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THE SO-CALLED NORTH EUROPEAN RACE OF MANKIND.

A REVIEW OF, AND VIEWS ON, THE DEVELOPMENT OF SOME
ANTHROPOLOGICAL QUESTIONS.

(*The Huxley Lecture for 1909.*)

BY PROFESSOR GUSTAF RETZIUS.

WHEN I received the flattering invitation from the Council of the illustrious Royal Anthropological Institute of Great Britain and Ireland to give the "Huxley Memorial Lecture" this year in London, I rather hesitated to accept this honour, having of late for some years devoted myself chiefly to researches in the world of the microscope.

But in recalling to my mind the image of that man in memory of whom these lectures are instituted, and in considering what science owes to him, my desire to accept the invitation overcame finally my hesitation. This decision was last but not least confirmed by the recollection of the numerous proofs of cordiality and friendship which I had received from that grand scientist on the occasions when I had the pleasure of meeting him, and also in other ways.

Though that matter was thus settled, there still remained the difficult problem of selecting a subject suitable for the purpose.

The races of Europe, to which I have principally devoted my anthropological studies, had already been comprehensively dealt with by Dr. Deniker in 1904, in his Huxley Lecture on that subject. I thought next of the enticing task of attempting to give a survey of the finds, both of early and recent date, relating to the ancient so-called *Neanderthal race* in Europe, which in so many respects are apt to confirm the ingenious conception of Huxley himself regarding the relation between that race of ancient times and those of the present day. However, as the documents dealing with the most recent finds are as yet only published in part, it would not have been suitable to take up that topic for a detailed discussion, tempting though it might be to do so.

It is doubtless an essential feature of these lectures, that the subject should be chosen in that particular field of anthropological science to which the respective lecturer has devoted his special attention. Consequently, I have decided to choose that branch of the blond long-headed race in Europe which, from ancient times, has had its home in my native country of Sweden, and I propose to deal with it in my lecture to-day, seeing that it is upon that that my own researches in

anthropology have mainly been directed. That race, which has for a long time past been spread over northern, and especially north-western Europe, and which has recently, owing to emigration, begun to form an increasingly large element in the white population of North America and other continents, has not been subjected to thorough investigation until recently, and is therefore, comparatively speaking, little known.

It was principally the study of the shape of the cranium that led anthropologists to pay special attention to and define this race and element, now usually termed the North European race, and so it may be of interest to my audience if I recapitulate here the chief facts in the history of our knowledge regarding that part of the human frame. It is the more desirable for me to do so, as it has become the fashion latterly—not so much among the representatives of the science of anthropology themselves as among outsiders—rather to diminish the importance of that portion of anthropology which is termed craniology. It is evident that these opponents, some of them hypercritical, others quite uncritical in their judgments, have unreasonably looked for startlingly remarkable results from this method of investigation, and have been ready, on discovering that the solution of the great problems has not been immediately forthcoming, to throw the blame for that on the method itself. That, however, is unjust in the extreme. On the same principle it would be possible to condemn various other branches of scientific research, *e.g.*, meteorology, physiology and several of the branches of medical science, for they too have failed as yet to lead us to the goals we have imagined we were to reach by their aid. The fact is, we imperfect human beings have got to realise that the highest goals are also the most difficult of attainment, and moreover, that nothing whatever is absolutely certain. Do we not repeatedly see that faults and deficiencies are discovered in almost everything that has been once for all, as it was thought, accepted as true and perfectly sure? To take a case in point, it is not many years ago since we were informed and taught, both at school and elsewhere, that the chemical elements were strictly individual and invariable, whereas now that theory has been proved to be untenable by the epoch-making discoveries of Sir William Ramsay.

But even if the investigator is not successful in arriving at the final solution of the problem which he is engaged upon, the labour that he expends in his efforts serves to extend the knowledge of the subject continually. In this connection I may perhaps be allowed to quote the apt words of the great natural scientist, Carl Ernst von Baer, written half a century ago, in his well-known “*Bemerkungen*” upon the desiderata for future investigation in the department of craniology, relative to the suggestions for the classification of the various forms of the cranium, which had been made by a prominent Swedish anatomist of that day: “*Mir scheint, dass dieser Impuls Epoche in dem Studium der Verschiedenheiten der Völkerstämme und Völker, somit auch in dem Urtheil über die Bedingungen derselben machen kann und hoffentlich auch machen wird. Nicht als ob ich glaubte, dass diese Früchte schon morgen in den Schooss fallen werden, oder auch nur in der*

Zeit eines Menschenalters gährndet werden Die wissenschaftliche Forschung führt uns freilich nicht ganz zu den letzten Zielen, die wir allmählich erkennen oder wenigstens ersehnen lernen, aber die letzten Ziele mit Bestimmtheit in's geistige Auge gefasst, lassen doch eine Menge Verhältnisse auffinden und erkennen, zu denen wir nicht gelangen würden, wenn wir nicht nach den wissenschaftlichen Zielpunkten zu suchen lernten."

If now a just and impartial summary be made of the results of research in craniology during the past half-century, it will be found that their total amount is by no means unimportant, even though the actual aim that was sought to be attained has not been reached. It must be remembered that anthropology makes use of a variety of methods and the object in view is to advance knowledge as a whole by a wise combination of them all. Science is, as a rule, most satisfactorily advanced by her devotees applying a new method or a new process for a considerable time after its discovery, and indeed until it no longer proves efficacious or until it has been superseded by a better one. It is bound to happen that from time to time a pause, as it were, in the general advance will occur, and when that is so, it is apt to call forth expressions of disappointment and of unjust criticism both of the method employed and of the scientist who still adheres to its use. Examples to illustrate the truth of this might be adduced, did time permit, from the domain of more than one of the sciences.

After these introductory remarks I now go on to give a brief survey of the development of craniological research, and propose, in doing so, to lay particular stress on the early stages, partly because they appear to have been rather left out of sight latterly, and partly because they are of especial importance in regard to the subject with which I am here going to deal, viz., the anthropology of the North European race.

* * * * *

The first scientist who found a place in the natural system for human beings, was, it will be remembered, Linnæus, the Swedish naturalist. He was also the first to subdivide human beings into distinct zoological categories. Men, he says, form one *species*, but among them there are to be found several *varieties*. He differentiated four, one in each of the continents then known, characterising them principally by the colours of their skins: *Americanus rufus*, *Europæus albus*, *Asiaticus luridus*, *Afer niger*. He also gave a category which he named *Monstrosus*, embracing certain varieties of an abnormal type with which he was not acquainted. The people living in Polynesia were wholly unknown to him. As for the white man, *Europæus*, the description he gives of him shows that he was only familiar with that section of Europeans living in the northern parts of the Continent. Linnæus himself had not extended his foreign travels beyond Northern Germany, Holland, Northern France, and England. Thus, when he defines his *Europæus* as: "*Albus, Sanguineus, Torosus, Pilis Flavescentibus, Prolixis, Oculis Cæruleis*," the characterisation, especially in the last items does not, generally speaking, suit the population of the whole of Europe, but rather only that of its

northern districts, *i.e.*, the peoples usually classed as belonging to the Teutonic family; the Scandinavians and the inhabitants of Holland, England, and the northern parts of Germany and France. Linnæus himself, however, undoubtedly included the peoples of Europe in general under his *Europæus*, differentiating them as a whole from the varieties of *Homo sapiens* to be met with in Asia, Africa, and America. The attempt made recently in some quarters to place the *Alpinus* of Linnæus side by side with his *Europæus*, as representing the population of the mountainous regions in Central and Southern Europe, is palpably due to a misinterpretation of Linnæus' own statements. His "homines Alpini," it must be observed, are classified in the imagined group "*Homo Monstrosus*," along with "*Monorchides*, *Macrocephali*, *Plagiocephali*," *i.e.*, forms of a more or less abnormal character, his knowledge of which was probably derived from the works of other writers or from hearsay evidence. If any definite race of man was in his mind when he spoke of "Alpini," it was probably the Laplanders; at any rate that is the view of those who know the work of Linnæus best, for he had had opportunities of studying the Lapps at close quarters, and describes them in another passage as "parvi, agiles, timidi." As he does not actually state, however, that he meant the Laplanders by his *Alpini*, it is best not to attempt to identify the two, but to leave the *Alpini* among the group of "monstrous" or abnormal varieties. It has appeared to me desirable to raise a protest at this early stage of my argument against the deductions and conclusions that have been recently made regarding the "*Homo Alpinus*" of Linnæus, for they cannot possibly be correct. Moreover, I have personally investigated all the different editions of Linnæus' *Systema Naturæ* as well as the hitherto unprinted notes taken by his pupils during his lectures, and have come to the definite conclusion that he only assumed that there is *one* variety of *Homo sapiens* in Europe, *viz.*, *Europæus*, but that he described that variety in accordance with the observations he had made personally in intercourse with those around him in his native country and in other parts of Northern Europe, and that he placed this variety side by side with those of the other continents: Africa's black variety, Asia's yellow variety, and America's red variety.

It is a known fact that other writers too, such as Leibniz, Buffon, Kant, John Hunter, etc., have treated the subject of the different varieties of the human race in various ways, but for the most part only in vague and general terms.

Blumenbach, the German anatomist, was the first to enter upon the investigation of the human race in a serious manner from the standpoint of a natural scientist, and to study its different varieties comprehensively and exhaustively. His subdivision, like that of Linnæus, was in accordance with the continents and with the colour of the skin and hair. He, however, noted for the first time variations in the *shape of the skull and the face*. Blumenbach added one more to the four principal varieties into which Linnæus divided *Homo sapiens*, this fifth variety, which was unknown to Linnæus, being located in the islands of the Pacific. Blumenbach's names for his five varieties were, we may remember :

the Caucasian, the Mongolian, the Ethiopian, the American, and the Malayan. The Caucasian embraced all the peoples of Europe except the Finns and the Lapps, but also included the peoples of Western Asia as far as the River Ob, the Caspian Sea, and the Ganges, and also the inhabitants of Northern Africa. This variety was characterised as possessed of *white skins, red cheeks, brown or nut-brown hair, rounded skulls, oval faces, slightly arched and rather slender noses, small mouths, perpendicular front teeth, and as not having big lips.*

The only peoples in Europe Blumenbach did not classify in this group, viz., the Finns and Lapps, he placed among the Mongolians.

Blumenbach published his characterisation of the five varieties of the human race in his well-known work, *De generis humani varietate nativa* (first edition, 1775, third edition, 1795). It is very clear from several remarks he makes, that he was concerned with *the shape of the skull* as well as with the colour of the hair and the skin. In his anatomical museum at Göttingen he had a fairly large collection—for that time—of human skulls, containing representatives of even very distant regions of the earth. His fundamental work, *Decas collectionis suae craniorum diversarum gentium illustrata* (1790–1820) deals with this collection. The work consists really of six decades containing sixty plates in all; a further five are reported to have been published subsequently in 1828, but I have not had the opportunity of seeing them, and another five appeared posthumously, long after his decease, though he had prepared them for publication before he died. It is a recognised fact that Blumenbach took into consideration also the shape of the skull itself, especially its length and breadth, its sincipital aspect—what he calls *norma verticalis*—and that he distinguished between “the square shape,” characteristic of the Mongols, and “the pressed-in from the sides” form, as found in negroes, and that he recognised the round, beautiful, intermediary form, represented by the Caucasians. Regarding the Malayan skull, on the other hand, he only remarks that the forehead is narrower, and about the American variety he merely states that the form of the forehead and of the skull have been in most cases artificially altered. However, in later editions of his above-mentioned work, *De generis humani varietate nativa*, he gives figures of three crania, viz., an Æthiopian woman, a Femina Georgiana, and a Tungus woman, and strangely enough the sincipital aspect of the Georgian woman is far more square (with markedly developed parietal tubera) than that of the Tungusian, whose sincipital aspect is more nearly oval-elliptical and very much like that of the negress, though larger in dimensions. In any case it is a fact that Blumenbach has displayed in this figure three crania as seen in what he calls the *norma verticalis*. Yet a study of his principal contribution to craniology, his *Decas*, shows that he considers, as he states definitely at once in his introduction, that the *os frontale et maxillaria* are the most important part of the entire cranium, forming as it were the foundation of the rest, and that they vary least, whereas the posterior sections of the cranium are of less importance and vary more. That this was his opinion is indisputably corroborated by the numerous figures in that same work of his.

