Meetings

Neurosecretion

The view is being abandoned that the activities of endocrine organs are controlled by hormonal feedback only, as it becomes increasingly clear that the nervous system plays an essential part in transmitting stimuli to and from the organs of internal secretion. To this end, the nervous system has at its disposal not only nervous pathways but also hormones which are produced by specialized nerve cells, the neurosecretory cells. The growing realization that herein lies the significance of the phenomenon of neurosecretion is one of the important new developments which took place following the first Symposium on Neurosecretion, held at Naples in 1953 [see *Science* **118**, 579 (1953)]. Since then a good deal of progress has been made in this field with respect to the chemistry and electron microscopy of neurosecretory material; also, new sites of neurosecretory activity and new hormones produced by neurosecretory cells have been discovered in recent years. Another meeting of investigators active in this special area was proposed, therefore, by Bertil Hanström; it took place 1–6 July 1957, at the University of Lund (Sweden).

Among the most valuable and unique features of the Lund symposium were the frequent cross references between observations on neuroendocrine mechanisms in the invertebrates and those in the vertebrates. Such neuroendocrine systems are well developed in invertebrates, particularly in arthropods. Recent findings in crustaceans reported from his own laboratory were summarized in a paper by Welsh (United States). Among these were detailed studies, in crabs, on the external factors influencing the endocrine control of molting (by Bliss) and on the active particles in the neurosecretory substance (by Pérez-González). Potter (United States) gave a beautiful demonstration of the cytological diversity of neurosecretory material in decapod crustaceans and reported on attempts to correlate the differently staining inclusions with a variety of specific functions, such as the control of pigmentary effectors. The latter topic was discussed in greater detail by Kleinholz (United States).

In insects, the neuroendocrine pathways controlling postembryonic development and reproduction were analyzed by B. Scharrer (United States), who also read a paper by Nayar (India) on one such system in the insect *Iphita*. Possompès (France) discussed interesting relationships between the brain and the composite "ring gland" in the highly specialized fly *Calliphora* and reported on work by Dupont-Raabe (France) concerning new types of neurosecretory pathways in phasmids. These contributions, as well as one by Johansson (Norway) on neurosecretory phenomena in *Oncopeltus*, led to fruitful discussions of the neuroendocrine pathways, over which, for example, malnutrition affects the endocrine control of the gonads in invertebrates and vertebrates, including man. The paper by Suomalainen (Finland) reporting on the effect of the stress of hibernation on the neurosecretory activity of the hypothalamic cells in the hedgehog was a further contribution to this topic.

Investigations of this kind point the way for studies concerned with the clinical aspects of neuroendocrinology. The contributions to the symposium by neuropathologists such as Lundberg (Sweden) and Christ (Germany) were therefore of much interest. Their data were complemented by a variety of comparative histological observations by Sano (Japan) and Legait (France). Present knowledge on the electron microscopic characteristics of neurosecretory elements was confirmed and extended by Bargmann (Germany), Welsh (United States), and Knowles (Great Britain). In this range of magnification the agreement between invertebrate and vertebrate data is particularly impressive. The further exploration of neurosecretory phenomena by means of the electron microscope, in combination with phase contrast, dark field, and fluorescence microscopy, promises many interesting insights. Other new techniques were employed by Malandra (Italy) and Sloper (Great Britain), who studied the hypothalamo-hypophysial system by using radioactive tracer elements; by Carlisle (Great Britain), who confirmed earlier observations by Potter and Lowenstein (1955) that neurosecretory axons are capable of conducting electrical impulses; and by Mazzi (Italy), who tested the developmental potencies of the different parts of the amphibian hypophysis in relation to the hypothalamus.

Some problems debated by investigators, among whom were Sloper (Great Britain), Schiebler (Germany), and Eichner (Germany), concerning the solubility, staining properties, and topochemistry of neurosecretory substances were answered conclusively from the point of view of the biochemist. According to Acher (France), the neurosecretory material consists of an "inactive" large protein molecule (neurophysine) and several polypeptides with hormonal activities. Among the latter the most thoroughly known are the oxytocin and vasopressin of the mammalian neurohypophysis. A comparable chemical composition may also exist in invertebrates. Chromatophor-

otropins, for example, obtained in highly purified form by Fänge (Sweden) and Knowles (Great Britain), are presumed to be polypeptides associated with an "inactive" protein molecule with the same staining properties as those of the neurophysine of the vertebrates. Additional contributions concerning the chemical characterization of neurosecretory material in invertebrates were those by Rehm, reported by Welsh (United States), and by L'Hélias (France).

The question remains to be solved whether vasopressin is the mediator which releases corticotropin, as proposed by Martini (Italy), or whether this task is performed by a third polypeptide, chemically similar to vasopressin and oxytocin, as demonstrated by Saffran (Canada). Oxytocin may play an important role in the release of luteotropic hormone (prolactin) in the rat, as was pointed out by Stutinsky (France). The distribution of substance P in the central nervous system of fishes and its possible relationship to neurosecretory phenomena were discussed by Ostlund (Sweden).

