Results of Observations with the Zenith Telescope of the Flower Astronomical Observatory—from September 6, 1898, to August 30, 1901. By Charles L. Doolittle.

This is fourth in the series of publications by Professor Doolittle of observations of latitude. The first two contained observations from April 1, 1876, to August 19, 1895, made at the Sayre Observatory, Bethlehem, Pa.; and the last two, from October 1, 1896, to August 30, 1901, at the Flower Observatory of the University of Pennsylvania.

This series is of exceptional value as being the earliest, as well as the most prolonged, thus far made in the investigation of latitude variations. It was begun seven years before the first proposal by Fergola at the session of the International Geodetic Association in Rome, that there should be an observational test of the constancy of latitudes, and eight years before Küstner began his observations whereby the discovery of variation was first boldly announced as proved. From that beginning, the series has continued, though with some interruptions, until to-day. The charts accompanying these four publications therefore show nearly a continuous curve from December, 1889, to September, 1901. Sections earlier than 1889 may be platted from the data given. The precision of the observations is shown by a progressively diminishing probable error for a single determination of latitude ranging from ± 0″.578 at the start with an inferior 'second-hand' instrument, to ± 0″.134 at present, with a superior instrument of Warner & Swasey's construction.

Possessing fully as much interest as the latitude curve, are the seven values of the aberration constant, simultaneously deduced as a by-product from the same observations, viz.,

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1889, Dec. 1, to 1890, Dec 13	20.448	± 0.014	½
1892, Oct. 10, to 1893, Dec. 27	20.551	.009	1
1894, Jan. 19, to 1895, Aug. 19	20.537	.014	1
1896, Oct. 1, to 1898, Aug. 16	20.580	.008	½
1898, Sept. 6, to 1899, Nov. 27	20.540	.010	1
1900, May 5, to 1901, Aug. 30	20.561	.008	1
1901, Oct. 1, to 1902, Aug. 18	20.510		1

The last value is a preliminary determination announced previous to publication of the observations on which it depends. The mean of these values is 20″.539, which differs only 0″.016 from the mean of all determinations thus far made by all methods included in Dr. Chandler's discussion of this value (*A. J.* 529, 530), namely 20″.523.

In view of the high degree of accuracy now attained in these observations and the prolonged period of time over which a single observer has already extended them, though beset with singular difficulties, particularly in the earlier portions of the series, it is a cause for gratification that this fourth publication does not mark the termination of Professor Doolittle's work. It is still in progress, and astronomers may confidently expect the publication of a fifth part, from August 30, 1901, onwards.

Herman S. Davis.

A Treatise on Roads and Pavements. By Ira Osborn Baker, C.E., Professor of Civil Engineering, University of Illinois, etc. First edition, first thousand. New York, John Wiley and Sons; London, Chapman and Hall, limited. 1903.

According to the preface, 'the object of this book is to give a discussion, from the point of view of the engineer, of the principles involved in the construction of country roads and city pavements.'

From this point of view we believe the work of the author extremely well done. We also believe that enough new matter and new ideas have been introduced fully to warrant this addition to the already large number of similar works devoted to this general subject.

Especially admirable is the arrangement of chapters and of articles under the chapters. This arrangement gives the table of contents unusual value, enabling the reader at a glance to observe both the presence and absence of the matter sought.

While almost every possible subject is present, we note with some surprise the absence of any detailed discussion of cements, although the use of cements in concretes and concrete foundations and for other minor