from LTE. The second problem in the calculation arises in establishing a common optical depth over which the bound-free integrations may be performed. In essence, one must know the departures from LTE before he may calculate the departures from LTE. Thus, the calculation is iterative in nature, and the first approximation is the LTE model of the solar atmosphere. We obtain finally, a common optical depth, an electron temperature, and the relative populations of the emitting and absorbing atoms.

The relative populations are such that the negative hydrogen ions are overpopulated from 3 to 7%. The electron temperatures derived amount to an increase over those in LTE models by about 75K° at $\lambda 5000$ and 150K° at $\lambda 12\,000$.

These calculations are applicable only in the bound-free continuum. Further, because of the neglect of collisions, these calculations represent the maximum possible departures from LTE.

A Possible Interpretation of the Ultraviolet Excess Stars. MERLE F. WALKER, *Lick Observatory*.—Spectroscopic observations of 15 uv excess stars in the Orion Nebula and NGC 2264 have been obtained using the prime-focus spectrograph (dispersion 100 Å/mm), and the Lallemand electronic camera attached to the coudé spectrograph (dispersion 48 Å/mm) of the 120-inch reflector. Generally, the spectra consist of (1) a late-type absorption spectrum, partially or totally obliterated by (2) an overlying continuous emission, superposed upon which are (3) emission lines of *H*, *Ca* II, and occasionally *Fe* I, *He* I, and *Ti* II. In addition, seven of these stars show, superimposed on the continuous emission, absorption lines of *H* and sometimes *Ca* II which may sometimes disappear, on one occasion in 24 h, but are always displaced redward 150 to 300 km/sec. Stars showing these redward-displaced absorptions are: SU Ori, SY Ori, XX Ori, YY Ori, NS Ori, LX Mon, and MO Mon. Stars not showing the effect are: KP Ori, $\Pi 1946$, AU Ori, Brun 134, HS Ori, VY Ori, Brun 637, LT Mon, LU Mon, and NX Mon. This “inverse P Cyg” or “YY Ori” effect was first detected in 1960 on spectrograms of YY Ori and MO Mon obtained with the electronic camera, and it was concluded that the cause is infall of material into the stars (Walker, M. F., *Compt. Rend.*, **253**, 383, 1961).

The present observations show that the “YY Ori” effect is very common among uv excess stars, and the fact that *only* redward displaced absorptions are observed strengthens the conclusion that infall of material is occurring in this class of objects. The continuous emission and uv excess might result from the interaction of the infalling material with

the outer layers of the stars. The nature of the uv excess is not yet clear. In some instances it may be only the Balmer emission continuum; in most of the stars the decrement is slow, presumably owing to self-absorption, and the peaks of the emission lines merge into the level of the uv continuum. However, in HS Ori the uv excess may have a different origin: weak *H* emissions are visible only to *H8*, while a strong uv continuum appears below about 3700 Å.

Observations of Lithium in Main Sequence Stars in the Hyades and Other F Stars. GEORGE WALLERSTEIN, GEORGE H. HERBIG, AND PETER CONTI, *Berkeley Astronomical Department and Lick Observatory*.—In addition to the observation of field stars discussed in the preceding abstract, we have made a survey of the main sequence stars in the Hyades. We have determined the *Li/Ca* ratio for 18 members between types F2 and G4. The lithium abundance in ten members with *B*−*V* between +0.50 and +0.68 and one with *B*−*V* of +0.36 ranges between 10 and 100 times the solar value. One sharp-lined cluster member of *B*−*V* = +0.54 and five somewhat rotationally broadened members with *B*−*V* between +0.40 and +0.45 do not show lithium (a rather high upper limit to the abundance is set by the line broadening).

Other main-sequence F stars, not in clusters, chosen more or less at random, which have lithium contents of 10–100 times the solar content are: ADS 1752A (dF6), 111 Tau (F8V), 27 Hya B (F4V), and γ Ser (F6V). Weak lithium lines have been observed in two high-velocity stars, ι Per (G0V) and 10 CVn (G0V), that may be comparable with the sun in age.

The following F stars show no lithium and hence have upper limits of less than 10–30 times the solar: α CMi (F5IV–V), π^3 Ori, 9 metallic-line stars, including the 5 in the Hyades, and β CrB. Three of the M–L stars in the Hyades have magnetic fields, as does β CrB, which has a varying field of ± 1000 G. Additionally, β CrB is drastically deficient in oxygen. Therefore we cannot now support the contentions that (a) the reduction in oxygen abundance has resulted in spallation-product lithium, or (b) the presence of large scale magnetic fields necessarily results in lithium production.

Photometry of Delta Delphini. W. H. WEHLAU AND K. C. LEUNG, *University of Western Ontario*.—Photoelectric observations on 25 nights have been used to derive light curves of Delta Delphini, with Zeta Delphini as comparison star. Observations were in the blue, except on two nights when *U* and *V* observations were also obtained.