values to establish average values. The data are as follows.

Type	Stars	S_{III} 4130 Å	S_{III} 4552 Å	S_{IV} 4089 Å	Sources
Bo V	τ Sco		.145	.174	1
Bo.5 V	ϵ Per	.04	.53	.36	2
B1 V	21856 24131	.05	.34	.12	2
B2 IV	γ Peg ζ Cas δ Cet	.035	.152	.032	2, 3, 4, 5
B3 V	ι Her 35 Ari	.094	.123	.018	2, 4, 5
B5 IV	ι Aql τ Her	.176	.039		2, 3
Bo.5 III	κ Aql	.04	.51	.13	2
B1 II	205139	.03	.39	.16	2
B2 II	ϵ CMa	.076	.392	.130	3, 6

1 A. Unsold, *Zs. Astroph.* 21, 1, 1941.

2 A. B. Underhill, this paper.

3 A. B. Underhill, *Ap. J.* 107, 349, 1949.

4 L. H. Aller, *Ap. J.* 109, 244, 1949.

5 L. Neven, *Thesis*, Liège, 1952.

6 L. H. Aller, *Ap. J.* 123, 117, 1956.

The resulting line ratios have been used to classify the theoretical spectra of 4 B-type model atmospheres. The models with $T_0 = 16,800^\circ$, $\log g = 3.80$, and $T_0 = 16,800^\circ$, $\log g = 4.20$ correspond to type B2.5 IV-V. The models with $T_0 = 18,800^\circ$, $\log g = 3.80$, and $T_0 = 18,800^\circ$, $\log g = 4.20$ correspond to B1.5 V. The models are composed of pure H . There is evidence that at B1.5 the strong line $\lambda 4552$ is formed largely in a "chromosphere" exterior to the models which are designed to produce the continuous spectrum correctly.

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Varsavsky, Carlos M. A new source of opacity in stellar atmospheres.

Limb-darkening observations between $\lambda 3700$ and $\lambda 6700$ obtained by Peyturaux in 1953 are analyzed by expanding the source function in terms of the exponential integrals introduced by Kourganoff. From the calculated values of the derivative of the optical depth with respect to temperature and the accepted values of the absorption coefficient of H^- , it is deduced that some unknown source of opacity is of importance at wave lengths less than $\lambda 5000$ and temperatures lower than 6500° , confirming previous reports of other authors. While analyzing several sources of opacity it was found that a transition between the unstable $(1s\sigma)(2p\sigma)^3\Sigma_u^+$ level of the H_2 molecule and its $(1s\sigma)(2s\sigma)^3\Sigma_g^+$ level produces a very significant absorption in the far ultraviolet.

Quantitative calculations of the amount of absorption and its wave-length dependence are made, and the conclusion is reached that this process provides the major source of opacity between $\lambda 1600$ and $\lambda 2600$. It does not, however, explain the increased absorption observed in the blue and near ultraviolet spectrum.

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Wilson, Raymond H., Jr. and Siry, Joseph W. Theory of eclipses of a close earth satellite.

Although, at the earth's surface, half of every great circle, except the sunrise-sunset terminator, is in shadow, simple consideration of the dip of the horizon shows that, at a height of 800 miles, a satellite will be illuminated even at midnight by the summer solstice sun when at latitudes above 35° .

For an orbit having its major axis perpendicular to its line of intersection with the terminator plane, and perigee within 90° of the sun, the fraction of time the satellite is sunlit is $M_1/180^\circ$, where M_1 is the mean anomaly at which it enters the earth's shadow. This M may be read inversely from the Union Observatory (1926) Tables of X and Y as that for the orbit's eccentricity and for which $(X^2 \cos^2 A + Y^2)^{\frac{1}{2}}$ equals the ratio of the diameter of the earth's shadow to the orbital major axis. Here A is the angle between orbit and terminator planes given by

$$\cos A = \sin(\Omega - \alpha_\odot) \cos \delta_\odot \sin i + \sin \delta_\odot \cos i. \quad (A < 180^\circ).$$

The major axis is normal to the terminator intersection when

$$\cos \omega_0 = \cos(\Omega - \alpha_\odot) \cos \delta_\odot \csc A,$$

with ω_0 in the same quadrant as $(\alpha_\odot - \Omega)$.

For the same assumptions, but for apogee within 90° of the sun, $1 - M_2/180^\circ$ would be the sunlit fraction of the period. For any A both M_1 and M_2 will correspond, because all quantities under the radical are squared. Such inverse reading of these tables has been found computationally feasible.

Much more difficult is the general case for which the major axis has been rotated in the orbit plane by an angle $(\omega - \omega_0)$ from perpendicularity to the terminator intersection. There will generally be four values of M for which