crystal structure analysis, other methods having left some ambiguities.

O. S. Mills, in an invited paper, spoke of structural variation in organometallic complexes; as the first step in collaboration, E. O. Fischer of Munich made chromium instead of tungsten compounds to give greater suitability for X-ray analysis. These compounds, containing carbene ligands, have variations in bond length which can be correlated with the electronic structures.

A wide range of chemistry was covered by G. A. Sim in his paper on X-ray studies of products of photochemical and other reactions. One example was the product of ultraviolet radiation of a benzene solution of triphenylphosphine and $C_5H_5Mo(Co)_2NO$ shown by structural analysis to be $C_5H_5Mo(CO)(PPh_3)_2NCO$. A group from the University of Essex have determined the structure of $[Cu(bipyridil)_2(ONO)]NO_3$ to confirm the reliability of spectroscopic evidence that the NO_2 group was coordinated through oxygen and that the copper was six-coordinated; they found a novel chelate nitrito group.

PALAEONTOLOGY

Microsaurs and Reptiles

from our Vertebrate Palaeontology Correspondent

THE reptiles and microsaurs of the Carboniferous are similar in size and in many details of structure. Until recently, so few members of either group were known at all completely that it was impossible to make a comprehensive and exclusive definition of the two groups, and several workers believed that they might be related to each other. A few years ago, Carroll showed that *Hylonomus* of the Lower Pennsylvanian of Nova Scotia is a reptile and gave a thorough account of its structure. Carroll and Baird have now provided an even more thorough account of *Tuditanus*, a microsaur from the Middle Pennsylvanian of Linton, Ohio, and discussed the relationships between the reptiles and the microsaurs in the light of this new information (*Amer. Mus. Novit.*, No. 2337, 1; 1968).

Tuditanus was originally about 14 cm long; with its relatively short vertebral column and well developed limbs it is very like the reptiles, and it differs from most of the previously known microsaurs, which have an elongate body and small limbs. Nevertheless, the pattern of skull bones of *Tuditanus* confirms the differences between the two groups. *Tuditanus*, like other microsaurs, has no tabular bone, but there is a large supratemporal meeting the postorbital and postfrontal. In reptiles, on the other hand, there is both a tabular and a supratemporal in the temporal region, but these bones are normally reduced in size and meet neither the postorbital nor the postfrontal. The pterygoid bone of *Tuditanus*, like that of the other microsaurs, lacks the transverse flange characteristic of all primitive reptiles.

The shoulder girdle of *Tuditanus* differs from that of early reptiles in being poorly ossified, and the ilium differs in having both a dorsal and a posterior process. The manus has only four digits, while all primitive reptiles have five and many other microsaurs have only three. Like most microsaurs, *Tuditanus* has oval dorsal scales, whereas early reptiles lack bony dorsal scales and have rod-shaped ventral scales.

The dorsal vertebrae of the two groups are very similar, but the intercentra found in reptiles are not present in microsaurs. In both groups there is a ball and socket joint between the occiput and the vertebral column. In reptiles the occipital condyle is convex and articulates with a concave surface formed by the first or atlas vertebra, which consists of several ossifications; the second vertebra is modified to form the axis vertebra. In *Tuditanus* and all other microsaurs the occipital condyle is concave and articulates with a convex surface formed on a large atlas vertebra; there is no axis vertebra. Furthermore, in microsaurs such as *Pantylus* there is an additional unpaired element wrapped around the anterior surface of the neural arch of the atlas, and two pairs of ribs articulate with the atlas complex. Carroll and Baird believe that the unpaired element is the neural arch of the original first vertebra, the centrum of which has become fused on to that of the second vertebra to form the unit known as the atlas—which is then not homologous with the reptilian atlas, for that is formed by the first vertebra.

Carroll and Baird consider that these differences between the craniovertebral joints of microsaurs (and of other lepospondyls and of modern amphibians) and reptiles indicate separate development of these two groups from the more primitive level of organization represented by the ichthyostegid amphibians, in which no specialized articulating surface had developed in this region. The microsaurs were already diverse even in the Early Pennsylvanian, and the other lepospondylous groups were all distinct very early in the Carboniferous. Carroll and Baird therefore conclude by suggesting that, if the labyrinthodont ancestors of the reptiles shared a common ancestry with these lepospondyls, this could only have been in the Devonian, and only at, or close to, the level of the rhipidistian fish.

MOLECULAR BIOLOGY

More about Translation

from our Cell Biology Correspondent

Do "informosomes" really exist? Newly synthesized *m*RNA in nucleated eucaryotic cells seems to migrate from the cell nucleus to the cytoplasm not as naked RNA but in association with protein. In 1966 Spirin suggested that the protein component of these ribonucleoprotein particles, which have become known as "informosomes", may somehow regulate the translation of the *m*RNA. One implication of this hypothesis is that the protein and the *m*RNA should both be associated with ribosomes in polysomes. In the latest issue of *J. Mol. Biol.* (**36**, 401; 1968) Henshaw reports that the *m*RNA released from rat liver polysomes, by treatment with EDTA, is indeed associated with protein. The *m*RNA protein complexes are heterogeneous and, to judge from their buoyant density, they have a higher ratio of protein to RNA than ribosomes.

Perry and Kelly (*J. Mol. Biol.*, **35**, 37; 1968) recently reported very similar results with cultured L cells. The RNA protein complexes liberated from polysomes closely resembled ribosome free RNA protein complexes found in the cytoplasm, which may be free "informosomes". The problem, however, is that all these RNA protein complexes might be artefacts; that is perhaps unlikely, but as Henshaw points out, the