whether a personal spirit or deity is called on to witness the covenant or decide the truth, punishing the offender, or whether the operation is merely symbolical. The ceremonies and formulas used should therefore be carefully described.

1. What forms of covenant are used, as in settling tribe rights, making peace, &c.? 2. Do they appeal to any personal being, as to Heaven or Sun, to punish breach of faith? 3. Is any thing of the nature of an oath taken by an accuser, witness, &c.? 4. If so, is it accompanied by any symbolic form, such as swearing on a bear's head or sitting over a pit, with the idea that the breaker of covenant will be killed by a bear or fall into a pit? 5. Is the blood of the parties mixed as a sign of covenant, each party drinking it? 6. Is eating and drinking together a form of covenant? and does it confirm friendship? 7. How is this supposed to act? is a deity considered to execute the punishment, or does it come by a magical connexion? 8. Does any thing of the nature of an oath enter into the marriage ceremony? 9. Do sorcerers or priests superintend covenants or oaths? and is their breaking looked on as a civil or a religious offence?

10. Are any ordeals in use, such as plunging into water, passing through fire, drinking poison, &c.? 11. May they be done by deputy? 12. Are they religious acts, as may be known by their depending for their efficacy on deities and being administered by priests? 13. Is the truth ascertained by this means when the accused denies or there is conflict of testimony? 14. Does the ordeal act symbolically, as when a weapon is touched with the idea that such a weapon will slay the guilty? 15. Does it act directly, as when food is taken into the mouth, with the idea that it will choke the guilty? 16. Are ordeals fraudulently used by chiefs and priests, so as to save their friends and ruin their enemies?

No. XXX.—RELIGION, FETISHES, &c.

By E. B. TYLOR, Esq., F.R.S.

It is often a matter of difficulty to obtain precise information as to the religion of an uncivilized people, who conceal their doctrines for fear of ridicule, and will purposely put the inquirer off the track. After long and friendly intercourse, however, a clue may generally be obtained; and when something is known, it serves as a means of raising further questions. It is especially desirable to watch for religious ceremonies, such as prayer, sacrifice, festivals, &c., as the native religion may be more easily learnt from the explanations of these acts, than by an attempt to obtain answers to questions on abstract doctrine. It is now difficult to find any religion which has not borrowed ideas from the civilized world; all that can be done is to ascertain, so far as possible, whether these have been introduced within the memory of the relater. Information should be obtained from as many sources as possible, so that the peculiarities of individuals should not be mistaken for the general doctrine of the nation. The accounts of missionaries are of the greatest value; but the impartial inquirer should be careful not to be led away by their descriptions of heathen deities as "devils," and their tendency in other matters to view native religions as essentially products of imposture and wickedness, instead of representative stages of theological and moral development in the course of civilization.

There is great difficulty in determining how far religions exercise a moral influence over the ordinary lives of believers. In many religions, the moral element seems hardly to enter at all; in others the strict performance of ceremonies seems held to atone for selfish and wicked lives; a fair way of classing religions as high and low is according to how far they inculcate morals, promise divine favour to the just and good, and threaten divine punishment against evildoers. The influence of each religion on morals in every nation demands careful and unprejudiced observation.

Souls.—1. Is something of the nature of a human soul believed in? 2. What is its name? is it associated with the breath, shadow, &c.? 3. Does it depart when the body dies? 4. Does it go away from the body in sleep, trance, &c.? 5. Are any ceremonies performed to bring back the soul when

the patient is sick or dying from its absence? 6. What is the soul considered to be? what is its form, substance, voice, power, &c.? 7. Is there more than one kind of soul? 8. Are souls ever driven away by beating &c., shut up, let out at holes, &c.? 9. Can souls appear in more than one shape? 10. How are all the phenomena of dreams and visions accounted for? 11. Is there any belief in wraiths, *i. e.* apparitions of men seen at a distance at the time of their death?

12. Is there, or has there been, a practice of wives or slaves being put to death at the burial of a man? 13. Is the purpose that their souls shall accompany him in the future state? 14. Are there any practices which seem derived from such a custom? for instance, is there a pretence of killing attendants, a custom that a widow may not marry again, &c.? 15. Are the lower animals considered to have souls? and are these of the same nature as human souls? 16. Are animals treated and talked to as if human? 17. Does any idea prevail of animals having human or even superhuman intelligence? 18. Are animals sacrificed at funerals? and if so, is there a notion of their souls being transported, with their master's, to the world after death? 19. Are plants considered to have life and consciousness like animals? 20. Have plants souls? 21. Is there any notion that objects, such as food, clothes, weapons, &c., have any thing of the nature of souls belonging to them, or phantoms separable from them, which continue to exist after the natural object is destroyed? 22. What are the images of objects supposed to be which are seen in dreams, such as clothes, weapons, &c.? 23. Are any funeral offerings given, that the souls of the dead may in any way become possessed of the objects or their phantoms? 24. Are food, money, ornaments, &c. placed near the corpse or in the coffin with any such idea? 25. Do the native notions of souls seem genuine, or have they adopted civilized ideas?

26. What becomes of the soul after death? 27. Do some souls survive after death, but others perish? 28. Can a surviving soul die a second death or be destroyed? 29. What reason do the people give for believing that the soul does not perish with the body? 30. Do they think that the souls of the dead visit the living? 31. When the figures of the dead are seen in dreams or as apparitions, are these souls? 32. Can only one person in a company see them, or all? 33. Are survivors in fear of ghosts of the dead? and do they take any means to get rid of them or keep them off?

34. Do ghosts of the dead haunt houses or burial-places?

35. Does it matter whether the body was properly buried or not? 36. Is food set out for the souls of the dead? 37. Are there annual feasts in honour of the dead? 38. If so, are the souls considered to consume the food? and how, materially or spiritually?

Future Life.—39. Is there any doctrine of transmigration of souls? 40. Are the souls of the dead supposed to be re-born in children? 41. Do men live successive lives in different human bodies? 42. Do souls transmigrate into animals, vegetables, inert bodies? 43. Is there moral reward or punishment in such transmigration, the good man going up and the bad man down in the scale of existence? 44. If transmigration is believed in, what do the people give as their reason for belief in it? 45. Is there a special locality where the souls of the dead live in the future life? 46. Are there stories of men going thither and returning to give an account of it? 47. Is it a material or phantasmal region? 48. Is there any particular road or starting-place where the souls set off? 49. Is any connexion to be noticed between the West or Sunset and the Land of the Dead? any myth of a divine personage (such as Odysseus) descending into Hades and returning, like the Sun? 50. Is the Land of the Dead in some distant country, mountain, or island? has any water to be crossed? and how, by boat, or bridge, or swimming? 51. Is there an under-world or Hades? is it a cavernous region, gloomy or fiery? 52. Are volcanoes mouths communicating with it? 53. Is there a heavenly region of the dead in or above the sky?

54. What is the fate of souls after death? 55. Is life in the next world much like this, with land, houses, and occupations? 56. Is it looked forward to as dismal or beautiful? 57. Is there a difference in men's conditions in the next life? 58. If so, what determines a man's happiness or misery? do nobles fare better than plebeians? have warriors a glorious life? what becomes of those who die by violence? 59. Is there a moral retribution? *i. e.* are good men happy and bad men unhappy after death? 60. If so, what qualities of virtue and vice constitute a good or bad man—*e. g.* bravery, hospitality, fidelity, chastity, temperance, kindness, &c. and their opposites? 61. Do the priests claim authority as to the fate of men, and require sacrifices, gifts, austerities, &c. to secure future welfare? 62. Is there a tribunal or judge to decide on the fate of the soul? 63. Is there a special place of punishment? 64. Is this of the nature of a purgatory? and are souls, when purified from sin, transmitted to a happy region?

65. Does the expectation of the future life affect men's conduct in the present? and how? 65*a*. How far do these notions of the future life seem original and genuine? and how far do they look as though adopted from foreign religions?

Manes-worship.—66. Are the souls of the dead, especially of ancestors, looked on as demons or divinities? 67. Are they worshipped with prayer, sacrifice, &c.? 68. Is there any recognized means of communicating with them? and is this done by any one, or specially by priests, &c.? 69. Are the divine manes of a kindly or unkindly disposition? do they treat all men alike, or favour their kinsfolk and worshippers, and do ill to others? 70. Are they looked on as causing the good and ill fortune of the living? 71. Do they act, fight, give counsel, &c. among men, or influence events in some spiritual way? 72. Are they the principal gods of the nation? 73. Is the primitive ancestor of the tribe worshipped under the form of, or in connexion with, some sacred animal or other object, as a totem or clan-deity?

Obsession and Possession.—74. Are some or all diseases regarded as caused by demons? 75. Do they enter into the patient or afflict him from without? 76. Are fever, delirium, trance, hysteria, epilepsy, mania, or other diseases specially ascribed to demoniacal influence? 77. Are nightmares considered real spirits? 78. Are erotic dreams caused by visits of demons (incubi and succubi), who have sexual connexion with women and men in their sleep? 79. Are there stories of women thus becoming pregnant? 80. Are there vampires or such spirits who suck their victim's blood in sleep, and cause them to waste away and die? 81. Is exorcism practised as a cure? and who are the exorcists, priests, sorcerers, or doctors? 82. What are the processes of exorcising spirits from patients? 83. Can disease-spirits be conjured into objects or animals, and the patient be so released? 84. Is the possessing spirit considered to speak through the patient's voice or by "ventriloquism?" 85. Does the intruding spirit give its name? 86. Are hysterical and epileptic fits, &c. encouraged or artificially brought on to obtain oracles from deities through possessed mediums? 87. Are patients of morbid constitution selected as mediums, prophets, or oracle-priests?

Spiritualism.—88. Are other proceedings, of the nature of those carried on by modern "spiritualists," known in the nation? 89. Are the souls of the dead summoned to be conversed with? 90. Are *séances* or assemblies held for the

purpose? and if so, in light or darkness? 91. Are there persons who act as "mediums"? 92. Are the spirits said to appear visibly, to speak, move objects, &c.? 93. How do they answer questions? 94. Are rappings and other mysterious noises and actions reported? 95. Do mediums rise in the air? 96. Are they supernaturally loosed from bonds?

Fetishism.—97. Do spirits or deities enter into or attach themselves to objects, such as sticks, bones, ornaments, &c.? 98. Are such objects of supernatural power? and are they kept sacred or carried as vehicles of spiritual influence? 99. What sort of spirits can be conjured into such objects? and by whom, and how? 100. Are relics of the dead, as bones, mummies, &c., so inhabited by their former souls? 101. Can ghosts be "laid" in objects? 102. Do possessed objects move, dance about, give oracular answers, &c.?

103. Are objects inspired or inhabited by gods worshipped? 104. Are blocks of wood, stones, &c. considered such habitations of deity, and worshipped? 105. Are they prayed to? sacrificed to? have they temples and priests?

Idolatry.—106. Are images made to represent ancestors, demons, and deities? 107. Do they receive worship by prayer and sacrifice? 108. Have they temples and priests? 109. Do they consume food, give oracular answers, speak, nod, wink, bleed, walk about, and act otherwise? and how do they do this? 110. Are idols mere representations of spiritual beings? 111. Or are they actually influenced or inhabited by souls or spirits, so as to act as animated beings? 112. If so, do the spirits go into and come out of the images? and when? 113. Is this brought about by the priests, or done at the pleasure of the deity itself? 114. Are the images treated well, or beaten and abused, according to their supposed behaviour to their worshippers? 115. Is there difference of opinion among priests and worshippers as to the nature of the idol, whether it is to be adored as a symbol only of the deity, or as itself divine?

Spirits and Demons.—116. Is the world full of spiritual beings? 117. Are some good and some evil? 118. Does this mean that they are kind to friends and hostile to enemies? 119. Have some men, and not others, the gift of seeing spirits? 120. Do animals see them when men do not? 121. Are persons often troubled by apparitions of demons? 122. Do they come especially in the dark? and is fire or light a means of driving them away? 123. Are they driven away from houses or villages by priests or with ceremonies? and is there

a periodical ceremony? 124. Have any persons familiar spirits? and what do they do for them? 125. Have some or all men guardian-spirits who attend them? 126. Is each man specially attended by a good or evil spirit?

Nature-Spirits. Worship of Plants and Animals.—127. Are there spirits especially attached to natural objects? 128. Are there spirits of pools, wells, springs and streams, rapids and cataracts, &c.? 129. Do they drown men? 130. Are offerings given to them? 131. Are there spirits of trees? if so, are they like souls of the trees, or spirits who dwell in them? 132. Are groves and woods favourite places of worship or sacrifice? if so, is the worship given to tree-spirits or to deities who inhabit the forest? 133. Are there special spirits of each tree, each wood, each kind of tree, or a god of the forest? 134. Are any beasts worshipped? 135. If so, are they creatures actually dangerous or powerful, as tigers or elephants, or many sorts of reptiles, birds, and beasts? Are sacred animals incarnations of a deity, or under its protection? 136. Is it unlawful to eat them? and to whom? 137. Are there tribes named after particular animals? 138. Is such an animal considered to represent the ancestor, totem, or patron deity of the tribe? 139. Are individuals of the tribe known by its name as a clan-name or totem? 140. Has each species of animals a patron deity?

Polytheism and Monotheism.—141. What are the gods worshipped? are any of them distinctly the great power of nature? 142. Is there a heaven-god? if so, is he the sky itself, or a being dwelling in or above it? or does he partake of both characters? 143. Is there a rain-god? 144. Is there a thunder-god? 145. Are thunder and lightning considered the same or separate deities? 146. Are the winds considered deities, independent, or controlled by a wind-god? 147. Is there an earth-god? 148. Are there great river-gods, a sea-god, a water-god? 149. A fire-god? 150. A sun-god? 151. A moon-god? 152. Star-gods? 153. What special ceremonies are performed for these gods, such as turning to the east in sun-worship, worshipping the moon at new and full, &c.? 154. What other great deities are known? are there special deities concerned with agriculture, war, &c.? is a divine ancestor of Man a god of the dead? 155. Are there other deities of importance, whose natures are other than those mentioned, or whose character and functions are of a mixed kind, not easily accounted for? 156. Do any deities

seem borrowed, in name or character, from the religions of other nations? 156 *a*. Are the gods of other nations recognized as being real and powerful? 157. Are there two hostile deities, one good and the other evil? 158. If so, what other functions have they? and is either of them one of the previously mentioned deities, heaven, sun, &c.? 159. Is there a Creator of all things? 160. Is any one of these deities the supreme deity above all others? 161. Is there a supreme deity distinct from all other gods? and is his nature that of a soul or spirit of the universe? 162. Is he active in the world and the affairs of men? or does he remain unmoved, seldom or never interfering, and leaving the conduct of the universe to deities of lower order? 163. Is the divine government of the universe regarded as having any moral element? are deities believed to reward good and punish evil? do they favour only certain individual nations or their own worshippers?

Worship. Priests and Temples.—164. Are particular persons set apart as priests? 165. Are they chosen as children and specially educated? 166. Are they at the same time sorcerers? 167. Are they spirit-mediums, giving oracles in trances, &c.? 168. Do they instruct youth? 169. Have they political influence? 170. Is the same person often both priest and chief? 171. Do they appear sincere in their beliefs, or impostors? 172. Do they practise austerities, observe chastity, &c.? 173. Are there several orders of priests? 174. Are there priests and priestesses? and what are the social conditions of the latter? 175. Is any special building set apart for worship? Is it built in a particular position, as facing the east &c.? 176. Is the deity supposed to reside there or to come thither? 177. Are idols kept there? 178. What rites are performed in the temple? 179. Are all the rites public? or are any of the nature of mysteries or orgies? 180. Are mysterious objects kept in the sanctuary and miracles performed there? 181. Is the temple kept inviolate and only accessible to persons in a state of ceremonial purity? 182. Is it respected in time of war?

Festivals.—183. What festivals of a religious character are performed? 184. What do they consist in—processions, games, dances, banquets, &c.? 185. Which are at regular periods, and which occasional? 186. Are there annual religious festivals marking the months, seasons, equinoxes, solstices, seed-time, first-fruits, harvest, &c.? 187. Is there an annual feast of the dead? 188. Are festivals held in honour of particular

gods? 189. Are festivals performed by particular families, classes, or castes? 190. Are there festivals with relation to war, victory, or such events? 191. Are there festivals at the puberty of the young men and girls or their initiation into the duties of life? 192. Do families celebrate private festivals of a religious kind, as at birth of a child, manhood, marriage, &c.? 193. Do the priests take part in such festivals? are sacrifices offered, &c.? 194. Are there festivals at which marriageable youths and girls mix and matches are made? 195. Are any festivals specially connected with sexual relations? if so, what are the social consequences? 196. Do any festivals commemorate mythical or historical events with significant ceremonies, &c.? 197. Are any at once political and religious?

Prayer.—198. Are formal prayers offered to souls of ancestors or other divine spirits? and in what terms? 199. Is prayer offered by private persons, chiefs, or priests? 200. Is prayer a private or public ceremony, offered in the house, temple, or elsewhere? 201. Is prayer solemnly made in times of emergency or distress? 202. Are only temporal benefits asked for, as aid against enemies, safety, abundance of food, children, &c.? 203. Are the gods asked to promote virtue or goodness in the worshipper or others?

Sacrifice.—204. Is sacrifice offered? and to what deities? 205. Is it a private or public act? 206. May anyone, or only priests, sacrifice? 207. Is sacrifice made in temples? What is offered? 208. Is an altar used and the offering placed on it? 209. Does the offering consist principally of food? 210. Is it exposed, destroyed, or consumed? 211. Is the deity considered to consume it or to become possessed of it? and how? 212. Is it fraudulently removed under the pretence of the deity having taken it? 213. Does the deity consume the essence or spirit of it, leaving the material part? if so, what becomes of this? do the priests or worshippers consume or remove it? 214. Is incense used? and with what motive? 215. Do people sacrifice objects that the deity may be pleased to obtain them? or is there a notion that there is merit in the worshipper giving them up? 216. Are human sacrifices made? if so, are the victims captives or slaves, or the sacrificer's own children, or who? 217. Are the bodies buried or exposed or eaten? 218. Are the souls of the victims considered to go to the deity? 219. Are substitutes in sacrifice used, such as part of an animal, an effigy, or imitation? 220. Do worshippers sacrifice parts of

themselves, such as hair, points of fingers, drops of blood, &c. ? 221. Are oblations and libations usual at meals ? and to whom ?

Austerities.—222. Do priests, devotees, or the whole nation perform religious austerities, such as fasting, flagellation, exposure, &c. ? 223. What are the motives ? Are spiritual communications ever obtained by dreams, visions, &c. ? 224. Does the suffering of the worshipper give pleasure to the deity ? 225. Is it a self-imposed punishment for offences ? 226. Are austere devotees considered holy ? and are they respected and supported by the people ? 227. Is public penance and mortification done on any solemn occasion ? 228. Can the divine anger be thus averted.

Purification.—229. Are ceremonial purifications practised ? 230. Are any persons at any time impure or unclean, and requiring purification, as after child-birth, during menstruation, after bloodshed or funeral, &c. ? 231. Do they purify themselves, or is it the priest's office ? 232. What is used for lustration—water, urine, herbs, fire, smoke ? 233. Does any kind of baptism exist ? how soon after birth, and connected or not with the naming ? 234. Is there an understood distinction between physical, ceremonial, and moral purification ? 235. Are disease, ill-fortune, contamination by contact with the dead, violation of religious ordinances, and moral wickedness capable of being removed by purification ? 236. Is the cleaning of the household and lighting of new fire a part of the purification ? 237. Is unchastity &c. connected with ceremonial impurity ? and how is it atoned ? 238. Are the same words used to denote bodily cleanness and moral purity ?

Special and Miscellaneous Ceremonies, &c.—239. Are there other religious ceremonies connected with birth, marriage, burial, &c. ? 240. Is new fire made on special occasions ? and by whom ? 241. Is it customary to turn to the east or west or to bury corpses so ? 242. Are religious dances, pantomimes, processions in masks or disguise, &c. in use ? 243. Are games practised with a religious significance ? 244. Is the installation of a chief or king a religious act ? 245. Is any religious ceremony used in treaties or alliances ?

NO. XXXI.—SUPERSTITIONS.

By E. B. TYLOR, Esq., F.R.S.

Superstitions are customs and beliefs of an absurd or harmful kind. They often belong to the class of "survivals," being old-fashioned habits and ideas retained after their original sense has vanished. But, especially among the lower races, they to a great extent still carry their original meaning and purpose, which may be ascertained best from the old people. When thoroughly analyzed, they can be referred to their proper heading, such as Magic, Religion, Custom; but it is convenient to keep Superstition as an open class for the collection of a number of obscure and puzzling usages.

1. Do any superstitions prevail as to touching fire, drinking water, handling particular objects, &c.? 2. Any ideas of lucky and unlucky objects and acts? 3. Prejudices connected with sneezing, yawning, spitting, whistling, talking, and any other actions? 4. Any curious fancies as to animals? 5. Are animals treated as rational, and talked to? 6. Are exaggerated stories told of their sagacity and habits? 7. Are special places considered lucky or unlucky, and visited or avoided? 8. Are houses or villages ever abandoned or destroyed on account of sickness, death, or other cause? 9. Are there any peculiar ideas as to east and west, north and south? 10. Any remarkable notions as to sun, moon, and stars? 11. Are storms, thunder and lightning, or darkness the subject of any special prejudices? 12. Is there an objection to crossing water, going by particular paths, &c.? 13. Any peculiar customs as to cutting hair and nails, leaving articles of clothing about, &c.? 14. Any superstitious usages as to birth and naming of children, period of manhood and womanhood, marriage, divorce, sickness, death, and burial? 15. Any other superstitions not included in these classes?

NO. XXXII.—MAGIC AND WITCHCRAFT.

By E. B. TYLOR, Esq., F.R.S.

Magic includes the results of two principles. On the one hand it may seek the aid of spiritual beings, in which case its theory forms part of that of religion; on the other hand it deals in sympathetic and symbolic hurts and cures, discoveries and communications, supposed to take place by the way of cause and effect, so that it is here a misdevelopment of natural philosophy. In all cases it is desirable to describe not only the magical method used, but its supposed motive and action.

