THE LUMLEIAN LECTURES

ON THE PATHOLOGICAL RELATIONS OF THE VOICE AND SPEECH.

Delivered at the Royal College of Physicians of London.

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LECTURE III.—(*Concluded.*)

THE next case that I shall quote is also one that interested me very much, and to which I gave considerable attention. It is that of a butcher, twenty-two years of age, who was brought to the hospital on the 13th January, 1871, having just been thrown out of a cart on his head, and stunned. On admission, he was insensible; both pupils were dilated, especially the right, which also responded less readily to light than the other. There was a lacerated wound on the right temple, above the eyebrow. The right eyelid was swollen, and there was a little blood oozing from the nostrils; no discharge from either ear; pulse slow and full; skin cool; respirations normal. He became partially conscious in a few hours, and he remained so till the 17th, when he had a slight fit, attended with twitchings of the face and rolling of the eyes. This was succeeded by a series of fits, following one another at short intervals, until the afternoon of the 19th. In most of these, the arms are said to have been stiff, and the left arm and leg convulsed. Between the fits, he lay in a semi-conscious condition. On the morning of the 19th, erysipelas attacked the wound. This proved to be a severe attack; but it had subsided by the 31st, at which time his general health seemed much better than it had been previously, and his intelligence had decidedly improved. He appeared to understand what was said to him; he protruded his tongue when asked to do so, and he answered questions imperfectly. About this time, small-pox broke out in the hospital, and he took it. He passed through a mild attack; and it was after this that he came under my care. When I first saw him, he appeared to be in very good health, and without a trace of paralysis; he could use his limbs freely, and his organs of sense were perfect; he could masticate, swallow, and articulate with facility; he understood everything that was said to him, and did in a moment whatever he was asked to do; he knew, as well as he had ever known, persons and things, and played well at dominos with the other patients; and, indeed, if not required to talk, read, or write, he appeared to be a perfectly sound man both mentally and bodily, except that he was somewhat inclined to be morose and ill-tempered at times. I may add that he had had a very fair education; that he could repeat accurately every word that was said to him; that he retained the power of whistling and singing, or humming tunes; and that, having the perfect use of his fingers, he could copy, in the sense of drawing with pen or pencil, whatever was placed before him, as well as ever he had done, and necessarily, also, the forms of letters. His inability to express himself in words was very great; and although by slow degrees he improved in this respect, he was still markedly aphasic at the time of leaving the hospital. At the early part of my intercourse with him, he could scarcely recall the name of anything he was shown; and, when asked to give it a name, would shake his head or utter a word which had no relation to the object before him, recognising however, almost invariably, the error he had made. On close examination, it seemed to me that it was not simply in the names of things that his memory was defective, but that there was an equal defect in availing himself for speech of verbs, adjectives, and other parts of speech. He spoke not in single words, but in short sentences; and I noticed that, when he endeavoured to converse, there was a tendency to harp upon certain formulæ, and to use the same words in the same combinations to express quite different things. But here, again, even in the process of speaking, he appeared obviously to recognise that he was talking nonsense; would check himself, try to correct himself, and then stop with a puzzled air or gesture of annoyance. The following examination, conducted some little time after he came under my care, will illustrate some of his peculiarities. A pencil was shown him, and he named it correctly. When shown a quill, he called it a pencil; and then, knowing that he was wrong, he added, "I used to keep a lot of them". He recognised the name of "quill-pen" when it was uttered. He could not name a jug; knew it was not

