THE GROWTH OF NERVE FIBERS

The view that each nerve fiber develops as an independent outgrowth from a nerve-cell, finally becoming united to other tissues (*e. g.*, muscle fibers) in the periphery of the body is associated especially with the name of His, and has been accepted by the majority of embryologists. Those who have worked at the question of nerve repair or have studied the mechanism of the regeneration of nerve fibers which leads to restoration of functions are divided into two camps; the majority hold, as Waller originally taught, that the nerve fibers grow in a distal direction from the cut stump attached to the central nervous system, ultimately finding their way into the peripheral segment. A minority of researchers hold the contrary view, namely, that restoration occurs in the peripheral segment independently of connection with the central nervous system.

Within the last year, Mr. Ross Harrison, of Yale, has demonstrated the correctness of the views of His in a very remarkable way. He has actually seen the fibers growing outwards in embryonic structures. Pieces of the primitive nervous tube which forms the central nervous system were removed from frog embryos and kept alive in a drop of lymph for a very considerable time; the cilia of the neighboring epidermic cells remained active for a week or more; embryonic mesoblastic cells in the vicinity were seen to become transformed into striated muscular fibers, and there was therefore no doubt that even under these artificial conditions—rendered necessary for microscopic purposes—life and growth were continuing. From the primitive nervous tissue, and from this alone, nerve fibers were observed growing and extending into the surrounding parts. Each fiber shows faint fibrillation, but its most remarkable feature is its enlarged end, which exhibits a continual change of form. This amœboid movement is very active, and it results in drawing out and lengthening the fiber to which it is attached, and the length of the fiber increases at the rate of about 1 micromillimeter per minute. Those interested in this subject should refer to Mr. Harrison's last paper, published in the *Anatomical Record* (Philadelphia, December, 1908), where they will find figures representing the growing fibers in various lengths drawn at intervals of half an hour or thereabouts.

Such observations show beyond question that the nerve fiber develops by the overflowing of protoplasm from the central cells and thus give us direct ocular evidence in favor of the view which most embryologists previously held mainly as the result of circumstantial evidence. It is not surprising to find that as this and other facts all bearing in the same direction are brought to light, the prevalent idea regarding nerve regeneration after injury follows the same lines. Indeed, the number of those who hold the so-called "autogenetic theory" of nerve regeneration is being reduced nearly to vanishing point.—*Nature.*

SPECIAL ARTICLES

HYDROGEN POLYSULPHIDE AS A REDUCING AGENT

When lime and "flowers of sulphur" are boiled with water and the resulting cooled, clear solution poured into dilute hydrochloric acid, a heavy colored liquid separates. This liquid is stated by some chemists to be an impure hydrogen polysulphide, whereas others regard it as a mixture of several hydrogen polysulphides.

The substance has well-developed reducing properties and I have found that its employment in organic work appears to offer considerable advantages in many cases.

The chief merits of hydrogen polysulphide, as compared with ordinary reducing agents, are as follows: It is neutral; it may be used at the ordinary temperature, dissolved in ionizing solvents such as water or alcohol, or in nonionizing media such as carbon bisulphide. The exact quantity of hydrogen polysulphide present in any of its solutions may be determined with great ease by titration with iodine.

At the ordinary temperature, hydrogen polysulphide reduces picric acid to picramic acid. With nitrobenzene its reaction appears to be somewhat more complicated. Further work on this subject and also on the general applicability of hydrogen polysulphide as a reducing agent is being carried out in the chem-

ical laboratory of the McMaster University, Toronto, Canada.

ALFRED TINGLE
LABORATORY OF THE CHIH LI BUREAU AND THE IMPERIAL CHINESE PEI YANG MINT,
TIENTSIN, April 11, 1909

SOCIETIES AND ACADEMIES

THE OHIO ACADEMY OF SCIENCE

THE eighteenth annual meeting of the academy was held at Denison University, Granville, O., on November 26, 27 and 28, the president of the society, Professor Frank Carney, presiding. On Thursday evening a reception was held at the residence of President and Mrs. Emory W. Hunt, of the University, where a most enjoyable evening was passed by the considerable number of members present. Accommodations for members had been generously made by the university authorities, who had placed the dormitories at the disposal of the society. The sessions were held in Barney Memorial Hall.

