The most favorite classification, however, has always been that according to the skulls. The skull, as the shell of the brain, has by many students been supposed to betray something of the spiritual essence of man; and who can doubt that the general features of the skull, if taken in large averages, do correspond to the general features of human character? We have only to look round to see men with heads like a cannon-ball and others with heads like a hawk. This distinction has formed the foundation for a more scientific classification into brachycephalic, dolichocephalic, and mesocephalic skulls. The proportion of 80:100 between the transverse and longitudinal diameter gives us the ordinary or mesocephalic type, the proportion of 75:100 the dolichocephalic, the proportion of 85:100 the brachycephalic type. The extremes are 70:100 and 90:100.

If we examine any large collection of skulls, we have not much difficulty in arranging them under these classes; but if, after we have done this, we look at the nationality of each skull, we find the most hopeless confusion. Pruner Bey, as Peschel tells us in his "Volkerkunde," has observed brachycephalic and dolichocephalic skulls in children born of the same mother; and if we consider how many women have been carried away into captivity by Mongolians in their inroads into China, India, and Germany, we cannot feel surprised if we find some longheads among the roundheads of those Central Asiatic hordes. Only we must not adopt the easy expedient of certain anthropologists who, when they find dolichocephalic and brachycephalic skulls in the same tomb, at once jump to the conclusion that they must have belonged to two different races. When, for instance, two dolichocephalic and three brachycephalic skulls were discovered in the same tomb at Alexanderpol, we were told at once that this proved nothing as to the simultaneous occurrence of different skulls in the same family: nay, that it proved the very contrary of what it might seem to prove. It was clear, we were assured, that the two dolichocephalic skulls belonged to Aryan chiefs and the three brachycephalic skulls to their non-Aryan slaves, who were killed and buried with their masters, according to a custom well known to Herodotus. This sounds very learned, but is it really quite straightforward?

Besides the general division of skulls into dolichocephalic, brachycephalic, and mesocephalic, other divisions have been undertaken, according to the height of the skull, and, again, according to the maxillary and the facial angles. This latter division gives us orthognathic, prognathic, and mesognathic skulls.

Lastly, according to the peculiar character of the hair, we may distinguish two great divisions, the people with woolly hair (Ulotriches) and people with smooth hair (Lissotriches). The former are subdivided into Lophocomi, people with tufts of hair, and Eriocomi, people with fleecy hair. The latter are divided into Euthycomi, straight-haired, and Euplocomi (not Euplocomic, wavy-haired, as Brinton gives it), wavy-haired. It has been shown that these peculiarities of the hair depend on the peculiar form of the hair-tubes, which, in cross-sections, are found to be either round or elongated in different ways.

Now all these classifications, to which several more might be added, those according to the orbits of the eyes, the outlines of the nose, the width of the pelvis, are by themselves extremely useful. But few of them only, if any, run strictly parallel. It has been said that all dolichocephalic races are prognathic, and have woolly hair. I doubt whether this is true without exception; but, even if it were, it would not allow us to draw any genealogical conclusions from it, because there are certainly many dolichocephalic people who are not woolly-haired, as, for instance, the Eskimos (Brinton's "Races and Peoples," p. 249).

Now, let us consider whether there can be any organic connection between the shape of the skull, the facial angle, the conformation of the hair, or the color of the skin, on one side, and what we call the great families of language on the other. That we speak at all may rightly be called a work of nature, *opera naturale*, as Dante said long ago; but that we speak thus or thus, *cosi o cosi*, that, as the same Dante said, depends on our pleasure — that is our work. To imagine, therefore, that as a matter of necessity, or as a matter of fact, dolichocephalic skulls have anything to do with Aryan, mesocephalic with Semitic, or brachycephalic with Turanian speech, is nothing but the wildest random thought; it can convey no rational meaning whatever. We might as well say that all painters are dolichocephalic, and all musicians brachycephalic, or that all lophocomic tribes work in gold, and all lissocomic tribes in silver.

If anything must be ascribed to prehistoric times, surely the differentiation of the human skull, the human hair, and the human skin, would have to be ascribed to that distant period. No one, I believe, has ever maintained that a mesocephalic skull was split or differentiated into a dolichocephalic and a brachycephalic variety in the bright sunshine of history.

But let us, for the sake of argument, assume that in prehistoric times all dolichocephalic people spoke Aryan, all mesocephalic, Semitic, all brachycephalic, Turanian languages; how would that help us?

