(f3) (*Cold Spring Harbor Symp. Quant. Biol.*, **34**, 223; 1969), but Miall and Tamaoki suggest that their factor is likely to be another initiation factor, f1. Either would imply that the dissociation factor has, in addition to its role in separating ribosomes into subunits, other functions in the initiation of protein synthesis. At least, however, both groups agree that the dissociation of the ribosome is caused by a specific dissociation factor.

VISUAL SYSTEMS

How to dye Cells

from our Neurophysiology Correspondent

THREE types of cell in the retina of the goldfish have been dyed by intracellular injection of procion yellow. The technique was first used in the lobster abdominal ganglion by Stretton and Kravitz (*Science*, **162**, 132; 1968), who showed that the dye would penetrate even the finest branches of neuronal processes. In the retina there are several cell types with complex morphologies and with many axial and lateral connexions. It has only recently become possible to record intracellularly from these, making possible an important increase in the detailed knowledge of information processing by the visual system. This has added to the importance of subsequent histological identification of individual neurones after their activity has been recorded.

Kaneko (*J. Physiol.*, **207**, 623; 1970) was able to record from and identify horizontal, bipolar and amacrine cells. (His beautiful micrographs stimulated cries of admiration when they were first shown at a meeting.) He filled glass microelectrodes with a 6 per cent aqueous solution of procion yellow (a fluorescent derivative of cyanuric chloride). The dye molecules are negatively charged and are expelled from the tip of the microelectrode by the passage of a current of 5–10 nA. Once inside a neurone, the dye remains, but diffuses to its extremities within thirty minutes. (It is important not to fix the tissue until spread of the dye is complete.)

Kaneko was able to show unequivocally that cells giving an S-potential response to illumination were horizontal cells, which make synapses with receptors and bipolar cells in the outer plexiform layer of the retina. S-potentials are sustained membrane potentials. There are two types: luminosity, or L-type, in which the neurone is hyperpolarized by any visible light stimulus; and chromaticity, or C-type, in which the polarity of response reverses at a particular wavelength in the visible spectrum. Both types were found in both external (nearer to the sclera) and internal (nearer to the vitreous) horizontal cells, although external horizontal cells showed more spatial summation than internal horizontal cells.

Bipolar cells, as in other preparations, had receptive fields with a centre-surround organization: no morphological difference was found between cells with OFF (responding to dimming of a light) or ON centres. No action potentials were recorded from bipolar cells. Amacrine cells, which synapse in the inner plexiform layer with bipolar cells and ganglion cells, the axons of which form the optic nerve, did show spike activity as well as slow potential changes. Responses were transient, again in accordance with results from other preparations, and there was no distinct centre-surround receptive field organization.

The first application of the procion yellow technique to a retina is extremely promising, particularly as the results in the goldfish agree well with those of Werblin and Dowling from the mudpuppy retina. Many physiologists will be pleased that the mudpuppy, which has a degenerate visual system but conveniently large neurones, might now give way to a fish with somewhat greater visual acuity.

CANCER

DNA from RNA Template

from our Cell Biology Correspondent

THE prospect of eight hot days (May 22–29) in Houston at the tenth international cancer congress was bad enough, but capped by the prospect of Vice-President Agnew performing the opening ceremony it was too much for some people. Renato Dulbecco, for one, decided to stay away and he was greatly missed. The show went on, of course, and despite the absentees and the occasional political protest, afficionados of international cancer jamborees could, towards the end, be heard saying that this Houston meeting had turned out to be more useful than most of its predecessors.

There were never less than four and sometimes more than thirty concurrent sessions so it would be presumptuous to do other than report a handful of the more stimulating reports. Dr H. M. Temin's tantalizingly incomplete work from the University of Wisconsin certainly falls into this category. He suggests that avian sarcoma virions contain an enzyme capable of making DNA using a single stranded RNA template. If this can be substantiated Temin will have established that nucleic acid synthesis is symmetrical, that RNA can act as a template for DNA synthesis as well as the reverse. Moreover, he will have provided an explanation of how the genetic information of an RNA tumour virus can be stably inherited.

But what is Temin's evidence for such unorthodoxy? First, there is the indirect evidence that transformation of chick or mouse cells by sarcoma viruses can be inhibited by exposure of the infected cells to bromodeoxyuridine and light in conditions in which the cells are not killed. Second, transformation is insensitive to pulses of cycloheximide immediately after viral infection. Finally, Temin claims that avian sarcoma virions, after treatment with an unspecified detergent, will incorporate deoxynucleoside triphosphates and that this activity is lost if the disrupted virions are first exposed to RNase. He was reluctant to give more details of his work and he has not repeated the experiments with the ribonucleoside triphosphates. More than one person must have hurried home from Houston set on repeating and extending this work as quickly as possible. Certainly the time is ripe for putting Teminism to an acid test.

Stable transformation of cells by DNA tumour viruses is certainly simpler to envisage than transformation by RNA viruses, but there were no great new revelations about DNA tumour viruses at Houston. It is still not clear whether the continuous expression of viral functions is required for stable transformation, and if such functions are required what they are is a mystery.