a dog or a plum-pudding; and picked out the word jug when it was named with several other words. He failed to name a hat, and several other articles of dress, but identified the names unerringly when he heard them. After a short time, when re-examined on the same subjects, he still failed almost in every case to recollect the appropriate names. When shown the jug, he could not name it, but said, "I broke it", not meaning, however, that he did actually break it. He could say some of the letters of the alphabet consecutively, but could not remember a fragment of the Lord's Prayer, or any text in the Bible, or any verse of poetry. When asked how old he was, he said, after thinking a minute, "price". But when asked a second time, he answered correctly, twenty-one. He was told to count, and he began at one and counted to forty; he was then stopped, and asked to begin at a hundred, from which he went on correctly until he was again stopped. He said twice two was thirty. Asking him something about his family, he said that "his sister came in at two", meaning that she died when he was two. He was then requested to name the letters of a sentence in a newspaper. The value which he assigned to them was as follows—"When about thirty years", "mhth hthtt thwhty hzht7". Before he left the hospital, he had learned the names of many common things round about him, but his power of joining in conversation or of expressing his meaning in sentences had improved on the whole but little. He was always trying to write letters; but there was little difference in them, and they were always failures. He would commence by writing "my", followed by "dear", and then lapse into a meaningless combination of letters or up-and-down strokes. He could not write to dictation, or read, but could copy written words when placed before him. On one occasion, I opened a prayer-book, pointed to a verse of one of the Psalms, and asked him to read it; but this he could not do. I then asked him to copy it letter by letter, meaning, of course, that he should copy the actual forms of the letters. But to my surprise he translated it accurately, without hesitation, into written characters in his proper handwriting. The verse was, "Plead thou my cause, O Lord, with them that strive against me". I now asked him to read what he had written; but, after careful study, the only words he attempted were, "O Lord" and "them", the latter of which he called "then". I then spelt each word successively for him, and asked him to name them; but again he only recognised "Lord" and "them". Subsequently I asked him to name each of the printed letters of the verse he had copied, and afterwards each of the letters he had written. The result was as follows:—

Names of printed letters: Plehr thor mr chust o loht hath ther that stroue with he.

Names of written letters: Plea-ther he cahst o lort woth then thet c-nile wish he.

On several occasions, I repeated this kind of examination, and always with the same result. He now and then pored over a newspaper; and on one occasion he had a paper containing a long account of the opening of St. Thomas's Hospital; and I tried to ascertain if he understood in any degree what he appeared to be reading. I need scarcely say that he could not read this aloud better than he had read the prayer-book; but it struck me that he might, notwithstanding, understand the words that he could not utter. He certainly seemed to look through the account with interest. To test him, I asked him to point out where certain statements, such as might be supposed to have some interest for him, were to be found. It seemed to me, however, that his condition was very like that of a person trying to read a book in a foreign language, of which he only knew a few words. He singled out, for example, the names of certain persons connected with the hospital, and pointed out here and there a sentence, the meaning of which he either understood or had a glimpse of; but I feel sure he had no general understanding of what he read. The only other point upon which I examined him was his knowledge of figures and arithmetic. I have mentioned that he could count correctly. When I first saw him, he could also write down figures correctly from dictation; further, he could do sums in simple addition. In doing addition of money, he was less accurate, and curiously would often name the right figure while writing the wrong one, or, conversely, name the wrong one, and yet write down the proper one. He left the hospital in July.

The points of chief interest in this case seem to be the association of greatly impaired power of recalling words and their elements, of speaking or writing them, of repeating vocally or of understanding written or printed language, and of writing to dictation, with the perfect capability of repeating all sounds dictated to him, and of understanding them; perfect capability of copying any writing what was placed before him, and even of translating printed words into their written equivalents, without, however, understanding them; the retention of the musical faculty, and in some measure that of calculation; and the retention of memory for other things than words, and apparently perfect comprehen-

sion of all that was going on about him. It is of course a matter of speculation as to what and where the cerebral lesion was in this case. There were no paralytic phenomena to guide us. The injury to the right side of the head, associated as it was with subsequent erysipelatous inflammation and aggravation of the head-symptoms, might seem to point to lesion of that side. On the principle of *contre-coup*, however, it is highly probable that the part injured was the surface of the left cerebral hemisphere, somewhere in the region supplied by the middle cerebral artery; in other words, in that area which includes the several centres presumably concerned in speech. Broca's convolution was probably involved directly. Beyond this I shall not go, except to remark that it is easy with some such diagram as I have placed before you to explain theoretically most of this patient's mental and linguistic peculiarities.