So long as we know anything of the ancient Aryan, Semitic, and Turanian languages, we find foreign words in each of them. This proves a very close and historical contact between them. For instance, in Babylonian texts of 3000 B.C. there is the word *sindhu* for cloth made of vegetable fibres, linen. That can only be the Sanscrit *sindhu*, the Indus, or *saindhava*, what comes from the Indus. It would be the same word as the Homeric σινδών, fine cloth ("Physical Religion," p. 87). In Egyptian we find so many Semitic words that it is difficult to say whether they were borrowed or derived from a common source. I confess I am not convinced, but Egyptologists of high authority assure us that the names of several Aryan peoples, such as the Sicilians, and Sardinians, occur in the fourteenth century B.C., in the inscriptions of the time of Menephthah I. Again, as soon as we know anything of the Turanian languages — Finnish, for instance — we find them full of Aryan words. All this, it may be said, applies to a very recent period in the ancient history of humanity. Still, we have no access to earlier documents, and we may fairly say that this close contact which existed then existed, probably, at an earlier time also.

If, then, we have no reason to doubt that the ancestors of the people speaking Aryan, Semitic, and Turanian languages, lived in close proximity, would there not have been marriages between them so long as they lived in peace, and would they not have killed the men and carried off the women in time of war? What, then, would have been the effect of a marriage between a dolichocephalic mother and a brachycephalic father? The materials for studying this question of *metissage*, as the French call it, are too scanty as yet to enable us to speak with confidence. But whether the paternal or maternal type prevailed, or whether their union gave rise to a new permanent variety, still it stands to reason that the children of a dolichocephalic captive woman might be found, after fifty or sixty years, speaking the language of the brachycephalic conquerors.

(To be continued.)

NOTES AND NEWS.

FROM an experiment reported in Bulletin No. 35 of the Kentucky Experiment Station, which is located in the heart of the Blue Grass region at Lexington, it appears that the results are the same as they have been for the last two seasons, that fertilizers, whether used in combination or singly, have no effect upon the yield of wheat. On the same lands, for corn, potatoes, hemp, and tobacco, the results of potash fertilizers show very favorably.

— Sr. H. Morize, astronomer at the observatory of Rio de Janeiro, has just published a "Sketch of the Climatology of Brazil," which will be welcome to meteorologists, as hitherto systematic observations have only been published for a very few points of that immense country, covering 39 degrees of latitude. The sketch has been drawn up mainly from the observations of travellers and private observers. *Nature* extracts a few brief notes from the sketch, as follows. Thunder-storms are very frequent all along the coast, and are mostly harmless; regular cyclones are very rare. The most dangerous winds are the pamperos, which blow from the south-west, and have been fully described by the late Admiral Fitz-Roy, and a still more rare and dangerous wind which blows from the south-east. As regards temperature, the

author has divided the country into three zones, and some valuable data are given for various localities. Parts of the country are subject to prolonged drought; it is said that at Pernambuco no rain fell during the whole year 1792, and a third of the population died from its effects; droughts have recurred during the present century with some regularity, the last being in the year 1888–89. The most complete series of observations is that for Rio de Janeiro, which dates from 1781, with occasional interruptions. The highest shade temperature was 99.5° in November, 1883, and the lowest 50.4° in September, 1882. There are also good series of observations for Rio Grande do Sul and São-Paulo.

—A recent calf-feeding experiment made at the Iowa Agricultural Experiment Station seems to indicate that (1) a ration of skim milk and ground flaxseed compares favorably with a new-milk ration for young calves; (2) the larger gain came from the whole milk, but a part of it was partly due to the individuality of the calves, and good results and thrifty growth were made on skim milk and ground flaxseed; (3) the skim-milk calves were interrupted less in their growth by weaning than the whole milk calves; (4) a saving in value of butter fat alone of $1.11 per month on each calf was effected by substituting the ground flaxseed; and (5) the cost of producing a pound of gain was 7.6 cents for the fresh-milk ration and 5 cents for the skim-milk ration.

— According to *Nature*, M. Lancaster has recently indicated in *Ciel et Terre* the divergences from normal temperature in Europe in the five years 1886–90. It appears (and is shown in a map) that the centre of the "island of cold" lies over the north of France, the south of Belgium, and the most western parts of Germany. From this centre the cold decreases pretty regularly outwards on all sides to a nearly circular line of *nil* divergence, which, embracing the whole of Great Britain, crosses the south of Sweden, then goes along the German-Russian frontier, through Hungary, the south of Italy, the north of Africa, and across Spain. Throughout this inclosed region abnormally low temperatures have prevailed. Siberia, too, shows thermal depression, which M. Lancaster thinks may be connected with that in western Europe.

— In *Nature Notes* for August, Mr. R. T. Lewis, on the authority of a correspondent in whose trustworthiness he has entire confidence, gives a curious account of the appreciation with which the song of the cicada is heard by insects other than those of its own genus. The correspondent has frequently observed in Natal, says *Nature*, that when the cicada is singing at its loudest, in the hottest portion of the day, it is attended by a number of other insects with lovely, gauze like, irridescent wings, whose demeanor has left no doubt on his mind that the music is the attraction. The cicada, when singing, usually stations itself upon the trunk of a tree with its head uppermost, and the insects in question, to the number sometimes of fifteen or sixteen, form themselves into a rough semicircle at a short distance around its head. During a performance one of the insects was observed occasionally to approach the cicada and to touch it upon its front leg or antennæ, which proceeding was resented by a vigorous stroke of the foot by the cicada, without, however, any cessation of its song. The insects composing the audience are extremely active; and so wary that they take flight at the least alarm on the too near approach of any intruder. Some of them, however, have been captured; and on examination these "proved to belong to the same family as the most beautiful of British insects, the lace-wing fly, which, indeed, they closely resemble except as to size, their measurement across the expanded wings being a little over two inches. They have since been identified by Mr. Kirby at the British Museum as *Nothochrysa gigantea*."

