not make its appearance in the individual before the average age of 15 years. It is congenitally and permanently absent in at least forty human beings out of every thousand. It would seem clear, as stated already, from a consideration of our historic ancestors, from the fact that this faculty rapidly fades out as we ascend into the past, that it cannot have existed in the race more than 10,000 years at the most. It is far more unstable in the individual than older faculties, such as self-consciousness. It is never present in dreams.

MUSICAL SENSE.

Finally, the musical sense (a faculty which is now in act of being born into the race) does not appear in the individual before the average age of about twenty years. It does not exist in more than half the members of the race. It has existed less (perhaps considerably less) than 5,000 years in the race. It is never, or almost never, present in dreams, even in the case of professional musicians.

THE SCHEME OF MENTAL EVOLUTION.

You see now clearly the scheme upon which I suppose the mind (as far as we have got) to have been built. I say advisedly "as far as we have got," because, if the mind has grown in the way set forth, it is still growing and is not built but is in the act of building. No man can ever say positively that his theory (of any fact) is the true one, but I am prepared to say of the above hypothesis that, if it be accepted, it will enable us to understand something of the phenomena of mind as we observe it, whereas if we should prefer to hold, as many do, that the human mind was created independently of any that preceded it by a fiat and *per saltum*, then I say deliberately that there is and can be no such thing as a science of psychology, and that every attempt to investigate or explain, to comprehend or divine the rationale of the facts observed as to its origin and growth in the individual must remain for ever futile. And if I could find the right words, I would bring home to each one who hears me the inextinguishable conviction that, in this idea of evolution, lies enfolded the mystery of the past, the explanation of the present, and the sure prescience of the future—what we were, what we are, and what we shall be.

THE ATAVISTIC THEORY OF IDIOCY AND INSANITY.

In conclusion, I desire to refer briefly to two corollaries which flow from this hypothesis. The first is, that if it is correct, then all forms of insanity, including all forms of idiocy, are nothing more nor less than cases of atavism. In this view insanity is due to congenital absence or imperfection (leading to breakdown) of some faculty or faculties, such absence or imperfection being due to more or less complete reversion to an ancestral type. In my opinion, this view explains insanity and its numerous forms more completely than these can be explained from any other point of view, and is therefore of great value to the thoughtful student of these phenomena. Upon this view, the comparatively recent origin and rapid evolution of the human mind, and especially the rapid mental evolution of the so-called Aryan peoples in the last four or five thousand years, is almost solely responsible for the large number of cases of insanity in the modern civilised world, since the stability of any form, function, or faculty in any race is dependent upon the time it has existed in that race, and therefore the more recent a faculty is in a race the more frequently will it be found absent, defective, or unstable in the individuals of the race.

FUTURE DEVELOPMENT OF MIND.

The second corollary, which is even more important than the first, is that, upon the view here set forth, the human mind at present is not formed, but forming, is not completed, but in process of construction. By slow and dubious steps taken in darkness our remote ancestors wearily climbed to simple consciousness. After another immense interval they reached self-consciousness. But that cannot be the end—the cosmic process cannot stop there—cannot indeed stop anywhere. Evolution, as far as we can see, has always gone on, is going on to-day, and will always go on. Our old mental faculties are some of them fading out, others advancing towards greater perfection, and alongside of them new ones

are springing up, some of which will, without doubt, be of overshadowing importance in the future.

So-called telepathy and clairvoyance seem to be specimens of such nascent faculties. I place in the same class the phenomena of what is often named spiritualism. The labours of the Society for Psychical Research have made it to me plain that these phenomena, as notably in the case of W. Stainton Moses, really exist. And I think that a study of the above-mentioned case, together with that of Mrs. Piper and that of Mary J. Fancher, of Brooklyn, would compel any unprejudiced person to make the same admission. But to me these are not cases in which outside agents are acting on or through a human being, but are cases in which a given human being has faculties which are not commonly possessed. Whether any given faculty, such as one of those now alluded to, shall grow, become common, and finally universal in the race, or wither and disappear, will depend upon the general laws of natural selection, and upon whether the possession of the nascent faculty is advantageous or not to the individual and to the race.