1. Are magic arts held lawful or unlawful? or is there both a "black magic" and a "white magic"? 2. Are they practised among the people at large? or is the craft set apart to special sorcerers, witches, &c.? 3. Are these priests, or connected with religion? or is there jealousy or hostility between the priest and the sorcerer? 4. What manner of people are the magicians? what lives do they lead? do they follow useful occupations, as rude herbalists or surgeons, &c.? 5. Are they largely rewarded, applied to in times of calamity? and is it usual for the mob to fall on them in times of misfortune, so that they seldom die a natural death?

6. Are spirits or demons called on to give oracles, disclose secrets, do good or harm? 7. Are they propitiated or influenced by sacrifices, prayers, charms, symbolic rites, &c.? 8. Have magicians the aid of familiar spirits? 9. Do they associate these with particular objects or fetishes, such as images, pictures, odd stones, or bits of wood, claws, seeds, and other things? 10. Are objects regarded as possessed or influenced by spirits to give magical omens, discover thieves, &c.? 11. Are drums, rattles, &c. used in such incantations? 12. Are particular songs or charms connected with these rites known?

13. Are dreams regarded? Do they give information of the past, and prophecy or omens for the future? 14. How are dreams interpreted? are they direct visits or communications from spirits? are their scenes taken symbolically—as when to dream of a knife or blood is an omen of war? do they ever go by contraries? 15. Are dreams sought by fasting, narcotics,

&c.? 16. Are the words of men in a state of ecstasy specially regarded? or the talk of madmen and children, words accidentally heard, &c.? Are omens taken from such words? 17. Are there any reported cases of second sight?

18. Is the effect of the evil eye believed in? Is cursing or ill-wishing dreaded as a practical means of doing harm? 19. How are these supposed to act on the victim? 20. Is he allowed to know of the curse? and does he actually fulfil it by dying of fear? 21. Is it usual for the sorcerer to operate through objects belonging to the victim or intimately connected with him, such as his cut hair or nails, morsels of his food or clothing or property, so that he may be harmed by what is done to these objects when they are burned &c.? 22. Are names considered to give a hold to the sorcerer? and are the real names of people ever concealed from fear of this?

23. Are symbolic arts of magic common? Are pictures or figures practised upon to produce an effect on the objects they represent, as when an image is wounded in order to act likewise on the person it stands for? 24. Are dice, lots, sticks, &c. thrown that they may indicate by their fall or position an answer to the question? 25. Are there any other mechanical divining instruments, as swinging-rings &c.? 26. Are death-charms or love-charms made with symbolic objects, such as a dead man's bone to produce death, knots to fasten love, &c.? 27. Are other symbolic objects used, such as beasts' claws to give courage, &c.? 28. Are special herbs &c. used for symbolic purposes suggested by the form, such as eye-bright for sore eyes? 29. Is the idea of curing a wound by salving the weapon &c. known?

30. Are cries of animals and birds taken as omens, by way of augury? 31. Is meeting a particular animal ominous? 32. Are omens taken from accidents, such as stumbling &c.? 33. Is haruspication or examination of entrails used? 34. Are the stars noticed as giving prophetic information? 35. Are there any distinct rules of astrology? 36. Are omens taken from names of persons and the like?

No. XXXIII.—MYTHOLOGY.

By E. B. TYLOR, Esq., F.R.S.

The collection of mythic stories among the lower races may be conveniently carried on with a view to several points of interest. It is desirable to take them down verbatim from the lips of a skilled storyteller, as they thus form specimens of the language in its best form, exhibiting native metaphor, wit, and picturesque diction. They should be copied out with an exact translation between the lines or on the same page. As to the subject-matter of mythic legends, they contain the ideas of the people on religious subjects, names of gods, &c. often in more original and exact forms than those used in common conversation. Real traditions of historical events and names often appear in them, and mentions of old arts, customs, and states of society, which are historical material of high quality; incidental remarks in them show the moral and social state of the people, often with curious contrasts between old times and new. The episodes, jests, &c. in mythic legends should be particularly noticed when they correspond to those known in the legends or folk-lore of other races, for such evidence throws light on the connexion or intercourse in former times between the two races. For this end it is especially desirable to separate all matter which might have been borrowed from the religious and other traditions of the Christians, Moslems, Buddhists, &c., so as to leave the native mythology as pure and genuine as possible. It would thus be a serious mistake to suppose the mythology of the lower races of little scientific value. Few studies throw more light on the early history of the human race and the human mind.

1. Are mythic legends, fairy tales, &c. told habitually? and is any special class of priests, bards, &c. concerned especially in preserving them? 2. How far are they seriously believed, and stand in the place of history and religious teaching? and how far are they told as nursery tales and popular jests, for mere amusement? 3. Are the personages who figure in them considered to be real and historical? and are there other traces of such heroes, chiefs, &c. having really lived?

4. What stories come under the heading of nature-myths, being told of the sun, moon, stars, rivers, &c. as personal beings? 5. Do any of the heroes and heroines bear names which suggest such origin? or do their feats seem to be suggested by natural phenomena? 6. Are there, for example, myths relating to the sun, his birth, course, and death; day and night; eclipses; the

changes of the moon? are stars and constellations imagined to be living beings? are there stories of rainbows, thunder and lightning, winds, whirlpools, rivers, volcanos, &c., as being animate beings? 7. Are there any native riddles in connexion with such subjects?

8. Are stories which seem myths told to account for events, such as peculiar customs, the invention of arts, the prevalence of certain plants or animals, &c.? in short, are fanciful tales told to account for all sorts of things in nature and life? 9. Are there eponymic heroes, *i. e.* names of a mythic chief or ancestor, devised to account for the names of tribes, like Danaos as the ancestor of the Danaoi or Greeks, or Albion of our own countrymen? 10. Are stories told to explain etymologically the names of places or objects? 11. Are there geological myths accounting for large fossil bones, as relics of giants, or for shells on mountains by legends of a deluge, or other philosophical myths of this class? 12. Are there stories of men being descended or developed from apes or apes from men, of transformation of men into animals, of monstrous tribes of men, one-eyed, great-eared, tailed, giants and dwarfs, &c.? 13. If so, is there reason to suppose these stories told metaphorically or exaggeratively of real tribes of men? 14. Are beast-fables told, *i. e.* stories of talking birds and beasts, and their adventures? 15. Are any stories, allegories, or parables told in order to teach some moral lesson?

16. Do any of the native stories contain episodes which seem as though they might have been learnt from modern Europeans, *e. g.* mentions of guns or of writing, stories of devils with horns, fragments of Æsop's fables, or other European notions, familiar Scripture stories, &c.? 17. Are there any similar touches which betray contact with Mohammedans or Buddhists? 18. Apart from these, are stories current which have a resemblance to well-known classical or folk-lore mythology, but may have a distinct or independent origin? 19. Are there episodes which resemble 'Jack and the Beanstalk,' 'Red Riding Hood,' &c.? 20. Are there traditions of a river of death, a bridge across the sky where souls pass, a universal deluge? 21. Is there any legend current of the origin of Man, the introduction of language, houses, war, civilization? 22. Are the gods of old time related to have come on earth and had dealings with mankind? 23. Do the legends of the people go back to a golden age or divine-human period, when wonders happened which have now ceased, and when the ancestors of men had knowledge, powers, and happiness now lost?

No. XXXIV.—GOVERNMENT.

By E. W. BRABROOK, Esq.

a. The head of the Government.—1. What is his title? 2. How is he appointed? 3. If by election, with whom does the election rest? 3 *a.* If by succession, what are the limits of the succession? 4. May females succeed? 5. May minors? 6. Who will be his probable successor? 7. What is the extent of his power? 8. How does he exercise it? 9. What is his personal character? 10. Are his people well affected to his rule? 11. How long has the present system of Government been maintained? 12. Are there frequent revolutions? and have they affected only the individual ruler, or extended to an alteration of the system?

β. Inferior Offices.—13. *Petty chiefs*: have they independent jurisdiction? 14. Does their power act as a check on that of the head? 15. To what extent are they accountable to him? 16. Are they elective or hereditary? 17. Does the power of each inferior chief extend over a sept personally attached to himself? 18. Has it territorial limits? 19. Do quarrels arise between chiefs? and are they settled by reference to the head, or by war, or how otherwise? 20. What is the extent of their power over their subjects? 21. Have their subjects any right of appeal to the head or to any other authority? 22. How does the system work? 23. What are the number of inferior jurisdictions? and are there any distinctions of rank between them? 24. Do the inferior chiefs ever meet in council?

25. *Counsellors or Ministers*: how are these appointed? 26. Have they any authority independent of the will of the head? 27. What offices do they hold? 28. Have they any direct power over the people? and how do they exercise it? 29. Is the head virtually ruled by his counsellors? or does he exercise an individual will? 30. Is he ruled by favourites? 31. Is he ruled by women? 32. Is there any machinery of government, or any established constitution? 33. What is the revenue of the chief and of the other rulers and officers? 34. How is it raised?

No. XXXV.—LAWS.

By E. W. BRABROOK, Esq.

a. Land.—1. Are there any territorial divisions? 2. Does the whole of the land belong to the chiefs? 3. Is there a separate class of landowners? 4. Whence are titles to land derived? 5. Is there any means of conveyance? 6. May females hold land? 7. May infants? 8. What remedy is there for encroachments on rights of property?

β. Game.—9. Is it preserved? 10. Are rights in it restricted to privileged classes? 11. How are those rights maintained? 12. What is the punishment for infringing them? (See XLIII.)

γ. Inheritance (see XXXIV.).—13. To how much of the property and rights of the father do eldest sons succeed? 14. To how much are younger sons entitled? 15. Have daughters any right of inheritance? 16. Is there any testamentary power? 17. Generally how far and in what degrees are relationships traced, and the devolution of property or rights of jurisdiction ascertained?

δ. Administration of justice.—18. Are courts held for the trial of offenders? 19. Are there any officers appointed for the purpose of administering justice? 20. Is there any recognized principle of procedure? 21. Must the accused be present? 22. Is he subjected to torture? 23. Must a confession be obtained before conviction? 24. Is there any ceremony analogous to the taking an oath by witnesses? 25. How is perjury dealt with?

ε. Punishments.—26. By what authority inflicted? 27. By what means executed? 28. Death: for what crimes? how suffered? 29. Is taliation ("an eye for an eye, and a tooth for a tooth") acted upon? 30. Mutilation: for what crimes? and how inflicted? 31. Flogging. 32. Mulcts or penalties: for what offences? how recovered? to whose benefit applied? 33. Imprisonment: how enforced? for what periods? with what consequences? 34. Other punishments, if any. 35. Is private revenge permitted? 36. Generally, is justice administered with severity or with clemency, with caprice or with regularity? are the laws respected? are they undergoing improvement? and what is their influence on the character of the people?

No. XXXVI.—CUSTOMS.

By E. B. TYLOR, Esq., F.R.S.

The distinction between a law and an authoritative custom may be best drawn with reference to the manner in which society compels obedience to it. If a judge or tribunal declares the rule, and punishes its infraction, it is a law; if it is left loosely to public opinion to practically accept the rule, and to visit those who disobey with blame, insult, and social exclusion, it is a custom. Many customs are mere habits without authority. Many exist whose original meaning is hardly known or doubtful. All customs should be recorded, and, not least carefully, the obscure ones, in the expectation that close examination and comparison with those of other districts will disclose their real meaning. The ethnological principle is daily growing more certain, that all customs soever had originally a real and rational meaning; they may have now lost or altered this by passing into "survivals," but when analogous examples have been collected from several districts, it is usually possible to trace the common cause to which all were originally due.

1. What customs prevail as to salutation, by bowing, prostration, touching and shaking hands, kissing, rubbing noses, &c.?
2. Do salutations differ according to rank and relationship?
3. Do members of a family greet in the morning? do husbands greet wives, &c.?
4. How do friends and relations meet after long absence or danger—with shouting, weeping, &c.?
5. What are the forms of meeting between strangers and enemies in truce?
6. What are the rules of politeness in the household and between strangers?
7. Are there special phrases of compliment? What rules of precedence?
8. How are guests served?
9. What are the rules of right conduct and politeness between men and women?
10. Do they eat together and associate?
11. Are women consulted and honoured, or treated roughly and contemptuously?
12. How are the aged treated?
13. Are they honoured and cherished, or neglected?
14. Are the hopelessly infirm old people and the mortally sick abandoned or put an end to?

15. What are the rules of hospitality as recognized between

kinsfolk, neighbours, strangers, and enemies? 16. What are the rules of propriety? 17. Are the young reproved for being forward and impudent? 18. Is respectful demeanour inculcated? 19. What are the rules of decency? what acts and exposures are considered indecent? 20. Is coarse conversation disapproved of between the sexes or with the young? 21. Does great license prevail among unmarried or married? 22. Is drunkenness approved, tolerated, or condemned? and how with reference to age and sex? 23. Is drunkenness usual at public feasts?

24. Do any remarkable ceremonial customs prevail? 25. Are old-fashioned customs used on state occasions? 26. Are ancient habits observed at feasts, &c., such as old dishes and ways of cookery? 27. Any special forms of address, healths, &c. at feasts? 28. Any remarkable customs at funerals, festivals on birth of children, harvest festivals, family gatherings, &c.?

29. Are peculiar forms of language in use? 30. Are certain words used or avoided in addressing certain people? 31. What forms of address are usual between common people, chiefs, kings? 32. Are old-fashioned terms and expressions used ceremonially or officially? 33. Are there ceremonies performed at puberty of lads and girls? initiation of lads as warriors, &c.? 34. Are there other remarkable customs not otherwise classed? (See also SUPERSTITIONS, RELIGION, MAGIC, TABOO, &c.)

NO. XXXVII.—TABOO.

By E. B. TYLOR, Esq., F.R.S.

Ceremonial prohibitions of eating certain food, touching or even looking at certain persons or things, mentioning certain names, are very frequent among mankind, and though not reducible to one common principle, are in various ways instructive as throwing light on early and rude ideas. In taking down the details of these prohibitions, it is well to inquire their reason, as this may sometimes be the true one, or at least afford a clue to its discovery.

1. Is any particular food, animal or vegetable, forbidden,

though obtainable and wholesome? 2. Do the whole people abstain from it, or only certain families or individuals, or persons under some special circumstances? 3. Is the prohibition religious or referred to custom and propriety? 4. Is there a distinction between young and old, male and female, as to these prohibitions? 5. Is the animal or plant abstained from in any way regarded as divine, a tribe-fetish, the incarnation of a local deity or personal guardian-spirit, or the soul of some ancestor? is it the animal after which the tribe or family has its name? 6. If the food is abstained from at certain times only, are these occasions puberty, menstruation, pregnancy, the period after childbirth, mourning after a death, time of purification after manslaughter, times connected with hunting and war, time of preparation for observance of religious rites, &c.? 7. Does it seem that the abstention has to do with fasting, and that it prepares the abstainer for spiritual intercourse? 8. Is the idea that the food is holy, and persons in a state of uncleanness must not defile it by eating it? 9. Or, on the other hand, is the person in a state of sanctity, and would the food defile him? 10. Is there any thing symbolical, as where the flesh of slow or cowardly animals is abstained from by warriors, lest they should become slow or cowardly? 11. Is there any particular caste or tribe, or member of family, who may eat what others may not, or may not eat what others may? and why? 12. Are any persons under any circumstances not allowed to eat with others? 13. Do men and women take their meals apart? and is this a ceremonial usage, or a matter of inferiority? 14. Are persons ever forbidden to feed themselves or touch their food with their hands?

15. Do any persons object to eating with, touching, speaking to, looking at, or calling by name other persons? 16. Do these prohibitions apply to persons of different ranks, occupation, or caste? 17. Are they between relations, as between parents-in-law and their children-in-law? 18. If so, what appears to be the motive? is the one holier than the other? is there an idea of magical harm, or is it a mere question of social separation?

19. Are the names of chiefs, of dead persons, &c, avoided in conversation, and even excluded from the language? and if so, why? 20. Are any special words or subjects considered improper or indecent?

21. Are any places or objects sacred or taboo? 22. Is this with a religious idea, as in case of temples, idols, sacred pipe, &c.? 23. If so, who may enter or touch with impunity? 24. Is

there a special prohibition to women and children? 25. Does the touch of any person defile or sanctify an object, so that its owner may not touch it? 26. Is a place or object made taboo with the idea of keeping it safe? and is it considered that magical evil will befall the unlicensed toucher? or is the place or object made sacred to the gods, who will punish violation?

27. In general whose authority is appealed to as to such prohibitions? and is their infraction punished by divine or magical vengeance, by law, or by public disapproval?

No. XXXVIII.—PROPERTY.

To what extent private property is recognized; personal and landed property. Tenures of land, customs concerning, &c. Individual, family, and common property. Heirship, succession to.

No. XXXIX.—TRADE.

By HYDE CLARKE, Esq.

Trade is one of those developments of culture which, when carried to its height, promotes the greatest prosperity of nations, and which is rarely found wanting, in some form, even among the rudest tribes; but the mode in which it is to be recognized and the degree to which its progress is arrested have seldom received attention; and it will repay observation to trace, in an obscure form, the real institutions from which, in earliest times, the commerce of the world had its beginning.

Produce.—The exchange of commodities is one step towards augmenting the individual enjoyment of each individual, by enabling him to profit from the labour of many, instead of being solely dependent on his own exertions. 1. What articles of home production are there? 2. Of what raw materials are they made? 3. What articles of foreign manufacture are

used? 4. What raw materials are introduced? 5. What articles are sent abroad? 6. What raw materials are sent abroad? 7. Is any article prohibited?

Home Production.—8. Does each household supply itself? 9. Do the people interchange any articles of produce or manufacture? 10. What are the trades carried on by the men? 11. What are the trades carried on by the women? 12. Do the people merely work as slaves for the chiefs, or do they supply the produce of their labour for a consideration?

Division of Labour.—13. Do particular individuals carry on particular trades or occupations, as husbandry, fishing, &c.? 14. Is the occupation hereditary or that of a caste? 15. Is there any superintendence of labour? 16. Are trades restricted to any nationality? Is any trade prohibited?

Labour.—17. Do all classes labour? 18. Do men labour as well as women? 19. Do warriors labour, or labourers take part in war? 20. Is there any preeminence assigned to skill in handicraft, or any degradation attached to labour? 21. At what age do boys begin to labour? 22. Ditto, as to girls? Is there any mode of apprenticeship or of training to any occupation? 23. Is there any trace of masters and journeymen?

Trades.—24. What are the general occupations of the people? 25. What are the separate occupations of individuals? 26. Are there workshops (for boatbuilding)? 27. Are there quarries for stone? 28. What are the tools employed in husbandry and in the several trades?

Foreign Trade.—29. Recapitulate what articles are brought in from abroad. 30. Also what sent out abroad. 31. By whom is the exchange effected? and what are the names of the races traded with? 32. How is it effected? 33. What article is brought from the greatest distance? and how?

Barter.—34. Is there any interchange of commodities freely between man and man—food, clothing, cattle, slaves, tools, arms, ornaments? Are presents to strangers binding? and how is the value of such presents regulated?

Relative Value.—35. What is the relative value of a man slave? 36. Woman slave? 37. Wife or wedding dowry? 38. Cattle? 39. Weapons? 40. Tools?

Measures of Value.—41. (See also under XL.)

Markets, Fairs.—42. Is there any common place of trade? 43. Is there a periodical market in the village? 44. Is there a periodical fair? 45. Are these markets or fairs frequented by various tribes or foreigners? 46. Are there market- or

fair-tolls or dues paid to chiefs or others? 47. Who collects the tolls?

Right of Way.—48. Is there any right of way for strangers to a market or fair?

Credit.—49. In the case of produce brought from abroad, is the article of exchange given at once or at a future season or crop? that is, is credit given? 50. In case of non-delivery of exchangeable goods, what remedy is there? 51. Is war made on the tribe? are goods of other traders of the same nationality seized? are the people of the nationality of the debtor excluded from trade?

Traders.—52. Do any of the people engage in trade? 53. Is there a distinct class of persons engaged in trade? 54. Are there pedlars? 55. Are there brokers? 56. Are there marriage-brokers?

Association. — 57. Are associations formed for fishing, for a canoe, for a trade-expedition by sea or land? 58. What is the principle of sharing? 59. What is the share of the head man? 60. What the share of the absent owner of a canoe, or person sending goods?

Trade-marks.—61. Are there any distinctive or trade-marks on goods, weapons, tools, &c.? 62. Is any trade-mark recognized on articles of importation from abroad?

Transport. — 63. How is the transport of commodities effected? 64. If by sea or river, is there any consideration for freight? 65. If by land, can porters be hired or beasts of burthen? (See also LVIII. COMMUNICATIONS.)

Stock.—66. Is there any accumulation of the labour of former generations in houses, walls, plantations, tools, weapons, ornaments, &c.? 67. Are the people careful in consumption, improvident or thrifty? 68. Is there any accumulation of objects by individuals? 69. Are the crops or fishing-produce cured or stored? 70. What store of food is kept on hand? 71. Has the community any claims, by way of credit or otherwise, on other communities? 72. Are the people, relatively to neighbours, rich or poor? 73. Do they or their neighbours assign any cause for the difference?

NO. XL.—MONEY.—EXCHANGEABLE VALUES.

By HYDE CLARKE, Esq.

Consequent on the development of trade (XXXIX.) articles assume a relative value, and measures of value are established, which ultimately take the shape of money.

Exchangeable Value.—1. As the existence of such an idea is sometimes obscure and does not present itself on the surface, it is useful to apply the questions under XXXIX. What is the relative value of a man slave? woman slave? wife or wedding dowry? cattle? weapons? tools?

Measures of Value.—2. What measures of value result from the relative values between various articles of property as above? 3. Is there any common representative of these recognized or which may be used within the tribe? 4. Is there any common representative understood among various tribes? 5. How is compensation attested for the murder of an individual, ransom, or the expenses of a war between tribes?

Money.—6. Does any article esteemed to be of value pass from tribe to tribe, as beads, shells, &c.? 7. Are there small and large measures of value, as beads (single or worked in belts), &c.? 8. What is there in the shape of coins, metal, glass, leather &c.? 9. Are tools or weapons recognized as mediums of exchange? are they so employed before or after they are finished and hafted, or after they have been in use? 10. Can the forms of any objects used as money be traced to those of tools, weapons, or other articles previously employed as mediums of exchange (as in China)? 11. Are pigs or bars of metal employed as money? and if so, what are their forms and value? 12. Are cakes of salt or hides used as money? 13. Are personal ornaments of gold, silver, copper, iron, or other materials recognized as money? 14. Any marks or stamps upon objects used for this purpose? if so, give drawings of them. 15. Are any such marks copied from European or Asiatic coins? 16. Any penalties for forging stamps &c.? 17. Give both the local and foreign names for all objects used as money?

