National Radio Astronomy Observatory.—Using the 140-ft telescope of the National Radio Astronomy Observatory, we have studied the 109α recombination lines of hydrogen and of neutral helium in six H II regions: NGC 2024, Orion, M17, W51, NGC 6357, and IC 1795. The ratio of the total intensity of the helium to that of the hydrogen is about 10% in all of the nebulae except NGC 2024 in which only an upper limit of about 2% could be established. A search for 173α line of ionized helium was made in Orion and M17, but no signal was observed.

During the course of this study, near the frequency of 109α , an unidentified emission line was observed in two of the nebulae: NGC 2024 and IC 1795. When these two nebulae were observed at the expected frequency of the 110α line, the line was also detected. Thus the new emission is a recombination line. The width of the new line is about one-fifth the width of the hydrogen 109α line, and the total intensity is approximately 3% that of the hydrogen.

Goldberg and Dupree (*Nature*, to be published) have suggested that the new emission is a recombination line of neutral carbon. Implications of this identification are discussed.

A Model for the "Filaments" in the Cygnus Loop.

ROBERT A. R. PARKER, *Washburn Observatory*.—Further spectrophotometric observations have been made of four "filaments," and in particular detail of one "filament," in the Cygnus Loop. The Balmer decrement for all of the "filaments" studied is 2.65, or radiative for case B. The temperatures obtained from the line ratios for [O III] and [N II] indicate that there is a stratification within individual "filaments." Collisional ionization may well be important in the high-temperature portions of the "filaments" but high-temperature thermal radiation produces the ionization of the cooler parts of the "filaments." It seems that the optical continuum may be either thermal or synchrotron and that the radio continuum is probably synchrotron emission. The so-called "filaments" are probably not filaments but irregular sheets produced by the collision of the advancing shock front with the clouds of the interstellar medium, seen edge on.

Yellow Supergiant Atmospheres. SIDNEY B. PARSONS, *Case Institute of Technology*.—A fine analysis of α Per (F5Ib) and β Aqr (G0Ib) is being carried out with the intent of deriving meaningful atmospheric parameters from realistic model atmospheres applied to high-dispersion (Lick 120-in. coude) spectrograms. Innovations in the treatments of convection, radiation pressure, and line blanketing are discussed.

Approximate models have already been compared with some of the observations by applying Strom's abundance program (*Astron. J.* **71**, 181, 1966; *Astrophys. J.* **146**, 880, 1966) to 130 metallic lines. The tentative results are as follows:

	α Per	β Aqr
Effective temperature	$6250 \pm 150^\circ$	$5650 \pm 150^\circ\text{K}$
Surface gravity, $\log g$	1.8 ± 0.5	2.0 ± 0.5
Microturbulent velocity at optical depth 0.2	5 km/sec	4 km/sec
Macroturbulent velocity (or $\frac{2}{3} v \sin i$)	10 km/sec	≤ 3 km/sec
N:C abundance ratio	5:1	10:1

The Solar Lithium Abundance. J. V. PEACH (introduced by Robert Howard), *Oxford University*, (present address: Mount Wilson and Palomar Observatories).—A photoelectric scanning technique has been used to record the Fraunhofer spectrum in the region of the lithium resonance lines with a resolving power of 500 000 and an rms noise level of less than 0.02% of the continuous intensity. As there is no direct evidence of the presence of the lithium lines, the spectra can be used only to set an upper limit to the abundance.

Computations of possible wavelength shifts in the lines due to interactions with neutral hydrogen atoms, due to the Stark effect of electrons and to the relativistic gravitational effect, indicate that the lines should not be shifted from their laboratory wavelengths by more than the errors of the wavelength scale in the spectra. Using this result and assuming a kinetic temperature of 5300°K and a microturbulent velocity of 1.4 km/sec for the layers of line formation, it is possible to set an upper limit of 0.61 mÅ to the lithium absorption which corresponds to an abundance $\log(N_{\text{Li}}/N_{\text{H}}) = 0.38$ on the scale of $\log N_{\text{H}} = 12.00$. This value, although considerably lower than the previously published estimates of Greenstein and Richardson (*Astrophys. J.* **113**, 536, 1951) and Lynds (*Astrophys. J.* **142**, 396, 1965), is consistent with the observed enhancement of the lines in spot spectra assuming the spot model atmosphere of Zwaan (*Rech. Astron. Obs. Utrecht* **17**, Part 4, 1965).

Hydrogen Lines in Early-Type Stars. D. M. PETERSON, *Smithsonian Astrophysical Observatory* and *Harvard College Observatory*.—The emergent Balmer profiles of stars in the spectral range B3 through A5 are of great interest. The lines serve as sensitive indicators of luminosity and surface gravity, and are also sufficiently strong to reflect the temperature structure of the star over a large