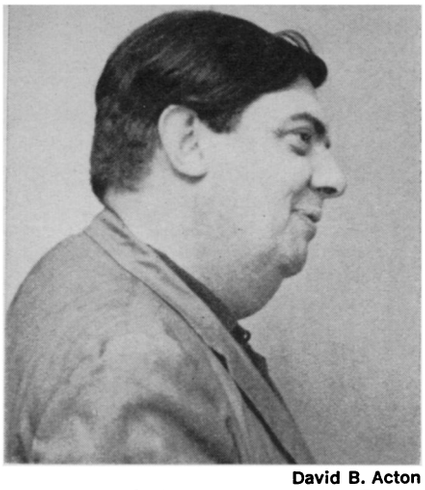


David B. Acton

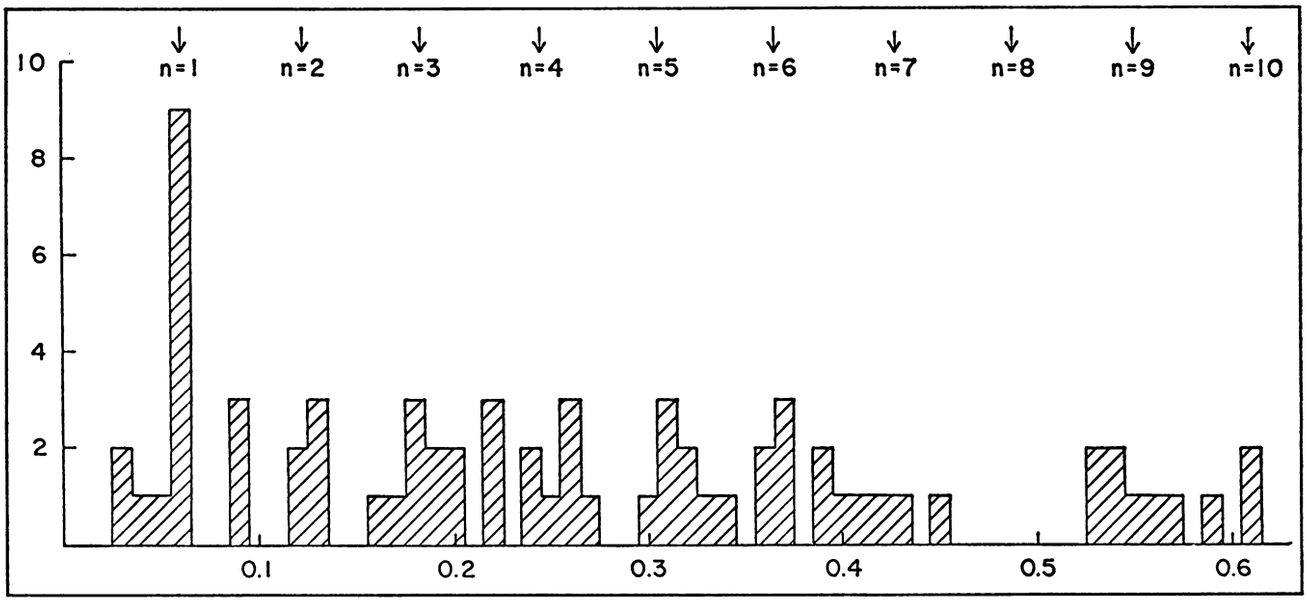
Dr. Burbidge: quasars at 1.95.

ASTRONOMY

Red shift anomaly

Radiation from quasars and other radio stars may not be related just to their distance from earth

by Ann Ewing



G. R. Burbidge

Red shifts of 45 stellar objects seem to cluster at multiples of 0.061, implying some intrinsic mechanism.

Since their discovery four and a half years ago, quasars have been a puzzle: The red shifts indicate they are billions of light years away, the most distant observable objects in the universe; yet they are optically so bright across the distances that known mechanisms cannot account for the energy they emit.

Observational evidence is now leading many astronomers to believe that there is something strange about the red shifts of some quasars and other strong sources of radio waves. This could radically affect the red-shift-based estimates of their distances.

The latest evidence has been gathered by Dr. Geoffrey R. Burbidge of the University of California at San Diego, a long-time questioner of the red shift's applicability to quasars.

The so-called red shift is a valuable tool for judging the distance and velocity of normal stars and galaxies. Astronomical objects give off light in a peculiar pattern of frequencies, depending on what materials are in the source.

As the objects move away from an observer, their frequency patterns or spectral lines are shifted toward the red, lower end of the spectrum. The amount of the shift is directly related to the velocity of the object.

Measuring distances to some objects, astronomers have come to a further conclusion: The farther the object is, the greater its red shift, and thus its velocity away from the earth. Turning the relation around, they can measure unknown distances by measuring the red shift, computing velocity and relating that to the distance.

Dr. Burbidge reported last year that there was an anomaly in the quasar red shifts: A number of them appeared to group around a single figure, 1.95, indicating that they were all at exactly the same distance from the earth (SN: 6/17/67, p. 573). That, said Dr. Burbidge, is too much to believe. Instead, he suggested, the huge shift in frequency could come from something intrinsic in the quasars, rather than from their velocities.

Now, Dr. Burbidge finds that there "appears to be a significant red shift peak" not only at 1.95 but also at 0.06.

He also has discovered a suggestion of peaks in the red shifts of some 45 out of a total of 90 objects surveyed at various multiples of 0.061.

If these objects were distributed randomly throughout the heavens—a fairly logical assumption—there wouldn't be any significant peaks.

The objects Dr. Burbidge surveyed for red shifts include not only quasars but so-called N-systems and Seyfert galaxies (SN: 3/2, p. 205) as well as radio and compact galaxies. If the bunching effect is confirmed by further observations of red shifts in the spectra of other such objects, it would mean the red shifts are due to something basic to the source itself and not to recessional velocity.

Dr. Burbidge concludes that if the red shifts are intrinsic, then the only conventional hypotheses are that they arise from gravitational effects or that the properties of the atoms in such systems are somehow different.