NO. XLI.—MEASURES AND WEIGHTS.

By HYDE CLARKE, Esq.

As a rudimentary institution, measures and weights derived from the parts of the body or from natural objects are widely recognized. Their multiples and mutual relations are partly dependent on the system of numeration derived from the fingers or other members.

Measures.—1. Is there a measure recognized corresponding to the nail or finger-joint? 2. Thumb? 3. Finger? 4. Span of hand? 5. Foot or hand in length? 6. Pace or stride of the feet? 7. Ell or cubit, from elbow to tip of finger? [If cloth be measured by women.] 8. Yard, from shoulder to shoulder? 9. Span of both arms? 10. Height of man? 11. Spear's length? 12. Spear's throw? 13. Bowshot? 14. Length of a rope? 15. Day's journey? (Cloth, &c., is measured by the hands and arms, but distance by the length of the foot or stride.)

Surface.—16. Is there any uniform size of a mat, hide, cloak, or field recognized as a superficial measure? 17. Is land measured by a rod? 18. How is arable land apportioned out for crops in the season?

Weight.—19. Is weight recognized by grains, &c.? 20. Is there an equivalent of the weight of a man? 21. Ditto load of a waggon, man, or beast? 22. Is weight determined by the hand? 23. Is there any balance? 24. Are stones used for weights?

Capacity.—25. Is there a measure equivalent to the hollow of the hand? 26. Handful? 27. Armful? 28. Load of a waggon, canoe, man, or beast? 29. Contents of a jar? 30. Basket?

Multiples.—31. Are there any recognized multiples or larger measures of length, surface, weight, or capacity, as of an inch to a hand, hand to an ell? 32. Are the multiples by doubling, by the hand of 4 fingers, by the hand of 5 fingers, by 10, by 12, by 4 hands of 4 fingers, by 4 hands of 5 fingers, by 4 scores of 16, by 4 scores of 20, by hundreds of 5 twenties?

Standards.—33. Are any standards used, as rods for measuring, stones for weighing, &c.? Are any of these standards divided for smaller measures?

Tallies.—34. Are tallies kept of numbers of articles? 35. How are they notched?

Counters.—36. Are counters, as stones, seeds, &c., used in numbering?

No. XLII.—WAR. By COL. A. LANE FOX.

The arts of peace and war have at all times progressed simultaneously. No nation has ever achieved warlike renown without some corresponding progress in the industrial arts; nor has any nation survived which has neglected the art of war. It is necessary, therefore, to study the warlike institutions of a people, in order to form a true estimate of their culture.

Organization.—1. Does any custom equivalent to enlistment exist? 2. Are all adult males warriors, or are any of them reserved for other duties during war? and at what age do they begin to serve? are tallies or musters kept of the warriors? 3. What are the functions of the women during war? 4. Is there any permanent organization for war during peace, or is it extemporized on the outbreak of hostilities? 5. Have they sham fights during peace? and if so, describe them? 6. How are the warriors brought together preparatory to war? and how is war proclaimed—by heralds or others? 7. How are war-councils composed?

Discipline.—8. How are the leaders appointed? 9. Are they identical with civil governors, priests, and doctors? 10. Have they any distinctions of dress (give drawings)? 11. Are they the strongest and most courageous? 12. Have they any subordinate leaders, and how are they appointed? 13. Have they any rewards for warlike achievements, or punishments for offences in war? 14. Is the religion conducive to warlike prowess? 15. Have the chiefs any aids, or runners, or criers, to carry messages? and what authority do these possess?

Tactics.—16. Do warlike expeditions set out by word of command? 17. How is the march of a party conducted? do they move in a body or in detached parties, with a broad front or in column? 18. Do they send forward advanced parties, or parties to guard the flanks? 19. Any specific order or custom with respect to encampments on the line of march? by whom are the encampments regulated? how are the horses tethered? any orders as to fires? how are the huts and tents made and placed? 20. Are battles planned beforehand? 21. Have they any disposition or order of battle? do they stand in closed or open files, and how many deep, in line or in disorder? and how many under the command of one voice? do they keep step? how do cavalry and infantry support each other when these exist? how are the camp-followers and baggage disposed of?

22. How do they change from the column of route to the line of battle? 23. Are they courageous? and are the young and the weak placed in front or in rear? 24. Have they any war-songs, cries, or dances? 25. Have they any recognized cries or commands for moving to the right or left, advancing or retreating in battle? 26. Are any portion of the warriors kept in reserve? and if so, at what distance, and in what numbers? 27. Have they any knowledge of turning an enemy's flank? 28. Any regulated method of carrying, holding, or using their weapons? 29. Do they rely chiefly on missile or hand-weapons? and have they any special disposition for these arms? 30. Do they employ noise as a means of encouragement, or do they preserve silence in combat? 31. Do they stand and abuse the enemy before fighting, or boast of their warlike achievements? 32. Any knowledge of the advantages of ground or position in battle? under what circumstances do they quit a masked wood or defile, and take to the open? 33. Have they rallying-points in rear in case of defeat? 34. Do they employ treachery, concealment, or ambush? and what is their usual mode of proceeding in this respect? 35. Any superstitious customs or omens in connexion with war? 36. Do they especially preserve chastity during or before war? and is there any superstition with respect to this custom? 37. Do they make night-attacks? 38. Any stratagems for concealing their trail from the enemy? 39. Are dogs employed in war? 40. Are the horses well reared, trained, and treated? what is their speed and endurance? give any details respecting farriery, mode of riding, &c. 41. Do they form alliances with other tribes? and if so, to what extent do they act in concert, and under what leadership? 42. Do personal combats take place between men of the same tribe? and how are they conducted?

Weapons.—43. Describe minutely all the varieties of their war weapons. 44. Are the same weapons used in war and the chase, or as tools? 45. Describe their defensive armour, and its capabilities for defending the body. 46. Are special weapons used by particular tribes? 47. Do the weapons vary in the same tribe? and what have been their varieties in times past? 48. Do they use the amentum, the throwing-stick, or any other means of accelerating the flight of the javelin? 49. Do they employ sinews, whalebone, or any other means of giving additional spring to the bow? 50. Are the arrows furnished with a foreshaft of hard heavy wood, and tipped with stone, glass, bone, or metal? 51. Are feathers used with the arrows? how many? are they set on spirally, or are the

heads twisted to give a spin to the arrow? 52. Describe the ingredients of any poison that may be used, its effects, and the cure employed. 53. Is the bow drawn to the shoulder or the chest? is it held horizontally or vertically? are the feet used in shooting? 54. What is the range, accuracy, and penetration of these missile weapons?

[*Note.*—It appears desirable that some test of accuracy should be established. If the natives can be induced to shoot at a target, the distance of each shot from the point aimed at should be measured, added, and divided by the number of shots. The figure of merit obtained by this means would enable a comparison to be made with the shooting of other races conducted under similar conditions. If no measure is at hand, tie a knot in a string for each shot, and divide the string into as many equal parts as there were shots fired. A target composed of grass bands covered with paper might be used, not less than 6 feet in diameter. Misses should be scored with a deviation of 4 feet; distances 50, 100, 150, and 200 paces of 30 inches.]

55. Have they any regular system of training to the use of weapons? and at what age do they begin? 56. Are the women trained to the use of weapons? 57. Are their weapons handed down as heirlooms from father to son? 58. Are the same forms of blades used for different weapons, as the axe-head, spear-head, sword, &c.? 59. Are the points of wooden implements hardened in the fire? 60. Are stones thrown by hand in war? and if so, with what degree of force and accuracy? 61. Is there any thing resembling a standard? and what is its history? 62. Describe the manner in which European blades are hafted by the natives. 63. Any use of slings, clubs (straight, curved, or mushroom-headed), crossbow, blowpipe, boomerang, holy-water sprinklers, knouts, glaives, bills, forked spears, pikes, gisarms, halbards, two-handed swords, serrated weapons, partisans, daggers, &c. 64. Are the swords single- or double-edged, used for cutting or thrusting? 65. Are the heads of the arrows constructed to come off in the wound? any use of harpoons? 66. Do they throw their axes, daggers, or other weapons at the enemy? 67. Any use of sickle- or concave-edged swords? 68. Are ogee-sectioned blades used for spear-heads, swords, &c. (blades sunk on alternate sides)? 69. Describe all the varieties of shields. Are the shields used for parrying darts by twisting them in the hand? are plain sticks or clubs used for the same purpose? 70. Describe the meaning and use of all the marks and grooves on the metal blades. 71. Describe the mode of hafting, holding, and using all weapons.

72. To what extent have the natives adopted civilized weapons and abandoned their own? do they take readily to European weapons? 73. Careful drawings to scale of all the varieties of weapons are very desirable, with the native names for them. 74. Describe the horse-equipment used—bits, saddles, spurs, cloths, and horse-armour.

Fortifications and Outposts.—75. Give plans and sections to scale of any defensive works. 76. Plans and sections of any pitfalls used for war. 77. Any knowledge of inundations for defensive purposes? 78. Any stakes, palisades, stockades, abatis, or thorn-hedges for defence? 79. Do they employ caltraps (small spikes of wood or metal fixed into the ground to wound the feet)? 80. Do they ever build on raised piles for defence? 81. Do they fortify the villages in which they usually reside? or have they strong places in the neighbourhood to resort to in case of attack? 82. Are their fortified posts arranged to support each other for the mutual defence of a large district, or constructed for isolated and independent defence? 83. Do they occupy naturally defensive positions, such as hill-tops, promontories, &c.? 84. Are their defensive posts selected with a due regard to water-supply? are there cisterns? 85. Do they take in stores for prolonged defence, and make a protracted resistance? 86. Do they man the whole line of their entrenchments, or only defend the gateways? 87. Give plans of any special defences for the gateways, drawbridges, &c. 88. Any knowledge of second and third lines, keeps or advanced works? 89. Any arrangements for cross-fire, flanking defence, &c.? 90. Are loop-holes used? 91. When earth-works are employed, do they stand *on* or *behind* them? 92. Do their entrenchments command the whole of the ground on the outside within range of their weapons, and have they a good command of view? 93. Do their entrenchments run in a straight line, or do they conform to the defensive line of the ground? 94. Is the size of the fortress regulated by the numbers of its defenders, or solely by the features of the ground? 95. Any knowledge of mines or fougasses? 96. Do the defenders roll down large stones on the enemy? and do they take in a store of them? 97. Any knowledge of fire-balls, fire-arrows, boiling oil, &c.? 98. How is the attack usually conducted? 99. Do they sit down and invest the place? 100. Any knowledge of escalading or breaching? and how is a breach defended? 101. Do they operate on the supplies of a fortified place? 102. Any lines of circumvallation or countervallation, saps, or breastworks against the place? when stone walls are

used, are they covered by earthworks in front? 103. Have they scouts or outposts? 104. Do they employ special men for this duty, or do all take it in turn? 105. Are outposts arranged on any regular system? 106. Have they any special signals for war?

Supply.—107. How do they supply themselves during war? 108. Does each man provide for himself? or is there any general arrangement, and under what management? 109. Is any portable food used, especially for war? 110. Are their proceedings much hampered by the difficulty of supply? 111. How are requisitions made upon the inhabitants in their own or those of an enemy's country? 112. How do they carry their food, water, and baggage, and the forage for their horses?

Causes and Effects of War.—113. What are the chief causes of war? 114. Do feuds last long between tribes? 115. How do they treat their prisoners and wounded? 116. Have they any special customs with regard to the first prisoner that falls into their hands? 117. Do conquered tribes amalgamate, or do they become servile castes? 118. How are the women of conquered tribes dealt with? 119. How do they divide the spoil? 120. Are their attacks always succeeded by retreat, or do they follow up a victory? 121. Is it likely that a knowledge of the arts, culture, &c. of other tribes has been spread by means of war? 122. To what extent has the increase of the population been checked by wars? 123. Has migration been promoted to any great extent by warlike expeditions? 124. Are scalps or heads taken? and how preserved?

NO. XLIII.—HUNTING. By COL. A. LANE FOX.

There has always been a close connexion between war and the chase; and many of the questions relating to the former will apply to this section. It is generally admitted that all races have passed through a stage of existence in which they were dependent on hunting almost entirely for their food. The hunting-practices of savages are therefore of great interest in tracing the origin of customs and institutions which may have survived in a more advanced state of culture. Endeavour should be made to trace the process by which tribes, in a hunting phase of existence, may have been led gradually to adopt a pastoral, and ultimately to settle down into an agricultural, life. The various arts and customs necessitated by the life of a hunter should be noticed, especially such as tend to throw

light on the relics of prehistoric times. This is, without doubt, one of the most persistent instincts in human nature, and the tendency to relapse into a hunting life is frequently seen in those whose means are such as to free them from the shackles of progressive industry.

1. How are hunting-parties formed in a tribe? 2. Are they identical with war-parties? 3. What honours are awarded to successful hunters? 4. Under whose command are the parties organized and conducted? 5. What hours of the day or night are employed for this purpose? 6. How is the possession of a carcase decided? does it belong to the killer or to the owner of the weapon? what rule is there as to the possession of an arrow or other weapon found in the body of an animal? 7. Are arrow-marks used to decide the title to possession? 8. How are the spoils divided amongst the tribe? and what are the rights of the non-hunting portion of the community? 9. How are disputes respecting the possession of game settled? 10. What are the seasons for hunting different animals? 11. Any laws or customs for the preservation of game? 12. How are the hunting-grounds arranged between the neighbouring tribes? 13. Are the regulations on this head respected? or are they a constant source of dispute and war? 14. Are the migrations of the tribe influenced by the habits of the animals they hunt? 15. After a successful hunting-expedition do they feed until they are gorged? 16. Are any hospitalities given on the occasion? 17. Is there any evidence of feasts having arisen in this way? 18. What are their methods of preserving meat? 19. To whom do the skins and horns belong? 20. Is any tribute paid in game? 21. What ceremonies or dances are practised on setting out or returning from a hunting-expedition? 22. What omens or superstitions have they in connexion with hunting? 23. To what deity do they attribute success in hunting? 24. How do they approach and capture the different animals? 25. What precautions are taken against being scented by them? 26. Do they evince an accurate knowledge of the habits of animals? 27. What means do they employ for deceiving game?—*a*, by dressing up in the skins of animals? *b*, by imitating calls and other noises? *c*, by smell? *d*, by colours? *e*, by decoys? *f*, by cunning appeals to any other of their senses or instincts? 28. Do they drive game? 29. Do they use nets in driving or capturing game? how are they constructed, and of what materials? 30. Any use of palings or trenches in driving or capturing game?

31. Give drawings of any pitfalls used. 32. Snares. 33. Any use of a spring-trap, consisting of a lance attached to an elastic stem, by which the animal is transfixed? if so, give sketches of all the varieties employed, and of any other traps, with the baits used. 34. Describe accurately the weapons employed in the chase. 35. Are they the same employed for war? 36. Are any of them also used as tools for different purposes? 37. At what distances do they use their weapons with effect against different animals? 38. Can they hit a bird on the wing? 39. Any use of bird-bolts or blunt-headed arrows for stunning animals without damaging their skins? 40. Any use of arrows with two or more points? 41. Are arrows with different-shaped heads carried in the same quiver, and used for different animals? describe the uses of the different forms. 42. Is any record kept of game killed? 43. Are fires employed to drive game? 44. Are dogs or other animals employed in hunting? what birds are used in hawking, fishing, &c.? 45. Are they trained to any special functions? 46. By whom are they kept and controlled? 47. Are horses used in hunting? 48. How is the game carried on an expedition? 49. Is there much waste? 50. Is it a reproach to wound without capturing an animal? 51. Describe the different modes of fishing. 52. Describe all the varieties of fish-spears used. 53. Fish-forks. 54. Dams. 55. Weirs. 56. Are arrows used for fishing, and with or without detached heads? 57. Is any connexion of form observable between the harpoon-head and the fish-hook? 58. Describe the varieties of fish-hooks used. 59. Harpoons. 60. Fish-nets. 61. Fish-traps. 62. How are fish preserved and cured? 63. Are they preserved alive in ponds? 64. Are captured animals ever preserved alive? and, if so, under what arrangements? 65. Any use of the lasso or other similar contrivance? 66. Is the milk of any wild animal used? and if so, how obtained? 67. If the tribe has no knowledge of agriculture, state what wild fruit, roots, or grasses are eaten, and how prepared. 68. Are the children instructed in hunting? and at what age do they commence? 69. Are the women employed in hunting or fishing? 70. To what extent are firearms employed in hunting? and how long have they been in use? 71. Are they expert in the use of them? 72. Are poisoned weapons used in hunting? and what are the ingredients of the poison? 73. If so, do they cut out the wound before eating the animal? 74. Are any records of hunting-feats preserved? and how?

No. XLIV.—NOMADIC LIFE. No. XLV.—PASTORAL LIFE. By H. HOWORTH, Esq.

1. Is the tribe settled or nomadic? 2. If the latter, what induces its migrations? to find fresh pastures for cattle, to escape the severity of summer or winter climate, for purposes of fishing or hunting, for purposes of trade and barter, or for what purposes? 3. Are its movements continuous all the year round, or does it encamp at certain seasons? if so, what is the character of its summer, autumn, winter, and spring camping-country? 4. Is it purely pastoral, or does it grow some produce in the spring and summer? 5. Is any hay or other fodder stored for winter use? if so, how is it prepared, how and where stored? 6. Give a list of the domestic animals kept by the tribe, with their native names (see No. XLVII.). 7. If oxen are kept, what colour and shape are they? are they horned or polled? are they used for draught purposes? is their flesh eaten, or are they kept only for dairy purposes? 8. Of what size and colour are their horses? are they used for food? Is mare's milk employed? What breed do they most resemble? 9. Describe the sheep and goats: are they horned or hornless? is their milk used for food? what use is made of their wool and hair? if felted, describe the process of felting. 10. If camels or reindeer are used, state for what purposes, and what use is made of their wool or hair. 11. What breed of dogs is kept? and what are they used for? 12. Are cats or poultry kept? if so, describe them. 13. Are there any traditions about the place where the domestic animals were derived from? 14. Are they traded in? if so, to whom are they sold? and at what markets, and what is the relative value of each? 15. How are the horses or cattle broken-in and trained? 16. Is gelding practised; if so, what is the process? 17. What diseases prevail among the domestic animals? and what remedies are employed to cure them? 18. Describe the harness, bits, saddles, stirrups, carts or other vehicles in use, and the manner in which the horses are picketed. 19. If milk is fermented, describe how the spirit is made; also describe the manufacture of butter and cheese. 20. What are the relative duties of men and women in regard to the domestic arrangements, the camping or moving, &c., &c.? who are the neat-herds? who do the milking, brewing, churning, &c.? 21. Describe the tents or yurts in use: are they floored or carpeted? are they covered with felts, with thatch, wattles, or how built? Are the tent-

coverings ever fastened down with large stones? and is it probable the use of stone circles might have originated in this way, as has been suggested? If there are special yurts used for summer and winter, describe their differences and idiosyncracies. 22. How are they moved from place to place? and what is the distance generally moved in a day? 23. What furniture do they contain? 24. Of the articles in use among them, which are home-made and which obtained by purchase or barter, and from whom? 25. Do articles reach them from a considerable distance? if so, by what way (*ex. gr.* Russian knives are found among the Esquimaux, close to the Great Fish River, Japanese things among the Kamskatki, &c.)? 26. Have they domestic gods? if so, how are they arranged in the yurt or tent, and how carried about? 27. What fuel is used? 28. How are the animals killed? are there any superstitions in regard to the method of killing them? 29. Are there any superstitions about using water for washing and other purposes, such as exist among the Mongols, who hold it sacred, and will not pollute it? 30. Note especially any particulars in which the tribe resembles some other tribe known to the inquirer, however distant. 31. How are the dead buried during the period of migration? and what burial-customs are induced by the nomadic habits of the people? 32. What arts are promoted, and what discouraged by nomadic life? 33. What are the particular institutions and customs which owe their origin to the necessities of nomads? 34. To what extent do cattle-lifting and the other concomitants of pastoral life promote war? 35. What particular weapons, tools, or other implements or contrivances may be regarded as characteristic of nomads? 36. What sanitary arrangements are in force in their camps? how are the latrines managed? 37. What precautions are taken to protect the animals from wild beasts? 38. What is the nature of their dealings with the tribes met with on their journeys? 39. What is the military organization induced by nomadic life? and what is the nature of their temporary defences? (See XLII.) 40. Do they work in metals? if so, describe the apparatus employed and the objects fabricated, and state whence the ores are procured. 41. Is the use of stone or bone implements in any case necessitated by nomadic life? 42. Describe the mode of catching the animals, and driving and herding the flocks. Is the lasso used? 43. How is wheat ground upon the line of march? 44. Describe any temporary ovens and cooking-places employed. (See XXIV.)

No. XLVI.—AGRICULTURE. By DR. BEDDOE, F.R.S.

