poxia, acidosis, stasis, thrombosis, and infarction scored the crucial nature of obstetrical factors. The pathophysiology of placental function would seem deserving of attention, at least equal to that lavished on liver and kidney. Hon and Dodge were among those emphasizing the need for centers of perinatal biology capable of the application of sophisticated methodology to the biophysical and biochemical events of labor. Such centers would bring together obstetricians, pediatricians, physiologists, biochemists, biomedical engineers, and other specialists to focus on the most vulnerable period in the life of the child.

The meeting was sponsored by the U.S. Department of Health, Education, and Welfare, National Institutes of Health, National Institute of Neurological Diseases and Stroke (NINDS). The detailed proceedings of the conference will be published by NINDS.

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Calcified Tissues

Useful, new contributions to the field of calcified tissues were reported at the Sixth European Symposium on Calcified Tissues held in Lund, Sweden, 21–24 August 1968.

In the first session, specialized instruments offered hope for the future. The presentation by Hobdell (London) on scanning electron microscopy was of interest since it brought into perspective how bone is constructed at the ultrastructural level. Bones from different animals were fixed and extracted with fat solvents, mounted, and then scanned at magnifications up to 20,000. Such specimens showed a great deal of detail of the lining of the lacunae, the nature of the interlamellar material, and the pattern of mineral collagen fibers and fiber bundles. Removal of collagen by solvents resulted in a pattern of the mineral front alone, suggesting that it separates one collagen fiber bundle from the next one overlaying it.

Höhling (Münster) provided further evidence of the power of probe methods in establishing the nature of mineralization at the subcellular level. Hitherto, electron-probe analysis has been a somewhat crude technique, incapable of locating the site of the mineral deposi-

tion in or near cells. It is now apparent that calcium, phosphorus, and sulfur can be detected with increasing precision. Dentine, both mineralized and mineralizing, was studied. The results show that the ratio of calcium to phosphorus is somewhat lower in the mineralizing front than it is for fully formed apatite. However, in predentine there is little phosphorus, with calcium apparently bound to an unresolved organic matrix.

Fleisch (Berne) reported some effects of diphosphonates on calcium metabolism, the thesis being that these compounds (which are close structural analogues of pyrophosphate) might stabilize hydroxyapatite crystals and inhibit bone resorption. Two diphosphonates were found to inhibit the dissolution of calcium phosphate in vitro and to inhibit aortic calcification induced by vitamin D in rats when they were given subcutaneously or orally. These compounds blocked parathyroid-induced bone resorption in tissue culture and partially or completely prevented hypercalcemia induced by parathyroid extract in thyroparathyroidectomized rats. A monophosphonate was found not to possess these properties.

Gudmundsson (London) reported that the blood calcitonin level in six normal subjects was 80 to 250 mU per liter of plasma. Foster had administered intravenous calcitonin to several patients with disorders of calcium metabolism and found an increase in urinary calcium and phosphorus in the first 3 hours. In some patients this increase was associated with hypocalcemia. Bijvoet (Leiden) had administered calcitonin to four patients with Paget's disease and observed a small fall in plasma calcium and a large fall in plasma hydroxyproline. Urinary calcium was increased and then decreased.

Heaney (Omaha) described the use of a circumferential counter with which radioactivity in 3-inch segments of the forearm was determined after intravenous administration of strontium-35. The combination of the retention data with the plasma specific activity values permitted calculation of turnover in the forearm which amounted to about 0.5 to 2.0 of calcium per segment per day, being higher in cancellous than in compact bone. Patients with rheumatoid arthritis had substantially higher accretion ratios in all joint regions than the controls, whereas whole-body turnover values did not reveal this discrimination.

Several useful techniques were

described in relation to radioisotope uptake. In particular, Rekonen (Finland) reported some interesting observations of uptake of strontium-35 in joints damaged by rheumatoid arthritis. The scanning methods were sufficiently precise to allow a good comparison between various tissues; the advantage of technetium-99 as a tracer was also illustrated. Later, Ahlback (Stockholm) gave details of the radiographic observation of a new syndrome which he called osteonecrosis of the knee; he outlined the history, symptoms, and the results of physical examination.

Of special interest was the nature of the radiolucent focus and the degree of nonuniformity from late radiographic changes. The following paper by Bohne (New York), using a slightly different technique of emission scintimetry, came to much the same conclusions—unusual radiolucent lesions in the medial femoral condyle. In this case, data were quantitated and the patterns of figures led to some sharp discussion as to the significance of the findings.

The cinematographic evidence of Ascenzi on the properties of single osteons was well received. For the first time we were able to see compression curves superimposed upon actual pictures of changes in single osteons isolated by techniques for which the Pisa Laboratory is well known. The degree of reproducibility was convincing, particularly with respect to the point of failure of osteons from different parts of bone. It is too early at this stage to be overcritical about the results but the general support of Gebhardt's theories is to be expected.

A new model for the study of hydroxyproline turnover was produced by Flanagan (Boston). He incubated rat metaphyseal bone slices in Krebs-Ringer solution for up to 6 hours and studied the time course of accumulation of hydroxyproline in the media. An early exponential release was attributed to solubility, and a linear component was attributed to new synthesis and release with resorption. Using labeled proline it was shown that there was no significant pool of free intracellular proline and that the rate of release of labeled hydroxyproline in the medium rose exponentially for 3 hours and then continued linearly for at least 6 hours.

Russell (Oxford and Davos) infused 3′5′-cyclic AMP into the renal arteries of ten thyroparathyroidectomized dogs. They were able to demonstrate a large increase in phosphorus excretion from

the infused kidney after a few minutes at cyclic AMP concentrations from 10^{-4} to $10^{-5}M$. This work provided additional evidence for the intermediary role of cyclic AMP in the action of parathyroid hormone on the kidney.

Finally, there was some light from Sledge (Massachusetts) on the subject of heparin and related compounds in the release of lysozome from embryonic cartilage. A flourishing finish to a successful symposium in which old subjects were aired once again and one or two promising new starters stumbled under questioning.

The proceedings of this symposium are published in the supplement to volume 2 of Calcified Tissue Research.

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Calendar of Events

Courses

Electron Microscopy in the Biological Sciences, Boston, Mass., 15–27 June. This is the 11th session of a 2-week intensive program in the preparation of biological materials as electron microscope specimens, electron microscopy, and interpretation of results. Designed for doctoral level investigators who wish to use the electron microscope in their research, but who have little or no experience in the field. Advanced graduate students will be considered. Limited to 12 students. (Prof. Clifford Youse, Center for Continuing Education, Northeastern University, 360 Huntington Ave., Boston 02115)

X-ray Diffraction Theory and Practice, Chicago, Ill., 16–20 June (elementary) and 23–27 June (advanced). The elementary course will include the study of physics of x-rays, elementary crystallography, elements of x-ray diffraction theory, techniques of x-ray diffraction analysis, procedures and interpretation of x-ray powder diagrams, elementary indexing procedures, identification of unknown substances, and precision lattice parameter determination. The advanced course will include sessions on the reciprocal lattice concept, development of theory for x-ray intensity, single-crystal techniques, Laue method, the rotating crystal technique, preferred orientation, and quantitative analysis. Tuition for each course is $250, or $400 for both (Prof. Paul Gordon, Metallurgical Engineering Department, Illinois Institute of Technology, Chicago 60616)

Marine Sciences. Courses will be offered at Cape Henlopen Marine Laboratory during the summer of 1969. Marine biology, coastal vegetation, geology of Recent sedimentary environments, and engineer-