Among all the figures (I–LX) in the first six decades of the work and among those published posthumously (LXVI–LXX) there is *not a single one* reproduced in the sincipital aspect, *i.e.*, in his own *norma verticalis*. (As mentioned above, I have been unable to examine the character of the figures LXI–LXV). *One only* of the crania is represented full face (*norma frontalis*), fourteen in a fairly exact profile or side view (*norma lateralis*), while *all the remaining forty-five* are given in a more or less exact half profile, *i.e.*, in none of his *normæ* at all; none, consequently, in *norma occipitalis*. It is evident from this how little he himself valued his *normæ*, more especially his *norma verticalis*. From the figure, and also from the descriptions he gives, one can perceive that Blumenbach concentrated his attention, in his craniological researches, primarily upon the *physiognomical* elements in the appearance of the cranium and especially of the forehead and the other parts of the face, *i.e.*, upon the typical features of the physiognomy. A confirmation of this may be found in the circumstance that, so far as is known, he never, or practically never, carried out measurements of the crania, either in his investigations or when he was describing the differences of shape in the crania he had collected. The most reliable evidence, however, of Blumenbach's not having grasped and appreciated the real value of the *norma verticalis* of the crania, and especially the importance of the ratio existing between the length and the breadth of the skull, lies in the fact that he included in one or other of his five varieties peoples whose sincipital aspects, and especially also the indices of length and breadth, are exceedingly different one from another. To take an example: he placed in his Mongolian variety Lapps and Eskimos, races of men that are very divergent as far as the shape of the cranium, especially their length and breadth relation, is concerned. In the Caucasian group, too, he collected a number of peoples whose crania show very marked differences one from another. It is very remarkable, moreover, that he selected the name Caucasian as suitable for the peoples of Europe, with the Caucasus and its round-headed population as the central point.

It has appeared to me desirable to bring forward these historical data by way of introduction to my account of the anthropology of the European, more especially the North European, race. My intention in so doing is not to depreciate in any way Blumenbach's very real merits, but simply to state the true facts as they have presented themselves to me, as a result of the critical examination of his works that I have undertaken. In other places I have already had occasion to point out these considerations regarding the matter in hand, most recently in the introduction to my work entitled *Crania Suecica Antiqua* (1899 and 1900), but nevertheless the earlier view, which is palpably false, still seems to be held in certain quarters. It is quite clear that Blumenbach has the merit, as above stated, of being the first to make a serious and extensive study of the form of the crania of the different races of mankind, but he appears to have been fettered by his absolute belief in the uniformity of his five varieties, and he neglected to observe that within them there are assembled races, whose crania-forms are so typically different, that these races cannot be brought together in the system. It seems singular to us that, although

he was a thorough naturalist, he should have classed together such widely separated races as Lapps and Eskimos, to confine ourselves to that one striking example already adduced. It would seem that his attention had become closely fixed upon the physiognomical characters of the facial features of the crania, as indeed is plainly apparent from a study of the Decades, his principal work on the crania. If, in pursuing his investigations, he had made use of his *normæ*, and especially his *norma verticalis*, he might have advanced science more than he really did. Blumenbach has the merit of having introduced into the science of anthropology the study of the form of the skulls—he is the real founder of Craniology. But his work shows a lack of clearly defined lines, of fixed points of starting, and of incentives to fresh investigation. Consequently his work in Craniology could not stimulate other scientists to successful researches, and a considerable time passed without real results in this department of science. Neither Sandifort nor Prichard were able, moreover, to furnish any new suggestions to help towards the solution of this particular question, though the latter rendered great services by his large and comprehensive work on Ethnology, and deserves to be looked upon as one of the pioneers in that field of inquiry.

In the year of Blumenbach's decease, 1840, Anders Retzius, the Swedish anatomist, laid before the Academy of Sciences in Stockholm the first draft of his theory regarding the shape of the crania, and in 1842 he lectured on "The Form of the Skulls of the Northern peoples of Europe" to an assembly of Scandinavian natural scientists in Stockholm. That lecture was subsequently translated and published in Holland, France, and Germany. It aroused no little attention in the scientific world, for it brought forward new suggestions and new points of view.

Up to then it had been usual to regard each of the varieties, into which the human race had been subdivided by Linnæus and Blumenbach, as essentially *uniform*. Anders Retzius, however, now showed, as a result of his unprejudiced and accurate investigation of the forms of crania upon which Blumenbach principally founded his theory, that not even the Caucasian variety, established as a unit by Blumenbach, was uniform throughout; that it indeed, on the contrary, included races of men possessed of very different forms of the skull. He not only proved that the Lapps, Finns, and Eskimos, whom Blumenbach brought together and placed in the Mongolian variety, have crania so widely differing from each other, that they cannot possibly belong to one and the same variety, but also that the proper inhabitants of Scandinavia, *i.e.*, the Swedes, Danes, and Norwegians, differ materially in the shape of the cranium from the inhabitants of Russia, and from the other peoples related to them, *i.e.*, the Slavs.

The skull of the Scandinavian is narrow and more extended backwards, and when looked at from above is more or less oval in outline; that of the Slavs on the other hand is broader, shorter, and when seen from above is more or less round in outline or squarer. The peoples with the longer shape of the cranium Anders Retzius called *Gentes Dolichocephalæ*, those with the shorter *Gentes Brachycephalæ*. In arriving at his conclusions he made use of *measurements* of the crania in various

directions. For the ratio between the measurements of maximum length and maximum breadth of cranium he adopted 1,000 : x. In Swedes the ratio of length to breadth was found to be 1,000 : 773, in Slavs 1,000 : 888, etc. Anders Retzius had thus given the initiative to the *index*-measurement system, which has since played so important a part in anthropology.

In the following years, until his death in 1860, there appeared a succession of treatises and reports, in which he placed on record the results of his continued investigations, and in them he made it abundantly evident that the relation between the length and the breadth of the cranium forms one of the most important criteria for race distinctions that those engaged in making a comparative study of the races of mankind can employ. He tried to group the peoples both in and beyond Europe by the aid of this relation, but it was not by any means his idea thereby to establish any sort of "system of the races of mankind," as is mistakenly supposed by some. In his works Anders Retzius spoke of the classification as merely *an attempt to arrange the forms of Crania*. He was able to show that dolichocephaly and brachycephaly are to be found all the world over, except in Africa; but he was not able, any more than those who have taken up the question subsequently have proved able, to explain the real purport of the phenomenon or how it has arisen. This difficulty of arriving at the explanation of the ultimate cause of a phenomenon is, as we know, characteristic in fact of all the phenomena we meet with in Nature. Research enables us to reveal their existence, to describe and register them, but it is rare indeed that we are enabled to discover their origin and cause. That is the case, too, with the majority of the other race-characters. We are aware that the negro's skin is black, the Indian's red, the Mongolian's yellow, and the European's more or less white. But has anyone ever been able to demonstrate *why* the colouring is so varied in the skins of these different races? The same difficulty arises when an explanation is required of the differences in the colour and character of the hair, the colour of the iris, the stature or length of the body, etc. It is therefore essential for us to rest content with having established the fact, that dolichocephaly and brachycephaly are to be found disseminated throughout Europe, Asia, Polynesia, and America, not, however, merely promiscuously without rule, but existing as a criterion of race for the different peoples inhabiting those regions of the globe.

Anders Retzius did not lay down any definite figures by way of limit to mark off dolichocephaly from brachycephaly. He had come across intermediary forms between the two varieties, and he seems to have thought it best to adopt a central point as characteristic for each. Thus, he states that the length of the head of the dolichocephali exceeds the breadth by about one-fourth of the length, *i.e.*, the length stands to the breadth in the ratio of 100 : 75, whereas the ratio for the brachycephali is 100 : 80–87, *i.e.*, the length exceeds the breadth by one-fifth to one-eighth.

From the account given by Anders Retzius we may see in general that he did not regard dolichocephaly and brachycephaly as merely a matter of measure-

ment and nothing more, but looked upon them rather as a typological character, a ratio indicative of form, possessing a very close relationship to other criteria of form, which he also described in several of his works.

That he paid attention in his researches, not only to the shape of the skull itself but also to the parts of the face, is evident from two circumstances, first, that in his classification he registers the greater or less degree with which the jaws project, their orthognathic and prognathic properties; and, second, that he gives the dimensions of the face (height of face, jugular breadth) both in his series of measurements and in his descriptions of the characters of the face.

It is not my intention, however, here to enter upon a further discussion of this phase in the history of anthropology. I have only desired to bring forward some of its salient points, seeing that they are of fundamental importance for us in seeking to arrive at a clear idea of the history of the race question, even as regards Europe alone. In accordance with the theory of Linnæus and Blumenbach it was generally supposed, as has been stated above, that the white, European, variety of the human race—Blumenbach's Caucasian variety—consisted of a *uniform group* of people more or less homogeneous among themselves. The idea put forth by Anders Retzius first directed attention to the existence of considerable *divergences of race even within the white variety, i.e., among the peoples of Europe itself*. The Swedish anatomist and anthropologist demonstrated that the skull of a Swede and that of any other representative of the same stem, the so-called Teutonic stem, differ very widely not only from those of the Lapp and the Finn but also from that of the Russian and, broadly speaking, from that of a Slav. Anders Retzius laid strong stress, consequently, upon the fact that *languages* do not afford any certain guide for determining criteria of *race*. As early as 1847 he expressed himself as follows in one of the publications that issued from his pen: "The whole of mankind belongs to *one* species; the varied types are varieties of several different grades, which, in many localities, have become hybridised one with another. In most countries more than one type of nationality is to be found naturalised; thus in many countries migrations of people have taken place, small sections of the tribes previously dwelling there still remaining distributed—though sparsely—among the more numerous new-comers. In several countries the people who thus remained adopted the language of the tribe that won its way in amongst them; that is said to have been the case in North Germany, where the population, originally Slavs, adopted German as their language in course of time, and by degrees, through acquiring familiarity with German ways and customs, became thoroughly amalgamated with the German nation. Similar conditions have produced the same results in many other regions both in the New and the Old Worlds."

There is also, he said, to be taken into consideration the influence exercised by minor immigrations of people from other countries, and the fact, too, that countries possessing a higher degree of culture often foster a considerable number of individual differences of form.

To establish for certain what is the primary form is, he added, under such circumstances, a matter that necessitates the carrying out of a great number of investigations. So far as is possible, *both living beings and the skulls of the dead* should be made the objects of examination. To be able to pronounce a verdict upon the forms, one requires to have an eye trained in prosecuting natural history research.

These statements published by Anders Retzius sixty-two years ago embody both the underlying principles and essential programme of cranio-anthropological research as it is to-day, for they are still recognised as valid and authoritative, and the way in which they are expressed could hardly be abbreviated or otherwise improved. What he asserts respecting the displacement of one language by another, and the conclusions that may be drawn from them regarding the races of men, have gradually become recognised as correct by scientists in general, in spite of the opposition of the linguists. It is evident that whole groups of people of differing nationalities have exchanged their own original languages for those of other peoples, and that, too, even in Europe. Thus, not only have bodies of people originally speaking a Slavonic language, adopted a Teutonic, but also *vice versa*; moreover, a number of the bodies of people speaking Slavonic have presumably originally had other languages widely differing from both Slavonic and Teutonic, which, as we know, are related one to the other.