T. R., a man aged 39, was admitted to St. Thomas's Hospital on January 29th, 1872, under my care. He had been attacked ten weeks previously with a fit, due, I believe, to extravasation of blood, from which he emerged completely paralysed on the right side and quite unable to speak even a syllable. In the course of a fortnight, he had improved so far as to be able to walk with assistance, and later he began to say a few words, but up to the time of admission he remained unintelligible. His words were few and misapplied. He could not spell out words, for his friends tried him with a box of letters, and his attempts to write with the left hand resulted only in the repetition of the word "the" over and over again.

When I saw him, his paralysis was incomplete; and he could not use the right hand for any useful purpose. He understood very imperfectly what was said, although he would put out his tongue when asked to do so. He could not repeat words to dictation, but had a series of words ready to hand which he uttered with more or less earnestness and volubility when he wished to speak or answer a question. They were "stablish", "can't", "simple", "can't afford it", "opposite", "can't see", "yes" and "no". He did not attempt to name, and probably could not name, any object placed before him; nor could he write. Some little time after he came in, there was gradual improvement; his vocabulary extended, and this extension was partly due to persistent instruction on the part of the sister of the ward, who taught him a variety of words and sentences, such as "good morning", "glass of wine", "St. Paul's", "Prince of Wales", and "Princess". But he had a tendency to curtail or alter words, so that "Prince of Wales" became "iss of Wales", and "Princess" "concess" and "cess". He learned also to say "sank you, sir". As he improved in other respects, the power of repeating words to dictation also improved; but there was always more or less uncertainty in this respect; and even when he left in April, although he had managed to learn and retain a good many words we had taught him by constant repetition, and although he would often name common objects readily, he more often failed, and failed even to some extent to recognise that a suggested word was erroneous. Thus, a few days before he left, he named a watch, spectacles, hat, and coat, but he could not name a cap; and when asked if the sister's cap was a nightcap, he assented, and then looked sheepish. He called my nose spectacles; and could not name a pen, inkstand, or key; and when asked if the last was a lock, said "yes". When puzzled, he would frequently exclaim "oh dear! oh dear!" There were a few other facts of interest in his case. At first, he did not appear to be able to write at all; but once or twice I got him to make an attempt to copy with the left hand. I drew a geometrical figure, and tried to explain to him that I wanted him to imitate it. On the first occasion, he drew a series of indefinite and meaningless lines; subsequently, however, he reproduced it with an obvious attempt at imitation, but imperfectly, as a child might do. I drew a capital Roman A and a few other easy letters, which he copied with moderate success. I then drew a hasty caricature, consisting of a couple of circles for the head and body respectively, with straight lines for the arms and legs, and asked him to copy it, which he did. He was sitting at a table at the time, with a good many students and others around him; and on the impulse of the moment I suggested to him to take the portrait of some one standing near. He at once drew such a figure as he had drawn before; and then, with a sudden twinkle in his eye, added to the body a short downward stroke between the strokes intended for the legs. Laterly, though he could not write spontaneously or to dictation, he reproduced in writing two words out of a sentence when a Prayer Book was placed before him. When first admitted, he did not appear to recollect anything he had learned; but, when he had recovered the use of language to some extent, I found that he could count up to ten or twelve, and repeat the Lord's Prayer in a fashion; that is to say, he would utter a kind of jargon, which was for the most part meaningless, but in which could be detected here and there actual words of the Prayer, and here and there words or sounds which were imperfect or remote reproduc-

tions of the actual sounds; at any rate, the ear could follow him, and it was generally possible to recognise the particular sentence he was uttering. I do not think he could read; at any rate, he could not point out letters or words; and, although on one or two occasions he apparently read the Lord's Prayer in the same manner as he repeated it, I am inclined to think that he said it chiefly from memory, since, after repeating the prayer which was before him, he added to it, as though he were still reading, the doxology, which was not before him. Shortly before he left the hospital, he sang "God save the Queen" at my request; the tune was satisfactory; the words, of course, were incorrect, and only partly distinguishable.