1. Do the people cultivate the soil, or do they only gather its spontaneous produce? 2. Are the cultivators the whole body of the people, or are they a separate class? 3. Are both sexes employed in agriculture, or is its practice restricted to men or to women? or what parts do the sexes respectively take? 4. What implements are employed—plough, hoe, spade, sickle, mattock? 5. What forms of these, and of what material made, and whether of home manufacture or imported (as are the hoes in some parts of Africa)? 6. Are any of them employed also as tools or weapons? 7. Are any of them used as money? 8. Figure any strange or unknown form. 9. Is any domestic animal employed in ploughing or harvesting? 10. What plants are cultivated, whether for food, stimulation, or ornament? 11. Describe any that are exotic, and ascertain when and whence they were derived. 12. At what seasons and in what manner are they sown and reaped or dug up? 13. Is any attention paid to the growing crops? 14. Is irrigation practised? what means are used to apply it? 15. How is the harvest gathered and carried home, and how stored—whether in stacks, caves, pits, or granaries specially constructed? 16. What means are adopted for cleaning, threshing, or winnowing grain, or for the preparation of food from roots? 17. Are any of the roots, or other alimentary substances used, poisonous or unwholesome before preparation and cooking? (No. XXIV. Food.) 18. Are there any legends respecting the introduction of any of the food-plants, or their creation by deities? 19. How are the lands to be cultivated selected or divided? describe land-marks. 20. Any hedge-rows or plantations to protect crops in exposed situations? 21. Has any one a permanent right of property in any portion of the soil? or has the tribe in general, or the chief a superior right? 22. Is the same land tilled again and again till it becomes barren, or is fresh ground cleared and tilled yearly? 23. Is the advantage of fallowing understood? or is there any idea of a rotation of crops, or of the use of manure of any kind? 24. How are the crops protected from depredation? 25. What are the relative values of the different cereal or other grains or roots? 26. Do they possess any domestic animals? if so, what kinds? and what are the apparent peculiarities of breed

found in these? 27. Were any of them introduced by civilized men or others from abroad? 28. Are they kept for their flesh, milk, or eggs, or for use in cultivation? 29. How is the milk treated, and in what state is it used? (see No. XXIV. Food). 30. Is any kind of sanctity attached to the domestic animals, or to the cow-houses, dairies, or implements used in connexion with them? 31. Are any wild or uncultivated plants commonly used as food, or resorted to only in time of scarcity? if so, what are they? and do they appear to yield wholesome nutriment, or are any diseases attributable to their use? 32. Are any of the cultivated plants apparently derived from indigenous wild ones? 33. What produce is imported and exported? and whence? 34. Is the tribulum employed for threshing? (a large plank or board stuck with flint or stone flakes on the underside, which is drawn over the wheat on the threshing-floor).

No. XLVII.—TRAINING AND DOMESTICATION OF ANIMALS, AND RELATIONS OF ANIMALS TO MAN.

By HYDE CLARKE, Esq.

1. What animals are domesticated or kept in subjection? (See XLIV., XLV.) 2. Are birds kept in captivity? 3. Are they kept for singing or taught to chirp? 4. What animals are hunted or fished? (See XLIII.) 5. What animals are sacred and what worshipped? 6. What animals are imitated in gesture or sound? 7. What animals give names to men? 8. What cries are used to call animals? 9. What names of animals are taken from their cries? 10. What animals are gregarious in the neighbourhood, as dogs, horses, &c.? 11. What peculiarities of habit do they present? 12. What animals live in the houses, and what outside? 13. Of what kind are the tame dogs and the wild dogs? and how many different breeds are known? have they the same intelligence and attachment to their masters as the dogs of civilized races? 14. Are the dogs liable to hydrophobia? 15. How are the habits of wild animals influenced by contact with man? 16. What hybrid or mule animals are there? 17. What animals are castrated? 18. Are tame animals branded or marked? Give drawings of the marks. 19. What difference of colour &c. is there between

tame and wild animals? and what other changes have they undergone under domestication? 20. What sports are noticed of animals? and are any of these imitated by man? 21. Are the souls of animals and men supposed to be interchangeable? and what animals are supposed to represent men? (See XXX.) 22. What knowledge is there of mythical animals, as dragons &c.? 23. Have any tombs or remains of supposed dragons &c. been found? 24. What animals are forbidden to be killed, and what eaten? 25. What animals are lucky? 26. What animals are unlucky? 27. What monsters exist in the sea or elsewhere? 28. What strange animals are supposed to live in rivers, wells, &c.? 29. How far do wild animals hinder or otherwise affect the movements of men? 30. What animals are migratory? 31. Whence are they supposed to come? 32. What traditions are connected with them? 33. Are the people expert in training animals? 34. What animals are trained? and for what purposes? 35. What are the means employed in breaking them in? 36. How is property in animals regulated? 37. What numbers are possessed by individuals, and what are in common? 38. Any customs or peculiarities in relation to the breeding of animals. What measures are taken to preserve the purity of breeds? 39. What animals are used for milk and what for food? 40. Any omens or superstitions in regard to animals. 41. Are they well treated? 42. What vermin is bred upon the person? what is done to destroy vermin?

No. XLVIII.—SLAVERY.

Causes and effects of; degree of bondage; treatment; rights of slaves; position in family; price of slaves; whether war-captives or others; whether increasing or diminishing.

No. XLIX.—SOCIAL RELATIONS.

Including family life; treatment of women, children, &c.

NO. L.—MARITAL RELATIONS.

By SIR JOHN LUBBOCK, BART.

1. Ascertain the marriage ceremonies. 2. Is there more than one mode of marriage? 3. Does the wife enter into the family or into the tribe of the husband? 4. What are the respective rights and duties of the husband and wife? 5. Is there more than one description of marriage? 6. Is polygamy permitted? if so, is there any head wife? and what are her privileges? 7. Do the wives live together? or do they have separate dwellings? 8. Is concubinage permitted? 9. Is polyandry permitted? if so, how are the husbands selected? 10. What are the restrictions on marriage? 11. What are the prohibited degrees of relationship? 12. May a man marry a woman of the same family? of the same name? of the same tribe? of another tribe? 13. In what estimation are courtesans held? 14. Is the marriage ceremony regarded as possessing any religious character? 15. In the wedding ceremony is there any symbol of a previous marriage to any deity? 16. Are the women allowed much freedom before marriage? 17. When married are they good wives? 18. Under what circumstances, if any, is divorce permitted? 19. May wives who have been divorced marry again?

NO. LI.—RELATIONSHIPS.

By SIR JOHN LUBBOCK, BART.

1. Are relationships traced in the male or female line? 2. How are they estimated? 3. How does property descend? 4. In what position does the family stand with reference to the tribe? 5. Are uncles and aunts on the father's side distinguished from those on the mother's? 6. Is a great uncle distinguished from a grandfather? 7. Is the system of relationship with reference to males the same as that with reference to females? 8. Is a friend generally addressed by his name, or by the title of his relationship? 9. Are the genealogies carefully preserved? if so, for how many generations is there any trustworthy record?

10. Fill in the following table as far as possible, with the names for each :—

1. My father.
2. My mother.
3. My son.
4. My daughter.
5. My grandson.
6. My granddaughter.
7. My great grandson.
8. My great granddaughter.
9. My great great grandson.
10. My great great granddaughter.
11. My elder brother (male speaking).
12. My elder brother (female speaking).
13. My elder sister (m. s.).
14. My elder sister (f. s.).
15. My younger brother (m. s.).
16. My younger brother (f. s.).
17. My younger sister (m. s.).
18. My younger sister (f. s.).
19. My brothers.
20. My sisters.
21. My father's brother.
22. My father's elder brother.
23. My father's younger brother.
24. My father's brother's wife.
25. My father's sister.
26. My father's sister's husband.
27. My mother's brother.
28. My mother's brother's wife.
29. My mother's sister.
30. My mother's elder sister.
31. My mother's younger sister.
32. My mother's sister's husband.
33. My brother's son (m. s.).
34. My brother's son's wife (m. s.).
35. My brother's daughter (m. s.).
36. My brother's daughter's husband (m. s.).
37. My brother's grandson (m. s.).
38. My brother's granddaughter (m. s.).
39. My brother's great grandson (m. s.).
40. My brother's great granddaughter (m. s.).
41. My sister's son (m. s.).
42. My sister's son's wife (m. s.).

43. My sister's daughter (m. s.).
44. My sister's daughter's husband (m. s.).
45. My sister's grandson (m. s.).
46. My sister's granddaughter (m. s.).
47. My sister's great grandson (m. s.).
48. My sister's great granddaughter (m. s.).
49. My sister's son (f. s.).
50. My sister's son's wife (f. s.).
51. My sister's daughter (f. s.).
52. My sister's daughter's husband (f. s.).
53. My sister's grandson (f. s.).
54. My sister's granddaughter (f. s.).
55. My sister's great grandson (f. s.).
56. My sister's great granddaughter (f. s.).
57. My brother's son (f. s.).
58. My brother's son's wife (f. s.).
59. My brother's daughter (f. s.).
60. My brother's daughter's husband (f. s.).
61. My brother's grandson (f. s.).
62. My brother's granddaughter (f. s.).
63. My brother's great grandson (f. s.).
64. My brother's great granddaughter (f. s.).
65. My father's brother's son (m. s.).
66. My father's brother's son (f. s.).
67. My father's brother's son's wife (m. s.).
68. My father's brother's son's wife (f. s.).
69. My father's brother's daughter (m. s.).
70. My father's brother's daughter (f. s.).
71. My father's brother's daughter's husband (m. s.).
72. My father's brother's daughter's husband (f. s.).
73. My father's brother's son's son (m. s.).
74. My father's brother's son's son (f. s.).
75. My father's brother's son's daughter (m. s.).
76. My father's brother's son's daughter (f. s.).
77. My father's brother's daughter's son (m. s.).
78. My father's brother's daughter's son (f. s.).
79. My father's brother's daughter's daughter (m. s.).
80. My father's brother's daughter's daughter (f. s.).
81. My father's brother's great grandson (m. s.).
82. My father's brother's great grandson (f. s.).
83. My father's brother's great granddaughter (m. s.).
84. My father's brother's great granddaughter (f. s.).
85. My father's brother's great great grandson (m. s.).
86. My father's brother's great great grandson (f. s.).
87. My father's sister's son (m. s.).

88. My father's sister's son (f. s.).
89. My father's sister's son's wife (m. s.).
90. My father's sister's son's wife (f. s.).
91. My father's sister's daughter (m. s.).
92. My father's sister's daughter (f. s.).
93. My father's sister's daughter's husband (m. s.).
94. My father's sister's daughter's husband (f. s.).
95. My father's sister's son's son (m. s.).
96. My father's sister's son's son (f. s.).
97. My father's sister's son's daughter (m. s.).
98. My father's sister's son's daughter (f. s.).
99. My father's sister's daughter's son (m. s.).
100. My father's sister's daughter's son (f. s.).
101. My father's sister's daughter's daughter (m. s.).
102. My father's sister's daughter's daughter (f. s.).
103. My father's sister's great grandson (m. s.).
104. My father's sister's great grandson (f. s.).
105. My father's sister's great great grandson.
106. My father's sister's great great granddaughter.
107. My mother's sister's son (m. s.).
108. My mother's sister's son (f. s.).
109. My mother's sister's son's wife (m. s.).
110. My mother's sister's son's wife (f. s.).
111. My mother's sister's daughter (m. s.).
112. My mother's sister's daughter (f. s.).
113. My mother's sister's daughter's husband (m. s.).
114. My mother's sister's daughter's husband (f. s.).
115. My mother's sister's son's son (m. s.).
116. My mother's sister's son's son (f. s.).
117. My mother's sister's son's daughter (m. s.).
118. My mother's sister's son's daughter (f. s.).
119. My mother's sister's daughter's son (m. s.).
120. My mother's sister's daughter's son (f. s.).
121. My mother's sister's daughter's daughter (m. s.).
122. My mother's sister's daughter's daughter (f. s.).
123. My mother's sister's great grandson (m. s.).
124. My mother's sister's great grandson (f. s.).
125. My mother's sister's great granddaughter (m. s.).
126. My mother's sister's great great grandson.
127. My mother's sister's great great granddaughter.
128. My mother's brother's son (m. s.).
129. My mother's brother's son (f. s.).
130. My mother's brother's son's wife (m. s.).
131. My mother's brother's son's wife (f. s.).
132. My mother's brother's daughter (m. s.).

133. My mother's brother's daughter (f. s.).
134. My mother's brother's daughter's husband (m. s.).
135. My mother's brother's daughter's husband (f. s.).
136. My mother's brother's son's son (m. s.).
137. My mother's brother's son's son (f. s.).
138. My mother's brother's son's daughter (m. s.).
139. My mother's brother's son's daughter (f. s.).
140. My mother's brother's daughter's son (m. s.).
141. My mother's brother's daughter's son (f. s.).
142. My mother's brother's daughter's daughter (m. s.).
143. My mother's brother's daughter's daughter (f. s.).
144. My mother's brother's great grandson.
145. My mother's brother's great granddaughter.
146. My mother's brother's great great grandson.
147. My mother's brother's great great granddaughter.
148. My grandfather.
149. My grandfather's brother.
150. My grandfather's sister.
151. My grandmother.
152. My grandmother's brother.
153. My grandmother's sister.
154. My great grandfather.
155. My great grandfather's brother.
156. My great grandfather's sister.
157. My great grandmother.
158. My great grandmother's brother.
159. My great grandmother's sister.
160. My great great grandfather.
161. My great great grandmother.
162. My father's father's sister's son (m. s.).
163. My father's father's sister's daughter (m. s.).
164. My father's father's sister's son's son (m. s.).
165. My father's father's sister's son's daughter (m. s.).
166. My father's father's sister's daughter's son (m. s.).
167. My father's father's sister's daughter's daughter (m. s.).
168. My father's father's sister's great grandson (m. s.).
169. My father's father's sister's great granddaughter (m. s.).
170. My mother's mother's sister's son (m. s.).
171. My mother's mother's sister's daughter (m. s.).
172. My mother's mother's sister's son's son (m. s.).
173. My mother's mother's sister's son's daughter (m. s.).
174. My mother's mother's sister's daughter's son (m. s.).
175. My mother's mother's sister's daughter's daughter (m. s.).
176. My mother's mother's sister's great grandson (m. s.).
177. My mother's mother's sister's great granddaughter (m. s.).

178. My mother's mother's mother's sister's daughter (m. s.).
179. My mother's mother's mother's sister's granddaughter (m. s.).
180. My mother's mother's mother's sister's great granddaughter (m. s.).
181. My mother's mother's mother's sister's great great granddaughter (m. s.).
182. My husband.
183. My wife.
184. My husband's father.
185. My husband's mother.
186. My husband's grandfather.
187. My wife's father.
188. My wife's mother.
189. My wife's grandmother.
190. My son-in-law (m. s.).
191. My son-in-law (f. s.).
192. My daughter-in-law (m. s.).
193. My daughter-in-law (f. s.).
194. My stepfather.
195. My stepmother.
196. My stepson.
197. My stepdaughter.
198. My adopted son.
199. My adopted daughter.
200. My half brother.
201. My half sister.
202. My two fathers-in-law to each other.
203. My two mothers-in-law to each other.
204. My brother-in-law (husband's brother).
205. My brother-in-law (sister's husband, m. s.).
206. My brother-in-law (sister's husband, f. s.).
207. My brother-in-law (wife's sister's husband).
208. My brother-in-law (wife's brother).
209. My brother-in-law (husband's sister's husband).
210. My sister-in-law (wife's sister).
211. My sister-in-law (husband's sister).
212. My sister-in-law (brother's wife, m. s.).
213. My sister-in-law (brother's wife, f. s.).
214. My sister-in-law (husband's brother's wife, f. s.).
215. My sister-in-law (wife's brother's wife, f. s.).
216. Twins (if of the same sex).
(if a boy and a girl).
217. Widow.
218. Widower.

No. LII.—TREATMENT OF WIDOWS.

By SIR JOHN LUBBOCK, BART.

1. How are widows treated? 2. Are they, or any of them, sacrificed at the husband's grave? or is this custom known to have existed in times past? 3. If not, do they pass to the husband's brother, or to any one else? 4. Are they allowed to marry again? 5. Do they retain any portion of the husband's property?

No. LIII.—INFANTICIDE.

By SIR JOHN LUBBOCK, BART.

1. Does infanticide prevail to any extent? or is it known to have been practised in times past? 2. If so, is it clandestine, or is it recognized by the law? 3. Is any difference made between male and female children? 4. Are any, and if so, what reasons given for it? 5. Are there any special peculiarities which lead to the destruction of the infant? 6. Are there any special customs with reference to twins?

No. LIV.—CAUSES THAT LIMIT POPULATION.

By FRANCIS GALTON, Esq., F.R.S.

If men or any other kind of animals were invariably mated early, and if their issue were always reared with care, the produce would increase geometrically, and in no large number of generations would occupy every habitable space. But, as a fact, the number of inhabitants of most countries is very stationary; what, then, are the causes which so exactly neutralize the tendency to increase?

These are best learnt by exhaustively working out the history of 20 or 30 families, finding out how many of their members married, and at what ages, what was their issue, how many of the children died, owing to what causes, and so forth, as stated

more fully below. Such an inquiry will necessarily lead to a far more accurate knowledge of the social condition of the people than could otherwise be obtained, and is sure to yield indirectly, as well as directly, a valuable harvest of results.

1. *Conditions of Marriage.*—At what ages do they marry? how many do not marry at all? What are the restrictions which hinder persons from marrying as soon as they are inclined? how as regards the frequency of polygamy or polyandry and the number of wives &c.? What is the proportion of male and female adults?

2. *Separation of husband and wife.*—Customs dependent on the institution of polygamy; other circumstances which separate them periodically, or for long periods.

3. *Influences restrictive of fertility.*—How long does the mother suckle her child? At what ages does she begin and end child-bearing? What is the proportion of children to a marriage? What is the frequency of sterile women?

4. *Loss of infant life.*—Still-births, infanticide, and of what sex? Death of child due to severe exertion of mother too soon after childbirth? Do more children die at one time of the year than another? and of what do they die—epidemics, other diseases, want, accidents, war? What is the mortality at different ages, as shown by the sizes of families whose parents are of different ages? What is the proportion of aged men to aged women?

It is not sufficient to collect disjointed facts here and there; the information ought to be full on every point, the materials well put together, and the conclusions fairly worked out.

NO. LV.—EDUCATION.

Mode of training children; aptitude for; effects of; absence of, &c.

NO. LVI.—INITIATORY CEREMONIES.

Account of; causes of.

NO. LVII.—GAMES AND AMUSEMENTS.

By COL. A. LANE FOX.

Describe the games played by men, women, boys, girls.

[It is useful to play European games with children to see if they are recognized.]

1. What games are international? 2. What games are noticed among animals? and are any imitated from animals? 3. Describe the toys used by men, women, boys, girls. 4. Describe any games of ball played, and give drawings of the implements employed. 5. Describe any gambling games, and give drawings of any marks, holes, notches, figures, or numbers upon dice, sticks, bones, or cards?

6. Are high stakes played for? 7. Are wives, children, or slaves staked? 8. Does suicide often result from gambling? 9. Are games of chance or physical exercise preferred? 10. Are any games considered manly or the reverse? 11. What animals are used in game-fighting? 12. Are they preserved and trained for the purpose? 13. Describe any spurs, defences, or other objects that are attached to them. 14. Are any omens relied upon for success in gambling? or any superstitions connected with the games?

15. Describe any theatricals in force amongst the people, with the masks, dresses, scenes, &c. employed. 16. What is the character of the performances? are they comic, tragic, elevated, or obscene? Have any of them a religious character? 17. Are there special actors? or do all take part in them? 18. Are the orations prepared or impromptu? 19. Are they historical or relating to passing events? 20. Do men, women, boys, and girls act? 21. Do boys dress and act the part of women? 22. Describe any dances performed for amusement. 23. Describe any juggling tricks; and ascertain, if possible, how they are performed. 24. Are animals employed in any of these performances?

25. Describe any foot-races that are run, horse-races, boat-races, &c., with the distances and prizes. 26. Feats of agility, climbing, boxing, and wrestling. 27. Describe any games of stone-throwing, weapon-throwing, and arrow-shooting, with the distances and the size of the mark aimed at. 28. Describe any

weapons used on these occasions, and state whether they are used for amusement only, or for war as well. 29. Are rats, birds, or other animals shot for amusement? 30. Aquatic sports, such as swimming-matches, shooting rapids, jumping from heights, diving, &c. 31. Equestrian feats, jumping on and off, standing up, shooting, jumping through hoops, &c.

32. Note any of the foregoing sports that are unknown amongst the people. 33. What sites are selected for the sports—natural rocks, hollows, hill-tops, &c.?

NO. LVIII.—COMMUNICATIONS.

By F. GALTON, Esq., F.R.S.

The actual weights transported and the greatest work to be got out of man and beast week after week deserve accurate measurement, also the food they do it on (see XXIV.). Marks like those made by gipsies or by scoring trees to show the road or to give hints to followers are worth inquiring into. Savages are accredited with an almost instinctive power of finding their way; but many of the cases quoted are found to be less extraordinary than stated. It would be a matter of extreme interest to rigidly test the power of several renowned path-finders, by leading them in a circular path in a new forest and seeing how directly they are able to find their ways back in a straight line.

1. Are there roads of any kind? how made and preserved?
2. Does the roadway through bush and forest consist of a network of paths running in and out of each other?

3. *Swamps*.—How are they passed? Is any thing sunk to preserve the roadway?

4. *Fords*.—Are any measures taken to preserve or improve them? Do the natives understand the natural line of fords from salient to salient banks?

5. *Ferries*.—Are any boats kept for the purpose? how maintained? what payment is made? any understanding with neighbouring tribes respecting them?

6. *Bridges*.—Are any of the following kinds used?—*a*, bridges of single trees, or trees from opposite sides crossed and fastened

in the middle; *b*, bridges of piles and beams; *c*, trestle bridges; *d*, lattice bridges; *e*, bridges of upright jambs and lintels of large stones; *f*, sloping jambs united at top; *g*, arches of horizontal slabs overlapping and converging, and closed by a large slab at the apex; *h*, bridges of radiating arches; *i*, boat bridges; *k*, raft bridges; *l*, flying boat bridges; *m*, swing bridges; *n*, rope bridges; *o*, suspension bridges.

7. Are corduroy roads known? 8. What points are attended to in selecting the halting-places? 9. Any kind of inn or public house? and how maintained? 10. How are travellers accommodated in villages? 11. Are wheeled vehicles used? if so, describe them? 12. Poles fastened to horses and trailed behind. 13. Are palanquins known, and carried by men or horses? 14. Describe pack-saddles, and all modes of carrying burdens on animals' backs. 15. Are cradles or knapsacks used on the backs of the men? 16. Any public conveyances or horses? 17. What ceremonies or salutes are made by passers on a journey, or on entering houses or villages? 18. What permissions have to be obtained by travellers? 19. Any passes or complimentary introductions to neighbouring tribes? 20. In transporting great weights by large numbers of men is the principle of pulling simultaneously by sound of music or voice practised, as with the ancient Egyptians and Assyrians? 21. Are great weights suspended by crossed beams on the shoulders of a number of men, as with the Chinese? what is the name for this? 22. Any thing of the nature of mile-stones? 23. Drawings of sign-posts, roadway marks? 24. Ditto of telegraphic signals? 25. Are any public wells dug? and any regulations established for the use of them?