Owing to these circumstances, which at this late day hardly admit of being cleared up satisfactorily, ethnological research has been rendered exceedingly complicated and involved. There are certain signs that point to the probability of the peoples whom Anders Retzius styled Slavs, and among whom he proved the general prevalence of brachycephaly, having belonged to a race wholly different from those that spoke the Slavonic and Teutonic languages, the remnants of that race having been to a very great extent mingled (hybridised) among the peoples now speaking Slavonic and Teutonic. It has long been recognised as one of the greatest of misfortunes, so far as ethnology is concerned, that nationalities took their names from linguistic and political characteristics, and the inconvenience is far from having been removed as yet. Anthropologists several times have pointed out the state of the case, but as long as the original races cannot, with any degree of certainty, be distinguished one from another with respect to their characters, it is out of the question to bestow upon them such designations, *termini technici*, as would meet with general acceptance in the scientific world. Not until this is realised may we hope to exchange such terms as Slavonic, Germanic, etc., as distinctive names of the various races, for more exact physico-anthropological terms.

After Anders Retzius, in 1842, had in this way established the fact, that the form of the skull of Swedes and of the Germanic peoples cognate with them differed in essential particulars from that of the Russians and the Slavonic peoples cognate with them, he proceeded, step by step, to show that dolichocephaly and brachycephaly were to be found to a greater or less extent in several other European countries. In an essay published in 1847 he writes: "From what has

been said it will be clear that it does not suffice to say that a cranium belonged to a Frenchman, an Englishman, a Russian, etc. France is inhabited by Basques, Germans (Teutons), Normans, several different Celtic tribes, etc.; the state of things in England is approximately the same, and the number of the varied tribes of people in Russia is still larger." In another paper, published in the same year, he reports having been in a position, during a stay in France and England, to obtain some data regarding the shape of the crania of the inhabitants of those countries. He found three varying shapes to be prevalent, viz., a round one in the south of France, and in some localities in Scotland and Ireland a long oval shape, which he regarded as being the Celtic variety, and a shorter oval, which is the Norman and cognate with the German (Teutonic). I do not, however, propose to enter upon a detailed description of his results in this department of his research work, but will content myself with citing one or two passages from his writings published towards the close of his life, more especially the following, which occurs in Joh. Müller's *Archiv* for the year 1858.

He says "Bereits vor längerer Zeit, hatte ich Grund anzunehmen, dass die brachycephalische Form in gewissen Theilen der Schweiz vorkomme, aber in diesem Sommer (1857) während einer Reise durch Bayern, Württemberg, Baden und die Schweiz bin ich überzeugt worden, dass diese Schädelform die vorherrschende in allen diesen Ländern ist."

Another communication, which did not appear until after his death, contains this remarkable passage, in the form of a note relative to the same treatise:—

"Since the above was published, I have been able to examine a considerable number of crania in Tuscany, Lombardy, Piedmont, the Tyrol and Switzerland, and have come to the conclusion that the races of men prevailing in those countries are black-haired brachycephali. That is also the case with the majority of those living in Bavaria, Baden and Württemberg. In France the Basques have the same shape of cranium. In Saxony and Austria this shape is very general and the population in these countries is probably of Slavonic extraction."

I desired again to repeat these quotations, for they contain the very germ of one of the most important discoveries made in anthropology during the whole of the last century: the revelation of the prevalence of brachycephaly in the population of Central Europe, *i.e.*, among a people that has recently been usually named the Alpine race, whose territory to the south abuts on the area inhabited by the long-headed Teutons proper, and which adjoins in the west the habitat of the brachycephalic population of France, and in the east that of Austria and Russia.

Anders Retzius, the Swedish anatomist and anthropologist, must consequently be credited with having, half a century ago, discovered dolichocephaly to be markedly prevalent among the peoples of Northern Europe, *i.e.*, the Teutons, and brachycephaly, on the other hand, to be markedly prevalent among the people living in the whole of Southern Germany (Baden, Württemberg, Bavaria), Switzerland, North Italy, the Tyrol, Austria, Greece, and also France (especially towards the south). These facts are found graphically recorded on the *chart, showing the extension of*

dolichocephaly and brachycephaly, which he published in 1860, shortly before his death, and which I have reprinted on p. 22 of my work, *Crania Suecica Antiqua*. When we are reminded that in the same chart he makes it clear how widely dolichocephaly prevails in Spain and the southern portions of Italy, we shall realise that his treatment of the subject really brought out the *essential elements of all that we know at present about this problem*. That is to say, the exhaustive and very careful investigations that anthropologists have carried out, since Anders Retzius' death, have confirmed and corroborated the theories which he enunciated half a century ago. One might remark that it was upon the basis of one single character, viz., the index of length and breadth of cranium, that Anders Retzius formulated this theory of his. This is on the whole true, for, in his writings, he refers almost solely to the shape of the head, the colour of the skin being mentioned only exceptionally. He alludes to the fairness or blondness of the Swedes, and, in the quotation from the year 1858 just cited, he says that the tribes prevailing in Tuscany, Lombardy, Piedmont, the Tyrol and Switzerland are *black-haired* brachycephali, but otherwise he touches upon neither the colour of the hair and the eyes, nor the stature and other measurements of the body. But the craniological character to which he directed his investigations in particular, viz., the relation of length of head to breadth, has proved, in spite of all efforts made to minimise its value, to be one of the most important factors in anthropological research.¹

This character was moreover the divining-rod with which he discovered and was enabled to prove that Blumenbach's Caucasian variety is not homogeneous, but includes within itself different races or branches of the same race. This was also acknowledged very soon after Anders Retzius' death by Alexander Ecker, the distinguished anatomist and anthropologist, in his work entitled *Crania germanica meridionalis occidentalis*, published in 1865, where he says in the introduction: "Die Zeit liegt noch nicht fern hinter uns, in der man die Schädelformen der nur zur sog. Kaukasischen Rasse gerechneten Völker für nahezu gleich, jedenfalls einer näheren Untersuchung in Bezug auf etwaige Unterschiede nicht für werth hielt. Es ist unstreitig das Verdienst von *Retzius*, auf die Verschiedenheiten der Schädelform der europäischen Volkstämme aufmerksam gemacht und dieselben durch kurze, allerdings vielleicht zu kurze Bezeichnungen ausgedrückt zu haben. Heutzutage ist das Bestehen solcher Verschiedenheiten und die Wichtigkeit des Studiums derselben sowohl für die Ethnographie als die Geschichte unangefochten anerkannt."²

¹ The ratio of length of head to breadth is, moreover, as Pfitzner asserts, one of the most constant of the characters, the one that alters least during the period of development as the individual grows older.

² That Anders Retzius was guilty at times of making mistakes, largely if not entirely by reason of insufficient or misleading material, we are perfectly willing to admit; thus, he was evidently mistaken in his verdict upon the shape of the cranium of the so-called Celts; on the other hand, with reference to the shape of the cranium of the Basques, which he put down as brachycephalic, thereby calling forth a severe reprimand from Broca after his death, it has been

I have dwelt at some length upon these points in the earlier history of physical anthropology, and especially of craniology, because they really contain the essence of the whole development of that branch of science, during the past half-century, regarding the question of the races of Europe, and particularly regarding the question I have selected for my lecture, viz., "The Anthropology of the Northern Race-branch of Europe." The phase in the history of anthropology here depicted appears, moreover, as above hinted, to have been, comparatively speaking, overlooked and neglected in recent times; one will too often find in recent literature an account of it devoid of real knowledge, yea, even partial and unjust.

It would now be interesting to pursue this sketch of the history of the development of our knowledge respecting the physical anthropology of the European peoples in the same manner as above, but the time allotted for this lecture does not permit of that being done.

Moreover, Professor Ripley in his detailed work, *The Races of Europe*, and Dr. Deniker in his comprehensive papers (on the "Cephalic Index" and the "Stature of the Body") as well as in his Huxley Memorial Lecture delivered in 1904, have already depicted the progress made during the last 50 years. I shall, therefore, only seek to bring out a few of the most salient points in very brief outline.

In that period of anthropological research it is possible to discern certain main currents and epochs:—

First, Carl Ernst von Baer, the great Russian natural scientist, after having put on record his appreciation of the impetus that Anders Retzius had given to this particular branch of research, craniology, devoted himself earnestly to its pursuit. Then the German anatomists, Hermann Welcker, Rudolph Virchow, Alexander Ecker, Julius Kollmann, Johannes Ranke and others, followed his example, and, thanks to their energy, more and more attention was paid to the subject. At about the same time the study was taken up with ever-increasing vigour and enthusiasm in France by Broca, de Quatrefages and Hamy, Topinard, Collignon, Bertillon, Manouvrier, Verneau and others, and also in England by Beddoe, Huxley, Thurnam and Davis, Busk, Cleland, Sir William Turner, Sir William Flower and others.

The formation of ethnological and anthropological societies also infused fresh life and interest into this line of investigation.

subsequently shown that Retzius was considerably nearer the true solution than Broca himself. One might, furthermore, criticise his methods, inasmuch as he did not base his conclusions upon measurements of extensive series of crania, nor upon the measurement of large numbers of living persons, though he fully saw and appreciated the desirability of proceeding in that way.

The further criticism might be brought against him that besides parts and features of the body, *e.g.*, colour of hair, eyes, and skin, he only makes use for his investigations of the cranium, and leaves out of account the rest of the skeleton. It should, however, be remembered, that, at the time when he took up this branch of study, he was already somewhat advanced in life, and could only devote such time to it as he could spare from his multitudinous occupations as a teacher of anatomy, physiology, etc., and as head of a large medical college, in addition to other calls and duties. This explains somewhat the limitation to which his activity in anthropology was necessarily subjected.

Welcker, Virchow, Broca and Huxley endeavoured in the first place to improve the methods of inquiry in such a way as to render craniological investigation more systematic and accurate, by discovering some more rational way of applying the system of measurements and by determining upon what basis the system itself should rest. Virchow and Huxley endeavoured to fix upon a determinate axis in the basal section of the cranium from which measurements might be consistently made. Welcker busied himself with trying to bring to light the laws of the formation and structure of the cranium by following out the development of the skull from the age of infancy onwards. Virchow sought to elucidate the differences in shape of various crania from a pathological point of view, more especially such as arise from a premature coalescing of the sutures. Broca, who devoted his energy and inventiveness to anthropology with the utmost zeal and enthusiasm, devised new measuring instruments and tried to solve by their means a whole series of those problems that present themselves to an inquirer in this field of knowledge. Both he and Welcker, though independently of each other, found it necessary to introduce a definite midway group between the Dolichocephali and the Brachycephali; Broca named his middle group Mesaticephali (Mesocephali), and Welcker called his Orthocephali, the latter embracing the large series of all those with indices between 72 and 80. They also determined the boundary-lines for the indices, marking off the three classes one from another. Broca, however, went still further, for between each pair of these three (1 and 2, 2 and 3), he set a subordinate class, so that his system was as follows:—

Dolichocephali	with cranial index	75 or below.
Subdolichocephali	„ „ „	75·01 to 77·77
Mesaticephali	„ „ „	77·78 to 80.
Subbrachycephali	„ „ „	80·01 to 83·33.
Brachycephali	„ „ „	83·34 and above.

