comment pointedly that it is not reasonable to seek a single theory of epitaxial nucleation.

These elegant experiments still cast no light on why (111) epitaxy is preferred at low temperatures and (100) at high temperatures, and how and why the crystallites rotate to a new epitaxy as they merge by combination of smaller colliding crystallites. Nevertheless, this work takes understanding of epitaxy a good way forward.

PRIMATOLOGY

Disappointing for Some

from a Correspondent

THE Oregon Regional Primate Research Centre acted as host to the Fourth International Congress of Primatology, held in Portland, Oregon, between August 15 and 18. The congress programme was divided into innumerable sessions of short contributed papers, and four principal symposia, covering the fields of primate behaviour, craniofacial biology, reproductive behaviour and pathology. Although very little new material was presented at these symposia, they did give non-specialists the opportunity to familiarize themselves with the results of recent research and to assess the trend of current research in these fields.

The symposium on primate behaviour fulfilled these objectives particularly well, even if the quality and coherence of some contributions left much to be desired. Three vital issues were raised: first, the limitations of an outlook centred on higher primates; second, the value of field experiments; and third, the extent of intraspecific variation in behaviour and social organization. In recent years, primate field studies have become increasingly rigorous in both concept and methodology, as might be expected in a discipline chiefly pioneered by anthropologists and psychologists with little formal training in field biology, and too often showing scant awareness of the extensive literature on the behaviour and ecology of other animals. (Until recently even the prosimian primates had been largely overlooked.)

It was refreshing, therefore, to hear Dr J. F. Eisenberg (Smithsonian Institution) consider primate societies in the broader context of mammalian social systems and expose the fallacy that higher primates are somehow superior to other mammals. He argued that examination of the behavioural repertoires, communication signals and learned traditions of selected mammalian species did not support the theory that higher primates necessarily enjoy a more complex social organization. The importance of field experiments has been ably demonstrated by Dr H. Kummer (University of Zurich) in his earlier work on hamadryas baboons, and its value was re-emphasized by his latest report. Observations on harem groups of hamadryas baboons suggested that a social inhibition prevented more powerful males from attacking weaker males and appropriating their females. A series of experiments with captured animals was designed to test this hypothesis, and his findings confirmed the existence of a social inhibition. Too little attention has previously been paid to variations in the social structure and behaviour of a species. It was therefore instructive to hear the contribution of Dr J. S. Gartlan (University of Bristol) on intraspecific variations in the behaviour of African cercopithecines. His results clearly showed that the group organization of a single species can vary according to its ecology and that, for instance, patas monkeys, who form one-male groups in East Africa, can be found in multi-male heterosexual groups in West Africa.

The symposium on craniofacial biology produced two outstanding studies on dental variability in living primates. The paper presented by Dr D. L. Greene (University of Colorado) was specially interesting because of its application to the study of fossil hominids, and particularly to showing whether the Australopithecines represent a single sexually dimorphic taxon or two different species. His research on dental metric variation in gorillas, chimpanzees and humans has revealed that sexual dimorphism was considerably greater in the gorilla. A comparative statistical analysis of mean differences in the male and female dentition of these three groups with mean differences in the dentition of the robust and gracile Australopithecines indicated, however, that the differences in the fossil forms could not be explained by sexual dimorphism. Dr D. G. Steele (University of Alberta) presented an elegant analysis of variation in forty-three non-metrical traits in the Tupaiidae. Among other things he showed that the dentition of Ptilocercus is markedly different from the rest of the Tupaiidae, and that the genus Tupaia can be divided, on the basis of these traits, into two distinct groups. Although this technique has proved extremely useful in studies of functional anatomy and population genetics, Dr Steele was careful to warn participants that it has only a limited value for taxonomy.

In recent years Dr R. P. Michael (Institute of Psychiatry, London) and his colleagues have produced some outstanding research on the hormonal mechanisms controlling sexual and aggressive behaviour in macaques. It was interesting therefore to hear the contributions of two former associates of his in the symposium on reproductive behaviour. Dr J. Herbert (University of Cambridge) presented a lucid review of recent work by himself and his co-workers on receptivity and attractiveness in rhesus macaques and talapoin monkeys. Earlier studies had

Excitation-Contraction Uncoupling in Muscle

IN fast striated muscle fibres, a system of radial invaginations of the outer membrane (the T system) ensures the inward propagation of the excitatory signal. This structure is an essential link in the excitation-contraction coupling. A rather selective disruption of the T system can be achieved by an osmotic shock: the fibre is soaked in a Ringer solution made hyperosmotic with glycerol, and then returned to normal Ringer solution afterwards. This procedure "uncouples" the fibre; action potentials are still generated and propagated but they do not produce a contractile response any more (Eisenberg and Gage, *Science*, **158**, 1700; 1967, and Howell and Jenden, *Fedn. Proc.*, **26**, 553; 1967).

In next Wednesday's *Nature New Biology* Zachar, Zacharova and Adrian report experiments concerned with the mechanism of this uncoupling, in which simultaneous records of electrical and mechanical activities have been made throughout the various steps of the osmotic shock procedure. Soaking the fibre in the glycerol-Ringer solution hardly affected its resting or action potentials, but mechanical tension was transiently abolished before recovering rapidly to a normal (or even supranormal) level. The return into normal Ringer solution first produced spontaneous contraction waves but eventually abolished the mechanical response, while membrane potentials remained practically unchanged. Later, the resting potential became less negative, and the early after-potential disappeared. Moreover, vesiculation made the fibre cloudy.

By exposing the fibre again to the first glycerol-Ringer solution the changes of membrane potentials and vesiculation were readily abolished. On the other hand, the recovery of tension depended on the conditions used in the first step of the procedure: complete reversal of the uncoupling could only be obtained if the glycerol concentration was less than 150 mM, and the soaking did not exceed 45 min.

The results are new data about the osmotic shock as a tool for investigating the excitation-contraction coupling.