NEWS AND VIEWS

Central Dogma, Right or Wrong?

EVEN if Professor J. D. Watson had set out to write his frank account of the discovery of the structure of DNA by really believing that it would be accepted by everyone concerned, he must have realized long ago that there are many critics who, for one reason or another, would seek some opportunity to retaliate when it came to reviewing *The Double Helix*. It is an open secret that the three people most involved, Drs Crick, Wilkins and Pauling, failed in their efforts to stop or at least to modify the publication. But they may have influenced the decision of President Pusey and the corporation of Harvard College to overrule the syndics of Harvard University Press and prevent the book appearing under that imprint. Since then, however, Drs Crick and Wilkins have sensibly stood aloof from personally attacking their friend and colleague. That could be left in quite capable hands.

The real danger of all this furore, however, is that fallacious attacks on the validity of the scientific work and judgment of Watson, and therefore Crick and Wilkins, will insinuate themselves among the personal rows. Dr Barry Commoner of Washington University, St Louis, an inveterate alarmist ever since the days when he decried the validity of ultraviolet light measurements of intracellular DNA in the 1950s, has taken exception to DNA and has made something of a name for himself by attacking the idea that DNA is the self-replicating genetic material. He had another opportunity to repeat his arguments and he confused the issue at a recent symposium in San Francisco organized as part of the 155th annual meeting of the American Chemical Society. Predictably Watson, Crick and Wilkins declined invitations, but several knowledgeable people, including Professors Chargaff, Kornberg and Commoner, did attend.

It is understandable that Chargaff may find it as hard to be objective about the history of DNA as Watson does. He may well feel that he had this prize within his grasp. And there should be no mistake that molecular biology is such a fiercely competitive field that who did what assumes almost as much importance as what in fact was done. That, if nothing else, is clear from Watson's account. But, in the mood of criticism which the book has inspired, Dr Commoner had a splendid opportunity to repeat his now familiar and, as far as most people are concerned, experimentally refuted arguments that DNA is not self-replicating. The crux of this view, the "crisis in biology" as Professor Commoner likes to call it, is that DNA polymerase—the enzyme which catalyses the polymerization of the four nucleotide bases to produce DNA—is not simply a catalyst. He maintains that the base sequence of the DNA or the genetic code is not determined solely by the sequence in the template DNA but is also somehow affected by the enzyme itself. His evidence for this is that the preparation of DNA polymerase which Kornberg isolated several years ago and has worked on ever since does not exactly copy the base sequence in the primer DNA and, furthermore, can make DNA in the absence of any primer. But it has never been shown that this unprimed DNA specifies any protein, and all Kornberg's more recent results, including the replication of infective *ΦX 174* viral DNA *in vitro*, which received publicity from President Johnson in December, point the other way. Kornberg, and almost everyone else in a position to judge, believes that there is overwhelming evidence that the enzymes involved in DNA replication are only catalysts.

The other plank in Dr Commoner's argument is that the amount of DNA per cell is not related to the taxonomic position of the species from which it comes. If the average size of genes is constant, the species of a higher taxonomic status should contain more DNA per cell than species of a lower taxonomic status. As this is not the case, Professor Commoner has devised a "nucleotide sequestration" hypothesis which explains the discrepancy in DNA content at the expense of the view that inheritance is exclusively controlled by DNA. But variations in the DNA content per cell can, of course, equally well be explained by gene duplication. A cell may contain many copies of a few genes and have more DNA than another cell of higher taxonomic status which has only a few copies of a greater number of genes.

When Professor Commoner restricts himself to such themes as the hazards implicit in many recent and fanciful claims about the possibilities of controlling human inheritance or the possibilities of poisoning resulting from excessive use of nitrate fertilizers, he certainly does little harm and may even do some good. But there is a real danger that the repeated publicity given to his arguments against the genetic role and self-replication of DNA will serve to confuse and to delay research. That should not be allowed to happen. What has to be clearly kept in mind is that, irrespective of the rights and wrongs of publishing *The Double Helix*, the importance to biology of the discovery of the structure of DNA ranks with the rediscovery of Mendel's work and *The Origin of Species*.

Pine Martens

THE pine marten, which looks like a large ferret with dark brown fur and a characteristic creamy orange patch under the throat, has never enjoyed legal protection in Britain. Over the centuries, as a result of