I have mentioned this in order to show that, owing to their subdividing the index-scale in this way, the theory enunciated by Anders Retzius regarding the signification of dolichocephali and brachycephali was wholly distorted and misapplied. Those names represented in his conception typical shapes of the cranium subject to expansive limits in each direction, so that all such variations in the shape of the head as are constantly to be observed among various peoples (latitude of variation) might find a place in one or other of the type groups.

Broca's minute subdivision reduced the terms to mere arithmetical conceptions with their fixed places on the scale. Thus, there would be no less than three of these subdivisions, Dolichocephali, Subdolichocephali and Mesaticephali, in which the long-headed Swedish people would be classed. Supposing terms for such minutely distinguished subdivision are necessary, other names should have been chosen so as to avoid confusion with the terms already in use in a different sense. As above arranged, they have caused no little misunderstanding in people's minds relative to this subject, and have made the whole study of the question complicated

and obscure. Some anthropologists accepted Broca's subdivision, others only adopted his middle group (mesocephaly), while a third rejected that too and declared their adherence to the original two, dolichocephaly and brachycephaly, with the index number 80 as the boundary between them. I myself belong to the last-mentioned section.

Also, Huxley proposed a further subdivision of the forms of the crania by indices. He, however, retained brachycephaly and dolichocephaly as main divisions, with the index 80 as the boundary-mark between them, but subdivided the former into two, the latter into four sections, an arrangement which commends itself to me as greatly superior to Broca's. Huxley's scheme of subdivision is as follows:—

Index of 80 or upwards	= I.	<i>Brachycephaly</i> , round skulls.		
" " 85 "	"	= (a)	<i>Brachistocephali</i> .	
Index below 85, of or above 80	= (b)	<i>Eurycephali</i> .		
" " 80	=	<i>Dolichocephali</i> , long skulls.		
" " 80, of or above 77	= (a)	} oval skulls		
" " 77, " "	74 = (b)			<i>Orthocephali</i>
" " 74, " "	71 = (c)			<i>Mesocephali</i>
" " 71, " "	= (d)			<i>Mecistocephali</i> , oblong skulls.

Welcker pointed out the importance of the ratio of the height of the cranium to its breadth, and drew up a classification of all the forms of the cranium to accord with the index that shows the ratio of height to breadth. He made out five groups, viz., *Hypsistenocephali*, *Hypsibrachycephali*, *Orthocephali*, *Platystenocephali*, *Platybrachycephali*.

As regards the features of the face, Welcker established a third group between prognathi and orthognathi, viz., opistognathi, and tried to determine limits for the three groups. Efforts were also made to find out a normal position, a fixed horizontal line for the cranium.

The length of the face from the root of the nose to the chin and its breadth under the eyebrows had, as we know, been measured by Anders Retzius and by his followers; they had also registered the measurements of the lower jaw. Those measurements were now, however, taken up with much greater eagerness and their indices were calculated. It was on those measurements that Julius Kollmann based his five types:—*Leptoprosopic Dolichocephali*, *Chamaeprosopic Dolichocephali*, *Chamaeprosopic Mesocephali*, *Chamaeprosopic Brachycephali* and *Leptoprosopic Brachycephali*.

It would take me too long to report here upon all the questions and problems that were brought forward, discussed and investigated in the domain of anthropological craniology during the last four decades of the last century. What must, however, be mentioned in this place is that the measuring of crania proceeded on a large scale, and often on the basis of very complicated systems; the crania measured were partly of people living in recent times, partly of those who died long ago. Remnants of skeletons from the Stone, Bronze and Iron ages,

and also from the early part of the Christian era, had been found in ancient graves and were carefully preserved. Davis and Thurnam in England led the way by publishing their great work, *Crania Britannica*, in which they proved, among other things, that in the prehistoric graves there were to be found brachycephali and dolichocephali, the latter apparently in the more ancient of the graves. Virchow examined and described the crania discovered in the ancient graves in Denmark; Ecker those found in Southern Germany, etc. Several interesting results were arrived at, and as a whole the statements of Anders Retzius respecting the distribution of dolichocephali and brachycephali in modern times were confirmed; but it appears to be clear from them that the distribution of race elements was in many places different in earlier prehistoric times from what it is now; thus, for instance, the dolichocephali were much more prevalent in Southern Germany formerly than now.

But in addition to the investigation of crania on a large scale, other physico-anthropological characters were studied. I may here specially mention the inquiries started regarding the colour of *hair*, *skin* and *eyes*. Concerning this important chapter of anthropology, one of the authorities on the subject, Dr. John Beddoe, gave an excellent report in his Huxley Lecture in 1905, and I therefore beg to refer to that lecture of Dr. Beddoe with the special remark that he is one of the foremost pioneers in this particular line of investigation. It is also a pleasing duty to acknowledge that the grand anthropologist, to whose memory these lectures are devoted, Thomas Huxley himself, was very much interested in this anthropological character and often remarked upon its great significance. It was one of the leading principles on which he founded his division of the races of men, and it will certainly always occupy a prominent place in the system.

There remains, however, one more criterion of race to be mentioned, *stature* or *length of body*. This has, indeed, for a long time past been a point to which anthropologists have been attentive, and in the tabulated measurements of the recruits for the army they have been provided with material ready to hand for purposes of investigation. It was not, however, until towards the close of last century, when several special inquiries on a large scale were carried out in different European countries, that this character came by its rights and received due attention and notice.

Thanks to the systematic investigations made by fully competent persons regarding the most important anthropological characters of *large army contingents*, the distribution and numerical amount of these several characters have at last been made known for some of the nations of Europe, especially by Dr. Otto Ammon in Baden in 1886–1899 and by Dr. Rid. Livi in 1896–1905. A brief report of the results of all these investigations was given in Dr. Deniker's Huxley Memorial Lecture in 1904.

There are five principal characters that were made the subject of inquiry:—

1. *The length and breadth of the head*, and consequently the length and breadth index;

2. *The form of the face ;*
3. *The stature or length of the body ;*
4. *The colour of the hair of the head ;*
5. *The colour of the iris.*

In conjunction with a number of more or less exhaustive investigations into certain of these characters for the same and other countries in Europe, such a general knowledge of the race-characters of the European nations has been obtained, that it has been considered possible to draw some general conclusions. Professor Ripley, of Harvard University, and Dr. Deniker, of Paris, have been specially occupied with summarising the general results of investigations in this department. The former gives three separate races called by him : "The Teutonic Race," "The Alpine Race," and "The Mediterranean Race." Of these the first two coincide with Anders Retzius' Dolichocephalic Germanic Race and Brachycephalic Central-European (Slavonic and Rhetian) Race. Dr. Deniker, on the other hand, went further in his subdivision of races ; besides the three named he added some others, but has on different occasions arrived at somewhat different results. In his last publication, however, in the Huxley Memorial Lecture of 1904, Dr. Deniker fixed the number of European races at six, viz.—

1. *La Race blonde dolichocéphale, de très grande taille (La Race nordique).*
2. *La Race blonde, sous-brachycéphale, de petite taille (La Race orientale).*
3. *La Race brune, dolichocéphale, de petite taille (La Race ibéro-insulaire ou méditerranéenne).*
4. *La Race brune, très brachycéphale de petite taille (La Race cévenole ou occidentale).*
5. *La Race brune, sous-dolichocéphale, de grande taille (La Race Littorale ou Atlanto-méditerranéenne).*
6. *La Race brune brachycéphale de grande taille (La Race Adriatique ou Dinarique).*

Of these six races, two (Nos. 1 and 3) correspond roughly to the races defined by Ripley and other writers as the Northern and the Mediterranean. Their Alpine race on the other hand appears to be subdivided by Dr. Deniker into three (Nos. 2, 4 and 6), while No. 5 would seem to be an offshoot from the Mediterranean race of other writers. It is still very difficult to determine whether Dr. Deniker's last classification has yet reached the truth ; a great deal of critical investigation on a comprehensive scale is still requisite, especially in the countries bordering on the Mediterranean Sea and Russia before a satisfactory answer can be given. But for anyone who has observed, for instance, the remarkably tall brachycephalic Montenegrins, it cannot—I agree with Dr. Deniker—but be repugnant to class that race with the short-statured Alpine race. As for the European population of Russia, a still more thorough inquiry is necessary before we are able to know their essential

race-characters. The first problem there that presses for solution is whether the dark-haired, short-statured, brachycephalic elements really appertain to the same sub-variety as the Alpine race of Central Europe or not. Until a thorough investigation has made matters clearer, it seems to me to be wisest only to admit of the existence of such races as have really been proved, and to leave the classification of the remaining to the future.

The following may, however, be admitted as surely existing :—

1. *The Northern European Dolichocephalic, Blue-eyed Tall Race* = Anders Retzius' Dolichocephalic Germanic type, which has latterly been designated by several writers (Wilser a.o.) *Homo Europæus* (the term Linnæus used), and which is now often termed the Northern Race (La race nordique, Nordische Rasse).

2. *The Middle European Brachycephalic, Dark-haired, Dark-eyed, Short-statured Race*, probably closely related to the similar population in the eastern portions of Europe (Anders Retzius' Slavonic and Rhætian people). This race has been designated recently *Homo Alpinus* (Linnæus' term); there may be some justification for this term in the fact of a large section of the race being resident in the Alpine regions of Southern and Central Europe. But it should not be forgotten that this race during the lapse of centuries has extended its habitat to a considerable part of France and even to a large portion of Central and Northern Germany. Linnæus certainly did not mean this race by his term "Homo Alpinus," a fact already stated above.

3. *The South-European Dolichocephalic, Dark-haired, Dark-eyed, Short-statured Race*, called *Homo Mediterraneus* (Sergi, Ripley, Wilser, and others), which may possibly embrace variations of distinct character in the various Mediterranean countries.

To name only the first of these three races *Europæus*, as appears often to be the fashion now-a-days, seems to be very strange, since the other two great races, too, have inhabited Europe from times immemorial, and it is by no means possible of proof that they originated in other Continents and migrated into Europe subsequently. I consider, moreover, that it is an entirely incorrect use of the nomenclature, established once for all for zoology, to call these races "Homo Europæus," "Homo Alpinus," "Homo Mediterraneus," as is so often done in modern anthropological literature. This leads to a confusion of our ideas about *species*. They can, of course, only be regarded as variations of one and the same species, *Homo sapiens*, and in reality only as sub-variations of a variety, viz., the so-called white race of men. It is unfortunate that the notions, *species*, *variety*, and *race*, have not been more definitely fixed in value as regards the races of mankind. The majority of anthropologists are probably of the same opinion as Linnæus, that the living races of mankind at the present day are all to be referred to one species, *Homo sapiens* Lin., and that their variant representatives are to be regarded as varieties of the species, even though very weighty reasons might be alleged for regarding some of these variations as *species* themselves; this question has now lost much of its significance since the triumphs of the theory of descent, but it is of

importance for the system and for the formation of terms. As regards the population of our own continent and the problems concerning them, it is of no great significance whether the white man, the European, is put down as a particular *species* or as a variety. But it is of real importance that its *subsections* should not be put down as separate *species*. For my own part, I am at present most inclined to agree with Linnæus and Blumenbach in regarding the great racial groups of the human species as varieties, though it must be admitted that the Australian, the Negro, and the American differ very widely from the European. There are to be found, however, remarkable transitional (intermediary) forms to bridge the gulf between the peoples of Asia and Europe, and there also exist similar transitional forms uniting the people of Asia with those of America and a portion of Polynesia. But if the term *variety* is to be preserved for the various large race-groups, we require a suitable term for the sub-sections under *Varietas*. Here to use the word *race* would not be the right thing, since the terms *race* and *variety* have long been employed as synonyms also for the *Varietates* of the human species. It seems to me, therefore, to be indicated that these sub-sections of the varieties should be designated as *sub-varieties* or *sub-races* (race-branches). This would mean for the population of Europe: *Varietas Europæa*, with three *sub-varieties*, viz., the *North European*, the *Middle European* and the *South European*, deriving their names from the respective main centres of distribution. Besides those there exist, as we know, two other race-branches among the population of Northern Europe, the Lapps and the Finns, who it is customary to assume to have immigrated from Asia, the proof of this still being far from absolute.