But of infinitely more importance than telepathy and so-called spiritualism (no matter what explanation we give of these, or what their future is destined to be) is the final fact to be here touched upon. This is that superimposed upon self-consciousness, as is that faculty upon simple consciousness, a third and higher form of consciousness is at present making its appearance in our race. This higher form of consciousness when it appears occurs, as it must, at the full maturity of the individual, at about the age of 35, but almost always between the ages of 30 and 40. There have been occasional cases of it for the last 2,000 years, and it is becoming more and more common. In fact in all respects, as far as observed, it obeys the laws to which every nascent faculty is subject. Many more or less perfect examples of this new faculty exist in the world to-day, and it has been my privilege to know personally, and to have had the opportunity of studying, several men and women who have possessed it. In the course of a few more millenniums there should be born from the present human race a higher type of man possessing this higher consciousness. This new race, as it may well be called, would occupy, as toward us, a position such as that occupied by us toward the simple conscious *alalus homo*. The advent of this higher, better, and happier race would amply justify the long agony of its birth through the countless ages of our past. And it is the first article of my belief, some of the grounds of which I have endeavoured to lay before you, that such a race is in course of evolution.

THE CAUSATION AND TREATMENT OF SPINAL CURVATURE.

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It would require a very long paper to discuss adequately the various causes of lateral curvature of the spine, but there are a few points which I shall be glad to refer to in connection with the present controversy.

When weakness of any kind affecting the back happens to be the predominant condition, whether it be weakness of the muscles alone or weakness affecting the vertebral joints, it is chiefly or entirely during relaxation of the back in its upright position that the spine becomes crooked, or, being crooked, that the curvature increases. This relaxation of the back, or, more correctly speaking, relaxation of the dorsal muscles happens chiefly and typically when the individual is sitting down, so that if the back be not adequately supported in an upright manner the spine tends to curve unduly in one or other direction. If during this relaxation there exist any exciting influence to guide the spine to one or other side, lateral curvature is produced, but otherwise we get excessive "roundness" of the shoulders (kyphosis). Irregularity of the spine, as a whole, to one or other side is either secondary or is dependent upon a variety of causes. Anything which throws the pelvis to one side (a short leg) may produce the so-called "amesial" condition, or it may be, and often is, the result of general debility or of a neurotic condition of the patient.

Considering it to be secondary in importance, I have dealt first and chiefly with what I have taken to be the primary condition—that is, the lateral curvature—and in treating this I have always found the amesial condition disappear rapidly. If the patient be very weak, the spine may tend to give way all the time that the patient is not recumbent, but in a great many instances the spine will be held straight during activity, and will only relapse into its lateral curves when the patient is trying to rest, by sitting down without supporting the back thoroughly.

It seems to me obvious that these facts—if they be facts—point to two objects of attainment: one the strengthening of the muscular system, so as to increase the power of the patient to keep the spine from subsiding into lateral curves, and the other the support of the spine in a straight position during the necessary periods of rest.

Periodical rest of the muscles is a physiological necessity, as we all know; and however much the muscular system may be developed, the spine cannot be constantly held upright. Directly the muscles cease to act, lateral curves are produced, unless the normal position is maintained by recumbency or by artificial support in sitting. For the latter purpose, a chair fitting the natural form of the spine must be used constantly whenever the patient is not using his dorsal muscles actively, if we are to obtain a beneficial result from the strengthening of the muscles.

This line of treatment applies only to slight cases—those in which the curves have so little developed that they do not show themselves when the patient stands firmly erect, or sits upright with muscular effort. When the curves are more pronounced—so that they are apparent under all conditions of posture, even when the patient makes the greatest effort to hold himself erect—something more must be done.

Some surgeons consider that these cases are hopeless, but I have found, upon the contrary, that the majority of them can be cured if dealt with before very severe rotation of the vertebræ has taken place.

Then comes the question which has been so often raised, and is now again under discussion, as to the relative advantages of treatment by exercises alone or by exercises in combination with mechanical support. We must bear in mind that when distinct curves have been developed the cartilages and even perhaps the vertebræ have already changed their form. They have become more or less wedge-shaped. The convexities of the curves are formed by the thicker sides of the cartilages and bones, and the concavities by the thinner edges of these wedge-shaped parts. Such a spine, in the earlier stages of the deformity, may, by certain movements and exercises, be temporarily placed in a straight position, and by long-continued and persistent application of this treatment permanently beneficial results may be obtained. The natural forces are, however, very much against perfect success by this means, for directly, and every time, these special exercises cease the spine will subside again to its curved position.

