He said that an awareness of the disadvantages of current insecticides, such as their ineffectiveness against resistant strains, their non-selective toxicity and their contamination of the environment, demands a different approach. Success might come if the natural balance between the hormones from the neurosecretory system of insects could be upset.

Although Šorm had little to report on the investigation of brain hormone, he referred to German progress with the moulting hormone, ecdysone (I), of which a synthetic analogue (II) has insecticidal activity. This compound (II) induces the synthesis of an enzyme which degrades the moulting hormone of the insect with fatal consequences. Unfortunately, moulting hormones and their analogues are inactive for the most part when applied to insects topically.

By contrast, juvenile hormone and its analogues can be adsorbed through the insect cuticle, thus enabling them to be used as insecticides in spray form. Šorm described how analogues of juvenile hormone (III), such as the derivatives (IV) and (V) of farnesic acid, could inhibit the transformation from larvae to adult insects in 10^{-8} g amounts with very high species specificity.

The need for compounds of easy preparability has been satisfied in part by the substitution of oxygen for carbon in the skeleton of (IV) and also through the use of derivatives of *p*-hydroxy- and *p*-aminobenzoic acid, (VI) and (VII). These resemble the structural features of 'Juvabione', a plant product with juvenile hormone activity, and are active against bugs such as *Triatoma infestans*.

Future research, said Šorm, must be directed towards the development of an anti-juvenile hormone: present success illustrates the application of pure science to answer a problem which cannot be solved by the purely empirical approach.

PERFUMERY

Essential Oils and Volatiles

from a Correspondent

SOME of the chemistry responsible for the olfactory delights of exotic perfumes was aired on April 20 to 22 when the British Society of Perfumers and the Society of Cosmetic Chemists of Great Britain held a symposium at Eastbourne.

Dr G. P. Moss (Queen Mary College, London), reviewing recent advances in the biosynthesis of terpenoid essential oils, emphasized the stereospecificity of each step of these processes, not only in the generation of optically active compounds of considerable complexity but also in the selection of hydrogen atoms from prochiral positions. Professor W. Cocker (Trinity College, Dublin), who discussed chemical selectivity in the reactions of carene, showed how the products depended on the conformation of the carene, and also on the facile isomerization of reaction intermediates. This was found to be especially important with catalytic reduction. Many of the reactions were complicated by the opening of the cyclopropane ring.

The importance of the growing number of natural products related to the ionones was stressed by Mr Y. R. Naves (Givaudan S.A., Geneva). Although many of these compounds were clearly derived from the metabolic degradation of substances such as

ionone, he was unable to suggest whether any or all of them were originally derived from carotenoids.

Although most speakers were concerned with human responses to scents, Dr E. M. Thain (Tropical Products Institute, London) drew attention to the importance of volatile compounds in insects, with functions including defence, sex attraction and trail making. A particular feature of many of these compounds was the extremely low concentration required for activity, at times suggesting relatively few molecules are needed to trigger off a response.

Dr E. T. Theimer (International Flavors and Fragrances, New York) described an attempt to determine whether optical enantiomers can be distinguished by odour. Using a set of four samples of five compounds prepared from *d*- α -, *l*- α -, *d*- β - and *l*- β -pinene he was able to distinguish between the effect of the principal component and possible trace impurities. He concluded that in all cases examined the enantiomers could be distinguished although individual responses varied with both volunteers and expert perfumers. He suggested that these results arise from specific chiral anosmia. The full effect of this result in perfumery remains to be seen.

Dr B. D. Sully (Bush Boake Allen, Ltd, London) described the determination of the composition of a liquid which will give a required vapour composition. His method requires an equilibrium to be set up between the vapour and an inert drop of a liquid. This equilibration process has proved to be controlled by diffusion, being faster at low pressures. As expected, the composition of the vapour differed significantly from that of the liquid phase.

PROTEINS

New Conformations Ahead

from a Correspondent

STRUCTURAL aspects of proteins and peptides were the dominant theme of the Chemical Society's Protein Group meeting on April 17 at Exeter. Professor H. N. Rydon (University of Exeter) reviewed the principles and scope of spectroscopic techniques for elucidating protein conformations, and emphasized that protein chemists must keep open minds on the possibility of the existence of hitherto unrecognized regular features in proteins, in addition to the familiar β -sheet and α -helix structures. As an illustration of the fact that at least one other type of organized conformation exists (albeit in a model which is only distantly related to natural polypeptide chains), Rydon and his colleagues have shown that a synthetic polypeptide with alternating D- and L- γ -benzylglutamic acid residues has an ordered conformation in solution. The evidence for this conclusion seems well founded, but the nature of the conformation remains a mystery.

Studies with model polymers in organic solvents are sometimes criticized as bearing little relation to the situation in proteins in biological conditions, and the manner in which water interacts with polypeptide conformations is clearly of importance. Dr B. R. Malcolm (University of Edinburgh) described how infrared spectroscopy can be used to investigate the way in which water molecules interact with α -helices. The interaction of polypeptide chains with each other is also of fundamental significance and in this connexion