There are some striking resemblances, and at the same time some important distinctions, between this case and the previous one. In both there was inability to express themselves in spoken words, to read and to write, and in both the capacity to sing remained to some extent. But whereas, in the former case, the patient could speak unerringly to dictation, always knew the right word when he said it or heard it, and had a clear comprehension of everything that was said and of all that was going on about him, in the latter case there was a difficulty, even at his best, in repeating words; he frequently used words in an utterly wrong sense without appearing to know it, and there seemed to me to be a marked failure of his general intelligence. He could not, I think, do simple arithmetical sums as the other did; but he recollected much better than he, not, perhaps, the actual words of the Lord's Prayer and of other things which he had learnt, but rather the general sound or rhythm, as a young child will sometimes do. As I first stated, I have grounds for the belief that the patient was suffering from the results of hæmorrhage into the left hemisphere, which was probably situated, as usual, in and external to the corpus striatum, and so affected the surface of the brain, less directly than by pressure and interruption to the fibres passing from the surface to the central ganglia.

S. A. Loveday, a married woman aged about 50, was admitted on the 12th of last July. Her history was imperfect. She was a woman of some education, and had been abroad, and had lately been confined to her house with rheumatism. On the day of admission, she had a fit, and was brought to the hospital in a state of almost complete unconsciousness. It was ascertained that there was a systolic murmur at the apex of the heart; that there was complete right-sided motor paralysis and hemianæsthesia; and that the left pupil was contracted. At this time, her face was turned strongly to the left side. During the next few days, consciousness returned to a considerable extent, and she began to recognise those around her. But the right arm and leg remained absolutely without power of voluntary motion. Hemianæsthesia was complete to the middle line. Reflex actions could be readily excited on touching the hand, foot, or eyelid. The right pupil remained more dilated than its fellow; and it was determined beyond doubt that she was totally blind in the right eye. She understood very imperfectly what was said to her, and did not attempt to utter any articulate sound or even to protrude the tongue beyond the teeth. About three weeks after admission, she began to suffer severe pain in the right arm, especially when it was moved, and she frequently screamed out. There was no rise of temperature at this time. A day or two later, she spoke for the first time, replying to all interrogations, "stomach, stomach". From this time, there was gradual recovery of sensation on the right side, associated with gradual increase of rigidity and pain in the arm and leg on passive movement, and the sight of the right eye returned, but there was no restoration of voluntary power. She undoubtedly improved in her mental condition, but continued to utter "stomach" and occasionally "no" in answer to all questions. She would sometimes pause and apparently strive to use some other expressions, but it always ended by the word "stomach" slipping out.

I shall not pursue the history of this case in chronological order. The patient remained under my care till late in February of the present year, when she was discharged at her own request. During this time, the paralysis of the arm and leg continued absolute, associated with rigidity and pain on movement. Her general health remained good; and, although rapid improvement took place in the power of speech for a short time after improvement began, it reached only a certain point, and for the last four or five months there was very little appreciable change in this respect. Her difficulty in naming things was always great. She could only rarely designate correctly things that were shown to her, and she almost invariably failed to name her thumb, fingers, nose, eyes, and ears. On one occasion, when shown a pen, she called it "sixpence". On another occasion, she misnamed it "thumb"; and, when asked its use, answered, "Write a pen with"; and still she could not name it. On another occasion, she made no apparent attempt, but exclaimed, "Gone out of my mind, stupid". Once, when I asked her to name her nose, she called it "eyes". When, however, I pointed to her eyes, she still replied, "eyes". Subsequently, she