NO. LIX.—PAINTING AND TATTOOING.

By A. W. FRANKS, Esq., F.R.S.

Painting.—1. Is painting employed in decorating the body? 2. What are the pigments used? 3. How is the painting applied? is it frequently renewed? and by whom is it executed? 4. Do the designs vary according to the sex of the individual? 5. Are there any special signs to denote the rank or religious sect of the individual? and is their renewal accompanied by any

special ceremonies? 6. Are any peculiar designs employed by the performers in dances or ceremonies? 7. Is any painting of the face employed to heighten beauty, or any application to the eyes to increase their lustre? 8. What are the substances used for this purpose? 9. Is any staining of the nails known? and is it confined to one of the sexes? 10. Is there any coating applied to the body to improve the skin or to keep off insects, or any application to the body in the nature of a thick cake of paint as by the Boobies of Fernando Po?

Tattooing.—11. Is tattooing known? and are there any accounts of its introduction, or legends connected with it? 12. Is it confined to one of the sexes? 13. At what age is it commenced? and is it done at once or at various periods? 14. Are there any ceremonies connected with it? 15. Is the tattooing made by any professional individuals? and how do they rank? 16. What remuneration do they receive? 17. What are the pigments employed, and what instruments? 18. Is any special diet observed by the person to be tattooed, or any peculiar vessels for feeding him (New Zealand)? 19. Is tattooing considered indispensable as a sign of manhood? 20. Is it connected in any way with pagan worship? 21. Is the practice dying out, or the contrary? 22. What are the designs employed? and have they any particular significance? 23. Do they vary with the social or family rank of the individual? 24. Are they in any way hereditary? 25. Is the tattooing symmetrical? 26. With what part of the body does it commence? 27. Is the design executed on some preconceived plan? and is any drawing of it prepared beforehand? 28. Is more than one colour employed? [It would be very desirable to obtain drawings of a few characteristic designs with native explanations of their meaning.]

Cicatrices.—29. Is the body ornamented in any way with raised cicatrices? 30. How are they made? and what are the substances rubbed into them? 31. Do they vary according to the tribe or rank of the individual? 32. Is the operation attended with much pain or disturbance to the general health? 33. At what age are they made?

[In the answers to this and the two following sections, it would be particularly desirable to obtain photographs or drawings.]

Further Remarks on Tattooing.

By J. PARK HARRISON, Esq., M.A.

Information is required under this head to supply data for ascertaining the meaning of tattooing and painting patterns or signs on the body, and to assist in tracing the early migrations of races.

The following examples have been selected as suggesting points for inquiry.

In India lines are painted on either side the mouth of native women. In Fiji their only tattoo-marks are at the corners of the mouth ; and in Easter Island, in the South Pacific, the fleshy parts of their lips used to be tattooed. This is distinctive of marriage amongst the Ainos, where the custom still prevails.

In Birmah and Laos, as well as Samoa and Easter Island, it was the practice a short time ago to tattoo the body from the navel to the knee. The marks may be often concealed by the dress, as in the case of the king of Birmah (Crawford). It is desirable, therefore, that travellers should inquire when amongst semicivilized peoples whether they have tattoo-marks beneath their robes, more especially in Arabia and Northern and North-western Asia, where it is known that the custom of tattooing once prevailed.

The following are some further particulars regarding which information is required.

34. Are marks or patterns found more commonly on the face, chest, shoulders, arms, stomach, thighs, or back ? 35. In the case of women, are there any patterns about the mouth, breasts, or abdomen ? 36. Or on the tip of the tongue, as observed by Captain Cook in the Sandwich Islands ? 37. Or under the armpit ? 38. Does the custom appear to have prevailed from remote times ? 39. Or has it been adopted from some neighbouring race or people ? 40. Do any marks appear to be personal, *i. e.* peculiar to or distinctive of the individual tattooed ? 41. Do the marks appear to be in imitation of necklaces, armlets, or other articles of dress or ornament ? 42. In the case of women, are any marks said to be tokens of marriage ? 43. Or in the case of youths, of puberty or manhood ? 44. Do warriors tattoo or paint their faces &c. with the intention of rendering themselves terrible ? 45. Or are the patterns fetishes to paralyze the enemy ? 46. Are they regarded as charms to

ward off danger generally? 47. Or as marks of religious dedication? 48. Are the idols or statues of a country ornamented with patterns of the same or a similar character? 49. In the case of young men and women, are the marks or patterns supposed to improve their appearance? 50. Mention especially any instances of the use of a chequered pattern on the forehead or elsewhere, as at Noutka Sound and the island of Aratika, South Pacific. 51. Do women tattoo their own sex? 52. Are additional marks added in after years? 53. Is it the case that very dark races adopt incision and cicatrices only? 54. Are raised scars made by producing "proud flesh"? 55. Is the colour very generally blue or of a bluish tint? 56. Is red ever met with as a stain in tattooing? 57. When the body is painted, is it in addition to tattooing? 58. When paint is used instead of or in addition to tattooing, is it usually red? 59. When used on the body, is it found to be the case that the idols or statues of a country are covered with the same colour? 60. Or painted with the same patterns? 61. When any particular colour is universally employed, is it because the pigment is easily procurable in the country? 62. Is it the custom to paint the body in broad bands of colour? 63. Is there any instance of children being marked with a black pigment except at Mocha? 64. Do any tribes paint their skin black on the death of the chief, like the natives of South Alaska? 65. Or use that colour generally as a sign of mourning? 66. Is the tattoo-mark of the individual ever engraved or painted upon his tombstone?

NO. LX.—CLOTHING.

By A. W. FRANKS, Esq., F.R.S.

1. Is any clothing used, or do the natives go entirely naked?
2. Is there any distinction made in the clothing of the sexes, or of persons of various ranks?
3. Is it varied according to the seasons of the year, or for special festivals?
4. Are there any sumptuary laws as to clothing?
5. Are any recognized peculiarities of dress restricted to the subdivisions of tribes?
6. Is any deviation in such peculiarities considered improper?
7. Are the clothes made by each individual or family? or are there

any recognized makers of clothes? 8. How do they rank? 9. Is there any thing which corresponds to what we term "fashion"? 10. Of what materials are the clothes chiefly made? 11. Are they native or imported? 12. Are the clothes much shaped or simple wrappers? 13. How are the latter folded? 14. Is there any difference between the indoor and out-of-door clothing? 15. Are any portions of clothing removed on saluting or visiting a superior? 16. How are the garments put together? 17. If sewn, have the needles eyes? or is the thread passed through a hole previously made? 18. What kind of thread is used? 19. Do clothes descend from parents to children? or are they burned with the individual who wore them, or otherwise destroyed?

Head.—20. Do the natives wear any kind of head-covering? and is it for ornament or protection from the sun or weather? 21. Are there any ornaments attached to their hats, caps, or turbans? 22. Are any sunshades worn (South Seas)?

Body.—23. Are the clothes shaped to the body, or loose? 24. Is the body entirely or partially covered? 25. Is any special garment worn to keep off the rain? 26. In what way do the natives cover their nakedness? 27. Do they wear the *maro* of the Polynesians, the wrapper of the Melanesians, the cases of South Africa, or the string of some tribes in South America? 28. Do the natives attach any ideas of indecency to the absence of such partial clothing? 29. What is the corresponding dress of the women? 30. At what age do the two sexes adopt such articles of dress?

Arms and Feet.—31. Are any gloves worn? 32. Of what materials are they made? 33. Are there any coverings to the feet?

NO. LXI.—PERSONAL ORNAMENTS.

By A. W. FRANKS, Esq., F.R.S.

1. Are any ornaments worn as symbols of rank or station in society, or to denote virginity? 2. Are any especially confined to the principal chief? and is there any penalty on their being assumed by others? 3. Are any special ornaments used by either of the sexes in dances, religious or other feasts, &c.?

Head.—4. In what way is the hair dressed? is it allowed to grow to its full length? 5. Is there any distinction in the mode of dressing it between the two sexes? 6. Are wigs in use? 7. Is any preparation used to alter the colour of the hair? 8. Is it plaited or twisted into ringlets? 9. What ornaments are worn in the hair, such as feathers, flowers, pins, &c.? 10. Do the natives wear beards or moustaches? 11. Is the absence of these due to natural causes, or are they removed by depilation, shaving, &c.? 12. When a beard or moustache is worn are they allowed to grow naturally, or are they cut into shape? 13. Are any ornaments worn in the ears? 14. Are they passed through the lobe of the ear, or are they pendent ear-rings? 15. Of what materials are they made? and of what forms? 16. Are any ornaments worn in the nose? and of what are they made? 17. Are they worn by both sexes? 18. Are any ornaments worn in the lips? to which lip are they attached? and what are their forms and materials? 19. At what age are they first inserted? do they increase gradually in size as the wearer grows older, or are they inserted at once of the full size? 20. Do they pass through the septum of the nose or the side? and which side? 21. Are they easily removable? 22. Are any ornaments worn in the cheeks? how are they inserted? and how kept in their places?

Body.—23. Are any necklaces, collars, armlets, or bracelets in use? 24. Of what materials are they composed? and are they easily removable? 25. Is there any difference in such ornaments between the two sexes? 26. Are any pendants worn on the breast? 27. Are any finger-rings in use? of what material are they made? 28. Are they signets? do they indicate rank, marriage, &c.? 29. Are any girdles worn? and do they serve to support weapons or other objects.

Legs and Feet.—30. Are any leglets or anklets worn? 31. Are they easily removable? 32. At what age are they first put on? 33. Are any toe-rings in use? 34. How many are worn, and of what forms? 35. What is the effect on the foot? 36. Are weapons or other objects attached to the leglets or bracelets, or worn between them and the body?

[It is very desirable in this class to observe the minuter varieties of ornaments distinguishing cognate tribes, and to obtain a good collection of specimens well labelled. Particular notice should also be taken of any instances in which natural objects worn as ornaments, such as teeth or shells, are copied in metal.]

No. LXII.—BURIALS.

Including customs at death; objects deposited with the dead; reasons assigned for; food deposited with; ceremonies at. See also No. XXX. RELIGIONS.

No. LXIII.—DEFORMATIONS.

By PROFESSOR GEORGE BUSK, F.R.S.

The practice of artificially producing deformities in the human subject appears to have existed from the most remote times of which we have any record, and to have prevailed at one time or another in all parts of the world. In the investigation, therefore, of the ethnographical characters of a people, considerable interest attaches to observations respecting artificial “deformations,” as the practice in question has been termed; for it is very possible that important information may thence be derived with regard to the relations between different tribes or races, even widely separated from each other.

The principal kinds of intentional deformation to be looked for may be arranged under the heads of:—

- A. Cranial.
- B. Facial, including the ears.
- C. Dental.
- D. Of the trunk and extremities.

As the practices of tattooing and circumcision, &c. are placed under other heads, they will not here be considered, although in one sense they may be regarded as kinds of artificial deformation.

A. Cranial Deformation.

Alteration in the natural form of the skull is, so far as is known, the most ancient and the most general of all kinds of artificial deformation, and consequently all observations relating to it will be of interest and importance.

There are two principal ways in which the change from its natural shape is produced in the human skull:—

The first consists in the application of pressure, usually both in front and behind, or in front or behind alone, by means of flat boards or pieces of bark applied in such a way as to exert continued pressure for a considerable time in early infancy, and commencing immediately after birth, when the shape of the head admits very readily of being moulded in almost any direction. It is to be observed, however, that under certain very common conditions a considerable modification of the form of the head, more especially in the hinder region, may arise, as it were unintentionally, from the practice of swathing the infant continually upon a board for the convenience of carriage. Or, again, the form of the head may be affected even by the manner in which the child is otherwise habitually carried, either on the right or the left arm of the nurse, in consequence of which a considerable degree of unilateral deformity may be produced.

It will be necessary, therefore, to ascertain whether any observed deformity of the head or skull arises from an intentional or unintentional cause, and in all cases to note the mode in which infants are habitually carried or swathed.

The other principal mode in which the form of the skull is altered is by the methodical application of bandages encircling the head in various directions. The artificial forms produced in this way are usually more or less elongated or pyramidal, or, as some may be termed, cylindrical. In the case of this kind of deformation, however, as in the former, considerable abnormalities of form may be produced, as it were, unintentionally, by the mode in which the head-attire, more especially, is worn. A striking instance of this has been observed very extensively in France, but more or less of a tendency to the same kind of thing may be frequently observed amongst ourselves.

As the practice of cranial deformation, though probably innocuous, cannot in any case be supposed to possess any direct advantages, the *reason* for its extensive prevalence among all races of mankind is not very obvious, and is a very curious subject of inquiry.

One of the most probable reasons, and also the most ancient, is that assigned by Hippocrates, viz. that it arose from a desire to magnify any form of head, considered either as intrinsically beautiful or as distinctive of a superior race or rank.

In investigating this subject, the principal points, therefore, to be attended to are :—

1. The kind or form of the deformation.
2. Whether by a flattening process or by bands.

3. Whether, in the former case, the pressure is applied both in front and behind, or on either aspect singly, and how it is effected.

4. In the latter case, whether the elongation be upwards or backwards.

5. In both cases the length of time during which the pressure &c. is continued.

6. Although the concurrent testimony of almost all recent observers would tend to show that deformation of the skull has no effect upon the moral, intellectual, or perceptive faculties, this is a point still worthy attention.

7. It should be ascertained whether in any given race the practice of deforming the head is general or whether it is confined to one or the other sex, or to any particular rank or station. And so far as may be possible the reasons assigned for the practice should be noted.

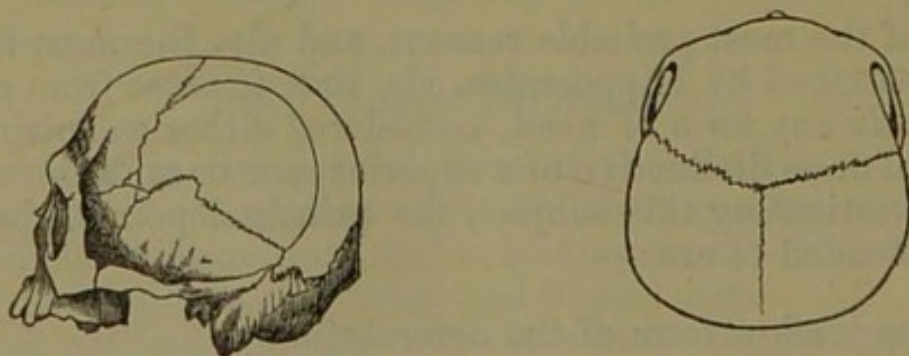
8. In view of the very probable assumption that the deformity is intended to magnify, as it were, the natural characteristic form of the skull, it should be observed whether the natural indigenous form is *rounded* or *elongated*, *broad* or *narrow*, *high* or *low*.

To explain this more fully it may be remarked that, though all skulls are naturally symmetrical and have uniformly rounded curved contours, they differ very considerably in the proportions of their length or antero-posterior dimension and their breadth or transverse direction, and in a less degree as regards their vertical height.

Human skulls have been arranged in two principal classes or categories according to the different proportions of these dimensions. These are:—

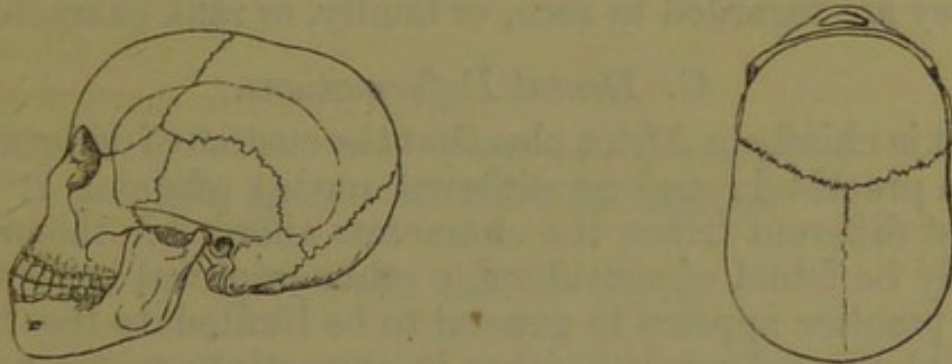
9. The *brachycephalic*, or short skulls (fig. 1), in which the proportion of breadth to length regarded as unity is as 800 to 1000 or above.

Fig. 1.



10. The *dolichocephalic*, or long skulls (fig. 2), in which the breadth is less than 800 to 1000—sometimes not exceeding 620, or even less.

Fig. 2.



11. In looking at a skull, therefore, or a collection of skulls rather, it will be necessary to note (*a*) to which of the two classes above given it, or the average of the collection, belongs; (*b*) whether the skull is symmetrical with evenly curved contours or unsymmetrical, and in what direction, and whether the surface is in any part unnaturally flattened.

B. *Deformations of the features of the face usually involve the nose, cheeks, lips, and ears.*

12. It is a custom among many savage tribes to flatten the nose, which is done either by continued pressure, or by such violence as to force in the bridge whilst the tissues are yet soft and cartilaginous. In some cases, however, attempts are made to improve the countenance by pinching the nose so as to give it greater prominence than it would otherwise have. A common practice also among some tribes is to perforate either the cartilaginous septum alone of the nose or the entire organ, inserting bars or rings of wood or metal and even of stone. Incisions and other mutilations are practised so as to alter the shape of the nose.

13. The cheeks are sometimes perforated, the holes being occupied by articles of wood, bone, or metal.

14. In Africa, more especially, great pains are taken to produce hideous deformity of the lips, either upper or lower or both, by perforating them and wearing ornaments in the holes, sometimes of very great size.

15. In a similar manner the ears are perforated and made to

support enormous weights, by which they become monstrously elongated and hypertrophied.

16. In many parts, more particularly of Africa, it is a common practice to produce large raised scars on the forehead, cheeks, nose, or chin, forming patterns peculiar to different tribes. The form and mode of making these scars should be noticed, and whether they are regarded as race, or family, or rank characters &c.

C. *Dental Deformations.*

17. It is chiefly in Africa also that the custom of deforming the teeth is practised; and as different modes of doing it prevail amongst different tribes, the characters afforded in this way will probably be found of considerable ethnographical importance.

The practice appears in general to be limited to the front or incisor teeth, and consists either in extracting, or, more usually perhaps, in breaking off one or more of them, or of filing them either to single sharp points or in serrate fashion.

The reasons for this practice, if any are assigned, should be ascertained, and, as in other cases, whether it is exercised upon one or both sexes, or is distinctive or not of rank, &c.

D. *Deformation of the Trunk and Limbs.*

The principal deformations to be noticed under this head are:—

18. As regards the trunk: (a) alteration in the form or hindrance to the development of the breasts, which is effected by the methodical application of bandages and compresses.

The most usual object, however, aimed at is to produce elongation of the mamma, which is thus rendered capable of being either thrown over the mother's shoulder or under the arm, so that the infant can suck whilst carried on the mother's back.

(b) Amongst some of the Caffre tribes the preternatural elongation of the nipple is commenced in early life by manipulation and the binding of it round with a narrow fillet or tape.

19. The chief deformation practised upon the extremities is (a) that of the feet peculiar to the Chinese women, with regard to which we already possess a great amount of information.

(b) Amongst some African tribes it has been stated that amputation of part or the whole of one of the fingers is practised. Should this be observed, the fact is one well worthy of record, together with the reasons that may be assigned for it.

(c) The practice of castration may also perhaps be included under the head of deformation or mutilation. The mode in which the operation is performed, the age at which it takes place, and the reasons assigned for it should all be duly noticed.

NO. LXIV.—TRIBAL MARKS.

Including all party badges, whether worn on the person or otherwise; origin of heraldry, &c.

NO. LXV.—CIRCUMCISION.

By COL. LANE FOX.

The practice of circumcision prevails, or has prevailed, in parts of Asia, Africa, and America, being confined chiefly to the equatorial and southern regions of the globe. It is undoubtedly of great antiquity, and was described as an ancient custom even in the time of Herodotus. So peculiar and painful a custom appears less likely to have arisen independently in different centres than others for which ordinary causes can be assigned; and it will therefore be of interest to trace all the varieties of the custom as it is practised amongst different tribes and races, and to record the reasons given for it at the present time or in the past history of the people.

1. Does the custom prevail at the present time? or is it known to have existed in times past?
2. Is it known, though not practised? and is it spoken of as a barbarous custom when practised by others?
3. Is it performed upon males or females, or both?
4. At what age is it performed on males and females?
5. Does the custom in regard to males and females appear to have the same or a different origin?
6. Who performs the operation on the different sexes—old women, priests, or midwives?
7. Is the position of circumcisor considered especially honourable?
8. Is it illegal after a certain age?
9. Is the part held with any special instrument?
10. Is any special knife or scissors used for the purpose?
11. Is it performed with a knife of flint or stone? and what is the reason given for this?
12. What is the part cut off in males? ditto in females?
13. Is it fully performed? or is it only a vestige of the custom?
14. Are any other incisions made upon the body at the same time? what is their meaning? Give drawings of them.
15. Does this apply to males and females alike?
16. What is done

with the parts cut off? 17. Any special custom with respect to the blood? 18. Is any godfather or godmother appointed? 19. Is a name given to the person at the time or subsequently? 20. Is any particular dress worn on the occasion? 21. Is the person to be circumcised led upon a horse, ass, or mule? 22. Is any thing done to heal the wound? 23. For how long is the circumcised person exempt from labour? 24. With what other ceremonies does it appear to be especially connected? 25. Are any lustration practices especially associated with it? 26. Is it considered a religious duty, a law, or only a custom? 27. Does happiness in a future state depend on it? 28. Is there any tradition respecting it? 29. Can its origin be traced to any other tribe, race, or locality? 30. What is the recognized name for it? 31. Is it ever performed after death? 32. Is there any reason to suppose it was established as an offering of part of the organ of generation to the deity? 33. What is the reason now assigned for it? 34. Is it supposed to prevent disease, or to preserve cleanliness? 35. Is it effectual for this purpose? 36. Is it considered to render marriage prolific? 37. Is any special seat set apart for the operator or the circumcised, or for an imaginary personage or deity? 38. Is the operation ever dispensed with for fear of deterring proselytes? 39. Is it performed by all classes alike? 40. Is it in full force or dying out? 41. Is it in any way connected with Phallic worship?

