

Whitfield (University of Reading), who outlined the way in which theoretical aerodynamic studies and conventional anatomical studies can combine to throw new light on the functional anatomy of *Pteranodon*.

In two studies on modern reptiles, Dr G. L. Underwood (City of London Polytechnic) explained a dendritic classification which provides a very satisfactory picture of the evolution of boid snakes, and Mrs L. Sheppard (St Mary's Hospital, London) showed that the joints between the neural arches in lizards and snakes contain menisci, and suggested that these provide a flexible and compressible element needed in joints which permit movement in more than one plane.

SCHIZOPHRENIA

Biochemical Aspects

from a Correspondent

THE first joint meeting of the schizophrenia associations of Canada, America and Great Britain was held in London on September 28 and 29. Work on the genetic basis of schizophrenia was reviewed by Mr J. Shields (MRC Psychiatric Research Unit, Maudsley Hospital, London) in relation to current hypotheses and he concluded that the evidence for the existence of genetic factors rests on general arguments. Dr L. R. Moshier (National Institute of Mental Health, Bethesda), referring to a study of identical twins discordant for schizophrenia, reported having found different patterns of interaction between one parent and one twin (who was later to become schizophrenic). The twin as a result was repeatedly less favoured and a relationship was established with a contradictory and incomplete role expectation and without cognitive and communicative clarity.

Schizophrenia is a changing concept, said Dr D. Richter (MRC Neuro-psychiatry Unit, Carshalton); it has altered as various subgroups have been isolated from the chief group of schizophrenias. Dr A. P. Ridges (University of Liverpool) emphasized the need for a definition of the criteria used in selecting patients and conducting experiments under carefully controlled conditions. She supported Dr Richter and said that altered activity of several enzymes or more probably isoenzymes could finally affect common metabolic pathways producing the symptoms of schizophrenia. Pink spot excretion seems to be associated with an altered catecholamine metabolism in schizophrenia. She reviewed other biochemical considerations including the suggested association between coeliac disease and schizophrenia.

The possible central effects in schizophrenia were considered by Dr A.

Randrup (St Hans Hospital, Roskilde), who presented evidence indicating an association between schizophrenia and dopaminergic hyperactivity in the brain. Professor J. Yaryura-Tobias (University of Buenos Aires) considered that the basal ganglia are of prime importance in the aetiology of schizophrenia. Dr K. Smith (Washington University) reported that she has found trans-3-methyl-2-hexenoic acid in schizophrenic sweat. This finding has not yet been confirmed independently by other workers nor has its presence in other psychiatric patients been investigated. The adrenochrome hypothesis has evolved into the aminochrome-melanin hypothesis. Dr M. Altschule (Harvard Medical School) said that these unstable compounds are rapidly converted to melanin by everybody and, regardless of whether schizophrenics make more aminochromes or not, the fact is that at least one of their tissues, blood, is abnormally sensitive to the toxic effects of these compounds.

The term "orthomolecular psychiatry" introduced by Professor L. Pauling in 1968 has taught American psychiatrists to appreciate a principle well known to scientists. Dr R. Maclean (Vancouver) defined orthomolecular psychiatry as the treatment of mental disease by the provision of the optimum molecular environment for the mind especially the optimum concentrations of substances usually present in the body. Reports which followed testified that large doses of vitamins together with other therapy can improve the functioning of the brain in a variety of conditions. Successes with both children and adult psychiatric patients were reported by Dr A. Cott (New York) and Dr D. Hawkins (Nassau Medical Health Research Center, Long Island). Dr A. Hoffer (Saskatoon, Saskatchewan) outlined the treatment which is based on administering vitamin B3 in combination with other vitamins. The over-regulating mechanism of the body in various forms of stress results in hypoglycaemia and although this is not specific for schizophrenia it is common in schizophrenics and ought to be treated, said Dr R. Meiers (Belmont, California).

REACTOR TECHNOLOGY

Structural Mechanics

from a Correspondent

REACTOR technology requires a synthesis of many skills. The ability to deal with the structural mechanical problems which arise is vital to achieving economic, reliable and safe exploitation of nuclear power. For the first time, largely due to the inspiration of Professor Dr Ing T. A. Jaeger (Bundesan-

stalt für Materialprüfung (BAM)), more than nine hundred delegates from the many disciplines involved in reactor technology met in West Berlin from September 20 to 24 to discuss these problems.

Introductory lectures allowed comparisons to be made between the different strategies applied to power reactor development within the European Community, in the United States and in the United Kingdom. The development of the different types of reactor systems was traced with particular emphasis on the ensuing mechanical-structural requirements.

The rapid progress of reactor technology has given rise to many structural problems which are consequent upon the use of sophisticated materials for various reactor system components. These components are required to operate under severe loading and hostile environmental conditions, and the analyses that must be made range from fuel element and cladding performance under mechanical thermal and irradiation, containment requirements, involving prestressed concrete steel lined vessels or heavy section steel vessels, to dynamic response characteristics of complete power installations. This stimulus has resulted in tremendous strides being made in the area of computational methods. It was underlined by the work of Professor J. H. Argyris (Stuttgart University) and others who have found that with the present generation of large computers it is quite possible to analyse almost any component, however complex, under virtually any loading conditions.

The basis of this development is the "finite element" method which, as the name suggests, splits up the problem into a large number of simpler standard elements which are combined in a suitable way. It has frequently proved to be the only feasible method in complex situations. There are, nevertheless, obvious limitations on cost and there remains the implementation of these procedures (or others) to produce the information required for design. Unfortunately analyses seem to have progressed faster than information on material response and it is not yet agreed how the working life of a structure can be predicted on the basis of failure criteria particularly in complex situations where irradiation damage, fracture and creep may interact. Similarly, analyses can only be as good as the input data they receive for situations such as accident conditions, earthquake disturbances or blast loading. It was emphasized by Professor R. K. Penny (University of Liverpool) that material and component testing of the correct type is essential and should be an interactive process with analyses in the overall optimization of design problems.