SOCIETIES AND MEETINGS

THE IOWA ACADEMY OF SCIENCE

THE fifty-first annual meeting of the Iowa Academy of Science was held at the University of Dubuque and Columbia College in Dubuque on April 16 and 17, with 212 members and visitors in registered attendance.

The presidential address, "Education and Industry," was presented by Dr. L. P. Sherman, professor of chemistry at Grinnell College. Other papers of general interest were "The Flow of Water in Unsaturated Soils" by Dr. L. A. Richards, of Iowa State College, and "The Mammals of Iowa," by Dr. Roy L. Abbott, of the Iowa State Teachers College. Dr. A. J. Carlson, professor of physiology at the University of Chicago, represented the American Association for the Advancement of Science at this meeting and also gave the annual address. His subject was "Studies on the Mechanisms of Hunger, Appetite and Thirst."

The following general officers were elected for 1937–38:

President, A. C. Trowbridge, State University of Iowa; *Vice-president*, J. N. Martin, Iowa State College; *Secretary-Treasurer* and *American Association for the Advancement of Science Representative*, J. C. Gilman, Iowa State College; *Editor*, Mrs. F. W. Nichols, Ames; *Executive Committee*, W. C. Oelke, Grinnell College, and E. E. Emme, of Morningside College. Section chairmen were elected as follows: *Botany and Bacteriology*, F. B. Smith, Iowa State College; *Chemistry, general and physical*, James A. Coss, Morningside College; *Chemistry, organic and biological*, Otto Nitz, Parsons College; *Geology*, Louise Fillman, Simpson College; *Mathematics*, L. E. Ward, State University of Iowa; *Physics*, William Kunerth, Iowa State College; *Psychology*, Robert Leeper, Cornell College; *Science Teaching*, S. M. Dietz, Iowa State College; *Zoology*, George Huff, Drake University.

The academy convened in eight sections for the presentation of 112 papers of special interest. A new section on science teaching was organized. The Junior Academy of Science of Iowa met with the academy and at the Dubuque Senior High School. Forty delegates from 14 clubs were present. The total registered attendance was 180. Dr. D. W. Morehouse, of Drake University, Dr. R. L. Abbott, of Iowa State Teachers College, and Dr. J. A. Eldridge, of the State University of Iowa, were speakers on the program.

J. C. GILMAN,
Secretary-Treasurer

THE TENNESSEE ACADEMY OF SCIENCE

THE spring meeting of the Tennessee Academy of Science was held on May 7 and 8 at Southwestern University, Memphis, Tenn. The program included "Welcome to Southwestern" by the president, Dr. Charles E. Diehl, papers at three general sessions and at a special session of members interested primarily in physics, a dinner on Friday evening and "Demonstrations."

About three fourths of the papers were by members of the faculty and advanced students of Memphis and Nashville schools. Four departments of the University of Tennessee Medical School were represented: Pharmacology, J. B. Mitchell, Jr., "Biology of the Black Widow Spider"; Physiology, J. Victor Monk, "Nature and Significance of Phasmaphaeresis"; Histology, D. S. Pankratz, "Foetal Movements in Rabbits"—a colored motion picture; Medicine, L. A. Diggs, "Sickle Cells Anemia."

The Botany Section, having planned "a botanical foray in the Smoky Mountains" for June, did not hold a special meeting. However, the chairman of the section, Dr. Jesse M. Shaver, was present as usual with a number of beautiful pictures of wild flowers and ferns; and with a specialized camera at hand he showed how he had made them.

At the meeting of the physicists Dr. Peyton N. Rhodes, vice-president of the academy, who presided, exhibited several interesting lecture-table demonstrations, four papers were read and a committee was appointed to apply to the academy for the formation of a physics section.

Mr. F. W. Brist, chief of the U. S. Weather Bureau, Memphis, made an address at the dinner on Friday evening at the Peabody Hotel on the subject, "Weather and the Public."

The "Demonstrations," which included live specimens of thirty-six species of reptiles and amphibia of Reelfoot Lake collected by Malcolm V. Parker, of Southwestern University, was a unique and interesting feature of the Memphis meeting.

Dr. C. L. Baker, director of the Reelfoot Lake Biological Station, stated plans for research work to be carried on there next summer.

The next meeting of the academy will be held on November 26 and 27 at Nashville. Dr. McGill will represent the academy at the meeting of the American Association for the Advancement of Science and the Conference of State Academies of Science at the meeting in Indianapolis next December.

JOHN T. MCGILL,
Secretary

THE SOUTH CAROLINA ACADEMY OF SCIENCE

THE fourteenth annual meeting of the South Carolina Academy of Science was held at the University of South Carolina, Columbia, S. C., in joint session with

the South Carolina Section of the American Chemical Society and the South Carolina Section of the Southern Society for Psychology and Philosophy, on Saturday, May 1, 1937. More than two hundred members attended.