* * * * *

It has, however, been recently proved with more and more certainty that Europe was formerly the home of another population very different from the race-branches above named, the so-called *Neanderthal race*. The finds of crania and skeletons at Neanderthal, Spy, Gibraltar, Krapina, and more recently at Le Moustier, La Chapelle-aux-Saints and Heidelberg, constitute, even though they are relatively few in number, a striking proof of this prehistoric race having been formerly widely spread throughout our Continent, though probably never very numerous. The question has been mooted, whether descendants of this race may still be found among the European peoples of the present day, since some of the cranial characters belonging to that race are still occasionally to be met; the opinions on this subject have differed very much indeed. During the last decade Professor G. Schwalbe has succeeded in showing, as the result of ingenious, scientifically exact, and methodical investigations of some of the ancient crania that have been found, what the peculiar and primitive race-characters of this primeval people were, and he has come to the conclusion that the race must be extinct. Whether the race ought to be regarded as a particular *species* or as a *variety* depends upon whether the races of mankind of low standard, that still are existing, are to be looked upon as species or varieties. According to my opinion, the Neanderthal

race is a special variety of low standard,¹ which Huxley himself compared, as regards characters, with the still living aboriginal population of Australia. We do not, unfortunately, know anything about the colour of the skin of the Neanderthal race nor about the hair on their bodies, etc.; consequently a closer comparison is out of the question. From a scientific point of view a serious protest must be lodged against a number of fantastic and sensational attempts at reconstructing the external appearance of the Neanderthal race, which have been made with clay and colours by a number of irresponsible artists, intending to arouse interest among the uncritical public, and also against the journalistic efforts of certain writers who wholly lack the training necessary for giving an objective and critical account of the matter. It is by no means proved that the Neanderthal race occupied so very low a position on the scale of development from brute to man, either as regards its outward appearance or its psychical character, as certain fantastic depictees of it have tried to make out. Professor Klaatsch, who was the first to examine closely the other bones of the Neanderthal skeleton and to determine their race-characters, and who, in order to pursue Huxley's idea of the similarity between this race and the present day Australians, made anthropological researches in Australia for three years, has pronounced as his opinion that essential points of similarity are to be found in structure of the cranium and of the skeleton between the Australians and the Neanderthal race, but that they are to be regarded as separate branches of the common stem and that they have arrived at approximately the same stage of development. Professor Klaatsch being convinced that, with regard to the Australians, they do not occupy so low a position in psychical endowment as is generally supposed, standing in fact pretty high in several respects, especially in their faculty of observation and in their general standard of life, he therefore considers, that the same might have been the case with the people of the Neanderthal race.

I am not going, as I already mentioned in the introductory words of this lecture, to enter further upon a discussion of these highly interesting questions, tempting as it might be to do so. I have only touched upon the subject in order to point out that the Neanderthal race of Europe is not to be regarded as "the missing

¹ However, not content with having registered a special *Homo neanderthalensis* or *primigenius*, the nature of which as a separate species is still rather doubtful, some authors have gone further, for almost every find of palæolithic skeletons has been designated as a special kind of "Homo," such as "Homo Spyensis," "Homo Krapinensis," and, quite recently, "Homo Mousteriensis." That this is not correct and must be protested against, should be patent to every anthropologist and zoologist, the more so, since all the "Homos" mentioned are reckoned by most authors as belonging to one and the same species or variety. Instead of being termed "Homo," they ought to be called "Individuum Spyense," etc., and these "Individua" ought then all to be referred to one and the same "species" (*Homo neanderthalensis* or *primigenius*), or to one and the same "variety." The question of species or variety with reference to them cannot well be solved until new finds have been made, showing how great its variations were. The choice of the name "Homo primigenius" for these remains of skeletons seems somewhat premature, as they probably belonged to a lateral branch of the main stem and were preceded by other forms which would rather have merited that name.

link," for it was considerably more closely connected with the existing races than was once supposed to be the case.

It is even possible that the races that are now in existence, especially the North European, existed contemporaneously with the Neanderthal race, and displayed the features that are still characteristic of them at the present day. At all events the finds of crania belonging to the Cro-Magnon type point to that particular race having been, in a geological sense, developed in its essentials not so very long after the period to which the Neanderthal skeletons belong.

The investigations concerning the stages of development of the human species that have been made by Professor Schwalbe primarily, but also by others, as a consequence of the prehistoric finds that have been brought to light in Europe, constitute in themselves one of the most important contributions to anthropology that have been made in recent times. I cannot suppress a note of regret that Professor Huxley did not live long enough to witness this advance in the special branch of science here under discussion, for he had foreseen it and was instrumental in preparing the way for it. Science must continue to proceed, however, cautiously upon her pathway, and be constantly on her guard against premature conclusions. That principle was one that the great Huxley himself observed. In his excellent essay entitled "On Some Fossil Remains of Man," which appeared in January, 1863, he remarks at the close: "In conclusion I may say, that the fossil remains of Man hitherto discovered, do not seem to me to take us appreciably nearer to that lower pithecoïd form, by the modification of which he has, probably, become what he is."

He adds too, in a note, a pronouncement of his own in another place, relative to the Neanderthal race as follows: "Inasmuch as a complete series of gradations can be found, among recent human skulls, between it and the best developed forms, there is no ground for separating its possessor specifically, still less generically, from *Homo sapiens*." It is interesting to compare with this a statement made by Professor Marcellin Boule in his preliminary account of the new find of a skeleton of the Neanderthal race, the one discovered in 1908 at La Chapelle-aux-Saints.

"Tout cela nous prouve que les origines humaines sont plus lointaines encore qu'on ne le suppose généralement. Des découvertes aussi importantes que celle de La Chapelle-aux-Saints nous apportent, certes, quelques lueurs nouvelles; mais il faut avouer qu'elles reculent le problème plutôt qu'elles ne le résolvent. Et c'est tout de même un précieux résultat."

As yet no genuinely transitional forms between the crania of the Neanderthal race and those of the race branches in Europe at the present day have been discovered in the prehistoric finds; the finds, however, of those prehistoric human skeletons have been so few in number, that there does not exist anything like enough material for definite conclusions to be drawn concerning them. The trend of opinion, however, as has already been stated, favours the assumption that the real Neanderthal race became extinct long ago, and that it yielded place to its rival,

the "Cro-Magnon race" and its descendants, and to the other racial elements to be found in Europe now. The relics of the Cro-Magnon race hitherto found, point to our present North European dolichocephalic race branch having descended in direct line from that "race." It is consequently a matter for regret that a greater number of well-preserved crania have not been found to enable us to form a more complete and comprehensive acquaintance with the racial characters of this prehistoric people.

From the periods immediately succeeding that one, the Neolithic, the Bronze, and especially the Iron age, there have been collected from the graves in France, England, Germany, Russia, Denmark and Sweden a large number of crania and portions of skeletons. I have already published a survey of the investigations made on the crania found among those collections in the second chapter of my *Crania Suecica Antiqua* (1900, in German), to which I may beg to refer.

Here it must suffice to mention that both dolichocephalic and brachycephalic crania have been found in most of the countries named, in the graves of the Neolithic period, and that they vary in proportion one to another, though in general dolichocephaly is more preponderating. Thus Salmon discovered that, out of 688 crania belonging to the Neolithic period, found in France, no fewer than 397 were dolichocephalic, 145 being mesocephalic (the limiting index-numbers being 77 and 80) and only 146 brachycephalic. E. Pittard asserts that in Switzerland two races can be traced, succeeding each other in the Neolithic period: first, a race of short-statured brachycephali, who appear to have come to Western Europe from the north-east and south-east, and seem partly to have superseded the dolichocephali formerly to be found there, and partly to have intermingled with them, thereby producing mixed races; towards the close of the Neolithic period a fresh immigration appears to have taken place by a dolichocephalic and leptoprosopic race, while at the close of the Bronze age a fresh brachycephalic race appeared on the scene, which had become superior in numbers to the others by the commencement of the Iron age. The researches of His and Rüttimeyer, in 1864, went to confirm the discovery made first by Anders Retzius and subsequently by von Baer, that at the present day by far the largest proportion (roughly three-fourths) of the population of Switzerland is brachycephalic.

It has already been remarked, that dolichocephali were found in preponderating numbers in the graves of earlier times in Germany, especially in the so-called "Reihengräber"; that was particularly the case in districts (*e.g.*, Bavaria, Würtemberg, and Baden) where the population of to-day is chiefly brachycephalic. This would appear to denote that the original Teutonic (Germanic) population of these parts of Germany has been displaced by the brachycephalic race-elements now resident there. Attempts, it is true, were made in certain quarters to explain this alteration in the character of the population by the assumption that the shape of the cranium had actually changed in the same race of people from a dolichocephalic type of a low grade of civilisation to a brachycephalic type of a higher grade, but that theory appears now to have been altogether relinquished.

As regards Russia, Anatole Bogdanoff has proved that the whole of Central and Southern Asia was formerly inhabited by a highly dolichocephalic race, which was more homogeneous than those in the European countries, and increasingly so the further back in time it is traced. It was not until a period not very remote from our own, he says, that brachycephaly began to become noticeable and to increase in amount to such an extent, that in our days it has largely superseded the dolichocephalic element. The data from the other countries in Eastern Europe tell the same tale.

From these finds, therefore, and the considerations to which they give rise, it seems as though we were entitled to conclude that for a long time past a shifting of racial elements has been proceeding on the continent of Europe, the brachycephali having driven out more and more the dolichocephali who were there before them. The latter can scarcely have consisted of any other people than the Teutonic (Germanic), whom it is best to term now the North European race branch. It is also to be taken for granted that the brachycephalic population, which by degrees usurped domiciliary rights in the country, belonged to that dark-haired brachycephalic race branch, the Middle European, which in our times is by far the preponderating one in those countries. Where that brachycephalic people may have emanated from is, as above said, up to the present wholly wrapped in mystery. It has been customary to trace it to Asia and to designate it as Mongoloid, but there are no real proofs of that supposition being correct. It is presumably more likely that its home was some tolerably limited region in Central or South-Eastern Europe, but that by rapid increase in numbers and owing to hardy qualities called forth in it, in accordance with the laws of the Darwinian theory, by the struggle for existence, it gradually spread, without having to carry on any real strife, further and further afield over the adjacent tracts of country, supplanting thereby the dolichocephalic (Teutonic) population already indigenous there. Lapouge, the French anthropologist, has characterised, as it appears to me in a trenchant manner, the differing psychological qualities of the two contending races in question. I regret that the shortness of the time at my disposal precludes my quoting the whole of what he says; the gist of it is, however, that the *dolichocephalic* individual of the North European race has considerable wants and always seeks to satisfy them, that he understands better how to gain riches than to keep them, that it is "easy come and easy go" with him. An adventurer by temperament, he hazards everything. He wages warfare for the sake of it, but not without some thought of his own betterment. His intelligence oscillates between narrowness and brilliance. The whole earth is his fatherland. The *brachycephalic* individual of the Central European race is, on the other hand, temperate, laborious, and economical. He is not short of courage, but he lacks warlike propensities. He is fond of farming and of the piece of land he has inherited. Though not wanting in cleverness he is seldom possessed of real talent. His aims are not lofty, but he works patiently to attain them. Distrustful by nature, even of progress, he is at bottom conservative; in religion he leans towards Catholicism, in politics he has only one aspiration: to

secure State support. He is alive to the interests of himself and his family, and he seeks to promote them.

