radio-loud QSOs are far more likely to be optically variable than are radio-quiet QSOs.

No doubts at all were raised over the cosmological interpretation of emission line redshifts. Indeed almost the last nail in the non-cosmological redshift's coffin was hammered in by the acclaimed work of A. Stockton (Hawaii), who gave strong evidence for an association of galaxies with bright QSOs. Furthermore he showed that the redshift distributions of the associated galaxies were essentially symmetric about the emission line redshifts—thus lending great weight to the formerly disputed notion that the QSO emission line redshift is a 'true' cosmological redshift.

An important recent development in the often frustrated application of QSOs to cosmology has been the discovery and employment of the 'Baldwin effect' (a correlation between the CIV line strength and continuum luminosity; see Baldwin *et al. Nature* **273**, 431; 1978; *News and Views* **273**, 428; 1978). At the workshop it became increasingly clear that the Baldwin effect is most strongly seen in flat-radio spectrum QSOs, for which it was in fact first established. Osmer, for example, has now found faint weak-lined OSQs so that 'violation' of the effect by the radio-quiet QSOs can no longer be entirely attributed to an optical selection effect. In addition Harding E. Smith (University of California, San Diego) has identified a new subset of steep radio spectrum QSOs possessing unusually steep optical spectra (and of intrinsic interest in themselves) which do not satisfy the Baldwin effect. Nevertheless, C. M. Gaskell (Lick Observatory) reported that the Baldwin effect does seem to be holding up well in the face of new data for the flat radio spectrum objects. However, the use of the relationship to derive a value for the deceleration parameter q_0 of well over 0.5 provoked perhaps the most lively controversy of the workshop. Some support for a q_0 of around 1 came from R. F. Green (Caltech) in his application of the Baldwin effect to satellite ultraviolet observations of two flat radio spectrum QSOs. This holds promise, as further data comes in from the International Ultraviolet Explorer (IUE), that a wider redshift range can be used and applied to cosmology. Naturally, for that application it will be important to demonstrate that evolutionary effects are either absent or can be correctly allowed for. In this respect the infrared observations of Puetter (University of California, San Diego) and the IUE observations of J. B. Oke (Caltech) and Green were important for showing the similarities between high and low redshift QSOs when regions of the same rest wavelength are compared.

All these observations accentuated recent problems in understanding the relative intensities of the hydrogen emission lines in both QSOs and Seyfert galaxies. Problems which had arisen earlier on a comparison of lines in composite spectra (which might therefore be suspect if QSOs of differing redshifts were dissimilar) were brought into stark focus now as it became clear that the Ly α to H β line ratios differed from those predicted by recombination theory by a factor of ten, and that this could not be explained by simple external reddening alone. Despite the endeavours of H. Netzer (Texas) and R. London (JILA, Colorado), no single mechanism seemed able to produce the desired suppression of Ly α or enhancement of the Balmer lines.

The nature of QSO absorption lines (that is, whether they are due to intrinsic or intervening matter) remains unresolved. There are still a large number of unidentified lines, differing from QSO to QSO. A. E. Wright (A.A.O.) made the (serious) suggestion that progress might be achieved by assuming that all absorption lines blueward of Ly α emission which had formerly been assumed to be all Lyman lines, should instead be assumed not to be Lyman lines at all. A. Wolfe (Pittsburgh) reported the detection of a third 21-cm absorption line QSO.

G. K. Miley (Leiden) in collaboration with J. S. Miller (Lick), produced the first significant correlations between the optical spectra and radio morphology of QSOs. Extended sources have broader and more complex Hβ profiles. A direct outcome of the workshop was a collaboration between Miley and R. Angel (Arizona) which showed a striking correlation between the position angles of the optical polarisation and the large scale radio structure of the double sources.

No startlingly new theoretical ideas were produced, although many old scenarios have been pushed much further. In particular the detailed evolution of the dense nuclei of galaxies has been pursued by M. C. Begelman (Cambridge) and S. I. Blinnikov (Moscow). It seemed that all routes led to black holes.

The organisers had assigned M. J. Rees (Cambridge) the heroic task of chairing the session on complete models; a job which proved even more challenging when none was forthcoming. The model of R. D. Blandford (Caltech) and Rees, which tried to explain BL Lacertae objects as ordinary QSOs viewed with their highly relativistic jets pointing at us, met with firm opposition from the observers on whom these jets were supposedly aligned. □

A hundred years ago

The Sea-Serpent Explained

On Monday, August 5, a number of geologists crossed in the Folkestone boat to Boulogne, to study the interesting formations of that neighbourhood, and, when about three or four miles from the French coast, one of these gentlemen suddenly exclaimed, "Look at that extraordinary object passing across the bow of the steamer, about a mile or a mile and a-half in advance of us!" On turning in this direction there was seen an immense serpent, apparently about a furlong in length, rushing furiously along at the rate of fifteen or twenty miles an hour; it was blackish in front and paler behind; its elongated body was fairly on the surface of the water, and it progressed with an undulating or quivering motion: *mirum erat spectaculum sane.*

Of course many suppositions were immediately started to account for this extraordinary phenomenon, but they quickly changed and settled into the fixed idea that the object before them could be nothing less than the great sea-serpent himself; for,—

> "Prone on the flood, extended long and large,
> Lay floating, many a rood, in bulk as huge
> As whom the fables name of monstrous size,
> Leviathan; which, God of all his works
> Created hugest, that swim the ocean stream."

The writer fortunately had with him one of Baker's best opera-glasses, and, after a few moments' use of this little instrument, the wonder was satisfactorily resolved. The first half of the monster was dark and glittering and the remainder of fainter hue, gradually fading towards the tail. The glass did not determine the matter until the extreme end was reached, and then it was seen to consist of a mass of birds in rapid motion; those that were strong on the wing were able to keep well up with the leaders, and so make the head appear thicker and darker by their numbers, whilst those that had not such power of flight were compelled to settle into places nearer and nearer the tail. Doubtless these birds were shags (*Pelicanus cristatus*) returning to their homes for the night from the distant waters in which they had been fishing, during the day; perchance it may be wrong to assert positively as to the variety of bird, but inasmuch as the writer has often seen shags on the Cornish coast in smaller numbers returning in single or double file to their roosting places, and since it is stated in works of natural history that they have been noticed occasionally flying in this peculiar manner to the number of a thousand or more, it does not appear an unwarranted liberty in supposing that they really were *Pelicani cristati.*

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