called her nose "bears". At the same time, she became puzzled about her teeth, lips, and tongue, and presently said, "I have lost those faculties". But it was curious that on several occasions, when I showed her well-pronounced colours, she named them with scarcely a mistake; and that she was usually accurate with regard to the names of pieces of money. Proper names were always especially difficult to her. When asked her name, she generally could not give it. Not unfrequently, however, she would answer, "Sarah Ann", which was her Christian name, and there stop. Occasionally, by a sudden impulse, she would add, "Harris", or "Loveday"; the former being her maiden name, and the latter the name of her present husband. Much more commonly she could not think of those words, and she generally forgot them a few seconds after she had said them. When the latter names were mentioned to her, she was in doubt as to which was the right one. Once she said her name was "tablespoon". She was often very talkative, and would sometimes utter long sentences which were quite appropriate; sometimes expressions which were altogether wide of the mark; and still more frequently an unintelligible gabble, which appeared to be divided into words and sentences, and came out with extreme volubility. She would often talk nonsense, or continue to gabble for a considerable length of time with great earnestness, as if under the impression that she was expressing her thoughts in intelligible language; and yet occasionally she would check herself, and apparently recognise that she was saying what was meaningless. In November, she was made the subject of a clinical examination, and was removed in a lift from her own ward to the one above it. This excited and alarmed her very much; and, when I saw her after her return, she poured out a flood of incoherent sounds, amongst which could occasionally be detected such expressions as "Lord have mercy! never shall I forget it". It is worth noticing that the candidate to whom she was allotted, after investigating the case, came to the examiner and said he could make nothing of her, for she was a foreigner, and he did not understand her language. On one occasion, when she was talking unintelligibly, I interrupted her by asking if she called it English, to which she replied, "I don't think it is; but I cannot read". At another time, I asked her how she was, and she replied, "I feel awfully cold; you look as if you were cold." I tested her several times in regard to letters and numerals. On one occasion, she counted up to seven and then stopped; and she repeated the first three letters of the alphabet, then *c*, and came to a standstill. I asked her what ten times ten was, when she exclaimed, "Oh dear! too long; you astonish me". I then tried to make her repeat the alphabet after me. Many of the letters she said correctly, but many she mispronounced. In place of some, she said, "yes" or "no", "one", "two", or some other word; and at times, instead of repeating the letter dictated, she went on to the next. I subsequently examined her on the Lord's Prayer, and asked her if she could say it. She replied, "I cannot see to-night; I never could". On urging her to try, she said, "Lord, and of the— Oh dear! I never can get through it." I then suggested "Our Father", which she repeated, adding a quantity of unintelligible stuff, and wound up with "I am sure I cannot". Her difficulty and uncertainty in reading and distinguishing letters were quite as great as those of speaking. Once I showed her a ticket printed in large type to the following effect: "St. Thomas's Hospital. No article of food is to be brought into the wards or given to any patient without permission of the sisters", etc. She read, "No medicines brought into the gallery without". Subsequently she read the word "Thomas"; but she did not recognise all the words, and could not point to a single letter, or name one. Before she left the hospital, I printed her name with my own, together with several other words, in large capitals, and placed them before her. She picked out her own name and read it, "Sarah Ann Loveday". But a day or two afterwards she read the same words as "Sarah Ann Harris". She made out the word "Dr." prefixed to my name, but could not read the name itself. She knew, however, that it was my name. At another time, when trying to read unsuccessfully, she exclaimed, "I have it in my head, but cannot say it"; adding several times, "Oh dear! oh dear!" with a look of perplexity and annoyance. On one occasion, I tried to find out if the flavours of things would recall their names, and I placed successively on her tongue sugar, salt, and mustard. She did not approve of the experiment, which failed; and, when she tasted the mustard, she exclaimed vehemently and with disgust, "Stinking stuff!" I several times asked her to try and sing, and at length prevailed upon her to strike up "God save the Queen". The words were imperfect, and there was a total absence of musical inflection. I must add that, although she evidently understood a good deal of what was said to her, there was even to the last much uncertainty in this respect. Two or three days before her discharge, she was hopelessly puzzled with respect to the actual meanings of the words "nose", "eyes", "lips", "tongue", "teeth", and "hair"; and,

although she would generally put out her tongue when told to do so, she would often point to her nose, or eyes, or hair, when asked to point to the tongue.