No. LXVI.—TOTEMS.

Description of; meaning and origin.

No. LXVII.—DYEING, &c.

By JOHN EVANS, Esq., F.R.S.

The use of colour for ornamental purposes is almost universal throughout the world, but the number of colours, their nature, and the purposes for which they are applied vary greatly in different countries. There are, broadly speaking, two distinct

methods by which colour is applied:—(A) dyeing, when the colouring-matter is used in a state of solution, and penetrates the pores of the object to be dyed; and (B) painting, when the pigment is mixed with some medium or vehicle to fix it when dry, and is applied to a part or the whole of the object to be painted by means of some kind of brush.

Dyeing is usually practised in connexion with animal and vegetable fibre and tissue, such as leather, thread, and cloth; but sometimes also the process is applied to wood and bone. Painting is more commonly applied to wooden objects. Both processes are occasionally employed with the object of rendering the human form either more terrible or more beautiful.

Dyes.—1. From what substances are these prepared? and how are they applied? (If possible procure specimens of the materials used, and an account of the method of preparation.) 2. What are the articles usually dyed—skins with the hair on, leather, twine, cloth, &c.? 3. Is any mordant or solution used, either to prepare the object for receiving the dye, or for rendering it permanent after it has been applied? 4. What are the favourite colours? (Their arrangement and proportions will come under No. LXXIII. ORNAMENTATION.) 5. Are any portions of the human body dyed, such as the teeth, nails, hair, or skin?

Painting.—6. What are the principal pigments used, and how prepared? (Obtain specimens if possible.) 7. In what manner are they ground or precipitated? and what is the medium employed to fix them? 8. Is any subsequent process of varnishing or lacquering employed? and if so, how is the varnish made? 9. What are the objects usually painted? and what kind of brushes are used? 10. What colours are most in vogue? and are they transparent, like dyes, or opaque, like body-colours? 11. Is any process allied to gilding known? 12. In painting patterns, in what order are the colours applied? and is the outline first painted and the colours subsequently filled in? or is the pattern roughly sketched in the first instance, and the outline completed as the final process? 13. Are any mechanical means, such as compasses or stencilling-plates, used? or any printing process? 14. Is paint employed on the human body or hair? and if so, on what occasions, and in what manner is it applied? 15. What are the colours used for these purposes? and with what ingredients are they mixed? 16. Is any colour regarded as especially sacred, and reserved for sacred purposes? 17. Are any earthen vessels painted after being burnt? (See No. LXXX. POTTERY.)

No. LXVIII.—MUSIC. By CARL ENGEL, Esq.

The music of every nation has certain characteristics of its own. The progressions of intervals, the modulations, embellishments, rhythmical effects, &c. occurring in the music of extra-European nations are not unfrequently too peculiar to be accurately indicated by means of our musical notation. Some additional explanation is therefore required with the notation. In writing down the popular tunes of foreign countries on hearing them sung or played by the natives, no attempt should be made to rectify any thing which may appear incorrect to the European ear. The more faithfully the apparent defects are preserved, the more valuable is the notation. Collections of popular tunes (with the words of the airs) are very desirable. Likewise drawings of musical instruments, with explanations respecting the construction, dimensions, capabilities, and employment of the instruments represented.

Vocal Music.—1. Are the people fond of music? 2. Is their ear acute for discerning small musical intervals? 3. Can they easily hit a tone which is sung or played to them? 4. Is their voice flexible? 5. What is the quality of the voice? is it loud or soft, clear or rough, steady or tremulous? 6. What is the usual compass of the voice? 7. Which is the prevailing male voice—tenor, barytone, or bass? 8. Which is the prevailing female voice—soprano or alto? 9. Do the people generally sing without instrumental accompaniment? 10. Have they songs performed in chorus by men only, or by women only, or by both sexes together? 11. When the people sing together, do they sing in unison or in harmony, or with the occasional introduction of some drone accompaniment of the voice? 12. Is their singing in regular time, or does it partake of the character of the recitative? 13. Have they songs for *solo* and *chorus*, or with an air for a single voice and a burden (or refrain) for a number of voices? 14. Describe the different kinds of songs which they have (such as sacred songs, war songs, love songs, nursery songs, &c.), with remarks on the poetry.

Instruments.—15. What are their instruments of percussion (such as drums, castanets, rattles, cymbals, gongs, bells, &c.)? 16. Have they instruments of percussion containing sonorous slabs of wood, glass, stone, metal, &c., upon which tunes can be played? if so, write down in notation or in letters the tones

emitted by the slabs. 17. Have they drums with cords, or some other contrivance, by means of which the parchment can be tightened or slackened at pleasure? 18. Have they drums with definite tones (like our kettle-drums)? and if so, what are the tones in which they are tuned when two or more played together? 19. Any open hand-drums with one parchment only, like our tambourine? 20. Are the drums beaten with sticks or with the hands? 21. What wind-instruments (trumpets, flutes, &c.) have they? 22. Any trumpets with sliding-tubes (like the trombone)? 23. How are the flutes sounded? is there a plug in the mouth-hole? 24. Any nose-flutes? 25. What is the number and the position of the finger-holes on the flutes? 26. What tones do the flutes yield if the finger-holes are closed in regular succession upwards or downwards? 27. If the people have the syrinx (or Pandean pipe), ascertain the series of musical intervals yielded by the tubes. 28. Do the people construct wind-instruments with a vibrating reed, or some similar contrivance, inserted in the mouth-hole? 29. If they have a reed wind-instrument, observe whether the reed is single (like that of the clarinet) or double (like that of the oboe). 30. Have they a kind of bagpipe? 31. What musical instruments have they which are not used by them in musical performances, but merely for conveying signals and for such like purposes? 32. Have they stringed instruments the strings of which are sounded by being twanged with the fingers? 33. Any stringed instruments twanged with a plectrum? 34. Any stringed instruments beaten with sticks or hammers (like the dulcimer)? 35. Any stringed instruments played with a bow? 36. If there are stringed instruments with frets on the neck (as is the case with our guitar), note down the intervals produced by the frets in regular succession. 37. What are the substances of which the strings are made? 38. Is there any particular contrivance on some of the instruments in the arrangement and situation of the strings? 39. Are there stringed instruments with sympathetic strings (*i.e.* strings placed under those strings which are played upon: the sympathetic strings merely serve to increase the sonorousness)? 40. What are the musical intervals in which the stringed instruments are tuned? 41. Do the people possess any musical instrument of a very peculiar construction? if so, describe it minutely. 42. Give the name of each instrument in the language of the country. 43. Describe each instrument, and give illustrations if possible. 44. Give some account of the makers of musical instruments; of the woods, metals, hide, gut, hair,

and other materials they use; of their tools, &c. 45. What are the usual adornments and appendages of the musical instruments?

Compositions.—46. On what order of intervals is the music of the people founded? Is it the diatonic major scale (like *c, d, e, f, g, a, b, c*), or the diatonic minor scale (in which the third is flat, thus *c, d, e flat, f, g, a, b, c*), or the pentatonic scale (in which the fourth and the seventh are omitted, thus *c, d, e, g, a, c*), or some other order of intervals? 47. Is the seventh used sharp (*c-b*) or flat (*c-b flat*)? 48. Does the superfluous second occur in the scale? (In the example *c, d, e flat, f sharp, g, a flat, b, c*, the steps from the third to the fourth and from the sixth to the seventh are superfluous seconds.) 49. Does the music contain progressions in semitones or chromatic intervals? 50. Are there smaller intervals than semitones, such as $\frac{1}{2}$ tones, $\frac{1}{4}$ tones? 51. Are there peculiar progressions in certain intervals which are of frequent occurrence in the tunes? if so, what are they? 52. Do the tunes usually conclude in the tonic (the key-note, or the first interval of the scale)? or if not, on what other interval? 53. Do the tunes contain modulations from one key into another? if so, describe the usual modulations. 54. Are there certain rhythmical peculiarities predominant in the music? if so, what are they? 55. Is the time of the music generally common time, triple time, or irregular? 56. Are there phrases or passages in the melodies which are of frequent reoccurrence? 57. Have the airs of the songs reoccurrences of musical phrases which are traceable to the form of the poetry? 58. Have the people musical compositions which they regard as very old? and do these compositions exhibit the same characteristics which are found in the modern ones? 59. Are the compositions generally lively or grave? 60. Describe the form of the various kinds of musical compositions.

Performances.—61. Have the people musical bands (or orchestras)? 62. Which are the instruments generally used in combination? 63. Which are the instruments commonly used singly? 64. What is the number of performers in a properly constituted band? 65. Is there a leader of the band? How does he direct the performers? 66. Does the band play in unison or in harmony? 67. If vocal music is combined with instrumental music performed by the band, is the instrumental accompaniment in unison (or in octaves) with the voices, or has

it something of its own? 68. Is the *tempo* generally fast or slow? 69. Are there sudden changes or gradual changes in the *tempo*? 70. Are there changes in the degree of loudness? 71. Do the musicians, on repeating a piece, introduce alterations or variations of the theme? 72. Do they introduce embellishments *ad libitum*? 73. Mention the occasions (religious ceremonies, social and public amusements, celebrations, processions, &c.) on which musical performances take place. 74. Are there military bands? and how are they constituted? 75. Is music employed to facilitate manual labour? 76. Are there songs or instrumental compositions appertaining to particular occupations or trades? 77. Have the people a national hymn or an instrumental composition which they perform in honour of their sovereign, or in commemoration of some political event? 78. Describe minutely the musical performances in religious worship, if there are any. 79. Have they sacred dances performed in religious ceremonies, at funerals, &c.? 80. Any war-dances, dances of defiance, &c.? 81. Any dances in which they imitate the peculiar movements and habits of certain animals, &c.? 82. Are their dances accompanied by musical instruments, by singing, or merely by rhythmical sounds, such as clapping of hands, snapping of fingers, reiterated vociferation, &c.? 83. Give a list of all the dances. 84. Endeavour to ascertain whether the rhythm of the music accompanying the dance is suggested by the steps of the dancers, or *vice versâ*.

Cultivation.—85. Do the people easily learn a melody by ear? 86. Have they a good musical memory? 87. Are the children taught music? and if so, how is it done? 88. Are there professional musicians? 89. Any performers who evince much talent? 90. Any minstrels, bards, reciters of old ballads? 91. Any professional improvisators? 92. Are there professional musicians of different grades? 93. Who composes the music? 94. Do the musicians follow other professions besides music? 95. Are the ministers of religion also musicians and medical men? 96. Have the people some kind of musical notation? 97. Have they written signs for raising and lowering the voice in singing, for giving emphasis to certain words or phrases, or for similar purposes? if so, describe the signs. 98. Do they possess treatises on the history, theory, &c. of music, instruction books for singing and for playing musical instruments, &c.? if so, give a detailed account of their musical literature. 99. Have they musical institutions? Give an account of them. 100. How do the people appreciate their own music? 101. What impression does the music of foreign countries produce upon them?

Traditions.—102. Are there popular traditions respecting the origin of music? 103. Any myths about a musical deity or some superhuman musician? 104. Any legends or fairy tales in which allusion to music is made? if so, what are they? 105. Any tradition about the invention of certain favourite musical instruments? 106. Any tradition or historical record respecting the antiquity of stringed instruments played with a bow? 107. Any records respecting their sacred music? 108. Is music believed to possess the power of curing certain illnesses? 109. The power of enticing and taming wild animals? 110. Are there popular tunes, or certain rhythmical figures in the tunes, which, according to tradition, have been suggested by the songs of birds? 111. If there is any thing noteworthy about music which has not been alluded to in the preceding questions, notice it.

NO. LXIX.—LANGUAGE.

By E. B. TYLOR, Esq., F.R.S.

The only really satisfactory method of treating a language for anthropological purposes is to have a complete grammar and dictionary drawn up. As to the compilation of such, in savage languages, two suggestions are worth making. First, that the dictionary should be printed with the grammar prefixed, otherwise neither will be properly available; second, that specimens of native compositions, such as folk-lore tales, poems, traditions, prayers, &c., should be taken down *verbatim*, and published with an accurate translation, with the grammar and dictionary. Where it is impossible to deal with the language in this thorough way, the fullest vocabulary possible should be drawn up, and sentences carefully taken down and translated word for word. The practice of judging of the affinities of a language by means of a short vocabulary of isolated words, without a guide to the grammatical structure, is to be condemned as loose and misleading. The missionary alphabet of Professor Max Müller and the phonetic alphabets of Mr. A. J. Ellis and Mr. Melville Bell may be used; the former is here inserted (p. 116) for the use of travellers. (See 'Outline Dictionary for the use of Missionaries, Explorers, &c.' Trübner and Co., 60 Paternoster Row.) Whatever alphabet is used, the

one essential point is to use each character for one sound, and one only, defining the pronunciation of each by examples from well-known languages.

1. What sounds are used in the language? and which differ from those of European languages? and what sounds are they unable to pronounce? 2. What expressive interjections are in common use? and how are they like or unlike our own? 3. Does the meaning of words and sentences depend much or little on tone, accent, or emphasis? 4. Does musical pitch or accent affect the meaning of words? 5. Can a sentence, such as an interrogative or affirmative, be roughly written with musical notes to show rise and fall of tone? 6. Are there words which are direct imitations of noises, cries of animals, &c., like *puff*, *mew*, *rat-tat*, &c.? and does such imitation of sound prevail largely in the language? 7. What is the grammatical structure of the language? are roots or crude forms, &c. clearly discernible in it? and by what arrangement of particles, inflexions, &c. are these built up into words? 8. Are particles, such as prepositions, pronouns, adverbs, &c., combined in the words, or do they stand separately? 9. Are prefixes or suffixes used? 10. Are changes of vowel or consonant usual in inflexion, &c.? 11. Are compound words usual, and how formed? is there a tendency to contract compound words into shorter forms in which the original words are mutilated? 12. Are there diminutive or augmentative words? and do changes of sound cause such changes of meaning? 13. How are genders indicated? and do they relate to difference of sex or to the difference between animate and inanimate? 14. Are there forms of number and case in nouns and adjectives? 15. What are the numerals? and do they show any traces of derivation from reckoning by fingers and toes, such as the words *hand*, *foot*, *man*, to indicate 5, 10, 20, &c., or their compounds? (See No. XXII. ARITHMETIC.) 16. How are the moods and tenses of verbs indicated? 17. What are the rules of syntax? are the relations of subject, object, predicate, indicated by grammatical inflexions or by their place in the sentence, or both? 18. Is the language a dialect of some well-known family? and if so, where does it differ from well-known languages of that family? 19. Are there neighbouring dialects of the same stock? and if so, are they mutually intelligible, or at least recognized as allied, by the tribes speaking them? 20. What traces are there of words having changed within the memory of man? 21. Are words to be noticed as borrowed from other languages?

Missionary Alphabet of Professor Max Müller.

a	America.	o	philology.
a	psalm.	o	note.
v	bought, all.	ö	könig (Ger.),
ä	väter (Ger.).		peu (Fr.).
ai	aisle.	oi	oil.
au	proud.	p	pat.
b	bid.	q	(see k).
c	(see k).	r	true.
ch	(see k).	r	car.
d	dock.	s	sin.
dh	this.	s	sharp.
e	debt.	t	tan.
e	date.	th	thin.
f	fat.	ü	une (Fr.),
g	gate.		für (Ger.).
g	gin.	u	full.
h	hand.	u	fool.
h	loch.	v	but, birch.
h	tage (Ger.).	w	wine.
i	knit.	w	whine.
i	neat.	x	i. e. ks.
j	(see g).	y	yet.
k	kite.	y	ich (Ger.).
k	church.	z	zeal.
l	let.	z	pleasure.
l	William.		
m	man.		
n	not.		
n	(or ñ) new.		
N	bon (Fr.).		
ng	sinking.		

No. LXX.—POETRY. By E. B. TYLOR, Esq., F.R.S.

The poetical compositions, which in some rude form appear among the rudest tribes, should be taken down carefully as to words, and also as to the musical intonation with which they are chanted. It has to be ascertained, if possible, whether the poem or song is one handed down from former generations, or a modern or extempore composition. Old records of national and personal history, and mythical and religious ideas, are often handed down in such old compositions, which also frequently preserve ancient words and forms of speech which have been disused in ordinary conversation.

1. Are poetical compositions common, old and new? 2. Are they repeated in precise unaltered form, and known to the people generally? 3. Are poetic compositions still often made? is there any thing like an order of bards? and do they receive rewards for making or singing them? 4. Are old historical events or personages commemorated in songs? 5. Are there special chants for religious purposes, prayer and praise of gods, &c.? 6. Are such chants sung at religious and other festivals? and by whom? 7. What are the rules of melody in chants? 8. Do they follow any definable rules of rhythm or metre? and are particular words used in order that they may suit this? (See LXVIII.) 9. Are any peculiar, mystic, or ancient words used in poetry? 10. Are choruses in use? and how far do they consist of intelligible words, and how far of nonsense-syllables? 11. Are there any performances of a dramatic nature, commemorating religious legends, wars, &c.? and if so, is the dialogue in set forms handed down by tradition? (See LVII.)

No. LXXI.—WRITING. By E. B. TYLOR, Esq., F.R.S.

The expression of ideas by graphic signs has two bearings on anthropology: first, the use of marks, pictures, &c. for record and communication preserves stages in that course of development which leads through full picture-writing to phonetic and alphabetic writing; second, when an alphabet of any kind is in use, it usually shows resemblance to that of other districts,

proving that they all must have had a common origin ; and it is an essential element in the history of any tribe or nation to discover from what country it obtained its alphabet. With the alphabet, it is probable that it derived other and not less important parts of its civilization.

1. Do any methods of the nature of writing exist? 2. When it is desired to send a message to a distance, to recruit a war-party, to record numbers, to preserve the name and feats of a dead warrior, &c., does any method exist of tying knots in a string, making notches in a tally, figures on wood, bark, or stone? 3. Do such marks exist on the rocks in the neighbourhood, as if made for the purpose of record? 4. Are pictures or carvings made for the purpose of communication or record, as distinct from mere ornament? 5. If so, does the picture simply indicate an object such as it represents, *i.e.* is the system one of picture-writing? 6. Or is any trace to be found of the picture representing not the object itself, but the sound of its name, *i.e.* is any rudiment of phonetic writing noticeable? 7. If pictures or other characters are used for phonetic purposes, what is the system of their use? 8. Is there a system of signs for syllables or letters? 9. Is any mixed system of picture-signs and sound-signs used, as in the Egyptian hieroglyphics? 10. Is the syllabarium or alphabet apparently of pure native invention, or suggested by the sight of some civilized alphabet? or is it directly borrowed from some other country? 11. Is there any record of the time and circumstances under which a foreign alphabet was introduced? 12. Is printing of any kind from stamps, blocks, or types in use? 13. Give drawings of any owner's marks upon arrows, weapons, tools, &c. 14. Draw mason's marks, cattle-brands, ciphers, and secret signs.

NO. LXXII.—DRAWING.

By COL. A. LANE FOX.

Great difference is observable in the capacity for drawing shown by different races. Thus the Esquimaux are comparatively skilful draughtsmen, whilst the Australians, as a rule, have but little or no knowledge of it. Amongst the relics found in the caves of Périgord, in France, life-like repre-

sentations of animals have been discovered, whilst the rock-engravings of South America represent figures so grotesque as scarcely to be recognized. Care should, however, be taken to distinguish between true representative art, however rude, which is the best attempt of natives to depict the objects truthfully, and conventionalized symbols, which are merely based upon the forms of nature. These, although of the utmost interest, come more properly under the head of writing or ornamentation, and must not be confounded with the former. The three branches, *drawing*, *writing*, and *ornamentation*, spring from a common centre; and the traveller should make it his best endeavour to classify the rock sculptures, carvings, and drawings of savages under one or other of these headings, assigning to each its true signification.

1. Have the natives a natural aptitude for drawing? 2. Do they draw animals in preference to other subjects? 3. Are the most conspicuous features, such as the head, nose, &c., generally exaggerated? 4. Have they the least knowledge of perspective? 5. Are the more distant objects drawn smaller than those nearer? 6. Are the more important personages or objects drawn larger than the others? 7. Do their drawings represent imaginary animals or animals now extinct? 8. Do they evince a tendency to introduce uniformity into the representation of irregular objects, such as trees, so as to produce a symmetrical pattern? 9. Are the drawings:—*a*, historical (XVIII.); *b*, religious (XXX.); *c*, obscene; *d*, symbolical or hieroglyphic (LXXI.); *e*, ornamental (LXXIII.); *f*, badges or tribal marks, heraldic (LXIV.); *g*, copies from nature; *h*, imaginative designs; *i*, topographical; *k*, scribbles to occupy idle time, without any definite meaning? 10. Are events of different periods depicted in the same drawing? 11. Have they any conventional modes of representing certain objects? 12. Do they draw from nature, or copy each other's drawings? 13. Do they, in copying from one another, vary the designs through negligence, inability, or other causes, so as to lose sight of the original objects, and produce conventional forms, the meaning of which is otherwise inexplicable? if so, it would be of great interest to obtain series of such drawings, showing the gradual departure from the original designs. 14. Do they readily understand European drawings? 15. Do they show any aptitude in copying European designs? 16. What are the materials usually employed for drawing? and with what tools are the carvings and engravings made? 17. What colours are

employed? and how are they obtained? 18. Have they special artists to draw for the whole tribe, or does each man draw his own designs? 19. Is there much difference in the degree of talent shown by men of the same tribe? 20. Is drawing more practised in some tribes of the same race than others? and if so, does this rise from inclination or traditional custom? 21. Do they draw maps or plans? 22. Do they understand European maps? 23. Have they any notion of drawing to scale? 24. Do they improve much by practice? 25. At what age do children commence drawing? are they encouraged to draw at an early age? (A series of native drawings by children of different ages, from five or six upwards, would be interesting as a means of comparison with the development of artistic skill in Europeans.) 26. Have they any knowledge of shading? with what colours are the shadows made? and are they correctly placed?



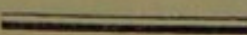

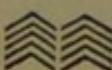


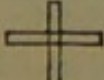
NO. LXXIII.—ORNAMENTATION.


