twenty-five amino terminal amino-acids of trout testis histone III is identical to the sequence of the corresponding segment of calf thymus histone III, the pattern of acetylation of these two histones differs. In both calf and trout histone III, lysine residues 14 and 23 are acetylated but the lysine residues at positions 9 and 18 in some of the trout testis histone molecules are also acetylated.

The first twenty-two amino-acids in trout testis histone IIb_2, which differs at several positions from the amino-acids of the corresponding segment of calf thymus histone IIb_2, include four acetylated lysine residues, those at positions 5, 10, 13 and 18. Comparison of the amino-acids adjacent to acetylated lysine residues in trout testis histones III and IIb_2 reveals an interesting pattern. Acetylated lysine residues are either bordered on either side by amino-acids with short neutral side chains (glycine, threonine and alanine, the codons of which are related by single base changes) or the acetylated lysine residue is part of a Lys-Arg, Arg-Lys or Lys-Lys pair. Such sequences may well, therefore, provide part of the recognition signals which presumably dictate the sites at which specific acetylase can act. But, as Candido and Dixon point out, other factors such as the secondary structures of these proteins must be involved in the specificity of acetylation because, for example, lysine residue 47 in rabbit and calf histone I is not acetylated, even though it is preceded by a threonine residue and followed by an alanine residue.

Allfrey and Mirsky, Dixon and others, have postulated that the acetylation, methylation and phosphorylation of histones alter the ability of these proteins to react with DNA, and thereby play a part in the regulation of gene expression. The observation, made by Ryan and Cristofalo (*Biochem. Biophys. Res. Commun.*, **48**, 735; 1972), that as populations of cultivated human fibroblasts (WI-38 cells) age, the rate at which the cells are able to acetylate their histones decreases markedly, even though the ratio of histone/DNA per cell remains constant, can, of course, be accommodated by this hypothesis. But whether changes in the extent or pattern of acetylation of histones have any role in ageing remains to be seen.

MEMBRANES

Solid for Liquidity

from our Molecular Biology Correspondent

CONSIDERING the weight of effort that has been brought to bear on the analysis of line shapes in n.m.r. and e.s.r. spectra of phospholipid bilayers, and the minute detail concerning the static and dynamic characteristics of the chains in these bilayers that has been extracted, one might suppose that the point of diminishing returns has long been passed. All the same, another squeeze of the lemon has produced something new. Work from two laboratories has demonstrated that, depending on conditions, there is rapid translational diffusion of phospholipid molecules in the plane of the bilayer. Since the now celebrated demonstration by Frye and Edidin of protein antigens diffusing rapidly across a cell membrane, this result should perhaps occasion little surprise. Its demonstration, together with an evaluation of diffusion coefficients, is nevertheless of no little interest, and reinforces again the view, asserted in recent years, that real and model membrane systems in general behave as layers of fluid, within which proteins may float more or less freely.

Plate Tectonics in South-east Asia

As Tarling remarked in *Nature* (**239**, 38; 1972) two weeks ago, South-east Asia is a complex area which is little known from the point of view of plate tectonics. But with the publication of next Monday's *Nature Physical Science* (September 18) the situation will have been transformed by a magnificent interpretation of the tectonic development of eastern Indonesia in relation to the breakup of Gondwanaland, carried out by Audley-Charles, Carter and Milsom of Imperial College, London. For what Audley-Charles and his colleagues have done is to marshal both geological and geophysical evidence for the evolution of Indonesia from the early Cretaceous to the present. Of course, only time will tell whether the interpretation is correct in detail; but what is certain is that the study by Audley-Charles *et al.* will for some time to come be regarded as the basic model against which detail will be judged.

The problem with South-east Asia stems from the complex geological history of the Banda Arcs (see map)—the Inner Banda Arc, which extends from the volcanic islands east of Flores through Wetar to the volcanoes in the Banda Sea south of Seram, and the Outer Banda Arc, which extends from Timor through Tanimbar, Kai and Seram to Buru. In general terms, Audley-Charles *et al.* conclude that the Outer Banda Arc formed part of the Australian continental margin from at least the Permian, but that Seram, Buru and eastern Sulawesi became detached after the breakup of Gondwanaland—a conclusion which implies that these areas have undergone very large rotations, and that during the mid-Mesozoic central New Guinea must have lain to the east of Australia.

The subsequent history of the area, the geological manifestation of which is a series of orogenic events recorded in the Outer Banda Arc and eastern Sulawesi, is then seen in terms of a series of collisions between the northward-drifting Australian continent and a series of northward-dipping subduction zones. The first such collision took place between the late Cretaceous and the Eocene, after which renewed subduction began further north to allow the continuing northward motion of Australia. The second collision (with the new subduction zone) then occurred during the middle Miocene, by which time central New Guinea had separated from the east coast of Australia and had rotated into an east-west position. There then developed another subduction zone still further north, with which the Australian continent collided (the third collision) during the late Pliocene.