microfibrils. The new evidence presented by Suzuki *et al.* is strong confirmation of the idea that the low sulphur protein originates from the microfibrils.

Suzuki *et al.* prepared the new helix rich fraction by partially digesting with chymotrypsin the S-carboxymethyl derivatives of the low sulphur proteins from merino wool. Optical rotatory dispersion measurements on a solution of this fragment indicated a helical content of 83 per cent. The elution profile of the 'Sephadex' gel-filtered fraction showed that most of the protein was confined to one major peak though minor components were present. The helix rich fraction was further purified by disintegration of the component chains in 8 M urea and gel-filtration on 'Sephadex' to yield fractions Ch.B. (molecular weight 25,000) and Ch.C. (molecular weight 12,500).

Oriented films of the helix rich fragment and of fractions Ch.B. and Ch.C. were then prepared for studies by polarized infrared spectroscopy and X-ray diffraction. The infrared studies revealed that the films of protein showed absorption bands associated with the amide I and amide II vibrations of a polypeptide main chain; the dichroism is that expected for α-helices preferentially oriented parallel to the fibre axis and the dichroic maxima are close to those obtained from synthetic α-helices. X-ray diffraction patterns showed the typical high angle pattern of α-proteins associated with a coiled α-helix as distinct from a straight α-helix. At small angles on the meridian of the X-ray diffraction pattern there are reflexions which index on a period of 160 Å. The first order of this series is particularly well developed and the breadth of the reflexions in the meridional direction shows that the order is maintained over at least 2000 Å in the axial direction though much less in the lateral direction. Along with other data this leads to the conclusion that this periodicity is probably attributable to end-to-end aggregation of particles about 160 Å long.

The pleasing feature of this report is the recognition of a homogeneous molecular subunit of simple conformation. The impenetrable complexity of α-keratin may be breaking down.

SOCIETIES

Bio-organic Chemistry

from a Correspondent

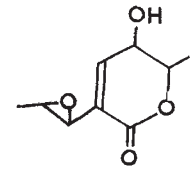
THE most recent symposium of the Perkin Division of the Chemical Society, in association with the Biochemical Society, was devoted to bio-organic chemistry, and was held in London on November 9. Before opening the scientific proceedings, Professor W. Klyne (Westfield College) presented the 1970 Corday–Morgan Medal and Prize of the Chemical Society to Dr D. A. Buckingham (Australian National University, Canberra) and Professor D. W. Cameron (University of Melbourne) jointly. Dr Buckingham was honoured for his contributions to the elucidation of the factors which influence the structures and reactivities of transition metal complexes; Professor Cameron received his prize for his outstanding researches on the structures of the aphid pigments and the chemistry of the related quinone systems.

The first part of the programme was devoted to porphyrin chemistry and biochemistry, and included the Simonsen Lecture of the Chemical Society, which was given by Professor G. W. Kenner (University of Liverpool), who spoke on porphyrins. Professor Kenner concentrated on recent work carried out in his laboratory at Liverpool, arising from a speculation about biosynthesis of the isocyclic ring in chlorophyll. Versatile new syntheses of porphyrins have been devised and the most important—the β-oxobilane method—was outlined. The new synthetic methods have provided specifically deuteriated derivatives of protoporphyrin IX, which have been used in nuclear magnetic resonance spectral studies of myoglobins and related compounds, notably harderoporphyrin and its 4-vinyl isomer. A biosynthetic experiment with the hexahydroporphyrins derived from these two porphyrins showed that the 2-propionate side chain of coproporphyrinogen III is transformed into a vinyl group before that at position 4. An efficient synthesis of porphobilinogen was described. Biosynthetic experiments in chloroplast systems with porphyrin 6-keto-esters and 6-acrylates were discussed. A novel conversion of 6-keto-esters into the corresponding phaeoporphyrins, involving a photolytic cyclization of a bisthallium complex, was described.

Professor A. Neuberger (St Mary's Hospital Medical School, London) next lectured on aspects of the biosynthesis of porphyrins and chlorophylls. The enzymatic condensation of porphobilinogen to uroporphyrinogen had been studied in the presence of inhibitors (ammonia, hydroxylamine); it was found that modified polypyrroles, probably tetrapyrroles, accumulate which are slowly and non-enzymatically transformed into uroporphyrinogen.

The conversion of coproporphyrinogen III into protoporphyrin IX under anaerobic conditions has been shown to require ATP, S-adenosylmethionine, NAD, flavins and non-haem iron. The function of the methionine derivative is not understood. The incorporation of magnesium into protoporphyrin, which could only be demonstrated in whole cells, also requires S-adenosylmethionine and the operation of the electron-transport system of the cell. The state of the oxidation-reduction of the *b*-type to the *c*-type cytochrome segment of electron transport seems to be involved.

In the second part of the symposium Sir Derek Barton (president-elect of the Chemical Society) presented the Flintoff Medal to Professor A. J. Birch (Australian National University, Canberra). This award is made once every three years by the Council of the Chemical Society to the fellow who has made the most meritorious contribution to the knowledge of the relationship between chemistry and botany. In his Flintoff Medal Lecture, entitled "Biogenetic Structure Determination: the Brevianamides", Professor Birch gave a stimulating account of the way in which biogenetic ideas have been important in the determination of structures of natural products. Some structural information is required in regard to "biogenetic type" and in recent years this has very frequently been obtained by physical methods. With knowledge of the biogenetic type, it is possible to make an "inspired guess" about the structure, and this can be tested. Incorporations of radioactive precursors and quantitative degradations are important not only in confirming the units present, but also in showing how they are linked. Professor Birch illustrated how such tracer uses are used with reference to structure determinations of pleuromutilin, phomazarin, echinulin, nystatin and the indoloid mould metabolites, the brevianamides. Biogenetic structures can be tested by physical methods, which alone may not readily suggest specific structures.



(I)

The programme concluded with a shorter contribution by Dr J. Staunton (University of Cambridge), who discussed the biosynthesis of a metabolite produced by *Aspergillus melleus*. The compound (I) was shown by feeding experiments with radioactive acetate and malonate to be biosynthesized from two polyketide chains which are formed separately. One of the chains has undergone a contraction to produce a link between two carbons derived from the methyl group of acetic acid with loss of the intervening carbon derived from the carboxyl group. At this stage of the investigation, however, the nature of the overall process is not clearly understood.