lication would cease with the current volume. Officers of the various biological societies will get in touch with their members in the near future, and final action will be taken at the Indianapolis meetings of the American Association for the Advancement of Science as well as at other centers where biological societies are meeting.

The Committee on Arrangements for Biological Abstracts

THE ANNUAL MEETING OF THE UNION OF AMERICAN BIOLOGICAL SOCIETIES

THE annual meeting of the council of the Union of American Biological Societies has been scheduled for Wednesday evening, December 29, in the Palm Room of the Claypool Hotel, Indianapolis, Ind., at 8:30 P. M. During the past year the union has been active in lending its support to such projects of broad interest in the support of *Biological Abstracts,* the Woods Hole Conference on Aging and the teaching of the biological sciences.

The report concerning *Biological Abstracts* by the Committee on Arrangements will be of great importance to those interested in seeing the *Abstracts* become self-supporting beginning with 1938. The importance of working out some permanent and satisfactory financial basis for keeping this valuable aid to research and teaching is recognized by most biologists.

These items, together with a brief report on the American Documentation Institute and other pertinent business, will be considered at the annual meeting. It is hoped there will be a full attendance of those interested, together with the official society representatives to the council.

GEORGE W. HUNTER, III,
Secretary

SOCIETIES AND MEETINGS

THE INDIANA ACADEMY OF SCIENCE

THE fifty-third annual meeting of the Indiana Academy of Science was held at Manchester College, North Manchester, on November 4, 5 and 6, under the presidency of Will E. Edington, professor of mathematics, DePauw University. After the usual transaction of business scientific papers were presented on November 5 in sectional programs: *Archeology,* 5 papers, Glenn A. Black, Indianapolis, *chairman; Bacteriology,* 3 papers, H. M. Powell, Lilly Research Laboratories; *Botany,* 17 papers, C. L. Porter, Purdue University; *Chemistry,* 9 papers, Paul D. Wilkinson, Indiana State Teachers College; *Geology and Geography,* 12 papers, W. LeRoy Perkins, Indiana State Teachers College; *Mathematics,* an address on "The Foundations of Geometry" by Karl Menger, University of Notre Dame; *Physics,* 15 papers, Leslie I. Steinbach, Central Normal College; *Psychology,* 7 papers, P. L. Hightower, Central Normal College; *Zoology,* 21 papers, W. P. Allyn, Indiana State Teachers College.

On the evening of November 5 Dr. Edington gave his presidential address, entitled "Science and Modern Thought." Other outstanding papers were: "The Homeland of Indian Corn," Paul Weatherwax, Indiana University; "A Tentative Outline of the Prehistory of Indiana," Eli Lilly, Lilly Research Laboratories; "The Goodall Focus of Elemental Hopewellian in Indiana and Michigan," Glenn A. Black, Indiana Historical Society; a series of papers by J. E. Potzger, Butler University, and his collaborators on "The Study of Fossil Pollens" as obtained from various Indiana bogs; "The Mineral Wool Industry of Indiana," William D. Thornbury, Indiana University; "Possibilities for Conservation in an Agricultural State," Kenneth M. Kunkel, director, Division of Fish and Game, Indiana State Conservation Department; "Insects of Indiana for 1937," J. J. Davis, Purdue University; "Staining Methods for Protozoa," W. P. Allyn, Indiana State Teachers College; the papers in zoology for the most part were presented as demonstrations rather than as formal communications.

On November 6 the entomologists had a meeting in charge of H. G. Nester, Butler University, to discuss their special problems. The taxonomists had a meeting, mostly composed of botanists, under the direction of Dr. Theodor Just, University of Notre Dame. The Junior Academy of Science, consisting of science clubs in secondary schools, held its meeting and displayed its exhibits, with George Hoffer, West Lafayette, in charge.

Officers elected for 1938 are: *President,* Eli Lilly, Lilly Research Laboratories; *Vice-president,* T. C. Yuncker, DePauw University; *Secretary,* W. P. Allyn, Indiana State Teachers College; *Treasurer,* W. P. Morgan, Indiana Central College; *Editor,* Paul Weatherwax, Indiana University; *Press secretary,* Will E. Edington, DePauw University.

Purdue University was chosen as the place of the next annual meeting. About 350 members and guests were present.