With regard to the morbid anatomy of this case, there is good reason to suspect, not only from her mental symptoms, but from the association of complete motor hemiplegia and anæsthesia with loss of sight in the right eye, that the middle cerebral artery was obstructed at its commencement; and that, consequently, a large extent of cerebral substance, including Broca's convolution, and the acoustic and perceptive centres, had undergone softening. The patient's symptoms, which were much like those of the last case, were in many respects such as might be expected under these circumstances, especially if it be assumed that the functions of this part of the brain were impaired, but not absolutely destroyed; or, what is more likely, that the functions of these parts being to a large extent annulled, their linguistic duties were supplemented by the inefficient correspondingly situated region of the right hemisphere. She had difficulty and uncertainty in understanding both spoken and written words, and in repeating words dictated to her. She had a similar difficulty and uncertainty in naming things which were shown to her; and, although she at times uttered appropriate groups of words, much more frequently she would use erroneous words, or speak a senseless jargon, without knowing that she was talking nonsense. Her general intelligence was much less seriously impaired than her knowledge of language might have led one to suppose.

The last case I shall venture to narrate is chiefly interesting from the fact that it adds one to the list of cases in which left-sided hemiplegia in a left-handed man was attended with typical aphasic symptoms. J. W., aged 26, came under my care on March 17th, 1874. He had been attacked with rheumatism four or five weeks before. A fortnight later, when the rheumatism had subsided, he was seized suddenly with loss of speech, coupled with paralysis of the left side. He could walk from the first, and from the first he could only say the words "little", "yes", and "no". On admission, he presented symptoms of partial paralysis of the left side. He could walk; but the leg was weak and dragged. He could not grasp so strongly with the left hand as with the right. The mouth was drawn to the right, and the tongue protruded to the left. There was no impairment of sensation. A well-marked systolic murmur was audible at the apex, and bronchitic râles were abundant over both lungs. He could say "yes", "no", and "little, little", which he repeated volubly and with energy in reply to all questions. For the most part, he failed to repeat words dictated to him; but occasionally a short easy one, such as "blue" and "red", slipped out as if by accident. He did not understand all that was said to him. I asked him if he were a hundred years old, and he laughed and said "No", but said "Yes" seriously when I asked him if he were two. When told to put out his tongue, he put it out; but, when asked to grasp my hand or to shut his eyes, he still put out his tongue. He could not name any object. I ascertained that he had not learned to read or write, and that he was left-handed. I tested this latter statement repeatedly by making him use a knife and fork in my presence, when invariably, notwithstanding the marked weakness in his left hand, he used his left hand for cutting. He improved in respect of speech from the time of admission onwards, and gradually acquired the power of uttering a few sentences and of counting; but to the last he had scarcely any power of naming. Moreover, he had a marked tendency to mispronounce consonants, and especially to replace those situated at the beginnings of words and syllables by *l* or *b*. He also became more ready of repeating words dictated to him, except that *l* and *b* largely replaced other consonants. In repeating the alphabet to dictation, most of the explosive consonants were called *b*. Latterly, he appeared to understand everything that was said to him. Unfortunately, while the patient was improving mentally and as regards speech, symptoms referable to his valvular lesion rapidly developed. These became serious about April 4th. Pulmonary apoplexy, with hæmoptysis and difficulty of breathing, enlargement and tenderness of the liver, with jaundice and vomiting, albuminuria, and general dropsy, successively supervened; and he died on the 27th. The *post mortem* examination was made on the following day. The lungs were congested, and contained several recent apoplectic clots. The liver was rather small and soft, but somewhat bile-stained and in a nutmeg-condition. The spleen contained one or two hæmorrhagic blocks. The kidneys were hyperæmic, especially in their medullary portions; and one presented an old depressed block. The heart was hypertrophied, especially on the right side; and recent vegetations, forming in some cases pendulous masses, were attached to both the aortic and the mitral valve. The former prevented regurgitation; but the mitral orifice was contracted, and the valve was incompetent. A secondary branch of the right middle cerebral, near a bifurcation, was obstructed by an embolus about as large as a pin's head; and the area to which the obstructed system of vessels led was yellow and soft,

