be determined; but I believe it may be safely assumed that the synchronism is defined within comparatively narrow limits; or, as previously expressed, "formations characterized by the same or very nearly related faunas in widely separated regions belong, in very moderate limits, to approximately the same actual age, and are to all intents and purposes synchronous or contemporaneous" (*Science*, No. 41). Professor Geikie, who is quoted by your correspondent as supporting the orthodox doctrine of homotaxis, or homotaxis in its broadest limits, judiciously refers to chronological divergences of only *thousands* of years, and *not* of *millions* ('Text-book of geology,' pp. 617-619). ANGELO HEILPRIN.

Academy of natural sciences, Philadelphia,
Jan. 12, 1884.

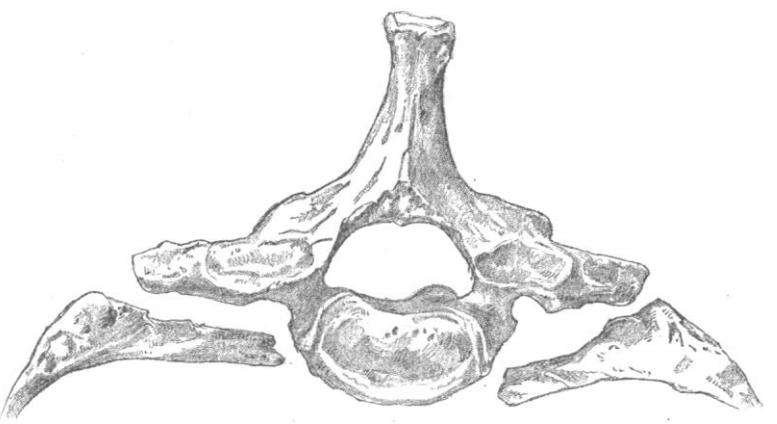
Free cervical ribs in the human subject.

I send you a photograph of a notable and very interesting anatomical preparation well worthy of being engraved and published in *Science*. It is the seventh cervical vertebra of the human subject, natural size, viewed from above, showing a pair of free cervical ribs. This demonstrates the fact that the so-called transverse process of a cervical vertebra consists of a diapophysis with a coalesced pleurapophysis, the vertebrarterial foramen so characteristic of cervical vertebrae being an opening between these two apophyses. The photograph shows the preparation so well that little description is required. The whole bone is seen to be a little distorted, and the two ribs are seen to be of different shape and size. The ribs are photographed a little apart from their respective articulations, otherwise *in situ*. Each freely articulates, as usual with ribs, by its head with the body, and by its shoulder with the diapophysis, of the vertebra. The base of each diapophysis presents anteriorly a nick (deeper and more regular on the left than on the right side) which is a part of the vertebrarterial foramen proper, the rest of which is circumscribed by the rib itself; the whole space between the vertebra and the neck of the rib being thus a large continuous opening of irregular contour.

The lower border of the body of this vertebra presents on each side a demifacet (not shown) for half of the head of the next (first dorsal) rib; so that the first dorsal vertebra must also have been anomalous in possessing two demifacets, instead of a full facet above and a demi-one below. The same subject was also badly put together in some other respects; e.g., one of the long thoracic ribs (I think the fifth) bifurcated at the sternal end. The specimens were handed to me by one of my pupils, Mr. Arthur J. Hall. The anomaly here figured, while not new, is so rare that I think I have seen but one illustration of it; namely, that given by Professor Owen in his 'Comparative anatomy and physiology of vertebrates.'

ELLIOTT COUES.

Smithsonian institution, Washington,
Jan. 4, 1884.



Seventh cervical vertebra of the human subject, life size, seen from above; showing well-developed and freely articulated pair of cervical ribs.

A possible solution of the standard time question.

Although the adoption of five standards of time for the movement of railroad-trains in the United States has simplified the time question for the travelling public, I believe it is a matter of deep regret, that, since a change has been made, that change could not have been to a single standard instead of five, and that Greenwich time, as Mr. Schott very significantly queries in *Science*, No. 38. This is the more to be regretted, since the railroad companies have found it impracticable to make the changes on the proposed meridians, and since, as Mr. Schott rightly apprehends, all ordinary business must always be conducted on local mean solar time.

It appears to me that this whole question could be very simply and forever settled by the adoption of Greenwich time for the movement of all public conveyances the world over, and the construction of time-pieces which would indicate at once both local mean solar time and Greenwich time. The only modification of the ordinary time-pieces needed, to enable them to indicate both times, is to provide them with two dials, one of which shall be movable about an axis, and capable of being set at any desired point. It is immaterial which dial is stationary: the same set of hands would sweep both dials, and indicate, of course, both times, at once. Thus provided, a person desiring to take the next train would be governed simply by the Greenwich dial. Furthermore, should his time-piece lose or gain, it would only be necessary to set it by either local mean solar time or by that of