

**ANNALS OF THE
ASTRONOMICAL OBSERVATORY
OF HARVARD
COLLEGE, VOL. XXVIII.-PART
I. SPECTRA OF BRIGHT STARS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649056439

Annals of the Astronomical Observatory of Harvard College, Vol. XXVIII.-Part I. Spectra of
Bright Stars by Antonia C. Maury & Edward C. Pickering

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ANTONIA C. MAURY & EDWARD C. PICKERING

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ANNALS

OF

THE ASTRONOMICAL OBSERVATORY OF HARVARD COLLEGE.

VOL. XXVIII.—PART I.

SPECTRA OF BRIGHT STARS

PHOTOGRAPHED WITH THE 11-INCH DRAPER TELESCOPE

AS A PART OF

THE HENRY DRAPER MEMORIAL

AND DISCUSSED BY

ANTONIA C. MAURY

UNDER THE DIRECTION OF

EDWARD C. PICKERING

DIRECTOR OF THE OBSERVATORY

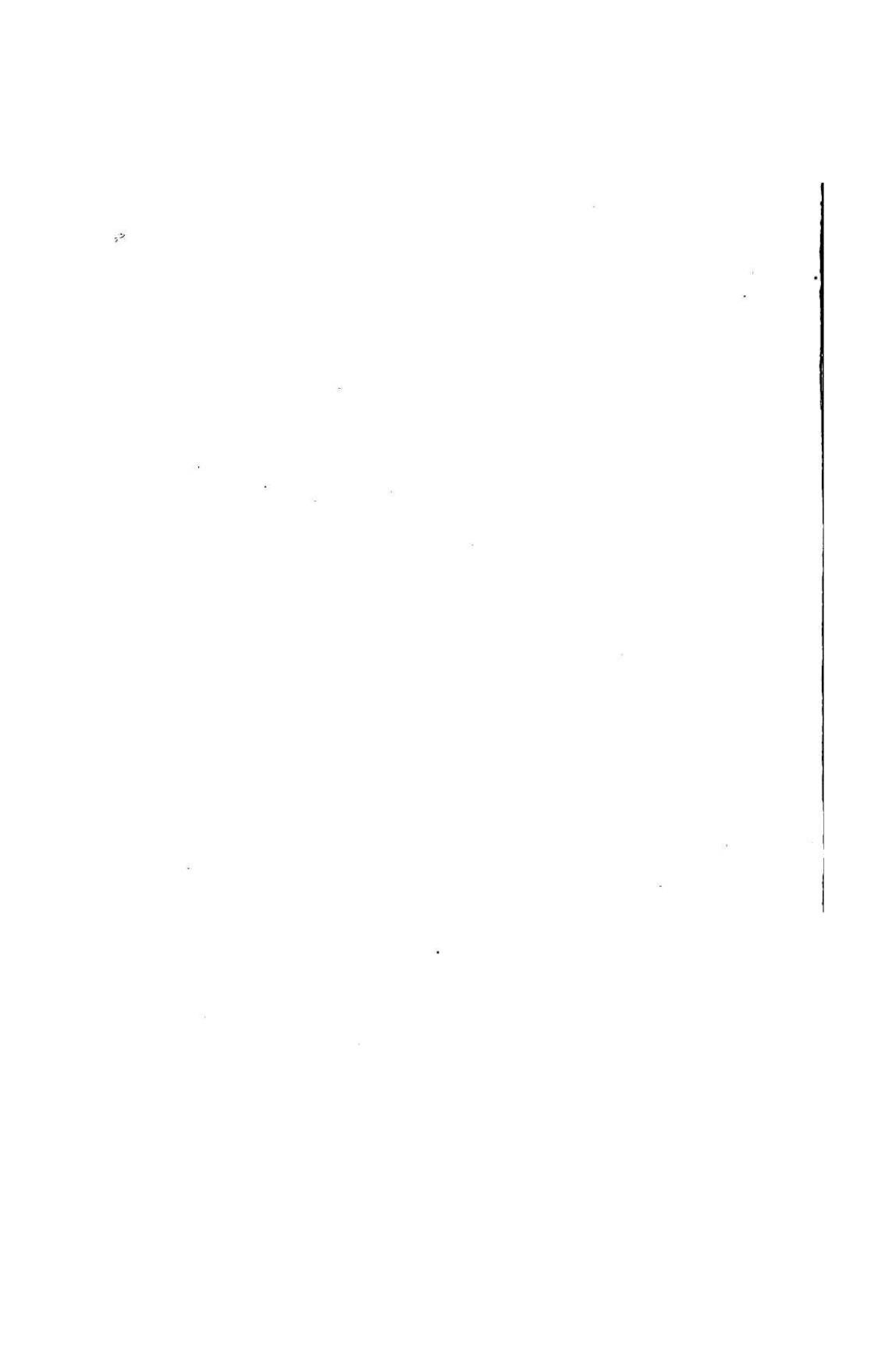
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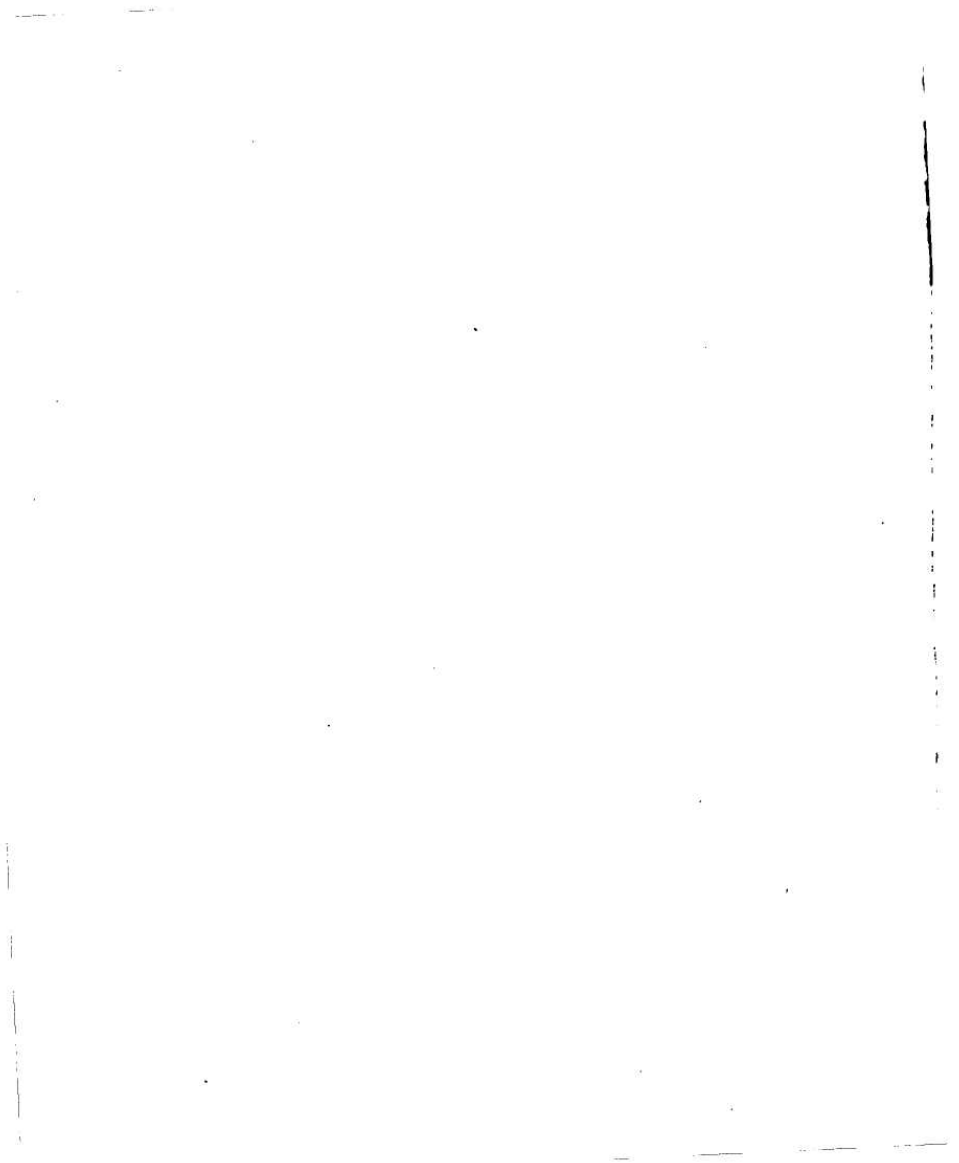
ONE of the first investigations undertaken as a part of the Henry Draper Memorial was the detailed study of the spectra of the bright stars north of declination -30° . This work was assigned to Miss Antonia C. Maury in 1888, and she is alone responsible for the classification contained in Part I. of this volume. A large part of the work of determining wave lengths, and of preparing the volume for publication, has been done by several of the other officers of the Observatory.

