

THE ANKLE-JOINT IN MAN, AND THE INHERITANCE OF ACQUIRED CHARACTERS.

PROF. RETZIUS has lately published an account of certain observations on the foetus of Swedes, which, in connection with similar observations recorded by Surgeon Havelock Charles on the Punjabitae, he believes to support the Lamarckian view that acquired characters are inherited. He endeavours to show that the evidence in support of the theory is to be found in our own skeletons.

Some years ago, Prof. Arthur Thomson pointed out that in certain races of men who habitually adopt a "squatting position," the tibia and astragalus present additional articular facets, allowing greater flexure of these bones upon one another, than is possible (or at any rate normal) in Europeans and other civilised races who have given up squatting, and in which these facets are absent. Accompanying these facets there is a retroversion of the head of the tibia. Both these characters are present in apes and in certain prehistoric races, and Surgeon Havelock Charles described, a year or two back, a series of instances of their presence not only in the adult Punjabitae, but in the foetus. At the meeting of the British Association at Oxford, Prof. A. Macalister exhibited these specimens, as well as similar specimens taken from British infants, and a discussion followed on the meaning of these peculiarities. Now Retzius ("Ueber die Vererbung erworbener Eigenschaften," *Biol. Untersuch.*, n.f. vii.) records these same characters in foetal Swedes, from an early age, even up to eight months; and reviewing the facts, he comes to the conclusion—in which I think most of us would agree—that the presence of these characters, viz. the retroversion of the head of the tibia and "Thomson's facets" is a more primitive condition than their absence in normal Europeans of the present day; that they have been inherited from early times; and in those peoples which habitually adopt the "squatting" position they have become gradually further developed. This last conclusion is perhaps open to question; it is quite possible that even in these races they are less developed than in ancestral forms. But Retzius proceeds to contend that Europeans have undergone gradual change in their skeletons from generation to generation; they no longer sit on their haunches, and have gradually lost the power to do so, and as a consequence "Thomson's facets" have disappeared; and he concludes that "it is, therefore, we Europeans who, on account of changed habits, have undergone changes, and it is in us that these changes have gradually been inherited."

But here, it seems to me, that Darwinians would join issue with Retzius. His own and other observations show that the changes are not inherited; for the characters of the bones are inherited from the ancestral ape-like forms, and it is, surely, only on account of individual habit that the peculiarities are not present in the adult.

It is by no means clear what is the "acquired" character on which Retzius hangs his views. Is it the osteological peculiarity, or the habit of using chairs to sit upon, instead of employing the squatting posture? His own researches show that the osteological characters are *not* acquired, whilst the habit of walking upright and sitting on chairs is distinctly acquired, and it is in relation to this acquirement that the osteological peculiarities cease to be evident. Young children, as we know, can and do sit upon their haunches, and can move their legs and ankles in a way that an adult, unless he is fairly athletic, finds it impossible to do; and it appears probable that the disappearance of the facets in the adult is closely connected with the ossification of the bone, which will obliterate the facets now no longer brought into use. It would be interesting to examine in this connection the leg-bones of "contortionists" and others who make a free use of their legs and ankles, for a very little practice enables even civilised men to employ exaggerated movements of their limbs.

Another point to which attention might be directed (which indeed may have been looked into) is the character of the articulation of the bones of the great toe in those races which make use of this digit. A casual observation on the skeleton of an Andaman shows that the articular surface of the first metatarsal with the entocuneiform is distinctly more rounded than in a European; a feature in which there is an approach to the condition in the apes. It might have been presumed that some difference, similar to that in Europeans and Punjabites, would be found in digitigrade and plantigrade mammals; but the result of a brief examination of skeletons of such forms is sufficiently surprising to be referred to; for instance, in the lion there is a facet of the same

kind as, but not really homologous with Thomson's facet, at the lower end of the tibia. This is absent in the bear and the dog; it is also absent in the sea-otter. It is present, however, in the beaver and other rodents; it exists in some ruminants, as well as in the horse, but is only slightly developed in the tapir, and is absent in the Suidæ.

THE PARIS OBSERVATORY.

M. TISSERAND'S report on the work accomplished in the Paris Observatory during 1895 has come to hand. The principal points referred to are indicated in the subjoined summary.

The revision of the right ascensions of the fundamental stars of the Paris Catalogue is completed, and the revision of the polar distances was commenced in May of last year.

During the year, MM. Henry obtained 319 plates for the photographic star catalogue, which number brings the total up to 1155. Eighty-eight plates, containing 35,814 stars, were measured under the direction of Mlle. Klumpke, and the measures of 13,663 stars upon forty-three plates previously obtained were reduced for the catalogue of the photographic chart.

The great Coudé equatorial has been used whenever possible in lunar photography, in order to complete the series of photographs of the moon required to make a large-scale map of our satellite. The photographs already obtained have been enlarged and reproduced by heliogravure by MM. Fillon and Heuse. The first fasciculus of the photographic chart of the moon, which MM. Loewy and Puiseux have in hand, containing six sheets, five of which will represent parts of the moon on a scale of 2'60 metres to the lunar diameter, will shortly be issued. The present report contains a heliogravure representing an unenlarged photograph of the moon obtained in February 1894. The picture is a most striking one, reproducing faithfully and beautifully the chief features of the lunar surface.

M. Deslandres has continued his photography of the solar chromosphere. He has also investigated the subject of the displacement in the lines of the spectrum of Jupiter, produced by the planet's rotation. A note upon this subject appeared in *NATURE* in March 1895 (vol. li. p. 443). In the first measures made by M. Deslandres, the equator of the planet was allowed to lie along the slit of the spectroscope, and the inclination of the lines produced by approach and recession of opposite ends of the equatorial diameter were determined. The method now followed consists in measuring the inclination of the lines in the planet's spectrum with reference to neighbouring lines of terrestrial origin. The mean of the measures thus made gives 48 ± 1 kilometres as the difference of velocity of two opposite points on Jupiter's equator. From the known time of rotation of the planet, and the length of the equatorial diameter, the velocity deduced is 49'6 kilometres. The same method has been applied by M. Deslandres to Saturn's disc and rings.

Reference is made to the spectroscopic photographs of the velocity of Altair in the line of sight. The photographs give evidence of differences in the radial velocity, even when the mean error of observation is considered. These variations have a period of about forty-three days, and a secondary period of about five days. The conclusion arrived at from an examination of the spectra is that Altair is in orbital motion under the influence of one or more unknown bodies. The star β Ursæ Minoris also shows variations of velocity in the line of sight which cannot be accounted for by errors of observation.

In addition to the matters referred to in the foregoing, the usual meridian work, and observations of comets and minor planets, as well as meteorological observations, were carried on during 1895, and the chief results obtained are stated in the report.

CABLE LAYING ON THE AMAZON RIVER.¹

WHEN it had been decided to connect Belem, the capital of the State of Pará, by means of a subfluvial cable with Manaus, the capital of the State of Amazonas, a preliminary journey became necessary, during which landing-places at the various intermediate stations had to be selected, some reaches of the river explored, as no trustworthy charts exist, and various

¹ Abridged from a discourse delivered at the Royal Institution by Mr. Alexander Siemens.