while the pia mater over it was thickened and adherent. The affected parts included the posterior part of the third frontal convolution, a small portion of the second frontal above it, the lower parts of the anterior and of the posterior ascending frontal convolution, a small patch of the supramarginal convolution, and a good deal of the adjoining temporo-sphenoidal, together with the convolutions of the island of Reil. The right corpus striatum was a little yellower than the other, and possibly somewhat softened; but the changes presented by this body were very slight.

In this case, as generally occurs in cerebral embolism, and as might have been supposed from the linguistic symptoms, a somewhat extensive surface of the brain had undergone softening. The diseased area included, in fact, not only the recognised speech-centre, but also a portion of the centre for visual perceptions and a considerable extent of the auditory centre. His symptoms were much like those exhibited by S. A. Loveday, in whom also there is reason to believe that the cerebral affection was due to embolic softening and of wide distribution.

ABSTRACT REPORT OF LECTURES ON THE COMPARATIVE ANATOMY OF MAN.

Delivered at the Royal College of Surgeons of England.

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VII.—THE MONGOLOID PEOPLE OF ASIA.

To the north and east of the line spoken of in the last lecture, running northwards from the head of the Bay of Bengal, and following more or less closely the great mountain-chain of the Himalayas, to the north of the Caspian Sea, the bulk of the people of the continent of Asia belong to the type to which Blumenbach applied the term Mongolian. As in the case of Caucasian, this word has been objected to as liable to lead to confusion between the whole race in its widest sense and the comparatively small and obscure tribe from which the name is derived; so perhaps Mongoloid (Mongol-like) is more expressive. Turanian is often used by modern ethnologists in nearly the same sense, although the races comprised under this term are not quite identical with those called Mongolian; the latter being characterised by physical, the former by linguistic affinities. With such infinite gradations between the more marked types, and with such difficulty in determining either the natural boundaries or the relative importance of the different groups of man, it is not to be wondered at that the terminology of the subject is at present somewhat vague and unsettled.

The physical characters of the Mongolian type in its fullest development, as found in the so-called Tartars who inhabit the country to the north of the great wall of China, and met with in a greater or less degree in all the people of the group, are as follows. In size, they are generally small, but thick-set. The complexion is neither white, nor rosy, nor black, but a pale brown, usually with a yellowish tinge; hence they are spoken of as the "yellow races", in contradistinction to the (so-called) white and black races. Their hair is black, perfectly straight, and coarse. In microscopic section, it is seen to be of large size, and more inclining to cylindrical than in other races; but there are always great differences in the form and size of the sections of hair even from the head of the same individual. Except on the scalp, where the hair is often long, the capillary development is very scanty. On the face, it is often limited to two slender pencils on the upper lip; and the beard, when developed, is acquired comparatively late in life. The features are extremely characteristic. The face is broad and flat; the space between the eyes is wide; the nose small, straight, and compressed; the eyes dark and small; the aperture between the lids narrow and somewhat oblique, being raised at the outer corner; the upper lid drooping, the inner corner partly covered by a vertical crescentic fold of skin; the cheeks very prominent; the mouth and lips of moderate size, the lower lip often hanging; the chin small and sharp.