By COL. A. LANE FOX.


Nothing is more persistent than the various patterns of ornamentation in use by the different tribes and races of mankind, and nearly all have some historical continuity by means of which they can be traced in their varieties to different nations. Nearly every uncivilized nation has a pattern of its own, or some two or three patterns, which are repeated continually in all their ornamental designs with but slight variation. These may be classed under three heads:—1st, incised lines and geometrical patterns; 2ndly, coils and scrolls; and 3rdly, conventionalized representations of animal and vegetable forms applied to ornamentation. Thus the ornamentation of Australia is confined chiefly to incised lines, punch-marks, and geometrical patterns, which also prevail over the greater part of the Polynesian Islands. The continuous looped coil is much used in Assam and Cochin China, but is unknown in China, where it is replaced by lines of broken coils and frets; and broken coil patterns constitute the prevailing feature in the ornamentation of New Guinea and New Zealand. The continuous looped coil was the principal ornament of the bronze age in Scandinavia,


and is used at the present time on the west coast of Africa, where it is an exception to the prevailing geometrical ornamentation of the African continent. The continuous coil ornament developed into the wave pattern and into the fret, which is used in Europe, China, and Peru, and in a modified form is still seen in the designs from South America and Marquesas. On the other hand, the ornamentation of the New Irelanders may be taken as an instance of the third class of ornamentation, consisting of an infinite variety of patterns, all derived from the representation of a human face; or that of the north-west coast of America, where patterns derived from the head and beak of the albatros monopolize the entire system of ornamentation amongst the Ahts and neighbouring tribes. In order to trace the history of the patterns, it is desirable that travellers should delineate as accurately as possible all the varieties of ornamental design amongst the races visited, especially those by which a sequence can be determined. Instances in which forms originally serving a useful purpose have survived in ornamentation are extremely common; such as, the binding of a spear or arrow-head represented by painted spirals, representations of strings used to carry vessels, or the parts of an extinct form of weapon or tool retained in the ornamentation of those which succeeded it. These should be figured wherever they are found, and their origin shown, as they afford useful links in tracing the development of the arts.

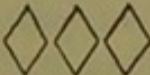
The following are some of the principal forms of ornamentation employed by savages:—


1. Circular dots or punch-marks 
2. Elliptical punch-marks 
3. Bands 
4. Chevrons 
5. Herring-bone 
6. Parallel incised lines 
7. Cross lines or chequer 
8. Crosses 


9. St. Andrew's cross 


10. Egyptian cross 

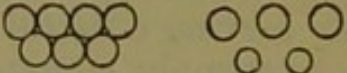
11. Lines of triangles, which may be filled with any of the foregoing ornaments 

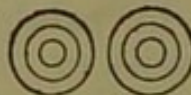
12. Lozenge pattern 


13. Double triangle 

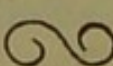
14. Pentacle 


15. Fylfot 

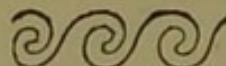
16. Contiguous or detached circles 

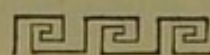
17. Concentric circles 

18. Plain coil 

19. Reversed coil 


20. Loop coil 

21. Continuous loop coil 


22. Fret derived from 21 

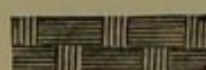
23. Broken or branching coils derived from 21.

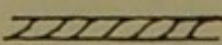
24. Broken frets derived from 22.

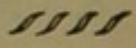
25. Wave pattern derived from 21 

26. Scrolls 

27. Plait ornament or guilloche 

28. Basketwork ornaments 

29. Rope pattern or spiral 

30. Impressions produced by twisted cords or thongs 

31. Note any of the foregoing that are not known, or any that are omitted here, and give the varieties of each.

32. What combinations of colours are used? are tertiaries (citrine, russet, olive), secondaries (orange, purple, green), or only primaries (yellow, red, and blue) employed? and in what proportions? 33. Are white, black, or neutral grounds used? 34. Is colour used to assist light and shade? 35. What is their idea of contrast, proportion, and harmony? 36. Are the details of ornamentation subordinate to the general forms and outlines? 37. Are conventionalized representations of flowers, trees, and branches employed? 38. Do the lines and curves radiate from a parent stem? 39. Are the junctions of lines and curves tangential to one another? 40. What is the effect aimed at in the ornamentation? 41. What objects are ornamented—houses, weapons, clothes, furniture, &c.? 42. Is filigree work used? 43. Is enamelling known? if so, describe the process.

NO. LXXIV.—MACHINERY.

By JOHN EVANS, Esq., F.R.S.

The use of machinery, even in its simplest form and moved by manual power, may be regarded as a sign that the people employing it have already emerged from the lowest stages of civilization. The transition, for instance, from the use of a pair of rubbing-stones or "saddle-quern" to that of a pair of millstones, one of which revolves and is driven by hand (the ordinary quern), is a great step in advance; but machinery can hardly be said to have been thoroughly introduced into a country until some of the forces of Nature, such as those of wind and water, have been utilized as motive power. The windlass, the common pump, the potter's wheel (LXXX.), the revolving hand-mill, the spinning-wheel (LXXVIII.), the turning-lathe, and some forms of looms (LXXIX.) may, however, be regarded as machines, as they are mechanical means of economizing human labour.

The earliest and simplest application of hydraulic power appears to have been for purposes of irrigation, and in some countries the use of water-power appears to be almost restricted to this purpose. The following questions are suggested:—

1. Are revolving millstones in use? if so, describe their form,

the manner in which driven, and the purposes to which applied. 2. What kind of stones are used for this purpose? and of what materials are the pivots and bearings formed? 3. Are pebbles with a conical socket in them used as bearings for the pivots, or are the pivots made of stone? 4. Are any pounding-mills in use, or any mechanical means employed to assist the motion of pestles in mortars? 5. Are any forms of rolling-mills employed for crushing-purposes? 6. Is any form of turning-lathe in use, and of what kind? is the rotary motion continuous or alternate? 7. How are the turning-tools applied? and what is their character? 8. What articles are turned? 9. Is the common windlass in use? and for what purposes? 10. Is any form of pump in use? if not, and wells exist, in what manner is water raised? 11. What form of bellows is in use? (LXXXIV.) 12. Are any water-wheels or other hydraulic machines known? if so, for what purposes are they applied, and in what manner? 13. Is any form of windmill known?

No. LXXV.—NAVIGATION.

Inquiries into the use and history of the forms of boats, paddles, mode of rowing; method of ascertaining courses employed by seafaring people; use of nautical instruments, whence derived, how and where constructed; sails; seaman-ship.

No. LXXVI.—HABITATIONS.

Description of houses, huts, tents, and their congregation in towns and villages; also cave-dwellings, buildings on piles, weams, and household furniture.

No. LXXVII.—FIRE. By E. B. TYLOR, Esq., F.R.S.

As a general rule, all tribes both preserve and produce fire. There are statements as to fireless tribes which should be carefully examined when met with; most of them have broken down under close inspection. The history of the practical art of fire-making is interesting; and the place of fire in social and religious ceremony gives valuable information as to the constitution of family and tribal life, the idea of moral purity, and several points of theology.

1. By what means is fire produced? 2. If by friction of wood, what is the exact instrument used, whether the stick-and-groove, the simple fire-drill twisted between the hands, or some improved form? 3. Is this ruder instrument still kept up in religious ceremonies? 4. If the fire is made by striking flint on pyrites or iron, is it remembered if this art was learnt from foreigners? 5. Are any other instruments used, such as the fire-syringe, burning-lens, &c.? 6. How is fire kept up and carried about? 7. What fuel is used? 8. Are there legends of the discovery of fire or invention of fire-making? 9. If so, do they seem myths personifying the fire or the fire-drill itself?

10. Is the household fire symbolic of family ties? 11. Is it held sacred, placed in charge of any particular person? is there any family worship connected with it? and by whom performed? 12. Is there a council-fire or other fires on special occasions or in special buildings?

13. Is a sacred fire kept up, or kindled on special festivals? and is its extinction unlucky? 14. Has such fire particular reference to the course of the sun, the solstices, year, seasons, &c.? 15. Are the fires put out and kindled from newly produced fire on such occasions, and by whom? and is the new fire made by friction of wood, or otherwise? 16. Is the kindling of the new fire a religious ceremony? and what is its meaning?

17. How is fire regarded in religion? 18. Is there any custom against wounding or polluting fire? 19. Are sacrifices given to it or consumed by it? 20. Is the fire itself a living divinity receiving worship and devouring the offered food? or does it act as a means of conveying sacrifice to deities and the dead, at funerals? and how? 21. Is there a fire-god to whom all particular fires belong? 22. Is fire a means of driving away evil demons?

23. Is fire a means of purification from uncleanness, blood, death, moral guilt, &c.? and how is it applied? 24. Is new fire made for such purification? 25. Is its making in any way connected with moral, especially sexual, purity?

No. LXXVIII.—STRING.

By JOHN EVANS, Esq., F.R.S.

The art of making string from vegetable fibre has been known from a very early period, and was practised by the occupants of the Swiss Lake-dwellings at a time when cutting-instruments were formed of stone and not of metal. The use, however, of animal fibre for ligaments of various kinds probably dates back to a much more remote period, as needles formed of bone have been found in caves of the first stone age, or what is known as the Palæolithic period. String or twine composed of long fibres is usually twisted, but sometimes also plaited. Thread made of finer and generally shorter fibres is usually spun either by hand or by means of a wheel; such spun thread is generally used for weaving. In some cases, split vegetable stems (such as rattan), strips of skin, or the intestines of animals are employed for binding purposes without being twisted. The following questions are suggested.

1. What animal or vegetable substances are employed for the manufacture of rope, string, or thread? 2. Are they subjected to any preparation before or after manufacture? 3. Are they used in strips or twisted, plaited or spun? 4. To what purposes are each of the principal varieties applied, as, for instance, for binding, netting, making bow-strings or fishing-lines, plaiting into articles of clothing or for weaving? (LXXIX.) 5. In the case of animal fibres being used, what are the parts thus employed? and how are they prepared? 6. Are the bands of these materials used wet, so as to tighten in drying? 7. In spinning thread for weaving, what process is employed? 8. Are any domesticated animals kept for the purpose of supplying materials to be spun? or are any plants cultivated for the sake of their fibre? is silk known? 9. How are articles sewn? are needles employed, or awls to bore holes, or tweezers to draw through the thread? 10. What is the process of netting, and the form of the needle and mesh? 11. Are knotted ropes or strings used as aids to the memory? 12. In the case of silk being known, what is the process of preparation? 13. Are cords in any way used as measures of length? 14. Are the string and thread usually dyed? (LXVII.) 15. Are spindle-whorls used in the manufacture of thread or string?

No. LXXIX.—WEAVING.

By JOHN EVANS, Esq., F.R.S.

Weaving, like spinning, dates back to a very early period; and the tissues found in the ancient Swiss Lake-dwellings are of more than one kind. The looms used for weaving vary considerably; but the simplest form of complete loom may be thus described:—There is a roll, or “yarn-beam,” on which the “warp” of unwoven thread is wound or “beamed,” and another roll, or “cloth-beam,” on which the woven tissue is received. The “warp,” or the threads passing from one roll to the other are kept in a state of tension, and each thread passes through an eyelet-hole in a vertical cord or “heddle.” The alternate heddles are attached to two separate frames, so that one set of alternate threads in the loom can be drawn away from the other, either upwards or downwards, and leave a space or “shed” between the two sets of threads, through which a shuttle can be thrown with the weft or transverse thread. This is then beaten up against the thread last thrown in, by means of a “reed,” or grating, through the intervals in which the warp-threads pass, and which is fixed in a swinging “batten” or “lay,” so as to give weight to the blow. The two sets of warp-threads are of course alternately raised and depressed between each throw of the shuttle, and this is usually done by means of treadles.

For weaving patterns, several sets of heddles are employed. The patterns may be either merely woven, as in diaper, or produced by coloured threads being thrown in, as in figured ribbons. In a still simpler form of loom, such as that in use in India, the reed and batten are dispensed with, a long shuttle like a netting-mesh being used, which first draws the weft into its place, and is then used to beat it up. In other cases, the threads of the warp are stretched in a frame, sometimes by means of weights, and the weft inserted by hand and beaten up with a sort of comb. Sometimes the surface of the tissue is hairy or piled like velvet, from short threads being woven in.

Articles closely resembling woven fabrics are in some instances made by the simple process of plaiting, like our ordinary rush-matting. Some baskets also present the same texture as

if they had been woven. Felting, or the formation of cloth by the entanglement of short fibres crossing each other in every direction, is another process closely allied to weaving. Coloured figures and patterns on cloth may be produced in various ways, either by dyeing portions of both warp and weft of different colours, or by using coloured portions in one of them only; or the tissue may be completed and subsequently printed. The bark-cloth made in Fiji and Tonga is ornamented in this last manner, and is itself a tissue which is neither woven, plaited, nor felted, but consists of the inner bark of the malo-tree dexterously manipulated and beaten. The bast which is used for matting affords an instance of a somewhat similar application of the inner bark of a tree: the outer bark, like the birch-bark so largely employed in North America, is usually employed for stiff and not flexible articles.

Another method of ornamenting is by embroidery, or working patterns on a fabric by means of the needle. Looped fabrics knitted from a continuous thread, and knotted fabrics made by tying strings together, may be regarded as varieties of woven fabrics.

The following questions may be of service:—

1. What are the principal materials used for weaving? and how prepared? (LXXVIII.)
2. What is the form of loom or other appliance for weaving?
3. What kind of shuttle is used? and in what manner is the weft beaten up?
4. In what manner is the warp kept in a state of tension?
5. What is the size of the largest webs that can be produced?
6. Is the weaving plain, or are patterns woven in the cloth? if so, of what character are they? and how produced?
7. Is any process of felting known? and how is it applied?
8. Is any kind of bark-cloth manufactured? if so, describe the process and the mode of ornamentation.
9. Are any tissues or kinds of leather or bark ornamented by embroidery? if so, with what materials, and with what kinds of pattern?
10. Is any process of knitting known?
11. Are plaited fringes or other articles of personal clothing or ornament manufactured from cord or strips of leather?

No. LXXX.—POTTERY.

By A. W. FRANKS, Esq., F.R.S.

1. Is pottery made by the natives? or, if imported, from whence? 2. Are there any traditions as to its origin? 3. What are the kinds of clay employed? 4. Are any other substances mixed with the clay? 5. Are the vessels turned on the wheel? 6. What are the most common forms? Give drawings. 7. What are the tools used in fashioning the vessels? 8. How is the ornamentation employed? 9. Are there any scorings or impressed ornaments? and of what patterns? 10. When moulds are used, of what materials are they composed? 11. How is the pottery burnt? 12. If in holes in the ground, is the smoke allowed to permeate the ware? 13. Is any kind of painting employed? and what are the pigments? 14. Is any kind of glaze, either of lead or salt, in use, or any varnish? and of what is the latter composed? 15. Is any porous pottery made, to serve as cooling-vessels? 16. Are any figures of men or animals made of clay? and how are they fashioned? 17. Is the making of pottery the work of any particular class or sex? or does each family prepare its own vessels? 18. Is the pottery exported to any other tribes? 19. Are different qualities used for different purposes? 20. Are earthen vessels made especially for funereal purposes? and if so, are they of different materials from those in ordinary use? 21. Is broken pottery buried in graves or beneath landmarks? 22. What substitutes for pottery are used, such as gourds, shells, &c.? and have they given the form to any of the earthen vessels? 23. Is congealed blood formed into drinking-vessels? and by what process?

No. LXXXI.—LEATHER WORK.

By JOHN EVANS, Esq., F.R.S.

The preparations of the skins of animals, so as to render them fit for use, for clothing and for the hundreds of other purposes to which they are applied, has always been one of the most important occupations of savage life. Even among civilized

replaces the part played by leather has but little diminished in importance.

Skins with the hair on are frequently merely dried, the inner part being dressed with some antiseptic preparation, and sometimes curried or shaved.

Leather, more properly so called, is usually tanned or prepared with bark, like shoe-leather—tawed, or prepared with alum &c., like kid-leather for gloves—or dressed with oil, like chamois or wash-leather.

For each kind the skins pass through several processes, one of the principal being usually the steeping the hides in lime-water, so as to loosen the hair and prepare the substance of the skin for receiving the final dressings. The uses to which skins and leather may be applied are so multifarious, that it would occupy too much space to attempt to enumerate them. The following questions may suggest to travellers some points towards which their attention might be directed :—

1. What are the animals the skins of which are principally prepared for use? is any fish-skin used? 2. In what manner are they removed from the animals? and what instruments are employed for the purpose? 3. Which of them have the hair left upon them? and in what manner are they prepared or dressed? is the hairy side dressed, or treated in any particular manner? 4. If the hair is removed, in what manner is this effected? and how are the hides tanned or prepared? 5. What are the ingredients used for dressing them? and how administered? 6. Are the inner sides of the skins scraped or curried? and if so, with what kind of instruments? 7. Is any beating-process employed so as to render the leather supple? 8. Is the preparation of leather the work of the men or the women? 9. Is the leather dyed, or its surface in any way ornamented or varnished? (In the case of shagreen, this is done by means of hard seeds being incorporated in the body of the leather. In the case of morocco leather, the grain is produced by crumpling the leather.)

10. Are any skins used for holding liquids, like wine-skins? if so, what are they? and how prepared? 11. Are raw hides used, either whole or in pieces or strips? and how applied? (LXXVIII.) 12. For what purposes are the different kinds of leather chiefly used? and are they dressed in any way for the sake of preserving them while in use? 13. Are any portions of the human skin, such as scalps, prepared in any way by drying or otherwise? and if so, how and under what circumstances?

No. LXXXII.—BASKETWORK.

By JOHN EVANS, Esq., F.R.S.

The process of basket-making is closely allied to that of weaving (LXXIX.), and in like manner dates back to a remote period. Baskets made of esparto have been found with hatchets and other instruments of stone in Andalusia; and our ancient British ancestors were renowned for their skill in basket-making, the Latin word *bascauda* being a mere derivative from the British.

“Barbara de pictis veni bascauda Britannis
Sed me jam mavult dicere Roma suum.”

Martial, Lib. xiv. Ep. 99.

Basketwork is either stiff or flexible; the stiff variety is generally made by wattling fine withes over others rather coarser which form the ribs of the structure, while the flexible kind is usually made by plaiting or weaving flat strips together; occasionally, however, rush-like stems are used for this kind of fabric. So closely are some of these baskets woven, that they are perfectly watertight, like the milk-baskets among the Kaffirs.

Basketwork of a coarse kind is sometimes employed in the construction of huts and stockades, and for the manufacture of boats or coracles covered with skin.

Bark of trees is in many countries employed as a substitute for basketwork of various kinds, and is employed even for boats (LXXV.). Articles of clothing, such as hats, and other objects for personal use, such as fans, are frequently made of basketwork. The following questions may serve as hints for the traveller:—

1. What are the materials principally used in basketwork, and how are they prepared? are any plants specially cultivated for basket-making?
2. What are the chief articles manufactured in this manner? If possible, describe the process.
3. What are the principal forms of baskets? and in what manner are they wrought, and to what purposes applied?
4. In what manner are they ornamented?
5. What other articles besides baskets are made in the same manner? and what are their forms and uses?
6. Are strainers or colanders made of basketwork? and if so, for what are they used?
7. Are special forms of baskets

used for special purposes? are they kept, or are they thrown away after having been once used? 8. Are baskets or other articles made from the bark of trees, without any plaiting? what are their forms, and how ornamented? 9. Are waterproof baskets in use? 10. Are baskets used as moulds for pottery? or are earthenware vessels covered with basketwork? 11. Are the shells or rind of any fruits or vegetables used as substitutes for basketwork?

NO. LXXXIII.—STONE IMPLEMENTS.

By COL. A. LANE FOX.

The study of the stone implements of modern savages is of interest as a means of explaining the uses and mode of fabricating those of prehistoric times.

1. What is the mode of cutting stone when metal is not employed? is sand-string or another stone employed for this purpose? 2. In what manner are holes bored in stone, and with what materials? 3. Describe the mode of grinding or polishing the surfaces; and of what materials are the rubbers employed for this purpose? 4. Describe the implements used in flaking, and the mode of holding the stones whilst flaking them. 5. What means are taken to procure long thin flakes? are the stones pressed against the thigh whilst flaking them, or are they bound round tightly so as to increase the line of least resistance to the blow of the flaker? 6. What are the uses of the different forms of stone implements employed? 7. In what manner are they hafted? and with what materials are they bound on to their handles? 8. What materials are employed for the different kinds of stone implements? and where are they procured? 9. What length of time do they take in fabricating the several implements? 10. How long do they continue in use? 11. What becomes of them when they are disused? 12. Are any of them used in the hand without handles? 13. Note and describe the effect of wear upon their edges, and the marks of abrasion where the handles have been fastened on; and observe the manner in which these marks are produced. 14. Note the length of time taken to fabricate the different objects with stone implements. 15. Are there special fabricators of stone implements, or does each man make his own? 16. Are there any implements which are

valued as specimens of the skill of the fabricator? 17. Are small flakes chipped off by pressure or by striking? 18. What is the use of serrated edges? 19. How are scrapers made? 20. Are arrow-heads used as knives in carving? 21. In cutting bone or wood, are flakes used with a sawing or cutting motion? 22. How are small holes, such as the eyes of needles, bored with flint? 23. Are flints used for striking lights? and are any particular forms of flints carried for this purpose? what other materials are used with the flints for this purpose? 24. Are flints or stones kept in water before working them? or do they undergo any other process before they are worked into implements? 25. Are the natural forms of stones and flints ever used as implements? 26. Give the native names of all the different parts of implements and materials employed. 27. Is the form of a knife or an arrow-head much influenced by accidents of fracture during fabrication? 28. To what extent are the different forms designed for special purposes, or merely the result of fashion? 29. Do the several forms of implements pass into one another by varieties, or are the different types well marked and distinct? 30. Are stone implements left as heirlooms? 31. Are there any superstitious usages associated with any of them? 32. Since the introduction of metal, are stone implements still used for religious purposes, mutilations of the body, or any other purpose? 33. Are metal implements made in imitation of the stone ones formerly employed? 34. Are stone implements used as a medium of exchange in lieu of money? (See also No. XIX. *ARCHÆOLOGY*.) 35. Are they regarded as thunderbolts, and supposed to have fallen from the skies? 36. Are they used as amulets?