— An experiment to test the effect of feed on the quality of milk, recently made at the Iowa Experiment Station, indicates that: (1) quality of milk, so far as measured by its percentage of fat, was changed by feed to a much greater degree than was quantity. Two-thirds of the increase in average gross yield of butter fat was due to improved quality of the milk, and only one-third to increased milk flow. (2) Sugar meal produced .58 of a pound more butter fat per 100 pounds of milk than did corn and cob meal; this difference is seventeen per cent of the amount of fat in 100 pounds of milk produced by corn and cob meal. (3) Sugar meal produced .73 of a pound more total solids per 100 pounds of milk than did corn and cob meal; this difference is six per cent of the solids in 100 pounds of milk produced by corn and cob meal. (4) As compared with corn and cob meal, sugar meal increased the ratio of fat to "solids not fat" in 100 pounds of milk, from 396 per 1,000 of "solids not fat," to 457 per 1,000 of "solids not fat" an increase of over fifteen per cent.

— Under the heading "Breeding of Orchard and Garden Fruits" attention is directed in a recent bulletin of the Iowa Agricultural Experiment Station to the following well supported facts: (1) In the States west of Lake Michigan no important advances have been made in the great work of adapting fruits to the peculiar climate and soil of Iowa by growing seedlings from the variety introduced from south-western Europe, nor from their seedlings originating in the Eastern or Southern States. (2) Valuable seedlings of the orchard and garden fruits have come from the varieties introduced from eastern Europe or northern Asia, and from native species. (3) Methodic crossing and hybridizing have given in the past, and promise to give in the near future, more valuable and certain results than can be hoped for from chance breeding from intermingled varieties and species.

— We learn from the Tiflis paper *Caucasus*, says *Nature*, that during an excursion to the sources of the Jiagdon, which was made recently by several explorers, no fewer than eight glaciers were discovered, six of which are not marked on the five-versts-to-the-inch map of Caucasus. They have been viewed now and sketched from Styr-khokh Pass. The southern slope of the branch-ridge of the main chain, between the Kazbek and the Syrkhubarzon peak, has also been sketched from the Trussoff's Pass, and it appears that several of the glaciers of this part of the chain are not represented on the great map, while perpetual snow is shown where there is none. The glaciers visited by the party proved to have very much changed their aspect since 1882. Several sulphur and iron carbonate springs were visited in the Trussoff's valley, and several interesting Alpine flowers in bloom were collected on the passes.

— It is well known that the fox possesses an excellent "head for country." Referring to this subject in an interesting article in the current number of the *Zoologist*, and quoted in *Nature*, Mr. Harting says a fox has been known to return seventy miles to his "earth," and this not once, but three times. He was caught in Yorkshire, and sent into Lancashire to be hunted by the hounds of the late Mr. Fitzherbert Brockholes of Claughton Hall, Garstang, and his identity was established by his having been marked in the ear by the fox-catcher. This story Mr. Harting had from his friend Captain F. H. Salvin, who was living in Yorkshire at the time, and was well acquainted with Mr. Brockholes, who gave him all the details.

— The following are some results of Herren Elster and Geitel's recent electric observations on the Sonnblick, described to the Vienna Academy, and noted in *Nature* of Sept. 10: The intensity of the most refrangible solar rays, measured by their discharging effect on a negatively electrified surface of amalgamated zinc, is about doubled on rising 3,100 metres from the lowland. The authors were unable to find other actino-electrically active substances; even pure fresh snow and dry Sonnblick rock were not perceptibly discharged by light. Waterfalls may produce in a valley a negative fall of potential, and to considerable heights (500 metres). The morning maximum in fall of potential, observed regularly between 7 and 9 A.M. in the plain and in Alpine valleys, was absent at 3,100 metres. Before thunder-storms in July, the positive fall of potential sank gradually, in light showers, to *nil*, at which it remained sometimes two or three hours till completion of the electrical process in the cloud. In thunder-clouds, or on low ground, during a thunder-storm, the atmospheric electricity usually changes sign after a discharge. St. Elmo's fire (negative as often as positive) always accompanied thunder-storms. The observation that negative St. Elmo's fire burns with blue flame, positive with red, was repeatedly confirmed.

— Professor Erwin H. Barbour, formerly of Iowa College, Grinnell, Io., has been elected to the chair of geology at the University of Nebraska, Lincoln, Neb.