trates into technico-economic assessments of national issues. Other valuable papers and discussions came from Germany, Poland, Netherlands, the United States and Canada. The differences between countries having much hydro-electric power and those lacking it were brought out in several contributions.

The central problem is best illustrated by an extreme example. A short, or even momentary, interruption to a £10 million petro-chemical complex can occasion a loss to its owner of perhaps 1,000 times the sale price of the electricity not used during the incident. This results from the disturbance and need for restarting procedures on a process designed (and costed) to be continuously operating. A long outage in the small hours on a commercial or domestic supply might pass unnoticed.

Plastid Nucleic Acids Again

from our Correspondent in Cell Biology

STUDY of the nucleic acids of plastids is rapidly becoming one of the great band wagons of biology. Two weeks ago (*Nature*, **216**, 14; 1967) in this column I wrote about some experiments done by Smillie and his collaborators indicating that the DNA of *Euglena* chloroplasts codes for chloroplast ribosomal RNA. Since then Fukuhara (*Proc. US Nat. Acad. Sci.*, **58**, 1065; 1967) and Suyama (*Biochemistry*, **6**, 2839; 1967) have reported that, in all probability, the DNA of mitochondria in the yeast *S. cerevisiae* and *Tetrahymena* codes for the RNA of the mitochondrial ribosomes. Suyama also reports the unexpected result that very little of the 4–5*S* soluble RNA in *Tetrahymena* mitochondria hybridizes with the mitochondrial DNA and—even more puzzling—that it does not hybridize with the nuclear DNA either. Earlier this year Barnett reported three mitochondrial specific species of *t*RNA in *Neurospora*, and Suyama and Eyer (*Biochem. Biophys. Res. Comm.*, **28**, 746; 1967) found mitochondrial specific leucyl *t*RNA in *Tetrahymena*, so it was confidently expected that mitochondrial DNA codes for these organelle specific *t*RNAs. Unless, however, Suyama is in error, this idea must now be questioned.

Recently Küntzel and Noll described the sedimentation properties and nucleotide composition of *Neurospora* mitochondrial ribosomes (*Nature*, **215**, 1340; 1967). Now Luck, well known for elegant studies of *Neurospora* mitochondrial DNA, and collaborators report a virtually identical study (*Proc. US Nat. Acad. Sci.*, **58**, 1025; 1967). The two groups report analyses of the nucleotide composition of *Neurospora* mitochondrial and cytoplasmic ribosomes that agree to within 5 per cent and show the two classes are quite distinct; for example, the G+C contents of mitochondrial and cytoplasmic ribosomes are 38 per cent and 49 per cent according to Küntzel and Noll and 35 per cent and 50 per cent according to Luck *et al.* But Luck's values for the sedimentation coefficients of the ribosomes and ribosomal RNA are unusually high and very different from those given by Küntzel and Noll. For example, under their conditions, Luck *et al.* find *E. coli* ribosomes sediment at 81·9*S* and *Neurospora* cytoplasmic and mitochondrial ribosomes have virtually identical (and high) coefficients, 89·8*S* and 89·5*S*, whereas Küntzel and Noll's corresponding values are 70*S* (the conventional value for *E. coli*) and 77*S* and 73*S* for the two classes of *Neurospora* ribosomes which are thus clearly distinguishable. Since the two groups find similar nucleotide compositions for *Neurospora* ribosomes, these perplexing differences must be attributed to differences in conditions of sedimentation, notably in the composition of the buffer solutions.

Also in the current *Proc. US Nat. Acad. Sci.* (**58**, 1051; 1967), Attardi and Attardi report the very interesting discovery that in HeLa cells that fraction of the cytoplasmic *m*RNA associated with ribosomes bound to the endoplasmic reticulum is of cytoplasmic origin. When cells are fractionated after a 30 min pulse of H^3 uridine, about twice as much of the newly synthesized RNA is associated with a membrane fraction, which contains mitochondria, endoplasmic reticulum and 10–15 per cent of the cell ribosomes as with free polysomes. This membrane associated RNA differs in base composition from the *m*RNA associated with free polysomes; it has a higher adenine and lower G+C content. Furthermore, the membrane associated RNA has a faster turnover than free polysome *m*RNA, sedimentation properties characteristic of *m*RNA and greater sequence homology to cytoplasmic, presumably mitochondrial, DNA than nuclear DNA. Bacterial *m*RNA is much less stable than eucell *m*RNA and mitochondria are thought to have arisen from symbiotic bacteria. It seems significant to this idea that the *m*RNA in HeLa cells which is thought to originate in mitochondria is metabolically unstable. Attardi and Attardi suggest that some of the *m*RNA transcribed off mitochondrial DNA migrates into the cytoplasm where it associates with ribosomes bound to the endoplasmic reticulum and is translated. It will be of great interest to see what proteins it specifies.

Recording Active Brains

from a Neurophysiology Correspondent

ONE of the outstanding problems in neurophysiology is the development of techniques for recording neural activity in alert, active animals so as to permit proper correlation of neurophysiology and behaviour. At present most knowledge of the neurophysiology of the central nervous system is derived from anaesthetized preparations in which it is most unlikely that cerebral processes are similar to those in alert animals. The problems to be solved include the rigid mounting of a microelectrode the tip position of which can be finely controlled, and the precise stimulation of, say, the retina of an unrestrained animal.

Recently MacLean (*Electroenceph. Clin. Neurophysiol.*, **22**, 180; 1967) described a platform which can be mounted firmly on the cranium of an experimental animal, so that it lies in the horizontal plane of the stereo-taxic co-ordinate system. Guide holes within the platform allow the insertion of micro- and macro-electrodes through holes drilled in the cranium. However, although it is possible to implant permanent recording and stimulating macro-electrodes, the use of micro-electrodes is more difficult. They are introduced at the start of a recording session during which the animal must be restrained, for head movements may cause movement of the brain relative to the electrode. The technique is therefore limited; nevertheless, intra-cellular recordings have now been made from units in the squirrel monkey's hippocampus