That characterisation is doubtless in all essentials perfectly correct. The merits and demerits of the two race branches are easily recognisable. As regards the North European race branch, the description fits the Scandinavian peoples excellently, both for prehistoric and present times. That is proved by the warlike venturesomeness and the piratical expeditions of the Normans and the Vikings of an earlier day, and also by the armed mercantile journeys of the Swedes and the Varangians to Russia and Byzantium in the ninth century, when they subjugated nations, founded kingdoms, and became soldiers of fortune for the sake of fighting, plundering, and carrying on trade in slaves.¹

There are still to be seen a good many traces of that national temperament in the Scandinavian peoples. For my own part, I have for a long time become more and more afraid that that racial element will not be found to be suited for the conditions brought about by the direction in which civilisation is developing. The North European race branch cannot properly adapt itself to the demands made upon it by industrialism. It desires a freer, less constrained life, it lacks the endurance necessary for carrying on a uniform kind of labour, it has not the patience to stand chained to machinery day after day, year in year out, and to work like a machine itself. It requires high wages for a moderate amount of work and short hours, that it may have time to indulge in pleasure and enjoyment.

The brachycephalic individual of Middle Europe, on the other hand, seems to be far better suited for the demands of industrial life; he is satisfied with a little, is possessed of patience and endurance even when things are dull and dreary, and his work tiring and little remunerative; he is not so much addicted to expensive forms of recreation, but lays by money for his family and for old age. We have not as yet any statistics based upon anthropological research into the racial characters of industrial operatives, but, to judge by the information I have received privately, I should be inclined to conclude that wherever the two races are both available, it is the dark-haired, small statured brachycephali who are preponderatingly employed in industrial occupations. That is so especially in America. From Sweden, my own native country, emigrants continue to set sail in large numbers to certain of the North American States and to Canada; they less often take up work, however, in the service of industrialism. That is said to be the case too with emigrants from England, Denmark, and Norway.

There are two reasons for my stating these facts. First, in order to point out that there may lie in the circumstances to which I have called attention, a very real danger of the North European dolichocephalic race branch not being able to hold its own. Just as it has been ousted during the past thousand years from

¹ Cf. *inter alia* Professor R. Weinberg's interesting disquisition on this point, in *Polit. Anthropol. Revue*, III Jahrg., "Rassen und Herkunft des russischen Volkes."

Germany and other countries in Central and Eastern Europe by the dark-haired small-statured brachycephali, it will probably have to yield place here too, and be reduced in numbers, perhaps by degrees disappear entirely out of the fatherland of its ancestors and itself, by reason of the ever-increasing might and power of industrialism with which it seems ill-fitted to cope successfully in the long run. The prospect is depressing, it cannot be denied, but the development of things in the world is not seldom harsh and unmerciful.

Doctor Roese in his work *Beiträge zur europäischen Rassenkunde* of the year 1906 seems to have come to similar conclusions: "Leider ist," says he, "der vorwiegend nordische Bestandteil des deutschen Volkes im langsamen Aussterben begriffen. Je rascher die neuzeitige Industrie-Entwicklung fortschreitet, und je länger sie anhält, um so rascher wird der nordische Bestandteil des deutschen Volkes sich vermindern,—falls nicht rechtzeitig auf Abhilfe gesonnen wird."

Latterly the attempt has been made, especially by German writers, to prove that the great advances which have been achieved in civilisation, in science, in art, and in literature, that discoveries and inventions, too, chiefly owe their origin to the offspring of the Teutonic race, to blond dolichocephali, not only in Germany itself, but in France, Italy, and Spain (Woltmann and others). Supposing this were true, what would become of the progress of higher civilisation, and of art and science in the future?

It has seemed well cursorily to touch upon these matters, because they give an indication of a new point of view as regards the work and aims of anthropology, which has asserted itself in the past few years, especially in Germany, viz., the importance of anthropology politically and socially; attention has been raised to the question of how far racial characters are hereditary through the ages, and also to the relative merits of the various race-elements, their various degrees of intellectual endowment, etc., as well as to the problem of the extent to which interference on the part of the State or society might be able to improve the races, or at all events prevent their degeneration.

It is not possible here to give a review of this, in many respects very interesting, movement in the science of anthropology, tending to explain the psychology and the inner characters of the different races and race branches, and to find out methods for their improvement. Through the researches and ideas of Sir Francis Galton and his school in England, and the important investigations and views of Dr. Otto Ammon and his followers—I will especially mention Dr. Roese in Germany and Dr. Lapouge in France—this new movement has been raised and developed. If guided by criticism, it promises good results also for the future. This field of research is indeed most interesting, but is also very dangerous and complicated.

These are actually important and also very delicate questions with which to deal, and several immature projects have already been ejected concerning them; certain proposals that have been put forward, however, may be worthy of mature deliberation, as containing a good deal of truth, though immense and perhaps in

some degree insurmountable obstacles may prevent their being practically realised.

I desired to touch upon these modern movements, as they are intimately connected with our European race-questions, particularly with that of the dolichocephalic North European race element and its struggle for existence, *i.e.*, the question of what its chances are of being able to hold its own in the future in the struggle with the dark-haired brachycephalic, Middle European race-element.

This struggle, which has been going on during a series of centuries, silently for the most part and hardly perceptible, constitutes one of the most wonderful and interesting events in the history of the world and of humanity during the past thousand years. It is to anthropology, and above all craniology, that we owe the possibility of being able to discover its existence. If craniological research and—to cite Kollmann—Anders Retzius's discovery of dolichocephaly and brachycephaly, among the peoples of Europe, had not effected anything more, they would have accomplished not a little.

However, to be able to observe accurately the gradual moving of the race-elements, their growth and diminution, in the various countries of Europe, a thorough and extensive anthropological investigation *at fixed repeated intervals* would be required, of about the same character as those that have been carried out, on a single occasion, in a few countries, *e.g.*, Baden, Italy, and Sweden. Under such circumstances it is greatly to be regretted that the investigation that Professor Schwalbe planned on a grand scale for the whole of Germany and Austria was not realised, as a thorough and extensive inquiry regarding racial factors in those two large realms would have been extremely desirable. As far as England is concerned, the best anticipations may be entertained, inasmuch as the anthropological investigations in this country are in the hands of a competent and enlightened committee that is perfectly aware of the importance attached to their work, and who may be trusted not to shrink from overcoming whatever trouble, expenses, or other difficulties stand in their way.

* * * * *

In my own country, Sweden, an anthropological investigation was carried out in 1897 and 1898, with the permission of our Government but at the expense of private persons. The investigation was carried out in the two annual contingents of recruits for our army, and comprised a total of 45,688 young men at the age of 21. 700 of these were from one cause or another, left as unsuitable for the inquiry, and there remained about 44,900 who were duly subjected to examination. The whole investigation was organised by myself in conjunction with Professor V. Hultkrantz, and was carried out by a staff of scientists and young physicians who were specially trained for the task. Among the workers Professors Hultkrantz, Carl M. Fürst, and Ivar Broman ought to be particularly mentioned.

The vast material collected was subsequently treated and elaborated under the direct guidance of myself, who had executed the inquiry in the provinces of

Dalecarlia and Westmanland, and of Professor Fürst, who had himself chosen the largest part of the inquiries, the provinces of Skåne and Blekinge. The work embodying the results of the investigation was published in 1902 under the title of *Anthropologia Suecica, Beiträge zur Anthropologie der Schweden*. It would carry me too far, however, were I to attempt here to give a survey of the contents of that book, which, moreover, are probably known in outline to all interested in the subject. I will, therefore, confine myself to quoting the final results merely, which are of special significance for a knowledge of the North European race branch.

The investigation included the following items, in addition to the place of birth of each individual (and of his parents); his height, when standing, and when sitting, maximum stretch of arms, maximum length and breadth of head, general shape of the face, colour of eyes and hair. The maximum length of the face (from root of nose to chin) and the bi-jugul breadth were only measured in the provinces of which I had charge (Dalecarlia and Westmanland). In the descriptive matter the measurements were dealt with by me, the colours by Professor Fürst.

The following were the principal results:—

1. The measurements of the length and breadth of the head showed that the mean for all the measurements led to the conclusion that in the whole of Sweden there were 87 per cent. dolichocephali and 13 per cent. brachycephali. This immense preponderance of dolichocephali was not evenly distributed throughout the country; it was still greater in some provinces, but less in others, though all over it was very considerable. The dolichocephali were found to be most numerous in a belt of country stretching right across from west to east in about the latitude of Stockholm, and also a little north of it. In Dalsland 95 per cent.; Södermanland nearly 95 per cent.; Dalecarlia, Härjedalen, Närke, Västmanland 92 per cent.; Värmland 91 per cent.; Bohuslän, Öland 90 per cent., etc.; Stockholm City 88 per cent. To both the north and the south the percentage diminished somewhat. In Skåne it was 81, in Västerbotten 80, and in Lapland 76. These figures are easily explained, partly, in the more southern parts, by the immigration in the course of time of strangers of brachycephalic race type, partly by the presence in the more northerly parts of the brachycephalic Laplander population and of a considerable sprinkling of Finns. In no Swedish province, however, did the percentage of brachycephali rise above 20, 21, or 23·67.

It is thus quite right to call Sweden a domicile of dolichocephali, whereas in Southern Germany, Tyrol and Switzerland, the condition of things is exactly the reverse, the percentage of brachycephali being there approximately as large as that of dolichocephali in Sweden. That result by itself made it clear that the North European (Teutonic) race type is still preserved in Sweden to a very appreciable extent, greater indeed than anywhere else, so far as we know at present, and far more than in Germany, the ancient heritage of the Teutons.

In Norway, the neighbour of Sweden, no extensive anthropological investigation embracing the whole country has been made, but it is clear from the researches that have been carried on in scattered districts by Arbo and others, that the number of

the dolichocephali preponderates considerably, especially in the easterly parts, but that in the south-western part of the country, along the sea-border, a large percentage of brachycephaly is to be found. No complete inquiry has taken place in Denmark either, but from the investigations made here and there it would seem as though dolichocephaly may be considered as by far more prevalent; brachycephaly, and mesaticephaly with a high ratio, however, are also to be found and not very sparsely either.

If now we compare these data for the state of things existing at present with the results yielded by an examination of the crania found in the prehistoric graves, we shall see, that, so far as it is possible to judge from the finds in the graves, there were indeed already in all three Scandinavian countries during the Neolithic period—a Palæolithic period of the really old type has not been discovered here—both dolichocephali and brachycephali, but the percentage of the latter was remarkably small. Of the 42 Stone-age crania from various parts of Sweden that are described in my work, *Crania Suecica Antiqua*, 39 are of dolichocephalic type (16 of them being mesocephalic) and only 3 brachycephalic. Out of a total of 51 crania dating from the Iron age, which were discovered in graves in various parts of Sweden (the majority, however, in the island of Gotland), 47 proved to be dolichocephalic (15 mesocephalic) and as few as 4 brachycephalic.

I considered that I was entitled to draw the conclusion, as a result of my investigation of this series of prehistoric crania, that the present population of the country are the descendants in direct line of that prehistoric people, and preserve to all intents and purposes the same racial elements as they had, even though new elements may have been introduced by immigration.