The osteological characters of the typical Mongolian are more marked in the face than in the cranium; for the latter may vary between the extremes of brachycephaly and dolichocephaly, though the former prevails. The face is large, being both high and broad; the forehead flat; the glabella and supraorbital ridges slightly developed; the orbits round, with thin sharp margins; the sublabellar nasal depression very

slight; the nasal bones narrow and flat, the whole framework of the nose inclining to the leptorhine form; the jaws neither prognathous nor orthognathous, but of medium prominence; the arch of the mouth broad and round; the malar bones both broad and deep. Perhaps the most distinctive feature of the Mongoloid face is the forward position of the outer margin of the orbit, as compared with the median line of the face. It is this which gives the characteristic appearance both to the bony framework and to the living face. It is best seen by looking at the profile, when the inner surface of the orbital cavity will be seen to be covered to a greater extent in a skull of any of the Mongolian races than it will in that of an European, Negro, or Australian. In order to estimate this character with exactness, Professor Flower measures the angle formed between two horizontal lines meeting at the most depressed point of the nasal bones in the middle line (the apex of the angle), and resting on the middle of the outer margins of the orbit. This is called the *nasi-malar* angle, and is readily obtained by a goniometer adapted for the purpose. In this character, as in all others in craniometry, there are considerable individual differences; but the averages give valuable results. For instance, in European skulls, the nasi-malar angle may vary between 120 and 140 deg.; but the average of one hundred and thirty specimens measured is 131 deg. The average of the twenty Maravars from Southern India mentioned in last lecture is exactly the same; the average of twenty African Negroes, 134 deg.; and of twenty Australians, 135 deg. In all of the true Mongolian races, the average exceeds 140 deg. Thus, in four Samoyedes, it is 144 deg.; in sixteen Chinese, 142 deg.; in seven Japanese, 141 deg.; in four Burmese, 144 deg.; in twenty-six Eskimo, 144 deg. The numbers of examples here given are too few to give a positive average for the race; but they are sufficient to indicate the usefulness of this very easily estimated character in deciding upon the Mongolian affinities of a skull.

Very little satisfactory information can be given regarding the proportions of the limb-bones and the characters of the pelvis of this type of man, as the materials at our disposal, at all events in this country, are quite insufficient for the purpose.

The Mongoloid races of Asia are conveniently divided into two groups, the northern and the southern. The former, called Mongolo-Altaic races, are united by speaking languages having considerable affinities. They nearly all lead a nomadic life, depending for their living on hunting, fishing, and cattle breeding. Occasionally, when united under the leadership of some military chieftains of extraordinary capacity, who have arisen among them at intervals, as Attila, Tchingis Khan, and Timur, they have overrun nearly the whole of the continents of Asia and Europe; now, however, they are everywhere either the actual subjects, or live by the sufferance, of the people over whom they formerly terrorised—the Russians, Chinese, etc.

Unfortunately, the anatomy of these races is very badly represented in the museum; and, as it is chiefly for the illustration of our own collection that these lectures are arranged, they must be passed over more briefly than their position in the general history of man would otherwise require.

We have, however, a complete skeleton and several skulls of Samoyedes, a people now inhabiting the most inclement parts of North-Western Siberia, extending along the shores of the Arctic Sea from the neighbourhood of Mezen in European Russia to the river Khatanga, and formerly still more extensively distributed. They were conquered by the Russians in 1499. They are dwellers in tents made of pieces of bark covered with reindeer skins, live chiefly by fishing and the chase, and by the produce of the herds of reindeer which they keep. Their external physical characters are always described as being typically Mongolian. Their skulls are very broad and low, the average latitudinal index of four being 847; the average altitudinal index 719. They are, therefore, decidedly brachycephalic. The cranium belonging to the skeleton, which came from the North of Russia in Europe, has a latitudinal index as high as 882. The orbits are round (megase), the average index being 938; the nasal index is 431, so that they are truly leptorhine; the alveolar index of 102 shows them to be mesognathous, with a strong inclination to prognathism. The skeleton, that of an old male, is slightly below five feet in height. The pelvic index is 78, somewhat below that of the average European (80), and, therefore, showing no affinity to the Australian or the Negro; but, on the other hand, in its limb proportions, this skeleton (whether exceptionally cannot be determined at present) presents some remarkable characters; both bones of the upper extremity being disproportionately long compared with those of the lower limb, and the radius and the tibia being relatively longer compared with the proximal segments of the limbs than in Europeans.

The Mongolian people who, from the cradle of their race in the great central plateau of Asia, have at various times poured out their hordes