in her work on cabbage. From his study of male sterility, Nieuwhof indicated how temperature sensitivity in this character might contribute to a practical breeding scheme. To produce truly homozygous lines for use in hybrids, G. R. Mackay from Pentlandfield advocated the induction of "matromorphs"—formed entirely from the female gamete—following pollinations by other *Brassica* species. Such di-haploids could save much time. I. H. McNaughton, also from Pentlandfield, reviewed interspecific crossing and amphidiploidy for *Brassica* and suggested that there is special promise in combinations with *Raphanus* as a route to new crop species.

Problems with incompatibility as a basis for producing hybrid seed received considerable attention at the meeting. K. F. Thompson from Cambridge explained the genetic relationships of the *S* alleles so far analysed, emphasizing differences in activity in stigmas and pollen. Incompatibility reactions could now be assessed directly and easily from pollen tube behaviour, using ultraviolet fluorescence microscopy; this was stressed by both J. G. van Hal from Unilever, Holland, and G. du Crehu from INRA, France. The use of serological techniques for such assessments was suggested by M. E. Nasrallah from Cortland, USA. Van Hal showed the important extent to which incompatibility behaviour is subject to modification, particularly the incidence of temperature effects and changes correlated with age.

During biochemical discussions, B. te Nijenhuis, from Unilever, Holland, showed that characteristic iso-enzyme patterns determined by electrophoresis provide a practical test for samples of hybrid seed; the proportion of hybrids can be assessed immediately after harvest. S. Ellerstrom, E. Josefsson and J. Sjödin from Svalöf, Sweden, reported marked differences in the content of thiocyanate-producing glucosides both between and within populations of kale and rape. Such glucosides caused disorders when stock were fed, but selection for low content has been achieved and was recommended. Also, these thioglucosides have been found to act as feeding stimulants for insect larvae, a point with interesting implications.

Successful *in vitro* culturing of young embryos of *Brassica* was reported by D. J. Harberd from Leeds, who suggested that crosses which tend to abort in the ovary could in future be handled in this way. Miss J. C. Wilmar from Unilever, Holland, has tried embryo culture to save time in Brussels sprout breeding, but the use of immature seed gave greater advantage and a one-year breeding cycle had now been introduced.

cellular membranes, thereby becoming a complete infectious complex (*Lancet*, ii, 714; 1968).

The scrapie disease, which in many ways resembles a typical slow-developing viral infection, has been the subject of speculation for some time. But according to Professor Field and Dr Adams, all the proposals concerning the nature of the scrapie agent that have been put forward so far assume in one way or another that the actual replicating or multiplying unit itself must be transferred from the infected host to the recipient (although the occurrence of replication in the commonly accepted sense has recently been questioned). This assumption, the two workers suggest, has led to difficulties in explaining, for example, the stability of the agent when exposed to radiation and the lack of antibody production.

Professor Field and Dr Adams have approached the problem from a different angle. They suggest that, alternatively, some incomplete replicating factor which absorbs thymidine and polysaccharide precursors is always present in the susceptible recipient (*Nature*, 218, 102; 1968), and that what is transferred may well be a small specific molecule which is necessary to complete and set into motion the otherwise incomplete system of the recipient. Although they do not guess at the specific nature of this "linking substance", they do suggest that it could be a substance which does not contain nucleic acid and which does not itself replicate. The mechanism of attachment of incomplete virus to cell membranes—which they postulate—is in many ways similar to Racker's conclusions concerning the attachment of part of the cytochrome system to mitochondrial membranes.

Professor Field and Dr Adams maintain that not only would their hypothesis explain some of the puzzling features of scrapie—failure to stimulate antibody production could be a reflexion of the small size of the protein and/or carbohydrate linkage substance, for example—but it may throw some light on other disorders of the nervous system such as multiple sclerosis and kuru. The emergence of scrapie in animals given preparations of these two would only require that the linkage material should be the same in the three diseases. The specificity of the resulting disease in any given case would then be conferred by the host spectrum of the incomplete, replicative "sub-viruses" and their specific avidity (when "linkage-substance" becomes available) for different types of membranes. Thus some might become associated with the mitochondrial membrane, others with cytoplasmic or nuclear membranes, and this might determine the pattern of cell sickness.

INFECTIOUS DISEASE

New Look at Scrapie

from our Social Medicine Correspondent

A NEW hypothesis for the infective process in scrapie, the disease which produces degeneration of the brain and nervous system in sheep and goats, is outlined in the current issue of the *Lancet* by Professor E. J. Field and Dr D. H. Adams of the Demyelinating Diseases Research Unit, Newcastle upon Tyne. In essence, they propose that the essential part of the scrapie infection process is the transfer from an infected host of a "linkage-substance" which enables incomplete "sub-virus" in the susceptible recipient to bind strongly to

HEART DISEASE

Diets and Death

THE MRC has now completed a trial of the potential value of a diet which lowers serum cholesterol in the prevention of myocardial infarction (*Lancet*, September 28). The patients concerned in the trial were men aged less than sixty who had recovered from a first attack of coronary heart disease. The two groups—test and control—were chosen completely at random. None of them suffered from severe hypertension or a disability which could make them unduly liable to a second attack.