M. V. L. Bennett (Albert Einstein College of Medicine) gave a detailed comparison of electrical and chemical synapses. The function of most known electrical synapses seems to be either to give fast responses, as in escape systems such as the Mauthner-giant axon synapse of fish, or to give accurate synchronization, as in axonic terminations onto some electroplaques or between cells in the central nervous system. Chemical synapses are superior in providing longer temporal summation (since transmitter is not removed when the postsynaptic cell fires) and in providing inhibition much more efficiently. They are probably also essential for low-level amplification at receptors. Both types of synapse can be arranged to provide linear, nonlinear, and one-way or two-way transmission between cells. It seems possible that electrical synapses could provide amplification (by utilizing regenerative membrane), defacilitation, and facilitation. Hence in many instances it seems unsafe to infer modes of transmission from functional requirements.

M. Jacobson (Johns Hopkins University) described results obtained by rotating the eyes of *Xenopus laevis* at various larval stages and mapping the retino-tectal projections of the resulting adults. He discovered that the tectal projections of the ganglion cells are determined at larval stage 30, first along the anterioposterior axis, and then along the dorsoventral axis, in a period of 7 to 10 hours. By autoradiography he demonstrated that DNA synthesis in the ganglion cells ceases at larval stage 29, just before specification of the central connections of the ganglion cells begins. The characteristic retinal morphology does not begin to appear until about stage 33.

R. L. Sidman (Harvard Medical School) pointed out that genetic mutants may be used to obtain information about neural function, embryology, or physiological genetics, and that there are 90 known neurological mutations in the mouse. Sidman and co-workers have studied four mutations of the mouse's cerebellum. In *swaying* mice some midline tissue is missing; the rest is scrambled, but the local cerebellar architecture is normal. In *weaver* the cerebellar granule cells die before migrating from the surface to their normal position below the Purkinje cell layer. In *staggerer,* they die after migrating there, perhaps because the Purkinje cells are delayed in maturation. In *reeler* the granule cells do not migrate past the Purkinje cells. This type of disruption also occurs in reeler's cortex and hippocampus, the only other areas where neuroblasts migrate past neurons.

M. H. Goldstein (Johns Hopkins Medical School) reported on the properties of units in the cat's auditory cortex. Using unanesthetized muscle-relaxed cats, he and coworkers confirmed that a small dose of barbiturate quiets most units in the auditory cortex. Unlike auditory nerve fibers, whose other properties can be predicted from their preferred frequencies, cortical units have many parameters. In 100 units classified as sensitive or not sensitive to tones, noise bursts, and clicks, there were units in all eight possible categories. A few were sensitive only to swept tones. Units also varied in firing pattern and preferred frequency range. Units with narrowly tuned overlapping optimum frequency ranges occurred in columns separated by regions of broadly tuned cells.

D. H. Hubel (Harvard Medical School) summarized recent studies with T. N. Weisel on the striate cortex of the monkey. The neurons of layer IV B, where the thalamic visual projection ends, are all monocular, and cells related to the two eyes are segregated, forming a mosaic. Cells above and below a left-eye area, for example, are dominated by the left eye, but affected by the right eye to varying degrees. The boundaries of these columns are cut by the boundaries of smaller columns containing cells with common receptive field axes. In layer IV B the receptive fields are simple, while those of the layers above and below it are usually complex and hypercomplex. Sometimes the axis-orientation columns are shaped like pillars about ¼ degree in cross section. Other times they form thin parallel slabs, like slices of bread. As an obliquely penetrating electrode passes through these slabs, the receptive field axes rotate progressively in discrete steps of 10 to 15 degrees, sometimes continuing for several rotations.

The conference was held under the auspices of the Society of General Physiologists. It was arranged and edited by F. D. Carlson, president of the Society. The proceedings will be published by Prentice-Hall and is scheduled for publication in March 1968.

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Calendar of Events

Courses

Tropical Botany, University of Miami, 17 June–26 July. Stipends, travel allowances, waiver of tuition, and graduate credit are available. Twelve students will be selected on the basis of nationwide competition. *Deadline for applications: 1 May.* (Dr. Taylor R. Alexander, Coordinator, Advanced Seminar in Tropical Botany, Biology Department, P.O. Box 9118, University of Miami, Coral Gables, Fla. 33124).

Application of the Electron Microscope to Problems in Molecular Biology, Oak Ridge, Tenn., 30 September–19 October. This advanced seminar will stress specimen preparation, examination techniques, and interpretation of results. It will be designed for participants, at the postdoctoral or advanced Ph.D. student level, with a good background in some branch of molecular biology. (Dr. Lucien Caro, Biology Division, Oak Ridge National Laboratory, P.O. Box Y, Oak Ridge, Tenn. 37830)

Organism-Sediment Interrelationships, Bermuda Biological Station, St. Georges, Bermuda, 1 July–1 September (supported by NSF). Emphasis is on the interrelationships of organisms and sea-floor sediments with special attention to coral reefs. Each student is expected to spend half of the seminar on an independent research project. The seminar is open to students from any discipline related to marine science who have completed 1 year of graduate work and are not actively working on a Ph.D. thesis. Stipends for travel and living expenses are available. *Applications must be returned by 15 April.* (Dr. Robert N. Ginsburg, Department of Geology, Johns Hopkins University, Baltimore, Md. 21218)

Sensory Evaluation of Foods, University of California, 17–21 June. The course is designed for research personnel of industrial, government, private, and academic laboratories, and will cover techniques for laboratory evaluation of sensory properties of foods and beverages, with application to specific commodities. Fee: $20. (Mrs. Helen Raikes, University of California Extension, Davis 95616)

Integrated Circuits Engineering, University of Arizona. Will be offered at three different times: 3–14 June, 17–28 June, and 8–19 July. Is designed to educate the participant in all aspects of modern integrated circuit design and fabrication. It will be an intensive 80-hour program with emphasis on practical laboratory experiences using the facilities of the solid-state engineering laboratory to fabricate components and circuits. Fee: $450. (Dr. R. H. Mattson, Electrical Engineering Department, University of Arizona, Tucson 85721)

Biological Electron Microscopy, University of Southern California, 3–14 June. This course is designed for professional and laboratory personnel desiring knowledge and experience in tissue preparation for examination with the electron microscope. No prior skill in electron microscopy is required. The class is limited to 12 participants. Fee: $250. (Dr. Robert F. Bils, Hancock Foundation, University of Southern California, Los Angeles 90007)