tion rich spectra such as PHL957 and 4C05.34 where there is a high probability of chance identifications. This still leaves a large number of unidentified lines, which may be due to optically thin clouds with too few absorption lines to be sure of their reality in individual cases, but which together account for most of the features in the spectrum.

Aaronson *et al.* also examine the question as to whether or not the probable absorption redshifts they have are likely to have arisen from intervening galaxies or matter ejected from the QSO. Perhaps not surprisingly, with only eight absorption line QSOs for which good spectral material is available, it seems that the available data are consistent with either picture, though they suggest that the intrinsic hypothesis might be slightly favoured. To verify this we must await additional material on new absorption line QSOs.

The question as to whether or not there are intervening galaxies between us and some QSOs depends to some extent on how distant the QSOs are, and this brings us to consideration of the nature of the redshift. It is generally believed that the high redshifts observed in QSOs are a result of nothing more than the general expansion of the Universe that seems well established from studies of normal galaxies at much lower redshifts. High redshifts are seen in QSOs only because they are intrinsically bright objects and can therefore be seen to much greater distances. But in spite of the wide acceptance of this view, some astronomers contend that there is really not sufficient evidence to say that there may not be some other explanation, for all or part of the high QSO redshifts, perhaps involving some physical principles of which we have no knowledge at present.

Given that we have no model of QSO behaviour under such circumstances, such a hypothesis is very difficult to test, but some headway can be made if we believe that some QSOs are physically associated with, for example, galaxies of much lower redshift. If this is true, then there could be an excess of QSOs near bright galaxies compared with the numbers we would expect on the basis of estimates of the number density of QSOs in the sky that have been made by Sandage and Luyten (*Astrophys. J.*, **155**, 913; 1968) and others. A few years ago Burbidge, Burbidge, Solomon and Strittmatter (*Astrophys. J.*, **170**, 233; 1971) found that in fact there were more QSOs identified from the 3C (third Cambridge) radio catalogue lying within 7′ of bright galaxies than could be due to chance, and subsequently another 3C QSO was found close to such a galaxy. This was fairly strong evidence, on the face of it, that QSOs had some intrinsic redshift. Subsequent studies of identifications from other radio catalogues did not show the same behaviour, though, and so after a while the result looked more as if it could have been due to chance apparent associations.

Recently, however, Arp, Baldwin and Wampler (*Astrophys. J.*, **198**, L3; 1975) have found two new radio-quiet QSOs near bright galaxies, and so now there are a total of four such known. On the basis of the estimate of the number of QSOs brighter than 19 mag the areas around several thousand galaxies would have to be searched to find four QSOs if they are randomly distributed, while the number of such searches made has been estimated by the authors to be about twelve. This suggests, then, either the estimates of numbers of radio-quiet QSOs are far too low or the associations are likely to be real. There are well-known dangers in drawing conclusions from statistics performed after the event, however carefully the work is done, so it is to be hoped that further searches in neighbourhoods of galaxies will be performed to see if the results are confirmed for a new sample.

Starting at the end

from R. Kamen

An EMBO-Inserm workshop on the *in vitro* transcription and translation of viral genomes was held on July 15–18 at Grignon, near Paris.

THE RNAs of picornaviruses such as polio and EMC have long been the paradigms for eukaryotic polycistronic messenger RNAs. These large RNAs encode a single nascent polyprotein which is cleaved to generate stable viral polypeptides, prompting the general hypothesis that eukaryotic mRNAs do not contain functional internal signals for the initiation of protein synthesis. The recent development of various plant and animal systems for *in vitro* protein synthesis and their successful application to the translation of a wide variety of viral messengers has provided a wealth of data generally supporting this hypothesis. The picornaviruses, however, now appear as one special case of a more general mechanism involving mRNA as well as protein processing. The results obtained in several laboratories, discussed at the Grignon workshop, fit a common pattern and experiments presented on the role of 5′ terminal 'capping' (see *Nature*, **255**, 9; 1975) in translation may explain why eukaryotic ribosomes start at the ends of mRNA molecules.

A hundred years ago

A RETURN has been presented to Parliament giving a statement of all the weather telegrams issued by the Meteorological Office, and also of all the storms experienced on the coasts of the British Islands during 1874, from which it appears that of the warnings issued, 78.2 per cent. were justified by subsequent gales or strong winds, and that 16.4 per cent. were not justified by the subsequent weather. This percentage of success in the warnings issued, which is slightly in excess of the last two years' of Fitzroy's management, considerably in excess of 1870 and 1871, and about equal to the results for 1872 and 1873, is perhaps as good as may reasonably be expected until the system be further extended and developed.
from *Nature*, **12**, 319; August 17, 1875

The process common to many of the viral systems discussed is the following: the 5′ terminal portion of a viral polycistronic mRNA functions efficiently in encoding a viral protein or polyprotein, whereas the 3′ terminal region remains largely silent even though it contains the sequences which encode a further viral polypeptide. A smaller viral mRNA, comprising the 3′ terminal cistron, must be generated (either by RNA cleavage or by selective transcription) to activate translation of the second protein. P. Kaesberg's (University of Wisconsin) results on brome mosaic virus (BMV) well illustrate this mechanism. BMV is a multicomponent plant virus comprising three distinct virions containing four different RNAs. RNAs 1 and 2 each have their own particles, while RNA 3 (0.7×10^6 daltons) and RNA 4 (0.3×10^6 daltons) share the third type of particle. When translated in the wheat germ system, RNAs 1 and 2 prove to be monocistronic messengers coding for large proteins of size consistent with their RNA molecular weights; thus the proximity of the initiation point to a 5′ end is assured by the genome segmentation. RNA 3, however, includes at its 3′ end all of the sequences of RNA 4. When translated *in vitro*, RNA 3 encodes one major polypeptide (called 3a) unrelated to the BMV coat protein, while RNA 4 is an efficient messenger for the coat protein. Thus RNA 3 contains one active 5′ proximal start signal and a second largely inactive internal start signal which is unmasked in the generation of RNA 4. Competition studies showed that the second start in its