were known and by 1949 only 34; however, 96 new viruses were isolated during the following decade and the rate does not appear to be slackening in the 1960s. The largest number (75) of viruses has come from South America, approximately equal numbers (41–45) from Asia, Africa and North America, and smaller numbers from Europe (17) and Australia (16). Many of the viruses have been placed in antigenic groups: registrations show 20 in group A, 42 in group B, 13 in group C, 14 in the Bunyamwera group and 10 in each of the California, Guama and Phlebotomus groups. There are at least 14 smaller antigenic groups and at least 49 further viruses which are unrelated to any of the recognized groups. Of the registered viruses 55 per cent (112) were isolated from culicine mosquitoes, 11 per cent (25) from anophelines and 12 per cent (26) from ixodid ticks. From man 33 per cent (69) have been isolated, from rodents 21 per cent (42) and from wild birds 10 per cent (18). The catalogue also shows that 18 per cent (37) have not yet been isolated from arthropods and 39 per cent (79) have not yet been isolated from vertebrates. The clinical classifications of infections produced by viruses show that 33 viruses are recorded as having caused febrile illness in man, 11 febrile illness with a rash, 9 have caused "haemorrhagic fever" and 18 encephalitis. A further 14 viruses have caused frequent or severe clinical illness after laboratory infections, and similar infections with another 28 have caused milder or less frequent diseases. Frequent or severe naturally occurring disease in man has been caused by 37 arboviruses and less frequent or milder disease by another 33. Significant human mortality has been attributed to 14 viruses and some deaths to a further 8 viruses. In addition a substantial number of arboviruses are of considerable veterinary importance: 7 in horses, 5 in sheep and 5 in other domestic animals or birds.

Molecular Hybridization

from a Correspondent

THE meeting of the Biochemistry Society held on May 23–24 in Newcastle included a colloquium on "Hybridization Techniques in Nucleic Acid Research", and attracted a number of other papers in the same field. In the colloquium Professor P. M. B. Walker from Edinburgh discussed the evidence for the minimum length of the intact sequence which is necessary before stable DNA–DNA or DNA–RNA duplexes can be reformed. Because this sequence length is almost certainly less than thirty nucleotides, it is paradoxical that cistrons coding for all proteins are not related in families as Britten suggested, and equally that hybridization experiments show gross differences between the DNA of mice and rats, and even between *Drosophila melanogaster* and *simulans* as Forbes Robertson described in another paper.

Dr J. E. M. Midgley of Newcastle proposed a graphical method of analysing DNA–RNA experiments, particularly in conditions of DNA excess; he has applied the method to a study of the *E. coli* ribosomal cistrons. E. Brody from Geneva described studies on the RNA species made during T_4 infection. He particularly stressed the dangers of using DNA-primed RNA polymerase because not all DNA cistrons may be transcribed and, if symmetrical transcription occurs, RNA–RNA hybrids seem to form in preference to DNA-RNA hybrids even in the presence of DNA. Dr M. Birnstiel of Edinburgh described his elegant experiments on the ribosomal cistrons of *Xenopus*, where the power of the hybridization method has been considerably enhanced by exploiting density gradient centrifugation methods and by careful attention to such parameters as molecular weight. This has allowed Birnstiel to make a fairly complete and convincing description of the ribosomsal cistrons in *Xenopus*.

Finally in the colloquium, Dr R. S. Gilmour of Glasgow gave a very clear account of the masking hypothesis of differentiation and of the experiments of the Beatson group which support the idea that chromatin in different tissues can transcribe *in vitro* different kinds of RNA which are similar to those found *in vivo*. In the discussion some doubts were expressed whether the RNA they were able to study is in fact messenger RNA, and about the proportion of the *in vitro* made RNA which could react with the DNA. These difficulties were underlined by other contributed papers; for example, Dr M. Melli and Dr J. O. Bishop showed that, in rats, RNA made *in vitro* bound preferentially only to certain fractions of the primer DNA, and W. G. Flamm described a highly redundant nuclear satellite from the guinea-pig the abundance of which may seriously bias hybridization experiments.

In other sessions less connected with the hybridization, several papers from the MRC Demyelinating Diseases Unit in Newcastle gave evidence for a DNA-polysaccharide complex in the brain of animals infected with the scrapie agent, and an interesting system involving free and membrane-band ribosomes in *Vicia faba* was described by P. I. Payne and D. Boulter of Durham, although G. Coleman of Sheffield presented some salutary evidence on the effect of ionic strength on the binding of ribosomes to membranes.

Prebiotic Synthesis

from our Cell Biology Correspondent

THE list of amino-acids and nucleic acid bases that have been synthesized under allegedly prebiotic conditions continues to increase. Earlier this year (*Science*, **159**, 1108; 1968), Steinman, Smith and Silver reported the first synthesis of an amino-acid containing sulphur –methionine. Apparently this is one of the products obtained by hydrolysing the cloudy precipitate which is produced by irradiating ammonium thiocyanate solutions with ultraviolet light and, in turn, ammonium thiocyanate is one of the products produced when mixtures of methane, ammonia, water and hydrogen sulphide are sparked. So now a total of at least fifteen amino-acids have been made under prebiotic conditions. Matthews and Moser reported the synthesis of fourteen amino-acids from polymers of hydrogen cyanide last year (*Nature*, **215**, 1230; 1967).

Sanchez, Orgel and Ferris over the past two years have described the prebiotic synthesis of the purines adenine and guanine. Adenine can be formed from hydrogen cyanide and guanine from cyanogen and hydrogen cyanide. Hydrogen cyanide is, of course, the most abundant product containing nitrogen, from the action of electric discharges on mixtures of nitrogen and methane, and cyanoacetylene is the second most abundant. Cyanoacetylene and cyanogen are also formed by passing hydrogen cyanide and acetylene through a heated tube. Moreover, hydrogen cyanide