American Society of Zoologists (F1)

Vertebrate Morphology, Session I. Malcolm T. Jollie indicated that the "pits" observed by others in the cranial bones of caecilians may represent a complex sensory system similar, at least in function and innervation, to the lateral line system of aquatic amphibians.

Kinesis in all tetrapods may be traced back to the crossopterygian condition, according to Walter J. Bock. The presence of a kinetic hinge—which is usually crushed and obscured in fossils—is accompanied by a basitemporal articulation which provides a necessary second point of articulation. The basitemporal hinge is usually well preserved in fossils and its presence means that a kinetic hinge must have existed in the same specimen.

The paper by Elazar Kochva supports the view that the proteroglyph and solenoglyph snakes arose separately from the proterodont and opisthodont colubrid-type snakes. The new evidence provided for this theory is based on studies of the venom glands and their innervation. Evidence suggests that the venom glands and compressor muscles in these two general groups of snakes are not homologous.

The report by Warren F. Walker, Jr., on the forces developed at the feet of turtles in walking provides additional evidence on the general subject of vertebrate locomotion. Such data will no doubt provide the basis from which will arise new ideas on functional morphology and vertebrate evolution, particularly regarding the shape and volume of the animal and the distance between the animal body and the substrate.

The details of the sebaceous gland complex in the gerbil (Meriones) by Douglas B. Webster is of interest because it provides another character which should be investigated to determine its importance in studies of rodent phylogeny.

Richard J. Baldauf, Presiding Officer

Vertebrate Morphology, Session II. The split-brain preparation was used by Theodore J. Voneida (Western Reserve University) in investigating the neural pathways of conditioned reflexes. Although the visual stimulus can be restricted to one half the brain by section prior to training, the sensorimotor cortex of the other half is still involved in the response. It was suggested that the efferent pathway for the front paw response (on the same side as the visual stimulus) decussates above the caudal boundary of the pons and forms synaptic contact subcortically with the visual center.

Paul T. Medici described a number of experiments involving the control of blood cell number. Polycythemia could be achieved by injection of homologous red blood cells into the peritoneal cavity of the rat. Such cells were absorbed by way of the lymphatics. This artificial increase in the number of erythrocytes depresses the cell production of the bone marrow. Such inactive marrow can then be used to test erythropoietic substances; stimulation is more evident under these conditions. Splenectomy appeared to affect absorption of blood cells and does not aid in achieving polycythemia.

The "existence energy" of birds was discussed by S. Charles Kendighe. He has produced some interesting figures relating size and energy requirements.

The morphology of the chondrocranial roof of modern anurans was described as of three types, and variations of these, by Richard J. Baldauf. There appears to be a distinct correlation between these types and the evolution of this group.

James M. Moulton described the development of the air bladder connections with the middle ear in the Menhaden. The values of this complex interrelationship were suggested in terms of hearing and depth perception.

The final session, presented by Bob Schaefer, was devoted to the question of radiation of the Ostechthyes. The discussion involved questions and suggestions from many in the audience, including A. S. Romer, Stewart Landry, Richard Baldauf, Walter Boch, Milton Hildebrandt, and Roland Walker. There appeared to be much interest in this discussion with an expressed desire to know more about source materials and the problems of their interpretation.

Malcolm T. Jollie, Presiding Officer

Zoological and Botanical Sciences (FG)

Ecological Society of America (FG5)

Sessions were held for plant ecology, invertebrate ecology, marine ecology, and vertebrate ecology. Janice Beatley showed that much of the damage to vegetation at the Nevada Test Site, which has been attributed to ionizing radiation, is actually caused by other factors. Also, winter annuals of the desert which have been referred to as ephemerals should not be so called; only summer annuals should have that designation. Frank W. Woods and Walter A. Hough explained radiotracer techniques for determining natural distribution of plant roots. Richard T. Hartman and Doris L. Brown reported on the analysis of the internal gases of submerged vascular hydrophytes appearing in both natural and simulated environments. By the use of radioisotope techniques it has been shown that Lumbricus terrestris distributes the materials vertically in the soil while Alolobophora sp. redistributes the materials horizontally (A. E. Augustson, R. E. Puetz, and Grant Cottam). Alolobophora is a secondary consumer of particles left by Lumbiricus. Ian E. Efford described aggregations of the sand crab, Emerita analoga, apparently arising from biological factors rather than environmental factors. D. H. Brant and J. L. Kavanau, by recording nocturnal movements of deer mice, Pomerus suncatus, with infrared television, showed that they may move as much as 3 miles in one night.

Ralph W. Dexter, Program Chairman

Recent Trends in Ecological Research in the Great Lakes. This symposium was cosponsored by the Ecological Society of America and the American Society of Limnology and Oceanography.

