Irvine) described new laboratory tests confirming the inverse square law at ranges around 4 cm in contradiction to some results of Long (*Nature* **260**, 417; 1976).

The ever-expanding capabilities of computers were much in evidence, and I suspect many relativists will have been converted to a new interest in the potential of the algebraic manipulation systems, most of which, such as the SHEEP system demonstrated by I. Frick (University of Stockholm), are designed for ease of casual use. Interesting numerical computations included two splendid films, by J. R. Wilson (Lawrence Livermore Laboratory) on collapse and by L. Smarr (Harvard University) and K. Eppley (University of Maryland) on the head-on collision of two equal mass black holes. Thorne suggested that generalisation of the latter to glancing incidence might increase the rather low gravitational radiation found by Smarr and Eppley.

The significance of black holes for astrophysics and cosmology was well reviewed by M. J. Rees (Institute of Astronomy, Cambridge) and I. D. Novikov (Moscow) respectively. Effects considered ranged from X rays through quasar models to the overall entropy of the Universe, and included the polarisation effects recently predicted by P. A. Connors and R. F. Stark of the University of Oxford (*Nature* **266**, 429; 1977). Among the other astrophysical contributions, J. L. Friedman (Wisconsin–Milwaukee) announced that all rotating stars are unstable, and C. M. Caves (Caltech) pointed out that gravitational Cerenkov radiation would cut off the cosmic ray spectrum in some alternative theories of gravity.

The singularities symposium consisted of many informal contributions, shorter even than their written abstracts, carefully organised by G. F. R. Ellis (University of Capetown) into an enlightening overview. The difficulties in defining singular boundary points and in formulating the 'cosmic censorship' hypothesis (roughly, that all singularities other than an initial big bang are hidden inside black holes) were well discussed. In the session on the initial-value problem Y. Choquet-Bruhat (Paris) reviewed her work with J. Marsden (University of California, Berkeley) proving that the energy of asymptotically flat spaces has a minimum, namely zero, at flat space, thus partially verifying the long-standing conjecture that such spaces have positive energy.

Complex variable techniques figured in various contexts. W. Kinnersley and D. M. Chitre (Montana State University) have developed a method for generating infinite families of solutions of Einstein's equations. R. Penrose (University of Oxford), in his review, related his twistor programme to the soliton solutions of Yang-Mills theory.

The various schools of thought on quantum gravity were well represented. The most rapidly growing seems to be 'supergravity', in which gravity is related to a spin-3/2 field through a symmetry. This removes some divergences, has positive energy, and, as shown by R. Tabensky and C. Teitelboim (Princeton University), can be regarded as a 'square-root' of general relativity much as Dirac's equation is related to the Klein–Gordon equation. S. W. Hawking (University of Cambridge), speaking on path-integral formulations, pictured the vacuum as a sea of Planck mass black holes and warned 'Danger! Virtual black holes.' The gap between quantum and classical approaches was still apparent, as when S. Weinberg (Massachusetts Institute of Technology) told a questioner that geometry did not matter, and only belatedly added 'in this case'.

One interesting contribution that did not materialise was by L. Domash (Maharishi University) on levitation. Did his theory break down in mid-Atlantic? Anyway, only lesser adepts in meditation were present. □

Oocyte microinjection

from H. Chantrenne

A symposium on the use of *Xenopus* oocytes in the study of DNA transcription and mRNA translation was held on 16 July, 1977 at the Université Libre de Bruxelles as part of an EMBO course. It was organised by Dr G. Marbaix and Dr G. Huez, Laboratoire de Chimie Biologique, Departement de Biologie Moléculaire, Université Libre de Bruxelles.

THE colloquium presented some recent results obtained with *Xenopus* oocytes. J. Brachet (Brussels) provided an introduction to oocyte structure and oogenesis.

A novel development is the use of oocytes to study the expression of injected DNA. J. B. Gurdon (MRC Laboratory of Molecular Biology, Cambridge) described techniques he has developed for studying the expression of purified genes by injecting the DNA into the oocyte germinal vesicle, where it is transcribed. He also described recent experiments showing that the oocyte cytoplasm can 'reprogram' injected nuclei. Nuclei from fully-differentiated *Xenopus* cells injected into oocytes of the newt *Pleurodeles*, directed the synthesis of proteins characteristic of the *Pleurodeles* oocyte stage rather than proteins characteristic of the differentiated cell (see *Proc. natn. Acad. Sci. U.S.A.* **74**, 2470; 1977).

The oocyte provides an alternative to the more usual cell-free systems for studying the translation of mRNA. L. van Vloten-Doting (State University, Leiden) emphasised the advantage of the oocyte. Translation is correct, the oocyte is of course able to adjust the conditions for adequate operation of the complex protein-synthesising machinery, and translation continues for several days. Another remarkable feature is the oocyte's ability to bring about correct post-transcriptional modification of the newly-synthesised polypeptide.

An illustration of this was given by J. Ghysdael (Brussels) with the 35S RNA from avian myeloblastosis virus. When injected into oocytes this RNA directs the synthesis of a long polypeptide which is the precursor of the 'group antigens' of the virus. In the oocytes it is correctly split into four viral proteins (p27, p19, p15, p12) exactly as in infected chick fibroblasts, but much more slowly, allowing a clear analysis of the process by classical chasing methods. According to C. von der Helm (see *Proc. natn. Acad Sci. U.S.A.* **74**, 911; 1977) protein p15, one of the final products of polypeptide cleavage, is involved in the cleavage. This raises an intriguing problem, for p15 is not initially present in the oocyte; no-one knows at present whether it can act enzymatically when it is still part of the large polypeptide and provided that the concentration of the latter is sufficient, or whether selective cleavage is brought about by oocyte enzymes.

G. Huez and G. Marbaix (Brussels) have been studying the role of poly(A) in the stability of the messenger. They showed that the addition of poly(A) to a histone mRNA lacking poly(A) increases its half-life in the oocyte from around 10 to more than 48 hours. G. Vassart (Brussels) showed how the translation of thyroglobulin mRNA in oocytes has resolved the controversy over the size of the protein subunit, which turns out to have a molecular weight of 300,000. It is only in the oocyte that this messenger is translated correctly. B. Lebleu (Brussels) showed that crude preparations of mRNA from cells induced to produce interferon directed the synthesis of biologically active interferon in the oocyte. □

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