The number of formal presentations was wisely reduced to five short papers per day. This left ample time for another important part of the symposium—namely, the exhaustive discussion of the problems posed by the lecturers. It should be mentioned, therefore, that a number of participants, while not presenting formal papers, made valuable contributions by their often extended remarks during the discussion. Among these, Wigglesworth (Great Britain), M. and E. Thomsen (Denmark), Karlson (Germany), and Rothballer (United States) might be especially mentioned.

The Lund symposium supplemented the exceedingly interesting eighth symposium of the Colston Research Society, held at Bristol in 1956 [see *Science* **126**, 456 (1957)], which was restricted to the neurohypophysis and did not concern itself with histochemical and electron microscopic studies. By necessity, it gave little attention to neurohormones other than vasopressin and oxytocin.

The Lund symposium again demonstrated the magnitude of the area in which neurosecretory phenomena of great diversity play important roles in neuroendocrine integration.

ERNST SCHARRER
BERTA SCHARRER
Department of Anatomy, Albert Einstein College of Medicine, New York

Forthcoming Events

July

9–15. Zoological Nomenclature Colloquium, London, England. (F. Hemming, 28 Park Village East Regent's Park, London, N.W.1.)

10–14. Research Methods in Soil Zoology, colloquium, Harpenden, Hertfordshire, England. (P. W. Murphy, Rothamsted Experimental Station, Harpenden.)

12–14. Biological Sciences, intern. union, 13th general assembly, London, England. (Chairman, Div. of Biology and Agriculture, National Research Council, Washington 25.)

15–19. Condensation Nuclei, 3rd intern. symp., Cambridge, England. (T. W. Wormell, Cavendish Laboratory, Cambridge Univ., Cambridge.)

15–19. Food Additives, 4th intern. symp., Paris, France. (M. E. Gradnauer, Documentation Center, Commission Internationale des Industries Agricoles, 18 avenue de Villars, Paris 7e.)

15–22. Association Française pour l'Avancement des Sciences, 77th cong., Namur, Belgium. (AFAS, 28, rue Serpente, Paris VIe, France.)

15–23. Educational Treatment of Deafness, intern. cong., Manchester, England. (A. W. G. Ewing, Dept. of Education of the Deaf, Univ. of Manchester, Manchester 13.)

16–23. Zoology, 15th intern. cong., London, England. (H. R. Hewer, c/o British Museum of Natural History, Cromwell Road, London, S.W.7.)

20–27. Americanists, 33rd intern. cong., San Jose, Costa Rica. (33rd intern. Cong. of Americanists, National Museum, P.O. Box 749, San Jose de Costa Rica, Central America.)

21-24. High Polymer Conf., intern., Nottingham, England. (Conference Secretariat, Dept. of Scientific and Industrial Research, Charles House, 5–11, Regent St., London, S.W.1.)

21–25. Diabetes, 3rd intern. cong., Düsseldorf, Germany. (K. Jahnke, Oberarzt, 2 Medizinische Klinik, Medizinische Akademie, Düsseldorf.)

22–26. Brazilian Soc. for the Progress of Science, 10th annual, São Paulo, Brazil. (Sociedade Brasileira para o Progresso da Ciencia, Caixa Postal 2926, São Paulo.)

23–28. Continuous Cultivation of Microorganisms Symp. (by invitation), Prague, Czechoslovakia. (I. Malek, Inst. of Biology, Czechoslovak Akad. of Sciences, Narodni Tr. 5, Prague I.)

24–25. Computers and Data Processing, 5th annual symp., Denver, Col. (Electronics Div., Denver Research Inst., Univ. of Denver, Denver 10.)

25–29. Chromatic Discrimination in Animals and Man, ICSU symp., Paris, France. (H. Pieron, Collège de France, Place Marcelin-Berthelot, Paris 5e.)

28–30. Regulation of Cell Metabolism, Ciba Foundation symp. (by invitation), London, England. (G. E. W. Wolstenholme, 41 Portland Pl., London, W.1.)

28–2. Home Economics, 9th intern. cong., College Park, Md. (Congress Director, American Home Economics Assoc., 1600 20 St., NW, Washington 9.)

28–8. Statistical Summer Seminar, Dedham, Mass. (I. Weiss, Bell Telephone Labs., North Andover, Mass.)

August

4–9. Microbiology, 7th intern. cong., Stockholm, Sweden. (F. C. Harwood, Soc. of American Bacteriologists, c/o Waverly Press, Inc., Mt. Royal and Guilford Aves., Baltimore 2, Md.)

(*See issue of 16 May for comprehensive list*)