

tions in both cases being those of Auwers' system. They come out respectively—

$$+ 43^{\circ} 4' 36''.97 \pm 0''.07$$

and

$$36''.99 \pm 0''.06,$$

remarkably accordant results. The fifth part of the volume is a 'Catalogue of 1,001 southern stars for 1850.0, from observations by Signor P. Tacchini, at Palermo, in the years 1867, 1868, 1869,' by Rev. Father Hagen, S.J., and Edward S. Holden. The original observations had never been reduced to mean place; but being good ones, and in a part of the sky where needed, we have here the anomaly of European work reduced and published in this country; and Father Hagen and Professor Holden are to be highly commended for making it available, while its comparison with Oeltzen's Arge-lander (south) and the Washington zones served to detect many errors in these catalogues. The sixth part gives the observations of 437 southern stars made with the Washington transit-circle, and also the position of the same stars (whenever occurring) from the catalogues of Yarnall, Gould's zones, and Stone, all the positions being reduced to 1850.0 by Father Hagen. This is the first opportunity for easy comparison on a large scale between these four systems of southern declinations, and the comparison develops the following important differences of north polar-distance:—

Yarnall	= + 1''.12 (from 220 stars)
Gould (Z.C.)	= + 1''.96 ( " 215 " )
Stone	= + 1''.00 ( " 238 " )

It is a rather unexpected anomaly to find the Cordoba zone-catalogue and Stone differing by nearly a second, but that the Washington transit-circle should be so much out will not probably occasion much surprise to any one.

The volume closes with a count of the *Durchmusterung* stars between  $-2^{\circ}$  and  $+13^{\circ}$ , a determination of the constants of some of the other instruments, meteorological observations for 1884, a summary of the same as taken at Madison continuously from 1853 to 1884, and is throughout a highly creditable publication. In his new field at the Lick observatory, Professor Holden will have the satisfaction of having left behind a valuable monument in these three volumes.

#### ARTIFICIAL WINDS.

A NOVEL apparatus has been constructed by M. Rougerie, a priest of Pamiers, in France, and brought recently before the French academy of sciences. It gives rise to air currents similar to the great winds of the earth's atmosphere, and hence its name, the *anémogène*. As described in *Engineering*, the apparatus consists of a small artificial terrestrial globe put into rapid rotation

in the surrounding air. In fact, it is a miniature of the earth, and by its rapid rotation it gives rise to air currents resembling the trade and other dominant winds of the world. These currents are shown by girouettes placed round the globe at small intervals, like the wind marks on the French marine charts. The apparatus reveals the following facts: The north-east and south-east trades are reproduced, and the equatorial zone of calms caused by their meeting. The gentle breezes from north and south, which disturb the equatorial calms, are also seen. So is the overthrow of the north-east trade in the south-west monsoons in the gulfs of Oman and Bengal. An ascending current in the equatorial regions is shown, and a descending current near the Azores under the centre of maximum barometrical pressure of the North Atlantic; also a descending current is indicated between St. Helena and the meridional coast of Africa, under the centre of maximum barometric pressure of the South Atlantic. At the poles there is a current descending from the zenith. The south-east trade at the Canaries is represented, while at the same time a south wind blows at the summit of the Peak of Teneriffe. Ascending currents from the east and west over Central America combine with the upper returning current of the north-east trade, thus explaining how the ashes of the volcano of Consequina, on Lake Nicaragua, were transported to Jamaica during the eruption of the 25th of February, 1835. Owing to the defects of construction, the *anémogène*, however, does not reproduce in a perfect fashion the variable winds between the tropic of Cancer and  $50^{\circ}$  N. lat., nor the corresponding winds between the tropic of Capricorn and  $50^{\circ}$  S. lat. In the same way the south-west and north-west winds of  $50^{\circ}$  N. and S. lat. are not very faithfully imitated.

EVERY student of biology knows of Huxley and Martin's 'Elementary text-book of biology.' Most teachers have either used the book, or been influenced by it in forming or modifying their laboratory courses. But the lack of illustrations, and brevity of the text, made the book to many almost useless. Mr. Howe's atlas (*Macmillan*) is intended to supplement the text-book in the first of these particulars. Its plates show the student exactly the points to which the text refers. It is a series of twenty-four large plates containing some five hundred figures. Each plate is accompanied by two or three pages of explanation, and the work closes with a few admirable practical directions and a bibliography. In anatomical accuracy the book is all that any one could reasonably desire. The figures, however, differ greatly in clearness and finish.