Professor H. A. Nielsen's treatise of 1906 on the anthropology of the prehistoric population of Denmark, shows that out of 119 Stone-age crania 83 turned out to be dolichocephalic, *i.e.*, 70 per cent. Nearly half of the 83 were genuine dolichocephali (47 per cent. with an index of 75 or below). Among the Bronze-age crania described by Nielsen one was found to be brachycephalic (index 81) and three more showed a tendency in the same direction (index 79). Out of the 35 crania dating from the Iron age in Denmark only one was brachycephalic (index 81) and two approximately so (index 79); of the rest no less than 25 had an index of 75 or below, and were consequently dolichocephali. The whole inquiry goes to show, as Professor Nielsen points out, that the conditions have been practically the same as those prevailing in Sweden and that the types of crania are similar on the whole to the Swedish, though there was a somewhat larger admixture of brachycephali during the Stone and Bronze ages.

2. *The Length of the Body (Stature).*—Professor Hultkrantz worked out the average height of 232,367 recruits for the citizen army, all of about 21 years of age, at 1.6951 metres, the mean measurements differing somewhat for the different provinces; thus, the tallest men were found in the provinces of Gothenburg, Jämtland and Västernorrland, and in the cities of Stockholm and Gothenburg; the inhabitants of Gotland, too, are tall of stature, whereas in other parts of Sweden,

such as the central part of the province of Småland, the stature of the men is less, the average being lowest for the most northern part of the country and for the most southern and the south-eastern districts.

The figures quoted in *Anthropologia Suecica* are in the main confirmatory of the results Professor Hultkrantz obtained, but our tables of figures and his are not quite commensurable.¹ Our average came out a little higher than his, viz., 170·88 centimetres. The maximum average height we found in Gotland and in Härjedalen (172·74 and 172·61 respectively); then came Hälsingland and Bohuslän 172·32 and 172·14); then Jämtland, Dalsland, Medelpad, Västergötland, Stockholm, Södermanland, Öland, Gästrikland and Ångermanland, all exceeding 171 centimetres. In no province but Lapland was the average found to be less than 170 centimetres. These figures give evidence of great uniformity in reference to stature for the country as a whole.

3. I must leave out here our results concerning *length of arm and leg, stretch of arm and form of face*, and speak of the *colour characters* dealt with by Professor Fürst. To take the colour of the eyes or the iris first, it was shown that there were 66·7 per cent. of the total number with distinctly light-coloured eyes (blue or grey), and only 4·5 per cent. with definitely brown eyes; the rest, 28·8 per cent., had eyes of a mixed colour. With respect to the colour of the hair the following data were obtained; 73·3 per cent. (*i.e.*, nearly three-fourths of all the 44,900 men examined) were fair-haired (yellow or flaxen); 21·6 per cent. had brown hair, 2·3 per cent. red hair, and only 0·8 per cent. black hair. These facts do not leave any doubt possible as to the Swedish nation being the fairest of all, unless the inhabitants of Norway or Denmark might compete with the Swedes for that distinction. The Provinces of Västergötland, Bohuslän and Halland show the highest, and the northern provinces the lowest average.

4. The results of the inquiry concerning the *combinations of the various race characters are peculiarly interesting*, but time forbids me to enter upon a discussion of that here. One point, however, may be given; the combination of *genuine dolichocephaly* (index below 75), tall stature (1·70 metres and upwards), fair eyes and fair hair, was still to be found in Sweden in 10·7 per cent. of the examined contingent of the population; for Dalsland the figure was 18·3 per cent.; for Södermanland, 16·2 per cent.; for Härjedalen 16 per cent.; and for Dalecarlia, 14·7 per cent. The purest Teutonic race-element was thus to be found evidently in the interior of the country, south of its centre-point, the pure type becoming rarer towards the coasts and also northwards and southwards.

¹ That is due partly to the fact that in our investigation those rejected for shortness of stature had been already removed, and partly to the figures given by Professor Hultkrantz being calculated for the enrolment areas of the regiments instead of for the several provinces; moreover, the numerous cases of men in the regiments not hailing from that particular district were included without further ado and not discarded as they should have been. Finally, it may be remarked that the numbers in our tables are based upon measurements taken by persons specially trained for the task, and can therefore claim to be more accurate and exact. On the other hand, the contingents treated by Professor Hultkrantz were much larger.

From our inquiry the conclusion may be drawn that Sweden is inhabited by the purest population of the North European (Germanic or Teutonic) race branch to be found remaining in our time. This result has, moreover, served as a support for the theory recently enunciated and energetically defended by K. Penka and L. Wilser, that proclaims Scandinavia and the region adjacent to the southern part of the Baltic as the original home of the Teutons (Germans), in opposition to the dogma, so long accepted as incontestable, of their, or rather the Aryans, having originated in Asia, the Indo-Germanic theory of the philologists.

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The anthropological investigations, carried out during the past two decades on large military contingents, have thus, for three countries at least, afforded a knowledge of the race characters of the present inhabitants of those three countries. As each of those inquiries has dealt with one of the three principal European types of race, a thorough acquaintance with all three has been acquired.

The excellent investigation of the inhabitants of Baden, conducted and reported by Ammon, with the active aid of L. Wilser, has given an excellent insight into the present-day constituent elements of a nation belonging to the Middle European (Alpine), dark-haired, short-statured, brachycephalic race branch. In addition to that quite a number of less elaborate investigations have been made regarding this same type of race, carried out, some earlier, some later, by Ecker, His and Rütimeyer, V. Hölder, J. Kollmann, J. Ranke, Blind (for Germany and Switzerland); by Weisbach, Toldt, Tappeiner, Zuckerkandl and others (for Austria); by Broca, Topinard, Collignon, Lapouge and others (for France); by Houze (for Belgium); by Bogdanoff, Kopernicki, Zograf, Weinberg and others (for Russia).

Livi's magnificent investigation of the population of Italy, the results of which were published in the work entitled *Anthropometria Militare*, gives an excellent anthropological survey of the Mediterranean race-element, and also of the distribution of the middle European race element in Italy. There are, besides, researches on the same subject by Nicolucci, Mantegazza, Sergi, Ruggiere and others.

Finally the North European (Germanic), blond, tall and dolichocephalic race element, through the above-mentioned anthropological inquiry in Sweden reported and published in *Anthropologia Suecica*, by myself and Fürst, has been extensively examined and described just in that very country of Europe, where it is still to be found existing in the greatest proportion and in the highest purity. This race branch has likewise been studied to a greater or less extent in other countries where it is extensively distributed, for instance in Norway, by Arbo principally, but also by Larsen, A. and H. Daae and others, in Denmark by S. Hansen, Steensby and others, in Holland by L. Bolk, in Belgium by Vanderkindere, Houze and others, and, last but not least, in England by Dr. John Beddoe, to be mentioned in the first place, that Nestor of physical anthropology, who for more than half a century with never flagging zeal and industry, has devoted himself to the solution of the complicated problems that this branch of research presents, and furthermore in that country by Beddoe's followers, Browne, Haddon, Maclean and others.

Of special merit are the summary statements of the knowledge collected by different scientists made by Dr. John Beddoe in his *Anthropological History of Europe*, Dr. J. Deniker in his extensive *Surveys and Reviews* (1899 and 1908), and also by Professor W. Z. Ripley of New York, now of Harvard, in his great comprehensive work, *The Races of Europe* (1900), and this by showing partly what knowledge we have attained and partly what is still missing.

The results hitherto obtained by these researches should not be reckoned as small when the exceedingly complicated conditions are considered, and when it is remembered that during the lapse of many thousands of years and particularly during the later centuries the different race elements of Europe have been brought into connection with each other and have been intermingled. Under such circumstances it is rather astonishing that so many important results have been obtained. With the present restless growth of communications and the movement of considerable parts of the nations it is of great importance that these primary inquiries should be carried on with energy; very soon it will be altogether too late to obtain information regarding the present and former diffusion of the race elements.

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There are however some particular problems that constitute impediments to the advance of anthropological science and require a thorough investigation, before we are allowed to draw quite reliable conclusions about racial conditions. But these problems certainly belong to the most difficult biological questions which await solution. I shall here mention three of them. One of them is the following: "How large may we generally consider the *sphere of variability* (Variationsbreite) of the typical characters of the different races and race branches?" For this decides where the limit is to be placed between these races and race branches. In this respect the opinions of authors are rather different. Thus some anthropologists consider the Neanderthal type as a particular race, others as a separate species, while others again, as for instance Julius Kollmann recently, regard it as only a variation of the same race, which forms the present European race.

Another problem difficult of solution is that regarding the *laws of heredity of the racial characters of the human races*. Some anthropologists believe that the racial characters of the parents are inherited by the children partly in an unmixed or nearly pure form, partly in a mixed condition. Some other authors, for instance Kollmann, are inclined to be of the opinion that the mixed forms now hardly exist, or will soon be vanishing from the chain of the pedigree, so that finally only the purer race-types, or some of them, will survive. There is some reason to believe that the Mendelian law is valid also in respect to the human races.

A third important problem, difficult to solve, which is in a way connected with the last, is this: Are the race characters and, consequently, the races themselves *still alterable or already fixed*? Or, in other words, are the human races still obeying the laws of evolution or not? One would willingly be inclined to accept the former alternative, but certain proofs have not yet been presented. Amongst the anthropologists there are differing opinions about this

question. Thus Professor Kollmann has already long ago held the view that since the Diluvium no change has taken place in the *essential* characters of the human races, only in the unessential, which are to be found within the limits of the sphere of variation. Other authors hold that alterations since that time not only have taken place but are still going on. Some of them even go so far as to pretend to be able to prove that amongst certain parts of the race branches in Europe, by the influence of culture, the whole length of the body has been augmented during the last century, and that the capacity of the skull has been increased during the last thousand years.

The last two statements being founded upon direct observations, I have considered it desirable to make investigations for controlling these pretended facts. As for the *bodily length*, I have not only taken into account the measurements of the army recruits during later times, by which an attempt has been made to demonstrate an apparent growth, but such an increase must be illusionary, depending upon an accelerated growth during the period of early manhood in consequence of an improved nutrition, which acceleration probably continues until the maximum size of that race branch is reached. In connection with my work on the skulls of the ancient Swedes (*Crania Suecica Antiqua*, 1899–1900), I have already undertaken an investigation of the long bones of all the ancient skeletons found in the graves of the Stone, Bronze and Iron ages in Sweden in order to calculate the bodily size of the ancient Swedes with the aid of Manouvrier's tables. But as these tables deal with a race branch other than the North European, I have always been hoping that before publishing the results of my measurements I should be able to control them by another table of measurements regarding this North European race branch.

Now Professor Hultkrantz has lately informed me that he has recently, without knowing of my investigation, undertaken measurements of a number of other series of long bones from our Iron and our Middle ages. I therefore placed at his disposal my series of measurements, in order that the greatest possible quantity of material might be assembled. Professor Hultkrantz has this summer accomplished a good deal of the work, and he has been kind enough to place his results at my disposal. I therefore beg here to give a short report of them. He will later complete his researches, and publish a detailed description of the results.

The long bones at his disposal were found in graves from the *Neolithic*, the *Bronze*, the *Iron*, and the *Mediæval* periods in Sweden. As they were but seldom found in such a position as made it possible to determine whether the different bones (humerus, radius, ulna, femur, tibia, fibula) had belonged to the same individual, it is impossible to tell how many individuals the bones represent. And in several of the series it was impossible with any certainty to distinguish the male from the female bones. Professor Hultkrantz is also of the opinion that the number of the different bones, especially from the Stone and Bronze periods, is still too small for drawing sure conclusions, and he therefore draws them only with some reserve. He, however, comes to the conclusion that during the *Stone*

period the average size of the body of the men was (if we judge from the femora) 1·66 or 1·67 m. During the *Bronze* and *Iron periods* it seems to have been about the same, even if the measurements are suggestive of an increase. The bones from the *Mediæval period* (the year 1361), from a great battlefield on the island of Gotland, gave an average size of the body of 1·67 m. The recruits in the years 1887–8 in Sweden, according to Professor Hultkrantz' investigations, had an average length of 1·6903 m., in the years 1897–98 a length of 1·6996 m., and in the years 1907–8 a length of 1·7147 m.

