an understanding of the nature of the irregularities in the ionosphere is very welcome.

Wild and Roberts, in Australia, showed that scintillations of Cygnus A were very broad band and probably did not arise from a superposition of waves from many independent irregularities, but from focusing effects in ionospheric prisms and lenses.

The Boulder interferometric radio spectrograph confirms broad bandwidths of scintillations on Cassiopeia A. Scintillations last long at high frequency, short at intermediate frequency, and long at low frequency. At a fixed frequency, the apparent source moves monotonically, the shift being in opposite senses on either side of the region of shortest duration.

At one frequency, rays come to a sharp focus on the ground. At higher frequencies, motion of the irregularity first brings rays from the leading edge of the lens, which are tilted away from the drift. At frequencies lower than the focused frequency, the observer first records the rays from the trailing edge of the lens, which are tilted towards the drift. Inside and outside of the focus, drifts therefore occur monotonically, but in opposite senses.

The converging bundles of rays producing scintillations arise in ionospheric lenses whose minimum dimension subtends about one-half degree at the ground, corresponding to a few kilometers in the ionosphere. Diffraction effects therefore are small relative to refraction.

Preliminary Results of Polarization Measurements of Radio Sources at 21-cm Wavelength.

R. W. WILSON AND G. A. SEIELSTAD, *California Institute of Technology*.—Twenty-one small-diameter radio sources were observed for linear polarization, using the Caltech interferometer as a polarimeter. The technique used was described by Morris and Radhakrishnan (*Astrophys. J.*, to be published), in an account of an earlier search of six sources. At the spacing used (292 λ , east-west), the visibility function of the sources observed was close enough to unity that the effects of resolution mentioned by Radhakrishnan, Seielstad, and Berge (presented at the August 1962 AAS meeting at Yale) should be negligible and the observations can be considered to be averages over the source distribution.

Of the 21 sources observed, 10 were found to be clearly polarized. Ten of the sources observed have been identified with extragalactic nebulae and four with stars. Six of the former group, but only one of the later group were found to be polarized at this wavelength.

New Direct-Intensity Microphotometer. KENNETH M. YOSS, *Mount Holyoke College*.—The output from a Jarrell-Ash model 23-050 microphotometer is converted to direct intensity by means of a function generator. The output from the ratio recorder is altered with 16 adjustable potentiometers, with the result recorded on a second recorder. Only in the case of very dense plates does the assumed characteristic curve consisting of 16 straight-line segments introduce appreciable error. In general, line intensities measured from the direct-intensity and transmission tracings agree within 1%.

Coronal Emission from Solar Flares. HAROLD ZIRIN, *High Altitude Observatory*.—The spectra of limb flares almost invariably show intense radiation of the coronal lines of CaXV, CaXIII and ArXIV, as well as strong continuum. The electron density in the flare condensation may be obtained on the assumption that the continuum is due to Thompson scattering. Calculation of the excitation of CaXV shows that the ratio of line to continuum emission is also a function of density. The results of these two determinations are compared for a number of flares. The effect of filamentation may also be evaluated.

Recombination radiation from HeII in such condensations is also a function of density, and gives us a third determination.

Densities ranging from 5×10^9 to 2×10^{11} electrons per cm³ are found.

In general, the line: continuum ratio depends on abundance. Approximate abundances for calcium, argon, iron, and helium are given.

Information on Double Galaxies. W. ZONN, *University of California, Berkeley*.—While he was classifying double and multiple galaxies on the glass prints from the National Geographic Society and Palomar Observatory Sky Survey plates, the

Classification of double systems.

Galactic latitude intervals	Number of pairs	Number of circular galaxies	
		Brighter component	Fainter component
$\pm 10^\circ - \pm 30^\circ$	44	25 57%	34 77%
30 — 40	53	26 49	39 74
40 — 50	108	46 42	66 61
50 — 60	149	60 40	89 60
60 — 70	163	67 41	94 58
70 — 90	182	74 41	105 58