The address of the president on "The Raised Beaches of the Berea, Cleveland and Euclid Quadrangles" occurred at 1:30 P.M. Friday, while in the evening, at 7:30, Professor R. S. Tarr, of Cornell University, discussed "The Glaciers of Mount St. Elias and Vicinity," giving an account of his recent trip, which was illustrated by a large number of interesting lantern slides.

A discussion of much practical importance was that on "The Preservation and Development of the Natural Resources of Ohio," the geological side of which was presented by Professor J. A. Bownocker, the forestry side by Professor W. L. Lazenby and the biological side by Professor Herbert Osborn.

The complete program of the meeting was as follows:

"Notes on *Spondylomorum quaternarium* Ehrb.," by M. E. Stickney.

"The Pteridophyte Flora of Ohio," by J. H. Schaffner.

"Injury to Trees by the Season's Drouth," by W. R. Lazenby.

"Snails Collected at Cedar Point, O., during July, 1908," by S. R. Williams and J. K. Breitenbecher.

"The Making of a Naturalist's Directory," by F. J. Hillig.

"The Occurrence of a New Species of Land Planarian in Ohio, with Notes on the Common Species, *Rhynchodemus sylvaticus* Leidy," by L. B. Walton.

"The Behavior of the Opossum (*Didelphys virginiana*)," by G. E. Coghill.

"Differentiation of the General Cutaneous and Visceral Ganglia in *Ameiurus*," by F. L. Landacre.

"Some Aspects of Amitosis in Synchytrium," by R. F. Griggs.

"Direction of Flow of Encephalic Fluid in *Amia calva* L.," by Chas. Brookover.

"Recent Evaporation Investigations," by J. Warren Smith.

"Adaptation in a Desert Lichen Flora," by Bruce Fink.

"Notes on the Ohio Flora," by J. H. Schaffner.

"The Laboratory Method for Beginning Students," by Maximilian Braam.

"Protective Encystment in *Phagocata gracilis*," by L. D. Peaslee.

"Cell Division in the Pollen Mother Cells of *Anthemis cotula* L.," by M. E. Stickney.

"Mitosis in *Opalina*," by M. M. Metcalf.

"A Preliminary Report on the Nuclear Divisions in the Pollen Mother Cell of *Convallaria majalis* L.," by L. W. Sauer.

"Is Synizesis an Artifact?" by J. H. Schaffner.

"A Preliminary Note on the Chondrocranium of *Eumeces*," by E. L. Rice. (Slides.)

"Notes on the Growth of the Western Catalpa (*Catalpa speciosa*)," by W. R. Lazenby.

"Faulty Specimens for Nature Study, and how Good Ones may be Prepared," by Chas. Drury.

"Cancer in Mice (*Mus musculus*)," by E. F. McCampbell.

"Relation of Rainfall to Crop Yield," by J. Warren Smith.

"Removal of the Showy Parts of Flowers as affecting Fruit and Seed Produced," by A. H. McCray.

"The Coals of the Monongahela Formations in Ohio," by J. A. Bownocker.

"Fresh Light on the Chronology of the Glacial Epoch in North America," by G. F. Wright. (Slides.)

"Glacial Erosion in the Canadian Selkirks," by L. G. Westgate. (Slides.)

"Some Effects of Glacial Erosion in the Alps," by N. M. Fenneman.

"The Raised Beaches of Lake Huron," by W. M. Gregory.

"Rock Terraces along Streams in the Vicinity of Columbus, O.," by G. D. Hubbard.

"Ecologic Notes from Beechwood Camp," by Bruce Fink.

"The Systematic Position of *Apathus elatus*," by A. H. McCray.

"Observations on the Tick, *Bryobia pretensis* Garman," by S. R. Williams.