Professor Hultkrantz comes to the conclusion that *he will not maintain more than that his inquiry has made it probable, that the mean length of the body during the Stone period in Sweden was less than in our age*, and that the difference seems to have been between 4 and 6 cm. Perhaps it has changed during different periods and in different parts of the country. *Probably the greatest increase has taken place during the historical period.* For this fact the relatively great increase from the fourteenth century until our age is suggestive, and particularly the rapid increase during the latest decades. In regard to the last-mentioned increase I may nevertheless point to the suggestion made above that there now may be more rapid growth during early manhood than was the case in former times, in consequence of better nutrition during recent decades.

As for the other question regarding the increase of the capacity of the skulls during the last thousand years, it was Broca who in his treatise, "Sur la capacité des crânes Parisiens des diverses époques" (*Bulletins de la Société d'Anthropologie de Paris*, tome iii, et plus tard dans les *Mémoires d'Anthropologie*, tome i, p. 348), was the first to raise this question and to publish observations upon it. He had at his disposal three series of skulls:—

	Number of skulls.	Capacity.
Series 1.—Skulls of the twelfth century ...	115	1425·98
Series 2.—Skulls from a burying-place, earlier than the eighteenth century.	117	1409·31
Series 3.—Skulls of the nineteenth century ...	125	1461·53
Total	357	—

It would carry me too far to refer more closely to the reasonings of Broca about the burial in these churchyards of the poorer or the higher classes of society, reasons and arguments which do not appear to me very convincing with regard to the conclusions made by him.

I shall here confine myself to the observation that for a satisfactory solution of such an important problem a much larger number of skulls is required; besides this it should have been necessary to be able to settle, at least in some degree, to what branch of the European race the skulls of the three series had belonged; finally, the sex of the individuals in each one of the series and also their age ought to have been taken into account.

To draw such important conclusions so positively from the average of the measurements of each of the above mentioned series, as Broca has done, can from a critical standpoint hardly be defended. His principal resolution was: "Je considère donc comme certain que, toutes choses égales d'ailleurs soit par suite de l'éducation, soit par suite de l'hérédité, le volume du crâne est plus considérable dans les classes supérieures que dans les classes inférieures."

Topinard, the pupil of Broca, who has repeatedly referred to these investigations of the master, became more and more cautious and reserved. In the year 1876 (*L'Anthropologie*) he declared: "La capacité crânienne paraît varier avec l'état intellectuel. Les crânes des Parisiens du dix-neuvième siècle sont plus capaces que ceux du douzième, ceux des sépultures particulières plus que ceux de la Morgue." In a treatise of the year 1882 (*Revue d'Anthropologie*, Sér. 2, 5), in which he gives a detailed account of these researches of Broca, he quotes the measurements of the cranial capacity of the master, but I do not here find his conclusions mentioned; Topinard, on the contrary, forcibly accentuates the importance of having large series of skulls, of being very particular in separating the male and female skulls, and of leaving out the hydrocephalic and microcephalic skulls.

In some anthropological works of later date, however, the opposite line, that of incautiousness, has been chosen. I shall quote only one of those works, Dr. G. Buschan's *Gehirn und Kultur* (Wiesbaden, 1906). After having mentioned the measurements of Broca and Topinard, which show an increase of the cranial capacity of 35.55 ccm. from the thirteenth to the nineteenth century, he adds (R. 2): "Mit Recht legten beide Beobachter diese ihre Ergebnisse dahin aus, dass die Grössenzunahme des Schädelinnenraums auf Rechnung der zunehmenden Intelligenz und Kultur zu setzen sei." Buschan further quotes the observation of Emil Schmidt, that the modern Egyptians have lost 44.5 ccm. of the cranial capacity possessed by their ancestors: "Für diese nicht minder bemerkenswerte Tatsache lag die gleiche Erklärung wie oben auf der Hand; nur vice versa." The poor Egyptians have gone backwards in civilisation, and in connection herewith they have lost a portion of their cranial capacity, *i.e.*, of their brain volume.

Buschan has in his treatise above quoted brought together statements of some other authors regarding these questions.

He has also himself, using the horizontal circumference of the skull as measurement, made an inquiry concerning the population of the Rheinland (*Rheinländische Bevölkerung*); from this inquiry he draws the following conclusion: "Hiernach zu urteilen hätte der Schädelumfang von der Steinzeit an bis zu

Beginn unserer Zeitrechnung zugenommen, wäre dann weiter aber bis zum frühen Mittelalter zurückgegangen und erst von dann an wiederum angestiegen, allerdings mit einem erneuten geringen Rückgang im 19. Jahrhundert."

"Wir haben gesehen," says Buschan, "dass vermehrte Gehirnarbeit ein Wachstum dieses Organs zur Folge hat. Es fragt sich nun weiter, ob ein solches durch Übung an Volumen vermehrtes Gehirn sich *vererben* kann? Wenngleich die Vererbung erworbener Eigenschaften vielfach noch in Abrede gestellt wird, *glaube ich für meine Person* doch an die Möglichkeit einer solchen Übertragung."

On such facts, as here mentioned, this whole "theory" (or rather dogma) is based. It ought to be superfluous to criticise it in a more detailed manner. In his interesting book, *Beiträge zur Europäischen Rassenkunde*, Dr. C. Roese has already delivered a good criticism of these views. But they are still often reproduced, especially as based upon the high authority of Broca.

Every person who is accustomed to draw strict conclusions from real scientific data will find that this theory of Broca's is based on far too slender arguments. So far as I knew his high love of scientific truth, I am inclined to think that Broca, if he had to judge now about the problem of this rapidly increasing capacity of the skulls, would himself hardly insist on maintaining the certainty of that theory.

Though I am, of course, in no way an adherent of it, I nevertheless thought it interesting to try to furnish some real proofs for my negation, and to make an investigation upon the Swedish skulls from the corresponding period, which are at my disposal.

In the Anatomical Museum of the Caroline Institute at Stockholm 133 Swedish skulls from past ages could be used for this inquiry, which skulls I have measured with the consent of the Director, Professor Erik Müller. And in the Anatomical Museum of the University of Uppsala, with the permission of the Director, Professor J. A. Hammar and of Professor V. Hultkrantz, Mr. Vallentin, the Assistant, has measured several series of skulls (424).

The Swedish skulls from the past centuries which have been measured thus amount to the number of 557. I am quite aware that this number is much too small to in any way give reliable results in so complicated a problem as that here discussed. But the number is nevertheless greater than that of Broca.

During this investigation I have also had the opportunity of convincing myself of the difficulty, even of the impossibility, of solving the problem by measuring some hundreds, or even thousands of such skulls collected in some old churchyards, where the mixture of different race elements and different sexes is often very difficult to discriminate, and where it is impossible to learn how far advanced in civilisation and culture the individuals there buried have been.

It would really be of very little use here to give a detailed report of this inquiry. The results of such an investigation depend above all upon an exact distinction of male and female skulls; but this is a rather difficult task, and not seldom we remain in doubt regarding the sex of the individuals. I shall therefore give only some few figures:—From the *Stone* period 14 male skulls gave a mean

capacity of 1502 ccm., 4 female skulls a mean capacity of 1276 ccm.; from the Bronze period 1 male and 2 female skulls gave respectively 1510 and 1266; from the Iron period 17 male and 5 female skulls gave respectively 1503 and 1294 ccm. From the older Mediæval period 15 male and 15 female skulls gave respectively 1441 and 1286 ccm. From the later Mediæval period 30 male and 30 female skulls gave respectively 1476 and 1291 ccm. Fifty other male skulls from three churchyards in different parts of Sweden gave the mean capacity of 1435 ccm. Forty male skulls from a churchyard (in a real Swedish centre of culture), which was used during the fifteenth, sixteenth and seventeenth centuries, gave a mean capacity of 1417 ccm., which is less than the average figures from the mediæval age and still less than those from the Stone, Bronze and Iron periods. Mean figures also of such insignificant value, I got from the other churchyards of the Mediæval period and of the later centuries. If only some more skulls of a higher capacity instead of a lower had been found, which is often quite dependent upon chance—the mean capacity of the series might have been brought up and risen to a remarkably high standard. Like Dr. Buschan, I think we ought to be very careful in drawing conclusions from average figures—and I have in my former anthropological works, now more than thirty years ago, repeatedly urged caution with regard to them. They may be of value, but they are also dangerous. In this particular case they have indeed been dangerous because first so great an authority as Broca and then after him several other authors have drawn conclusions of great importance from such doubtful data. These data and similar conclusions have already been quoted as certain in books written for the general public and for school-children, who accept them as confirmed facts. It is for this reason that I have attacked them here in rather strong terms.

I also take this opportunity here to warn workers in the field of anthropological research generally against drawing conclusions from uncertain facts and passing them on to the public. We have during the last year witnessed how the newspapers and journals in almost all civilised countries have abused the latest anthropological discoveries in the south of France, and furnished the most fantastic descriptions and illustrations of the palæolithic human skeletons found there. Professor Klaatsch in his last treatise about them also protests against this profanation of science. It is indeed of importance that all lovers of true science should do all they can to resist this thirst of the great public for sensational stories, which bring true science into discredit. The great public, as well as the scientists, ought to be conscious of the great difficulties connected with anthropological science and should not draw hasty conclusions.

* * * * *

It is not my intention here to furnish any programme for anthropological research. It would require the time of a whole lecture at least. I shall in closing this address only point out a few things, which are of special importance for the study of the European race. As to the knowledge of the descent of this race and its different branches we must wait with patience for the discovery of

many more authentic, old, palæolithic human skeletons and relics. And regarding the investigations of the recent race-elements we ought to continue to collect all the testimonies which are of value for the solving of the problems, *i.e.*, the testimonies in the graves as well as among the *living* peoples.

As to the latter I want to repeat the proposal which I have already made here, that in *every country there ought to be arranged every 25th or 30th year a thorough anthropological scientific investigation of the population*, as extensive as possible—and above all on the fullgrown men—in order to investigate *what changes it has undergone during the preceding period*. And then in every country the anthropologists also ought to choose some special fields for their investigations and there particularly investigate those portions of the nations which possess the purest racial characters. In this respect I myself long ago (in 1873) chose the province of Dalecarlia in Sweden, where I have collected a good deal of material for such a research, and I hope some time to have an opportunity of giving a thorough account of this very interesting portion of the inhabitants of my native country. As proposed in the Preface to the *Anthropologia Suecica*, such a thorough investigation of the population in the Swedish provinces, and then, especially, also in those where the anthropological differences, above all the dolichocephaly and the brachycephaly, are more numerously represented, ought to be undertaken as soon as possible.

It is, however, not so easy to find enough trained workers in this field, and the expenses for such investigations and for the publication of them are not inconsiderable. There are therefore several obstacles to overcome. I suppose the same difficulties are to be found in most countries.

The nations and their Governments do not yet understand the high ideal and social importance of the anthropological investigation of the populations. Their sympathetic and material support is very desirable in this vast and arduous field of scientific research.

With the lapse of time this work is becoming more and more complicated and difficult to accomplish. In connection with rapidly improving inventions in the domain of communications, population is becoming more and more mobile. If we are to learn to know the real characters and the present distribution of the race elements, it is necessary that the thorough anthropological inquiries above mentioned should be made as soon as possible. It will then be easier in the future to understand that mixture of the peoples, which certainly is going on with constantly increasing rapidity and intensity.