of their tissue extracts towards the presumed *in vivo* substrate GM_2 was lost on purification of hexosaminidase A. Li and colleagues, however, provide exciting new evidence that hexosaminidase A (but not B) activity towards GM_2 can be stimulated by a non-dialysable, non-enzymatic, heat-stable liver 'factor'. How does this finding fit in with the subunit model? Is the factor ever an integral part of the hexosaminidase A molecule? Further purification and characterisation of this component will clearly be informative.

East and West ribosomes

from a Correspondent

A SYMPOSIUM on ribosomes organised at Schloss Reinhardsbrunn from May 13–16 by the Biochemical Society of the German Democratic Republic provided a rare opportunity for scientists from East and West to discuss their work together at first hand. Many of the reports came from the two big ribosome groups in Berlin, with eukaryotes to the East of the Wall and prokaryotes to the West, and the time of the meeting was evenly divided between the two classes of ribosome.

To start with the prokaryotes, H. G. Wittmann summarised the work being done in West Berlin on mutant proteins from both subparticles of *Escherichia coli* and B. Wittmann-Liebold (W. Berlin) described amino acid sequences of many of these proteins; a clear pattern of amino acid changes in mutants of several proteins has emerged. The emphasis in *E. coli* has moved to the 50S particle, and R. Brimacombe (W. Berlin) reported two 50S ribonucleoprotein fragments, one containing proteins known to associate with 5S RNA. From the work of V. Erdmann (W. Berlin), it now clear that 5S RNA is capable of interacting with the TψCG loop of transfer RNA, and D. Richter (W. Berlin) showed further that oligonucleotide TψCG inhibits ribosomal functions associated with the A (aminoacyl tRNA) site, but does not affect the P (peptidyl tRNA) site. I. Rychlik (Prague) described a very specific inhibitor (TPCK) which prevents the formation of a ternary complex between tRNA, GTP and the elongation factor T_u. In other experiments on 50S sites, K. Nierhaus (W. Berlin) rebound single 50S proteins to lithium chloride cores, to identify the proteins involved in peptidyl transferase activity and chloramphenicol binding. A similar approach was used by G. Howard (Basel Institute for Immunology) to look for proteins involved in binding of elongation factor G and the antibiotic thiostreptone.

Affinity labelling is a technique which is being used with great success to pinpoint functional centres on the ribosome. O. Pongs (West Berlin) reported experiments with analogues of chloramphenicol and puromycin, and W. Möller (Leiden) an analogue of GTP. E. Küchler (Vienna) used affinity label analogues of both tRNA and mRNA designed to attach to protein, and also a tRNA analogue which reacted with the 3′ half of 23S RNA. A. Girshovitch (Poustchino) and D. Knorre (Novosibirsk) both preferred to use tRNA analogues which could attach to protein or RNA, and found that the RNA was preferentially attacked.

Coming now to the eukaryotic results, the affinity label method has also been used successfully here by J. Stahl (E. Berlin) to identify two proteins at the 60S A site with a puromycin analogue. H. Welfle (E. Berlin) and P. Westermann (E. Berlin) reported experiments on iodination of rat liver ribosomes. Those of Westermann were particularly interesting, as he was able to show which proteins are specifically protected from iodination by bound mRNA, tRNA and factors. W. Möller (Leiden) found that two acidic proteins from yeast 60S ribosomes could be interchanged with proteins L7/L12 from *E. coli*, with retention of EF activity. The surface of eukaryotic ribosomes is rich in pyrimidines, according to M. Saarma (Tartu) who suggested that these could interact with poly(A) as the first step in mRNA binding.

On the strictly functional side, H. Bielka (E. Berlin) showed that ribosomes from different tissues are very similar in activity, but that the corresponding cytosolic fractions are very variable. The ever-increasing complexity of mammalian initiation was summarised by T. Staehelin (Basel Institute for Immunology); the number of initiation factors now stands at six, and ATP is also involved. H. Bloemendahl (University of Nijmegen) described his calf eye-lens cell-free system, which seems a useful alternative to the reticulocyte system, and a good summary of current knowledge of ribosome-membrane interaction came from G. Blobel (New York). G. Shapira (Paris) talked about his new RNA species which stimulates protein synthesis; it is about half the size of tRNA, and seems not to be interchangeable between different systems.

Finally, the electron microscopists V. Vasiliev (Poustchino), N. Kiselev (Moscow) and G. Lutsch (E. Berlin) were in reasonable agreement that the smaller subparticle of both pro-and eukaryotic ribosomes is divided into two distinct regions of unequal size, but failed to agree on the shape of the large subparticle of eukaryotes.

Protein receptors of juvenile hormone

from our Insect Physiology Correspondent

IT has long been assumed that the lipid soluble juvenile hormone must be transported in the haemolymph in protective association with a hydrophilic carrier which was likely to be a protein. Emmerich and Hartmann (*J. insect Physiol.*, **19,** 1663; 1973) have found that in the haemolymph of adult female *Locusta* there are six distinct lipoprotein fractions and one of these (molecular weight 220,000) binds the juvenile hormone of cecropia. It closely resembles the lipoprotein which binds juvenile hormone in *Hyalophora cecropia* itself (Whitmore and Gilbert (*J. insect Physiol.*, **18,** 1153; 1972)). It seemed a reasonable suggestion that this might in fact be a specific carrier lipoprotein which could have a very important role in the action of the juvenile hormone in preventing its unspecific incorporation into the lipophilic phases of the cells and its rapid breakdown to inactive carboxylic and hydrated products.

But Kramer *et al.*, with Law (*Proc. natn. Acad. Sci. U.S.A.*, **71,** 493; 1974), have now recognised the existence of a somewhat different specific juvenile hormone binding protein in the haemolymph of the hawkmoth caterpillar *Manduca*. The authors point out that the C_{18} juvenile hormone, the chief form in the silkmoth *Hyalophora cecropia*, has considerable solubility in water, yielding a monomeric solution exceeding 10^{-5}M. The binding protein has a molecular weight around 34,000; it has a much higher affinity for the hormone and its analogues than for the products of hydrolysis. Kramer *et al.* found that there is sufficient of this specific protein carrier in the haemolymph and it binds hormone at a sufficiently low dissociation constant, for it to take up virtually all hormone present in normal physiological conditions. They find, indeed, that the juvenile hormone is taken up by lipoprotein only when the binding protein has been saturated.

Besides transport in the haemolymph, the question arises as to whether, in analogy with the action of oestrogens in vertebrates, the juvenile hormone binds to a specific receptor in its target organs. It is well known that the insect epidermis is the chief site of action of the juvenile hormone. Schmialek *et. al.* (*Z. Naturforsch.*, **28C,** 173 and 453; 1973) have obtained new evidence of a receptor protein in the epidermal cells of the *Tenebrio* pupa. Using the juvenile hormone analogue 10, 11-epoxy-6, 7-*trans*-2, 3-*trans*-farnesylpropenylether as the active substance, they found that the target cells will accumulate this against