M. W. LYON, JR.,
Press Secretary

THE UTAH ACADEMY OF SCIENCES, ARTS AND LETTERS

THE Utah Academy of Sciences, Arts and Letters held its autumn meeting at Weber College, Ogden, Utah, on November 5 and 6. The academy banquet

was held on Friday evening from 6:00 to 8:00 P. M. in the Hotel Ben Lomond. Dr. H. A. Dixon, Mr. Reed W. Bailey, Superintendent W. K. Hopkins and Mr. M. T. Allred briefly discussed the theme—"Status of Sciences, Arts and Letters in Ogden." There were 116 attending the banquet.

At 8:00 P. M. there was a public meeting in the Weber College Auditorium. President Milton Bennion presided. The following members presented short papers as follows: "Conserving Cultural Civilization in Utah," Dr. A. L. Beeley; "Conserving Rural Civilization in Utah," President E. G. Peterson, and "Conserving Intellectual Freedom in Utah," Professor John C. Swenson. About 400 members and visitors were in attendance.

The executive council breakfast was held at 7:15 on Saturday morning in the Weber College Cafeteria. The 14 members present were the guests of the president of Weber College, Dr. H. A. Dixon.

A general session meeting for the transaction of business was held at 9:15 A. M. The names of 23 new members were presented to the academy membership for approval. It was decided to hold the thirty-first annual meeting of the academy at the Utah State Agricultural College in Logan, Utah, in May, 1938.

The general session adjourned at 9:45 for section meetings. About 30 papers were presented in the biological, physical, social and arts and letters sections.

VASCO M. TANNER,
Permanent Secretary-Treasurer

SPECIAL ARTICLES

THE RELATION BETWEEN VISUAL ACUITY AND THE OPTIC PROJECTION CENTERS OF THE BRAIN

THE accepted view to-day concerning the central neural basis of visual acuity is that the projection areas of the retina on the cortex, *i.e.*, the striate areas of the occipital lobes, contain the spatial arrangement of cells which is necessary for the neural resolution of small changes in visual detail or pattern. In the present paper evidence is offered which suggests certain modifications of this theory. The experiments described below prove that only under limited conditions does the abolition of the cortical centers of vision bring about a reduction in visual acuity.

In the investigation described hereafter, the striate cortex was completely extirpated in six cats under aseptic conditions. The operations were carried out in one stage under Nembutal anesthesia. After the animals had recovered from the operative shock, their visual acuity was tested at irregular intervals by observing the presence of pursuit movements of the head and eyes made in response to rotating striped patterns of varying widths, presented on the inside surface of a large cylinder (Fig. 1). Measurements of minimum separable acuity were made by presenting the animals with moving, alternate, black and white lines of equal width. For tests of minimum visible acuity, single lines rotating against a contrasting background were employed. In addition, observations were made when patterns containing a varying number of lines were presented to the animals. In all the tests the animal was restrained in a box holder at the center of the cylinder, with its eyes approximately 50 cm from the moving patterns.

When animals are given the various visual acuity tests described above, the main defect of vision as a result of extirpation of the optic projection areas of

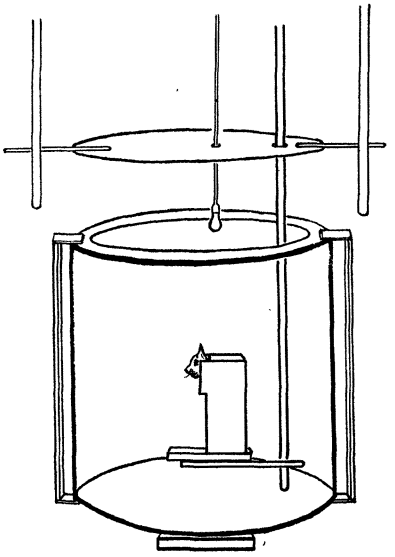

FIG. 1

the cerebral cortex is the abolition of pursuit responses to single lines, to a limited number of adjacent black and white lines (usually below three or four), and to either black or white striations spaced at wide intervals in the visual field. With black lines 0.1 cm in width, responses do not occur if the stripes are separated by distances greater than 2.5–7.6 cm, whereas with white lines the corresponding limit is 15.2–22.9 cm. These defects in visual acuity presumably underlie the commonly noted fact that higher mammals lacking the cortical connections of the visual system are unable to respond to simple objects held or moved in the field of vision,[1,2] and to discriminate between simple geometrical patterns.[2,3]

[1] D. G. Marquis, *Proc. Asn. for Research in Nervous and Mental Disease*, 13: 558–592, 1934.

[2] M. Minkowski, *Arch. f. d. ges. Physiol.*, 141: 171–327, 1911.