the effect of dilution is quite pronounced. The radial velocity determined from the absorption lines is $V = -6.5$ km/sec. Hence, the shell—if there really is a shell—does not expand rapidly, as it does in P Cygni. The presence of *Fe* III in γ Cassiopeiae was first detected by Swings and Edlén,[1] who identified several emission lines measured by Baldwin[2] in the fall of 1937. Additional lines of *Fe* III were observed in emission by Mao-Lin and Dufay.[3]

We are indebted to Dr. Swings for the use of an unpublished list of *Fe* III lines by himself and Edlén.

YERKES OBSERVATORY
AND
MCDONALD OBSERVATORY
February 20, 1940

NEW EMISSION LINES IN MIRA CETI

BY P. SWINGS

P. W. Merrill and A. D. Thackeray[1] have shown that only the component $z^3G^\circ_4$ of the z^3G° term of *Fe* I is excited in long-period variables and gives rise to emission lines. The observed lines λλ 4202, 4308 ($a^3F_{4,3} - z^3G^\circ_4$) and 3565 ($a^5F_3 - z^3G^\circ_4$), all arise from the sub-level $z^3G^\circ_4$, whereas other strong components of the same multiple transitions (for example, λ 3570.13, $a^5F_4 - z^3G^\circ_5$) do not appear in Mira Ceti.

A spectrogram of o Ceti obtained on February 4, 1940, by Struve and Elvey at the McDonald Observatory, shows a strong line (int. 6) at λ 3565 and, simultaneously, another line at λ 3521.21 (int. 2). This line is obviously the other component, $a^5F_4 - z^3G^\circ_4$, arising from $z^3G^\circ_4$. The line 3570.13 is again absent. These results confirm the conclusion of Merrill and Thackeray.

Another emission line (int. 2) was measured at λ 3277.41 and is the *Fe* II line λ 3277.36 ($a^4D_{3\frac{1}{2}} - z^6D^\circ_{4\frac{1}{2}}$). The excited sub-level $z^6D_{4\frac{1}{2}}$ is directly connected with the ground level

[1] *Pub. A.S.P.*, **49**, 120, 1937.

$a^6D_{4\frac{1}{2}}$ by a very strong line,[1] λ 2599.39 ($a^6D_{4\frac{1}{2}} - z^6D^\circ_{4\frac{1}{2}}$). The line λ 3277.36 was absent in October 1939 (near maximum).

Finally, a third line has been measured at λ 3735.0 (int. 4), which is presumably λ 3734.88, *Fe* I ($a^5F_5 - y^5F^\circ_5$, int. 40 in the solar spectrum). This line is of a type similar to λ 3277.36 *Fe* II; the excited level $y^5F^\circ_5$ is directly connected with the ground sub-level a^5D_4 by the very strong line λ 2966.9. But this wave length does not coincide with any other known strong line. The other component $a^5F_4 - y^5F_5^\circ$ at λ 3798.52 (int. 6 in the solar spectrum) is also weakly present (int. 1).

In September and October, 1939, several spectrograms of o Ceti in the ultraviolet region and extending as far as λ 3300 A, showed the Balmer series at least up to H_{19}; the Balmer continuum was fairly strong in emission.

YERKES OBSERVATORY
February 1940

NEW B-TYPE SUPERGIANTS

BY J. A. O'KEEFE

In the course of a spectroscopic examination of the reddened B-stars of the Stebbins-Huffer catalogue[2] a number of previously unrecognized supergiants were found. They are listed in Table I. The notation c— indicates a star of somewhat

TABLE I

HD	m	Sp	C	E
15571	8.0	cB2	+0.02	+0.22
17088	7.5	cB9	+ .25	+ .37
17145	8.0	c—B5	+ .28	+ .45
17857	7.8	c—B8	+ .16	+ .29
23675	6.8	cB1	+ .08	+ .29
25443	6.8	cB2	+ .02	+ .22
185859	6.4	cB1	+ .04	+ .25
195592	7.2	cB0eα	+ .30	+ .52
199216	7.1	c—B1	+ .11	+ .32
208501	6.0	cB8	+ .26	+ .39
216411	7.2	cB1	+0.15	+0.36

[1] This line practically coincides with a strong *Fe* I line (λ 2599.57; $a^5F_4 - x^5G^\circ_4$). Thus fluorescence effects are probable, but the excited lines are either weak or too far in the ultraviolet.

[2] *Washburn Obs. Pub.*, **15**, 217, 1934.