The morning session was devoted to papers of more general interest and the address, "The Ubiquitous Insect," of the retiring president, Professor Franklin Sherman, of Clemson College. The afternoon session was divided into sections of biology and chemistry.

At the business session the following officers for 1937–38 were elected:

President: Dr. J. E. Mills, Sonoco Products Company, Hartsville, S. C.

Vice-president: Dr. G. G. Naudain, Winthrop College, Rock Hill, S. C.

Secretary-Treasurer: Dr. F. W. Kinard, Medical College, Charleston, S. C.

Curator: Dr. J. E. Copenhaver, University of South Carolina, Columbia, S. C.

Editor: To be appointed.

Executive Committee: Professor A. C. Carson, University of South Carolina; Professor Franklin Sherman, Clemson College; Dr. C. B. Waller, Wofford College; Dr. Velma Matthews, Coker College; Dr. J. C. Kinard, Newberry College.

The Jefferson Medal for the outstanding paper was awarded to Dr. Roe E. Remington, of the Medical College, for a paper entitled "A Quantitative Technique in the Study of Goitre." The 1937 Research Fund was granted to Drs. J. Hampton Hoch and Hillyer Rudisill, Jr., of the Medical College.

The next meeting will be held in the spring of 1938 at Charleston, South Carolina.

F. W. KINARD,
Secretary

SPECIAL ARTICLES

ON THE STRUCTURE OF INSULIN

IT has recently been shown[1] that the cyclol theory of protein structure,[2] originally developed with special reference to the structure both of unimolecular protein films[3] and of the multi-laminar proteins, logically implies the existence of "space-enclosing" protein molecules; these contain certain specific numbers of amino acid residues. In particular a certain series of space-enclosing cyclols C_1, . . . C_2, . . . C_n, . . . which comprise 72, 288, . . . $72n^2$, . . . amino acid residues have been constructed. The theory thus passes the test, to which any theory of protein structure must submit, of predicting in general terms the body of facts relating to the "globular" proteins established by Svedberg and his collaborators.[4]

In view of the fact that considerable data relating to insulin are now available, including the x-ray analysis of the structure of insulin crystals,[5] it was deemed worth while to investigate in detail how far any of these space-enclosing cyclol molecules which have now been constructed can be used as a basis for a discussion of the structure of insulin. The molecular weight of insulin is known accurately enough for it to be plain that C_1 is much too light and C_3 much too heavy. The only cyclol of the series which comes into question is therefore C_2. Here the number of residues is of the right order of magnitude.

Each space-enclosing molecule consists of a piece of the cyclol fabric shown in Fig. 1, which by bending

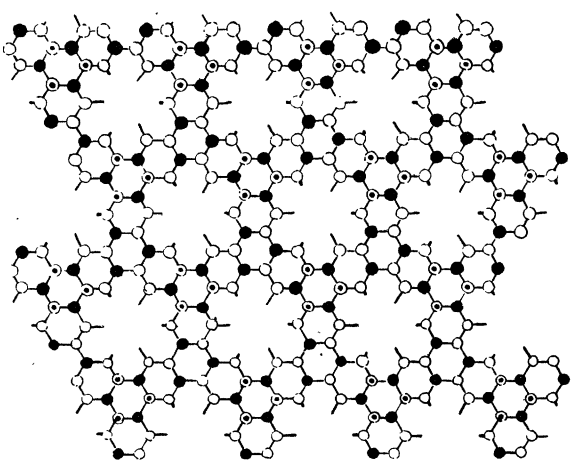

FIG. 1. The cyclol pattern. The median plane of the lamina is the plane of the paper. The lamina has its "front" surface above and its "back" surface below the paper.

● = N.
○ = C(OH), peptide hydroxyl upwards.
⊙ = C(OH), peptide hydroxyl downwards.
○— = CHR, direction of side chain initially outwards.
○– = CHR, direction of side chain initially upwards.

across one line after another joins up and so surrounds a portion of space. For simplicity of exposition, the cyclol fabric may be replaced by its median network in which the C-C-N atoms in the constituent residues are replaced by points midway between linked atoms. Various views of a model of the median network of the molecule C_2 are shown in Fig. 2. This network lies on the surface of a truncated tetrahedron and

[1] D. M. Wrinch, *Nature*, 139: 1937 (in the press).
[2] D. M. Wrinch, *Nature*, 137, 411; 138, 241 and 651; 1936. *Proc. Roy. Soc. Lond. A.*, 160: 59, 1937.
[3] I. Langmuir, V. Schaefer and D. M. Wrinch, SCIENCE, 85: 76, 1937.
[4] T. Svedberg *et al.*, *Koll. Z.*, 51: 10, 1930. *Trans. Far. Soc.*, 26: 72 and 737, 1930. SCIENCE, 79: 327, 1934. *Biol. Bull.*, 66: 191, 1934. *Chem. Rev.*, 14: 1, 1935, and a series of papers in *Jour. Am. Chem. Soc.*, from 1929.
[5] D. Crowfoot, *Nature*, 135: 591, 1935.