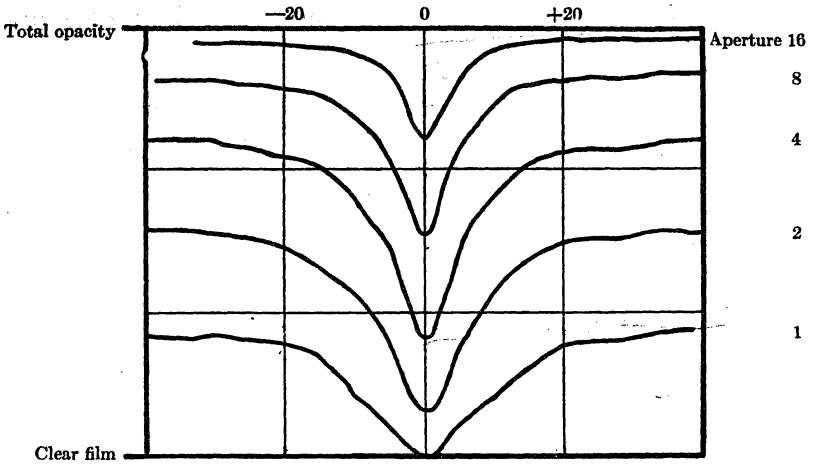
Mr. Leon Campbell. The total cost of the catalogue, distributed unevenly throughout the years since the accumulation of the necessary spectrum plates was begun, may be uncertainly estimated at a quarter of a million dollars — largely paid from funds provided by Mrs. Henry Draper. Special gifts to aid in the observations and in the printing of the catalogue have been made by Mr. G. R. Agassiz, Professor E. C. Pickering, Mr. and Mrs. C. W. Elmer, and Mrs. James R. Jewett. An edition of six hundred copies has been issued. The printing was done by the Harvard University Press.

Discussions of the assembled data have been published during the past two or three years in Harvard Circulars 226, 229, 239, 240, 243, 245, and 248; Harvard Bulletins 787, 792, 796; Proceedings of the American Academy of Arts and Sciences **59**, No. 9, 1924; Scientific Monthly **18**, 449, 1924; and elsewhere. Lists of errata are given immediately after the preface in Harvard Annals **98** and **99**. A description of the Harvard classification of spectra is given in each volume. A note on the accuracy of the published positions appears in Harvard Annals, **98**, 14, and a special note on the magnitudes in **96**, 14.

To supplement the Henry Draper Catalogue, particularly for the faint stars in the Milky Way, an extension of the work is now under way. Special plates for magnitudes and spectra have been procured in several regions. The extension will be printed in small parts as soon as completed. The first instalment may appear within a year. (H. S.)

Preliminary Report on the Brightness of Absorption Lines. — It appears to be commonly believed that the light intensity at the centers of strong absorption lines in stellar spectra is but five or ten per cent of that of the neighboring continuous spectrum (cf. Nature, **113**, 389, 1924). A study of Harvard objective prism spectra made especially for the purpose shows that this, in general, is not the case for strong lines in stars of Classes B and A. For instance, the intensity at the centers of Hβ, Hγ, Hδ, and Hϵ is found in the case of Vega to be at least one-fourth that of the adjoining portions of the continuous spectrum (outside the wide wings of the hydrogen lines).

The accompanying figure shows that the lowest intensity in the Hδ line (or band) is almost exactly twenty-five per cent of the intensity of the continuous spectrum. The five curves illustrating the distribution of light in this line are slightly enlarged from a direct photographic record made with a Moll thermo-electric microphotometer. The minor irregularities due to plate grain have been smoothed out in the figure.



FORM OF Hδ IN SPECTRUM OF VEGA. ABSCISSAS ARE ANGSTROM UNITS.

The spectrum plate on which the figure is based was made with the 16-inch telescope, using two prisms and a special set of apertures. The dispersion is Hβ – Hϵ = 19 mm. Five successive exposures of equal duration on the same plate were made with apertures differing by the ratio of two. The definition is good. Usual precautions were taken in exposing, developing, and measuring. The diagram therefore gives directly, in a perfectly definite relative scale, several measures of intensity at any portion of the absorption line. The brightness at the center of the line is shown to be equal to that of the continuous spectrum when for the latter the aperture is reduced to one-fourth.

The total expanse of the wings of Hδ is about sixty angstroms. The width at two-thirds of the way up from minimum intensity of the line is about twenty-two angstroms. In making the analysis with the microphotometer, the effective width of the light beam, which runs parallel to the absorption line, is equivalent to one-third of an angstrom. There is, therefore, no fear that a smoothing factor has decreased the range of intensity at the center of the line.

To illustrate the large amount of radiation emitted within the hydrogen absorption lines, which have generally been considered nearly lightless, both the total photographic radiation and that within the individual lines (between points four-fifths of the way up from minimum intensity) were integrated by quadratures, using the microphotometer tracing. The ratio of the two intensities is twenty-five to two. From this result the somewhat surprising conclusions can be drawn that if all the radiation of Vega were cut off except that coming from the absorption line Hδ the star would be of the fourth photographic magnitude, and in absolute luminosity would be more than twice as bright as the Sun; if all the hydrogen absorption lines contributed, and nothing else, the photographic magnitude would be 2.8.

The intensities at the centers of the hydrogen lines in Sirius and Altair are much the same as for Vega.

The Moll microphotometer was purchased with the aid of a grant from the Rumford Fund of the American Academy of Arts and Sciences. It has been operated by Miss Ames in the analysis of the spectra used in the present research.

(H. S.)

Broad Absorption Band in Class A Spectra. — The photographs and the microphotometer tracing described above show very clearly the presence of a wide absorbing band in the spectrum of Vega — a point of considerable significance in view of the evidence that the temperature of the reversing layer in stars of this type is at least as high as ten thousand degrees Centigrade. The band extends throughout one-third of the interval between Hγ and Hδ. The average loss of light, along its total measured width of eighty angstroms, is a little over two per cent of the light intensity of the adjacent unaffected part of the spectrum. The maximum loss of light is 3.5 per cent near λ4160.

All available spectra of Vega that have the proper density and dispersion show the absorption band. The suitable spectra of other early type stars were examined and the band found to be universally present, though much fainter in some stars, such as Sirius and Altair.

Presumably the absorption is to be attributed to the so-called cyanogen band that extends from λ4215 toward the violet. Lindblad and others have shown it to be a conspicuous factor in the spectra of the redder giant stars (cf. Mt. W. Contr. 228, 1921), and it is used at Harvard as a valuable criterion of absolute magnitude in Classes G and K on plates of very small dispersion. (H. S.)

Asteroids.—Positions referred to the epoch 1925 have been determined at Harvard by Miss Woods for the following asteroids, which appear on photographs made with the 16-inch Metcalf telescope:

No.	Name	Mag.	Year	Date, G.M.T.	R.A.	Dec.
					h m	° ′
31	Euphrosyne	10.0	1921	October 25.64	0 39.6	— 9 10
742	1913 QU	12.5	1921	October 25.64	0 51.0	— 8 30
347	Pariana	12.0	1921	October 25.64	0 51.4	—11 54
737	1912 QB	10.5	1920	September 21.79	1 50.3	+ 7 20
472	Roma?	12.5	1922	November 16.62	1 51.0	—15 41

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