The object of mechanical treatment is to maintain any improvement effected by exercises, or by the support alone, keeping up the improved position until the cartilages and vertebræ have again altered their shapes into the normal.

That these parts can alter their shapes is proved by the gradual increase of deformity which occurs when no treatment is employed, and therefore, if we can hold the spine straight continuously for a sufficient length of time, we may depend to a certainty upon obtaining a perfect and permanent cure, provided we take care to strengthen the body in the meantime. If we agree as to the correctness of this view, it remains to be decided if it be possible to effect this correction by any mechanical means at our disposal. In such a case as I have last described we can generally, upon examination of the patient, hold the spine by means of our hands alone, in a much straighter position than the patient can possibly effect by his own unaided muscular efforts, and in many cases we are able to entirely remove the curve while so holding him. That being so, we ought to be able, by scientifically constructed apparatus, also to hold up the spine, and in my experience we are certainly able to do this. The use of apparatus undoubtedly requires careful study and aptitude, and should be avoided by those who cannot carry out the

details of adjustment themselves without the help of the instrument maker.

Some of the advantages of Chance's splint and the modifications of it which I have introduced, are correctly described by Dr. Lewis in the *BRITISH MEDICAL JOURNAL* for August 14th, but the description in the *JOURNAL* for July 17th is no hard-and-fast rules as to the disposition of the plates, as absolutely incorrect. In using such an apparatus there are might be supposed from the statements there made. Each case is treated in accordance with its own peculiarities, and it is quite possible by careful adjustment to hold up the spine without interfering with the development of the patient's body, without interfering in the least with the use of the muscles, and without producing any harmful effect upon any function or organ of the body.

I have entered so fully elsewhere¹ into all the details of these matters, that I should be encroaching unfairly upon the columns of the *JOURNAL* if I were to discuss them now; but I shall be glad to touch upon one important point. It is well known that in lateral curvature the rotation is increased when the individual stoops, and in the examination of the spine it is customary to make the patient bend down as low as possible to show the degree of this rotation.

If in treatment we can only hold the patient upright and prevent his stooping we shall thereby lessen the rotation and also straighten the curves. The maintenance of this upright position will alone in some cases entirely remove the curves, and therefore is a curative procedure. When side plates are applied they do not exert injurious pressure, but hold the spine straight or towards that position, just as the hands of the surgeon have previously done. The instrument as a whole acts as a guide to the patient, directing him how to hold himself straight by his own exertions, and it only interferes with those movements which would be detrimental in their action.

If the patient can hold himself for any short period absolutely erect and straight the apparatus does not interfere, but directly he allows the spine to subside towards its former vicious position the instrument comes into action and checks that subsidence.

Judging from the large number of cases treated in this way by my colleagues and myself at the City Orthopedic Hospital I can say that the use of apparatus is of very great value in the treatment of lateral curvature of the spine; so much so that cases undertaken in the earlier stages can be cured with almost absolute certainty.

There are a variety of means which can be brought to bear to help our efforts, amongst which I have found massage of great value, but if we wish to produce the greatest amount of good with the least amount of trouble to the patient and the least amount of expense to the parents we shall have to use mechanical apparatus.

REFERENCE.

¹ *Curvatures of the Spine*. Fourth edition. London: Smith, Elder and Co. 1896.

A CASE OF SPONTANEOUS ANEURYSM OF THE ULNAR ARTERY IN THE PALM: EXCISION OF THE ANEURYSM: RECOVERY.

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THE rarity of spontaneous aneurysms of the ulnar artery, or, indeed, of any small limb artery, is so great, that each example that comes under notice deserves to be put on record. The case I herein describe came under my care at Addenbrooke's Hospital, and, in addition to a descriptive account of it, I intend giving the results of an inquiry into the changes induced in the artery wall, and making some remarks upon the plan of treatment adopted.

The cases hitherto published are (1) one reported by Walton¹ an aneurysm, the size of a horse-bean, that formed without any assignable cause in the ulnar artery one inch above the wrist in a medical student, 21 years of age, a pupil at the Middlesex Hospital Medical School. Direct com-