transcription of the H2A gene. Interestingly, this deletion appears to cause the synthesis of RNAs with heterogenous 5′ ends located downstream from the normal 5′ end.

A number of observations in viral systems point to the same type of phenomenon. Bending and Folk (*J. Virol.* **32**, 530; 1980; *Cell* in the press) have isolated viable deletion mutants of polyoma where both Hogness box and cap region are deleted. Likewise Benoist and Chambon (*Proc. natn. Acad. Sci. U.S.A.* in the press) have constructed the equivalent mutants in SV40, which are still able to express the early region. A large deletion removing sequences far upstream inactivates this region. Finally, Gluzman, Sambrook and Frisque (*Proc. natn. Acad. Sci. U.S.A.* in the press) have shown that a large deletion of about 200 nucleotides which eliminates the Hogness box and the upstream sequences apparently inactivates the SV40 transcription unit. It seems, therefore, that loss of the Hogness box causes the production of RNAs with heterogenous 5′ ends when transcription is assayed *in vivo*, and at least in viral systems still greater deletions cause the elimination of transcription.

Clearly *in vitro* transcription assay systems offer another convenient and rapid means of mapping promotor sequences. Wasylyk *et al.* report an initial search in this direction. They show that deleting the DNA sequences upstream from position −44 has no detectable effect on the *in vitro* transcription of the conalbumin gene. However, deletion of the additional DNA sequences from this position to −8 eliminates transcription entirely.

It now seems clear therefore that at least some of the sequences required for the transcription of structural genes by RNA polymerase II are localized in the DNA immediately flanking the gene on the 5′ side. This differs from the results obtained with RNA polymerase III based systems where these sequences can be deleted without affecting transcription (Sakonju *et al. Cell* **19**, 13; 1980; Bogenhagen *et al. Cell* **19**, 27; 1980; Kressmann *et al. Nucl. Acids. Res.* **7**, 1749; 1979; Thimmappaya *et al. Cell* **38**, 947; 1979)

It seems likely that the Hogness box forms part of the 'promotor' yet proof for this must await specific alteration of this region by fine structure deletions and point mutations. However, *in vivo* results point to a second DNA region, localized further upstream, that is implicated in transcription initiation. One obvious difference between the *in vivo* and *in vitro* data is that *in vivo* the DNA is packaged in some form of chromatin whereas this does not appear to be so in the *in vitro* systems, and perhaps this is involved in the functioning of this second 'region'. One thing, at any rate, is clear — the 5′ ends of every gene under the sun are in for a beating with mutagens and nucleases this year in the quest for the eukaryotic promoter. □

100 years

Several papers have stated that an official commission will be appointed in France to witness the crossing of the British Channel by a balloon travelling from France to England (weather permitting). The fact is that the experiment is to be made from Boulogne by M. Javis, with his own balloon and at his own risk. But the port authorities have agreed to send M. Javis such information as will enable him to select for starting a time when the wind is blowing with some sufficient prospect of reaching England. M. Javis will keep watch from June 1 to 20. A steamer will follow as far as possible the hardy aëronaut on his adventurous trip.

The Emperor of Russia has conferred the Grand Cross of the Order of Stanislaus upon Dr. Hermann Obst, the director of the Ethnographical Museum of Leipzig.

In a series of papers on the northern part of the continent contributed to an Australian paper the writer mentions a curious feature of the creeks and lagoons in the north of Queensland. This is what is called "floating grass." It is a tall aquatic grass, which while growing in the mud when within reach, is quite independent in that respect, and extends its creeping stems into the deepest water; and by the interweaving of these, and of the roots emitted from every joint, makes a dense mat of verdure, which, at first sight, seems to have its origin on solid ground. It is however quite possible to walk on it without risk of entanglement. The method is to keep going, lifting the feet well, and with the body in as flat a position as possible. Horse and cattle are fond of this grass, and it is said that the massess of it are sometimes so dense, although with twenty feet of water underneath, that horses have been known to cross on them.

From *Nature* **22**, 3 June, 110 & 111, 1880.

Asteroid Hektor

from Jonathan Gradie

THE asteroids are more than just the 'minor planets' of our Solar System. Their small size belies their importance to our understanding of the formation of all the planets. Today we see the asteroids not as the vestige of a disrupted planet, as was once thought, but as the remains of the process which formed the planets. They are not only a window back in time to the beginning of our solar system, but are also a record of the events as they happened in time and space.

The past decade has shown an explosion of knowledge about asteroids. Physical studies have shown the existence of at least two major types of asteroids: the low albedo ($p_v \sim 0.04$), spectrally neutral 'C' objects, and the higher albedo ($p_v \sim 0.13$), spectrally reddened 'S' objects. The 'C' objects are probably similar to if not identical to the carbonaceous chondrite meteorites; the 'S' objects appear to closely match the stony-iron meteorites. The asteroid Vesta has been found to be identical to if not the source of the basaltic achondrites.

One fascinating aspect of recent theoretical work is the study of the collisional evolution of the asteroids. Collisions appear to have dominated the history of the asteroids; collisions can range from minor erosive cratering impacts to major catastrophic events which result in the complete disruption of the body and the formation of a Hirayama family. Depending upon the circumstances of the collision, the final product can take on a most curious form, at least according to Hartmann and Cruikshank (*Science* **207**, 976; 1979). They hypothesize that under very special circumstances, some collisions may result in the accretion of a new and larger asteroid. They cite the Trojan 624 Hektor as a possible example.

Hektor is a strange object. It orbits with the proceeding Trojan cloud at one of the Lagrangian points of Jupiter. The large amplitude (1 mag) lightcurve was originally interpreted as evidence that Hektor was a very elongated, cigar-shaped object ($b/a \sim 1{:}3$), probably a splinter from a larger asteroid destroyed by a catastrophic collision. Thermal radiometry identified Hektor as a comparatively large asteroid (long axis ~300 km) with a very low albedo ($p_v \sim 0.02$). As Hartmann and Cruikshank have pointed out, the combination of the 1:3 elongation and the large size is unusual among asteroids and somewhat puzzling as the other Trojans in the proceeding cloud do not appear to be splinter-like fragments of a much larger parent body destroyed by a catastrophic collision. It appears that the lightcurves may have been interpreted incorrectly, that perhaps the large amplitude lightcurve was due to albedo effects, i.e., one side light, the other dark, instead of shape effects. If the lightcurve is caused mainly by albedo variations this would remove the problem caused by the combination of elongated shape and large size. Hartmann and Cruikshank were able to prove with simultaneous observations in reflected light and emitted thermal radiation that Hektor is indeed highly elongated and that the unusual shape accounts for most of the light variation.

How did Hektor become so elongated?

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