prepared by John Eliot, F. R. S., Meteorological Reporter to the Government of India.

AUSTRALIAN WEATHER.

MENTION was recently made in these *Notes* of a little volume entitled *Australian Weather*, containing three essays of considerable importance on matters connected with Australian meteorology. We have since been informed that the book can be purchased of G. Robertson & Co., George street, Sydney, N. S. W., for 2s. 6d. Meteorologists are certainly under a debt of gratitude to Hon. Ralph Abercromby, under whose auspices and at whose expense the book was published. Mr. Abercromby, though now incapacitated for active work by reason of poor health, still keeps up his interest in meteorology by providing means for others to do the work he is no longer able to accomplish.

NOTES.

AMONG other publications are the following:

O. PETTERSON: *Ueber die Beziehungen zwischen hydrographischen und meteorologischen Phänomenen.* Met. Zeitschr., August 1896, 285–321. An important paper, containing much of interest on the temperature and other conditions of the ocean surface in their relations to meteorological phenomena.

J. L. CLINE: *The Climate of Texas and the Cultivation of the Apple.* Reprinted from the Galveston *Daily News*, August 22, 1896. 8vo. Pp. 7. The author concludes: "There appears nothing in the climate of the greater portion of Texas to prevent successful apple culture except that irrigation will be necessary."

H. F. WILLIAMS: *Temperatures Injurious to Food Products in Storage and during Transportation, and Methods of Protection from the Same.* Prepared under the direction of the Chief of the Weather Bureau, Weather Bureau Bull. No. 13, 8vo., pp. 20. This is a revised and enlarged edition of a publication bearing the same title and originally issued as a circular of the Weather Bureau.

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ASTRONOMICAL NOTES.

AMONG recent American publications we notice Vol. IX. from the Washburn Observatory. It contains Prof. Comstock's investigation of the constants of aberration and refraction by means of a modification of M. Loewy's method. This consists in measuring with a micrometer the distances of stars which are about 120° apart on the sky. In order to bring the images of such distant stars simultaneously into the field of view of the telescope, a prism is placed outside of the object glass. From the variation of the distances throughout the year it is possible to deduce a value of the aberration which should be independent of any assumed star places. In order to make the refraction constant likewise independent of assumed star places, Prof. Comstock has employed sets of pairs of stars so situated that it was possible to take advantage of the fact that the sum of the successive differences of right ascension of any series of stars will be exactly 360°, provided the series begins and ends with the same star.

It is to be regretted that we have not space to devote to Prof. Comstock's work an extended review. Very high praise is due, however, to the skill and care with which the whole very large piece of work has been accomplished. It is a praiseworthy thing to turn out a large series of observations well made and reduced, with instrumental methods and with methods of reduction which have been well settled by the experience of successive generations of astronomers. But it is a very different thing to take up a new method of observing with a new form of instrument, and to carry out successfully an investigation of

one of the fundamental constants of astronomy. While therefore we give to the present research very high praise, we do not doubt that Prof. Comstock himself would make not a few changes, if he had the work to do over again.

Among the things which might perhaps with justice be subjected to criticism is the insufficient manner in which the thermometers and the determination of the temperature of the air have been treated. This is, of course, a matter of vital importance when the constant of refraction is to be determined. Yet the thermometers from whose indications the refractions were computed were simply compared with a standard thermometer for the determination of their division errors, as well as their other errors. The standard thermometer itself was examined at the Signal Office in Washington, but no details are given as to the method used in the examination. In a research involving the fundamental astronomical constants all such details should be published. As a matter of fact, Prof. Comstock should have used only standard thermometers, and he should have determined their division errors and their fundamental points himself. He makes no statement as to his method of comparing his thermometers with the standard, and this very important omission leaves us entirely in the dark as to the possible uncertainty of the temperature determinations.

Another rather unusual thing is the manner in which Mr. Flint's observations have been treated. All of these observations which differed more than 1″ from the mean of Mr. Comstock's own observations were rejected, and the others were given half weight. This was done because it appeared 'from an inspection of his (Mr. Flint's) individual results that they are peculiarly subject to large accidental errors.' It would probably have been better to have rejected all Mr. Flint's observations, especially as their number was not very large in comparison with Mr. Comstock's. The retaining of these observations will probably diminish somewhat the confidence felt by astronomers in the result of the research regarded as a fundamental constant. Yet they have probably had but very little effect on the final values obtained for the refraction and aberration, in view of the unusual method of weighting used.

THE *Astronomische Gesellschaft* has just published the eleventh part of its great star catalogue. It gives the positions of 9,789 stars in the zone from 15° to 20° North declination, observed at Berlin by Prof. Auwers. This brings the total number of stars in those parts of the Gesellschaft catalogue already published up to 72,951. The published zones now cover all the sky between the equator and 80° North declination, with the exception of the zones 5° to 15°, 25° to 40°, and 70° to 80°. The Cambridge (England) zone, 25° to 30°, is announced as in press, so that its publication may be expected during 1897.

WE note the appearance of the 1896 volume of the *Anuario publicado pelo Observatorio do Rio de Janeiro*, and of the 1890 volume of the Washington Observations. The latter contains as an appendix the new catalogue of stars derived from the zone observations made at Santiago de Chile by the U. S. Naval Astronomical Expedition under Lieut. J. M. Gilliss, in the years 1849 to 1852. The catalogue gives the place of 16,748 southern stars.

THE Cape of Good Hope Meridian Observations for the years 1888 to 1891 have also appeared, as well as the volume of Greenwich Observations for 1893. H. J.

SCIENTIFIC NOTES AND NEWS.

FIELD WORK OF THE GEOLOGICAL SURVEY.

THE field work of the United States Geological Survey is still going actively on in all