No. LXXXIV.—METALLURGY.

Smelting; forging; ores, how found; origin of; uses; blacksmiths, &c.

No. LXXXV.—MISCELLANEOUS ARTS AND MANUFACTURES.

All arts and manufactures not included under any special heading.

No. LXXXVI.—MEMORIAL STRUCTURES.

1. Are there other memorial structures apart from those erected over the dead? if so, what is their character? 2. Are stones erected in honour of the dead, apart from those over their graves? 3. Are such monuments ever erected to the living? 4. Are they put up to commemorate battles, murders, accidents, or other historical events? 5. To record journeys, discoveries, or conquests? 6. In honour of, or to propitiate, deities? or to commemorate religious festivals, miracles, or other events connected with religion? 7. Are large conical mounds or cairns ever erected for these or similar purposes? 8. Are any objects buried in such mounds, apart from human remains? 9. Any figures cut in the turf, upon the sides of hills, such as figures of men and animals? 10. Any mounds in the form of saurians, snakes, or other animals? and what do they signify? 11. Are any objects buried in the foundations of buildings or beneath landmarks?

No. LXXXVII.—ENGINEERING.

By JOHN EVANS, Esq., F.R.S.

In most countries, even those now highly civilized, there are earthworks of various kinds belonging to some prehistoric period, and of which, in many instances, the purpose and method of formation are unknown; observations of similar works of more recent construction in other countries may perhaps throw some light upon the history of the more ancient examples.

The prevention of floods by means of *levées* thrown up along the banks of rivers, the construction of artificial islands to serve as places of retreat or safety, the damming up of streams so as to form lakes, the formation of artificial channels either for irrigation or for communication by means of boats, the throwing up earthworks and making palisades for protection in time of war or for hunting-purposes (XLIII.), the construction of bridges (LVIII.), all require a certain amount of engineering skill, and the processes employed are all worthy of study.

It will be well to note any works of this kind, and where possible to give an approximate idea of their antiquity. Where such works are being carried on at the present day, it will be well to state their object and describe the means employed.

1. If earthworks are being constructed, how is the material procured, and how is it transported? what tools are used for digging and carrying? give approximate sections and an estimate of the number of men, women, and children employed, and the amount of work done in a given time. 2. Is any piling employed? and if so, how driven? and are there other materials than earth employed? 3. If palisading is used, how are the trees prepared and fixed in the ground? what is the mode of entrance and its defence? 4. What is the usual manner of constructing bridges?

No. LXXXVIII.—TOPOGRAPHY.

By HYDE CLARKE, Esq.

1. What boundaries are there? how are they marked? 2. What are the names of places or routes followed by the natives? 3. What foreign slaves are there? and what routes can they describe? 4. What geographical beacons or landmarks are there? 5. What seas are known? and what is said of the land beyond them? 6. How do the natives account for the sources of rivers and the formation of hills, valleys, rocks, &c.? 7. What generic names have they for the natural forms of land and water? 8. What is their idea of the form of the universe? 9. What account do they give of the history of creation? 10. Give drawings of any native maps, and state whether they are done by the eye or by measurement.

No. LXXXIX.—SWIMMING.

Mode of; powers of; uses; diving.

No. XC.—NATURAL FORMS. By COL. LANE FOX.

In the infancy of the arts mankind must have availed themselves of the natural forms of the objects met with; and as the process of adapting and modifying them to their wants has been slow and continuous, traces of the forms of nature have been preserved in those arts which are indigenous and have remained isolated. When, on the other hand, they have been derived from civilized races, or have degenerated from a more advanced state, the more complex forms of the higher civilization become conventionalized, and are frequently retained in an altered condition after the knowledge of their original uses has been lost. It is desirable, therefore, to pay attention to the forms of the objects constructed by savages, with the view of ascertaining to what extent they approximate to the natural forms of the materials employed, and to note those objects in which the natural forms have been little or not at all changed.

1. Do the clubs and other weapons approximate to the natural forms of the stems, roots, or branches of trees? 2. Are the curves the natural curves of the branches? and do they follow the grain of the wood? 3. Are the natural forms of stones employed as hammers, mace-heads, or for other purposes? 4. Are gourds, shell-fruit, sea-shells, human or other skulls employed as drinking-vessels? 5. Are the forms of these closely imitated in pottery? 6. Are gourds, reeds, bones, skulls, sinews, and root-fibres employed in musical instruments? 7. Are the skins of animals or bark of trees much altered in clothing? 8. Are the skins of animals flayed off the body with only one incision employed as water-vessels, bagpipes, pouches, or bellows? 9. Are the head-skins of animals, with the ears and mane, employed as head-dresses, or the skins of horned or prickled fish? 10. Are any of them copied in artificial head-dresses? 11. For what purposes is the bamboo used—tubes, drinking-vessels, baskets, rings, &c.? 12. Are shells, teeth, claws, seeds, bones, beetles' wings, vertebræ of snakes, and other natural objects employed as personal ornaments? 13. Are any of these copied in metal for the same purpose? if so, give drawings of them. 14. Are the defences of animals employed in artificial defences—tusks or horns as spears? sawfish-blades as swords? teeth, claws, split reeds, or blade of the sting-ray as arrow-points? crocodiles' backs as breast-plates or shields? scales of the pangolin as scale-armour? 15. Are any of these copied in metal? if so, give drawings. 16. Are the thorns or spines of trees employed as barbs, awls, pins, needles, or for other

piercing-purposes? 17. Is a plough used, consisting of a tree-stem, with a branch as a share? 18. Are trees or skins used as boats, the people sitting outside? 19. Are caves, rock-shelters, or tree-tops used as dwellings? 20. Can the use of these be traced in the architecture of the people? 21. Are leaves used for roofing?

NO. XCI.—CONSERVATISM.

By E. B. TYLOR, Esq., F.R.S.

The indisposition of most men to change of habits is to be studied for its immense practical effect as a barrier to improvement in art and reformation in society, while also, to a great extent, it tends to preserve existing art and knowledge from decay. Among its results, one has special value to anthropologists as a means of tracing the history of civilization. This is "survival," which takes place when old arts and fashions, though superseded for ordinary purposes, are kept up under special circumstances, especially on state occasions and in solemn ceremonies, as may be exemplified in our official retention of garments otherwise disused, or in the making of fire for religious purposes in India by the almost forgotten process of friction of wood. These "survivals" prove that the people keeping them up had them in ordinary use at some earlier period, information which history often fails to give.

1. Is there a general attachment to ancestral habits and dislike to change and reform? 2. Does this refer to all the proceedings of life, or especially to matters of state, magic, religion, &c.? 3. Are weapons, houses, &c. made in a way which is practically unreasonable, and only intelligible as the keeping up of ancient ruder practices? 4. Are any rude arts or inconvenient customs kept up as matters of ceremony while disused for ordinary purposes? 5. Do any of the usages at festivals, peculiar dishes and costumes, &c., appear to be relics or "survivals" from an earlier state of civilization?

NO. XCII.—VARIATION. By E. B. TYLOR, Esq., F.R.S.

Every slight variety which distinguishes the art and custom of a tribe from those of its neighbours is worth study, as affording evidence of the course of development into new forms.

This is well shown by weapons &c., all the varieties of which should be noticed, and drawings of them preserved. Many of the connecting links between existing forms have no doubt been lost, but might be discovered by inquiring of the older natives, or by examining the relics deposited in the graves.

It is obvious that these remarks apply to arts and customs in general.

Are, then, variations of this kind noticed which seem to have arisen in the tribe, as to social customs, penalties, and course of judicial procedure, religious doctrines, ceremonies, &c.? Can reasons be assigned for these changes taking place, and especially are they improvements? Do the tribe tell any myths &c. slightly altered from the form in which they are current among neighbouring tribes?

No. XCIII.—INVENTION. By E. B. TYLOR, Esq., F.R.S.

Among nations capable of historical record, account is to some extent given of the invention of particular arts, the introduction of new laws, the change of customs, &c. All such accounts should be preserved, although, more often than not, they are but fables invented to account for the facts. Otherwise our information as to new inventions &c. must be derived from inspection of the arts themselves. Thus some instruments show that they must have been derived by improvement from earlier and ruder forms, as the cross-bow from the long-bow. Some arts are judged to have grown up among a particular tribe because no neighbouring tribe possesses them—like the use of iron pyrites for striking fire among the Fuegians. The best general advice to observers is, that in cataloguing the details of art and customs, they should carefully look for symptoms of native invention and modification.

1. Are there any arts used which are not common to most or all tribes of the district? 2. If so, are they such as the people themselves probably invented? 3. Are there any tools, weapons, &c. used which seem as though they had been improved or modified by the people? 4. Are any such arts connected with plants or minerals specially belonging to the district, so as to show that they were no doubt brought into use by direct discovery or invention there? 5. Do the people themselves claim to have invented any such art &c.? and if so, is the alleged inventor a mythic personage or divine ancestor, or does he belong to actual history?

PART III.

MISCELLANEOUS.



No. XCIV.—POPULATION.

By FRANCIS GALTON, Esq., F.R.S.

Count wherever you can. The contingents of fighting-men afforded by a district, as compared with that procurable from other districts, gives their relative population, and it is not difficult to make out the particulars of a small district in detail. In some countries the numbers attending a religious festival may give a clue, so may the number of marriage-feasts and burials.

No. XCV.—CONTACT WITH CIVILIZED RACES.

By SIR T. GORE BROWNE.

1. Were the first civilized strangers who visited the races reported on refugees, convicts, deserters, settlers, or missionaries?

2. Did they communicate the vices rather than the virtues of civilized life?

3. What was the influence of the missionaries? Did they impart religious instruction only? Was the conversion of the tribe reported on real, or did they only add a belief in a new sort of magic to their old superstition?

4. Did the missionaries impart instruction in the uses, habits, and arts of civilized life? and if so, with what effect?

5. Are the Aborigines apt at, and did they make rapid progress in, learning the elements of knowledge?

6. Are they able to advance beyond the elements? and if not, is the cause a physical one?

7. Is there any physical bar which prevents the race from elevating itself in the social scale?

8. Has any existing civilized race acquired knowledge of the arts of civilization in less than several generations? And if civilization be not gradually and spontaneously developed, is it possible to force it rapidly on any particular race without causing its destruction or decay?

9. On first contact with a civilized race aboriginal races usually retire or give way, but no decrease in numbers is at first perceptible. At what period did the decrease in number of the race reported on become perceptible?

10. Was any taint in the blood or other cause of decay known to exist in the aboriginal race before they came in contact with civilized men?

11. Were the women in the habit of using any particular food affecting their reproductive powers? (The Maoris do.)

12. Can the decay of the race be partially attributable to sudden change in the habits of life, want of the excitements proper to savage life, and listlessness resulting from passions subdued (but not eradicated), in obedience to the commands of the Christian religion and enlightened laws? such change having been enforced before "culture" and a knowledge of the arts of civilization has provided other pursuits and enjoyments.

13. If No. 12 is answered in the affirmative, would the same consequences have ensued if the change from savage to civilized life had been gradually developed instead of having been stimulated by contact with a superior race and rapidly effected?

14. What effect, in causing disease, has a partial change of diet and dress? *i. e.* is disease produced by the occasional use of European clothing and a sudden return to the nakedness of savage life? by temporary residence in towns and a return to the smoky, unventilated cabins used by savages?

15. What have been the effects of scrofula, smallpox, typhus, and other diseases unknown before the arrival of white men?

16. What remedies were used by the Aborigines? or did they refuse all remedies?

17. To what extent have diseases affecting the sexual organs been introduced by white men?

18. Can it be shown that, after intercourse with white men, aboriginal women are either sterile or less prolific with men of their own race?

19. Is commerce with white men necessarily fatal to aboriginal races.

20. Can any system (which the superior race would submit to) be suggested by which the fatality attendant on the contact of white and aboriginal races would be avoided or mitigated?

21. Would it be desirable, and if desirable would it be possible, to forbid the settlement of whites in isolated positions surrounded by Aborigines, and to require them to settle in specified localities, from which they should only extend by the acquisition of contiguous blocks of land?

22. Are the laws of England suited to the abnormal state of society necessarily existing when white men first intrude on an aboriginal race? and is it capable of adequately protecting the rights and interests of the latter?

23. What effect has the custom of holding lands in common upon aboriginal races?

24. If the communal tenure is a bar to progress in civilization, would it be possible to induce the race reported on to divide their lands and cultivate them for the benefit of families or individuals?

25. In cases where land has been so cultivated, what has been the result?

26. What is the condition of any individuals among the Aborigines who have been educated from childhood by Europeans and have consequently adopted European habits and customs? and are their families as numerous on an average as those of Europeans?

27. What effect has the partial contact of European with black races, *e. g.* the Zulus? Has the race reported on welcomed or resisted the approach of civilization?

28. Compare the condition of the aboriginal race in districts where they mix with Europeans with that where there are few or no Europeans.

No. XCVI.—PRESERVING SPECIMENS.

By DR. BARNARD DAVIS, F.R.S.

If it be possible to procure *human skulls*, get them in as perfect a state as possible, with lower jaws, teeth, and every part complete; but at the same time do not cast away altogether imperfect specimens. These are worth preserving. All should be packed up as carefully as possible, previously marking in some part of each, in ink if it is accessible, the name of the tribe to which the individual has belonged, the place at which the specimen was obtained, even the name and age of the individual if these can be ascertained.

If after a battle, or other slaughter, the head of a native can be obtained with the soft parts in it, it might be preserved and transmitted carefully and perfectly closed up in a small keg filled up with spirit, or brine thoroughly saturated with salt.

No. XCVII.—ANTHROPOLOGICAL COLLECTIONS.

Instructions for obtaining, preserving, and disposing of.

No. XCVIII.—CASTS, &c.

Instructions for taking casts of objects, rubbings, inscriptions, and antiquities, &c.; masks of faces, &c.

No. XCIX.—PHOTOGRAPHY.

Instructions for the use and transport of photographic apparatus.

NO. C.—STATISTICS.

By FRANCIS GALTON, Esq., F.R.S.

The topics suitable to statistics are too numerous to specify; they include every thing to which such phrases as "usually," "seldom," "very often," and the like are applicable, which vex the intelligent reader by their vagueness and make him impatient at the absence of more precise data. The principal things to be borne in mind in making statistical inquiries are:—

1. That the groups with which they deal should be homogeneous. *Ex.* It would be correct to inquire into the average height, and the frequency of different degrees of deviation from it, of greyhounds, and similarly as regards the speed of race-horses; but it would be absurd to talk of these averages as regards dogs or horses generally, because there are many varieties of them differing greatly and irregularly in height and speed (see further remarks in par. 5).

2. When the homogeneous groups are largely governed by the variation of a dominant influence, it is necessary to split them up into subdivisions, each referring to a short phase of the variation. *Ex.* It is correct to seek the average height of boys between 11 and 12, 12 and 13, and so on, but it would be absurd to seek that of boys generally.

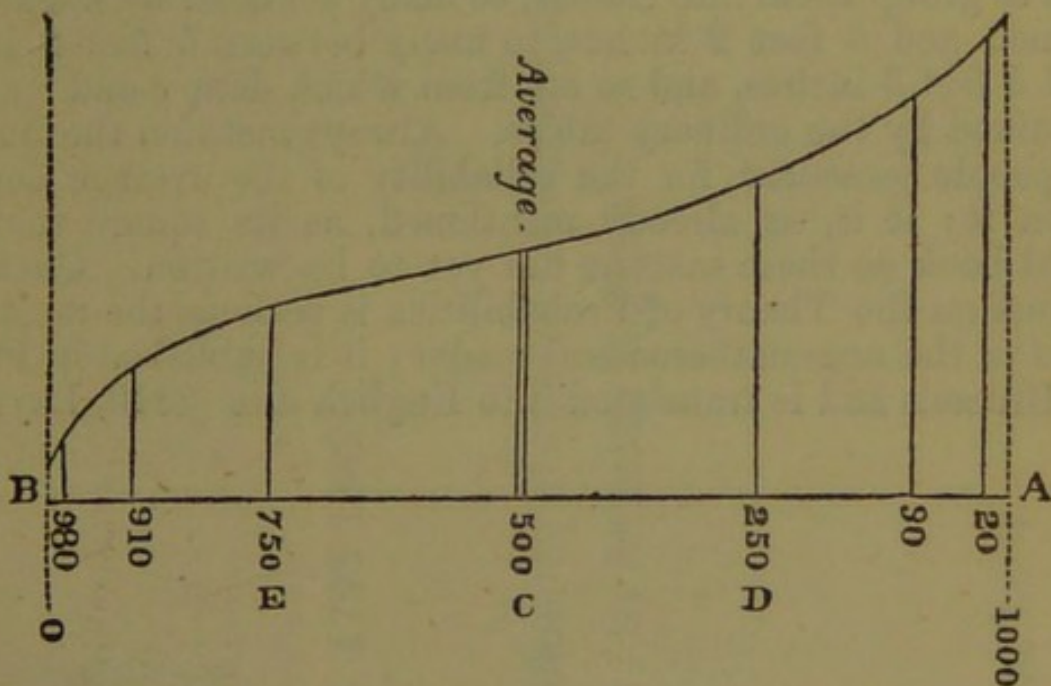
3. To select cases on a system wholly independent of the quality about which the inquiry is made. *Ex.* It would be correct to estimate the stature of the male adults of a nation by measuring individuals selected by lot; but it would be incorrect to take townsmen alone, and still worse those who lived in an unhealthy suburb of a town. It requires keen observation and much wariness to avoid errors due to a neglect of this caution, because phenomena that appear independent are often linked together in indirect and subtle ways. *Ex.* If we were to select the upper classes of Londoners according to the initial letter of their names, as printed in the Court Guide, and were to choose the letter Z for the purpose, we should be led utterly astray, as nearly all those names are foreign.

4. As regards the requisite number of cases, a few that are wisely selected and accurately reported are better than very many that are not. Each error sacrifices several good observations before it is diluted until it disappears; but if a faulty bias

(as in par. 3) runs through all the observations, no increase in their number will eliminate it. Otherwise, the rule is that the precision varies as the square root of the number of observations; thus, twice the precision necessitates four times the labour. It is the best plan to proceed tentatively; if the results fall into more harmonious sequence as you proceed, it is worth proceeding; and if after dividing your statistics into 2, 3, or 4 groups you find the groups agree pretty well and that their sums form a yet more regular curve than that obtained from any of the subdivisions, you may safely trust it.

5. The law of deviation.—Mention is above made of “homogeneous” groups: this epithet is applicable when individual differences are entirely due to the *aggregate* effect of a great many small and independent variable influences. *Ex.* The stature of an English male adult is due to his being a man of English race, reared under the range of those conditions of food, temperature, clothing, disease, and the like which prevail in England. The large causes common to all are the English breed and the range of English conditions; the small causes are differences of varieties and families, and of food, temperature, clothing, and the rest, within the range. The law of deviation depends wholly on the fact of *multifariousness of origin*; it has no more to do with the particular items of that multifariousness than the rules of arithmetic have to do with the quality of the things to be added or multiplied. Two and three make five, whether the objects be pence, or peas, or bills before Parliament; so the law of deviation holds for the stature of men and animals, and apparently, in a useful degree, for every homogeneous group of qualities or compound qualities, mental or bodily, that can be named. It is a very general statistical law. The obvious effect of multifariousness is to make it an extremely rare event that all or nearly all the influences should be exerted in the same direction. *Ex.* It is a very rare event that all the cards in a hand at whist are found to be of the same colour. This is a simple result of the law of permutation: there are a vast and calculable number of different events each of which is equally likely to occur, and only one of these is the event in question. Proceeding on this principle and making certain rather forced suppositions to render calculation feasible, the law of deviation is mathematically deduced; and comparing fact with theory, wherever comparison is possible, it is found that they agree very fairly and in many cases surprisingly well. Reasoning backwards, we may suspect that a group is not homogeneous, or that the

large influences are not sufficiently subdivided into phases (refer back to 3), when it does not conform to this law. The law shows that the frequency of small deviations must be very much greater than that of large ones, and that the larger the deviation is, whether above or below the average, so the frequency of the occurrence diminishes in an accelerating degree. It also shows, owing to the suppositions introduced, that the deviations on either side of the average are symmetrical; this is rarely strictly the case in nature. The rate of diminution, according to the above-mentioned theory, is shown in the following diagram,



in which I suppose 1000 men to be ranged in a long line in order of stature, beginning with the tallest at A and ending with the shortest at B. Then the middle man at C (500th in the scale) will be of the *average* height, and the 250th man at D will be as much taller than the one at C (owing to the symmetry of the curve) as the 750th, at E, is shorter. Knowing these two facts, the height at C (call it c) and the difference (call it r) between C and D (or C and E), we can tell the distribution of height all along the line until we come near the ends, where the run of the figures always becomes irregular. Thus it will be found that the height of the 90th man is $c+2r$; that of the 20th man is $c+3r$. Similarly the 910th man is $c-2r$, and the 980th is $c-3r$. The curved line of the diagram remains unaltered whatever may be the number of equal parts into which the horizontal line A B is supposed to

be divided. If it referred to 100 men instead of 1000, the ordinates would correspond to the 2nd, 9th, 25th, 50th, 75th, 91st, and 98th men instead of the 20th, 90th, &c.; consequently the traveller need only deal with a moderate number of men, arranging them in a series, and noting the height of those who stand at the *quarter points*. Thence he obtains c and r . He may do this for any quality whatever, running, shooting, colour, &c.; but it would be very proper that he should take notes concerning the men standing at the other points I have named, besides C and D. The common but much more laborious way of obtaining these results is to measure every individual and to group them into classes, so many per cent. between 5 feet 1 inch and 5 feet 2 inches, so many between 5 feet 2 inches and 5 feet 3 inches, and so on, from which data c and r can be obtained by the ordinary tables. Always mention the number of people measured, for the reliability of the average depends upon it; it is, as already mentioned, as its square root. A good book on these matters has yet to be written. Quetelet's letters on the Theory of Probabilities is perhaps the most suitable to the non-mathematical reader; it is published in French in Brussels and is translated into English also (1849, Layton).

THE END.