As the investigations were made several years ago, they could not take account of the recent discoveries respecting the spectrum of helium, which, if known at the time, might have had an important influence upon some of the conclusions. Such modifications could not now be introduced without practically rewriting the treatise, which is therefore published without change. A discussion of the relation of the spectra of stars of the Orion type to that of helium has, however, been made, and is contained in the "Supplementary Notes," pages 122 to 128.

EDWARD C. PICKERING,

Director of the Observatory of Harvard College.

CAMBRIDGE, U. S., *February 18, 1897.*



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SPECTRA OF BRIGHT STARS.

CHAPTER I.

OUTLINE OF CLASSIFICATION.

THE following pages contain the results of an examination of about forty-eight hundred photographs representing the spectra of six hundred and eighty-one of the brightest stars north of declination -30° . The photographs were taken with the apparatus described in Volume XXVI. of these Annals (p. xv). The telescope employed was one originally constructed for visual use by Dr. Draper, but provided with an additional lens to adapt it to photographic purposes. It has an aperture of 11 inches, and a focal length of about 153 inches. Four prisms, each having a refracting angle of about 15° , a deviation of 8° , and a clear aperture of 11 inches, may be placed singly or together in front of the object-glass. The telescope is mounted as an equatorial, and the clockwork driving it is controlled electrically by an auxiliary clock in the photographic laboratory, the rate of which is varied at pleasure by adding or removing weights placed upon the pendulum. The spectrum photographed is accordingly made to traverse the plate in the direction of the spectral lines with any desired speed, in order to widen it sufficiently to make the lines distinct. The rate of this movement was regulated in accordance with the brightness of the star under observation, its color, and the dispersion employed. The time of exposure was usually one hour, but sometimes more. The length of the photographed spectrum between $H\epsilon$ 3970 and $H\beta$ 4861, was 8.0 cm. when four prisms were used together, and 2.0 cm. with one prism only.

Since only the brighter spectra could be photographed when four prisms were employed, a number, selected as typical, were photographed also with two prisms and with one, in order that they might be satisfactorily compared with those of fainter stars, which had not in any case been photographed with the entire number of prisms. The classification of stellar spectra which will be described below depends chiefly upon the comparison of spectra photographed with one prism. Remarks upon the details of the brighter spectra are of course frequently derived from the photographs exhibiting a greater degree of dispersion.