Eight speakers reviewed and elaborated on the physical, chemical, and biotic environmental factors in the Great Lakes. Discussions included a history of ecological research (T. H. Langlois) and the importance to the ecologist of Pleistocene geology, paleoclimatology, recent bottom deposits, and so forth (Howard J. Pincus). D. V. Anderson pointed out that few physicists and chemists have been concerned with environmental studies: much of the chemical and physical research has been by biologists and fisheries workers. The necessity was stressed for repeated seasonal studies of whole lakes.

E. B. Henson noted that the main stimulation to work on the bottom fauna has been through consideration of fisheries problems. There is need for a fundamental species inventory for the Great Lakes. In discussing plankton
Use of Morphological and Autecological Characteristics of Plants in Community Gradient Analysis. The fundamental advantages of using coordinates in multiple dimensions to study variation in plant communities was demonstrated in this symposium. Examples from both the east and west coasts in North America and from the central deciduous forests were cited. E. V. Bakuzis outlined the developing potential of synecological coordinates in Minnesota forests, with emphasis on techniques for graphic representation of four or more dimensions. The coordinate axes are based on the average moisture, nutrient, or heat requirement index for the tree, shrub, and herb species present in the sample. O. L. Loucks (University of Wisconsin) compared the use of synecological coordinates with scalar coordinates obtained by synthesis of diverse environmental data from the coniferous and deciduous forests of New Brunswick, Canada. Although the synecological technique is based only on a listing of the species present in the sample areas, the resulting coordinate positions for moisture, nutrients, and heat at each sample correlate remarkably with the corresponding synthetic scalars. An alternating approach, applied in the coastal redwood forests of California, was provided by R. H. Waring (Oregon State University). Gradients similar to those in controlled-environment research are used to obtain ecological groups and a calculated moisture axis. Plant structure, spatial arrangement and size of plant parts (leaves, twigs, bark, and so forth), plant function, and apparent adjustments to environmental extremes were the bases for the coordinate approach used by D. H. Knight (University of Wisconsin). This method does not require identification of unfamiliar vegetation, yet results in coordinate representation of the ecological factors. Pierre Dansereau was ill and unable to present his paper personally. A summary was distributed and an abstract has been published.

O. L. Loucks, Program Arranger

Botanical Sciences (G)

Section G concentrated its program into 1 day (30 Dec.). For the third year, a symposium entitled “Plant biology today: advances and challenges” was presented. The two morning papers concerned symbiosis, the first by Vernon Ahmadjian on cultural and physiological studies of the lichen symbiosis and the second by John J. A. McLaughlin on algal symbionts in marine animals. In the afternoon the first paper by Henry N. Andrews reviewed significant advances in our knowledge of higher pteridophytes and the origin of seed plants. This was followed by a report on recent research on electron transport carriers in respiration and photosynthesis by Walter Bonner. The afternoon was completed with a paper by Charles E. Hess on naturally occurring plant growth regulators.

The luncheon for botanists included an address by the retiring chairman of the section, Aaron J. Sharp. It was entitled “The compleat botanist,” and was a thoughtful and forceful plea for botanists and biologists to maintain and develop a broad view of their subject and its importance to an understanding and intelligent management of our world.

Harriet B. Creighton, Secretary

Psychology (I)

In the symposium, “Learning research pertinent to educational improvement,” reports were given of experimental evaluation of new methods of instruction relevant to reading, mathematics, and problem-solving behavior. A common problem investigated in each of these areas concerned the question of the degree to which choices in the direction and approach to learning can be determined by the learner himself and still result in an effective outcome. The evidence showed that discovery and self-direction yield superior learning under some conditions.

In the vice-presidential address, L. G. Humphreys emphasized how the intra-individual variability in many kinds of performance usually increases with lengthening of the interval between tests.

The papers in a symposium cosponsored by Section I provided a number of illustrations of the use of multivariate statistical techniques to yield relevant analyses of data from experimental psychology. R. Darrell Bock outlined the extension of analysis of variance from the traditional univariate case to the multivariate case, with examples drawn from educational psychology. Keith Smith reported on studies of speech and speaker recognition by electronic and computer methods. Warren Torgerson discussed problems in multidimensional psychological scaling as dependent upon a problem of the appropriateness of equating similarity in perception to distances in the model.

In the symposium on “The development of perception during the first six months of life,” Robert Fantz described experimental data indicating that human infants, from birth, can see and discriminate patterns as the basis for form perception. He pointed out that during the third month of life unlearned visual selectivity begins to be modified by past visual experiences. Evidence was presented to support the view that visual perception precedes action in development, rather than the reverse as is often assumed. Burton White reported that environmental enrichment and additional handling significantly increase the attention of institutional children to external objects.

The symposium on engineering psychology dealt with new work in the areas of photo reconnaissance, real-time simulation in air-intercept problems, and complex human performance under high gravity conditions. The research described by R. Chambers, most of which was carried out on the Johnsville, Pa. AMAL centrifuge, was exceptionally complete and authoritative. Some of this work was based on recent findings in the Mercury astronaut training program.

The vice president for Section I in

Charles C. Davis, Arranger
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Science 143 (3608), 846-847.
DOI: 10.1126/science.143.3608.846-c