loids in solution will become adsorbed in the surface layer in function of the time. When salts, NaCl, for example, are contained in the solution, the dissociated ions are adsorbed on the micellae or molecules of the colloid, and carried to the surface of adsorption, thus decreasing to a considerable extent the concentration of salts in the solution. In other words, when colloids are present with salts in a solution, the concentration of salts in the bulk of the liquid, according to Gibbs's law, does not occur. On the contrary, the salts are concentrated in the surface layers, together with the colloids. This explains the precipitation of colloids at interfaces and the formation of membranes.[4] The experimental illustration of this fact is made as follows:

Solutions of different colloids (serum, albumins, gum arabic, saponin, dyes, etc.) are prepared in saline solution (NaCl 0.9 per cent.). The following concentrations are then placed in watch-glasses, carefully cleaned: 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, 10^{-5} and intermediate values up to 10^{-7}. Pure NaCl solution is also placed in watch-glasses as a control. After evaporation, the pure saline solution shows large, well-formed NaCl crystals at the bottom of the watch-glass, while the watch-glasses containing the colloids exhibit a large opaque white disk, with a dark area in the center. The white disk is made of minute NaCl crystals, so small as to give the impression of smooth white paint. At the bottom, instead of large crystals, a few small scattered crystals are seen, showing that the crystalloid could not concentrate in the bulk. The diameter of the white disk is almost that of the solution before evaporation, showing that, as it evaporated, the liquid abandoned progressively on the glass the colloid and the salt concentrated in the surface. The phenomenon with saponin is very clear up to a concentration of saponin of 1×10^{-7} gms per cc (1/10,000,000), and with proteins up to (1/4,000,000) (NaCl concentration of 1 per cent.).

At a given concentration (10^{-2} for serum, 10^{-3} for saponin and sodium oleate), periodic rings consisting of small crystals are observed on the watch-glass, a little over 1 mm apart. These experiments show very clearly the adsorption of crystalloids by colloids in the same solution.

P. LECOMTE DU NOÜY
THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

BREEDING HABITS AND MUTATIONS IN THE MOTH-LIKE FLY (PSYCHODA)

DURING the last eighteen months I have been engaged in studying the breeding habits and life history of a moth-like fly (Psychoda alternata) with the view of determining whether the form might not be used in studies in genetics. The effort has been attended with unusual success both in breeding the flies and in the discovery of at least one mutation.

Culture methods and life history: The adults are minute, hairy animals about two millimeters in length. They ordinarily breed in decaying vegetation, but dung from either horses or cattle has proved to be an excellent medium. Breeding takes place readily under laboratory conditions, the life cycle being completed in from twelve to sixteen days. Adult females are favorably stimulated by the culture medium, so that ovipositing takes place quickly. The eggs hatch in a little less than two days into active, eyed larvae resembling those of midges. The larvae feed for about ten days, after which they become quiescent and pupate. Adults emerge two days later and complete the life cycle.

Pedigreed strains are being maintained in test tubes and small flasks, while battery jars are being employed for large mass cultures.

A second species of moth-like fly (psychoda minuta) is being bred successfully under conditions similar to but somewhat more difficult than the first.

Mutations: Several mutations have appeared which reoccur regularly and a number of fluctuating variations have been induced by altering conditions of temperature and moisture. The most striking mutation has been studied in detail especially as to its method of inheritance, and it has been found to behave as a simple Mendelian recessive. The normal, wild fly has a reddish-brown pigment in the lens of each ommatidium, giving a reddish-brown color to the entire compound eye. The pigment is also found in the Malpighian tubules from the earliest stage in which the tubules may be distinguished and the ocelli of the larvae are also colored reddish-brown. In the mutant the pigment is lacking, so that the adults are white-eyed except for the pigment between the ommatidia and colorless Malpighian tubules appear in larvae, pupae and adults. The larvae also have colorless ocelli. This mutation breeds true and has been carried through forty-eight generations with no indication of a return to the normal condition.

Two other mutations have appeared and their methods of inheritance are being studied.

Because of the ease with which this fly is bred and handled, its short life history and its possibilities in the production of mutations it is predicted that the form will become very useful in the study of heredity.

Articles with figures and photographs are being prepared dealing with the life history and culture methods, with the white-eyed mutation and its method of inheritance and with the phototropic reactions of the normal and mutant flies.

Zoological Laboratory, Beloit College — C. L. Turner

THE IOWA ACADEMY OF SCIENCE

The thirty-eighth annual meeting of the Iowa Academy of Science was held at the Iowa State College, Ames, Iowa, May 2 and 3, 1924. The associated societies, Iowa Section, Mathematical Association of America, Ames and Iowa Sections of the American Chemical Society, and the Iowa State College Branch, Society of American Bacteriologists, held their sectional meetings in connection with the Academy.

The meeting was especially commemorative of President L. H. Pammel's thirty-five years of service in the state, and several of the papers and addresses were in review of the scientific work of that period. Special features of the meeting were addresses by Dr. William Trelease, of the Illinois State University, on "Personal recollections of some North American botanists," and by Dr. Herbert Osborn, of the Ohio State University, on "Recollections of early workers in entomology and zoology," a paper on "The early history of the Iowa Academy," by Dr. D. S. Fairchild, of Clinton, and the presidential address by Dr. L. H. Pammel, of the Iowa State College, on "A century of botany in Iowa."

Officers were elected as follows: *President,* O. H. Smith, Cornell College; *vice-president,* R. I. Cratty, State College; *secretary,* P. S. Helmick, Drake University; *treasurer,* A. O. Thomas, State University; *representative to A. A. A. S.,* D. W. Morehouse, Drake University.

The sectional chairmen for the ensuing year are: *Bacteriology,* Paul Emerson, State College; *botany,* H. E. Jaques, Iowa Wesleyan College; *chemistry,* H. F. Lewis, Cornell College; *geology,* W. F. V. Leicht, Simpson College; *mathematics,* E. R. Smith, State College; *physics,* P. S. Helmick, Drake University; *zoology,* Dayton Stoner, State University.

The following papers were presented:

Bacteriology[1]

(Iowa State College Branch, Society of American Bacteriologists.)

The application of electronic theory in its applications to oxidation-reduction potentials in bacteriology: F. E. Brown.

The problem of stream pollution in Iowa: H. V. Pederson.

Production of hydrogen sulfide by members of the colon group of bacteria: Fred S. Paine.

Utilization of chinic acid in the differentiation of the colon-aerogenes groups: Demonstration. B. H. Butcher.

Some observations on the Voges-Proskauer reaction: Clair S. Linton.

The epizoology of an outbreak of anthrax in Iowa: C. D. Rice.

Nutrose medium as a substitute for sugar-free broth in the study of carbohydrate fermentation: S. H. McNutt and Paul Purwin.

The diagnosis of bacillary white diarrhœa in chicks: Chas. Murray.

Studies on the Morgan group of paratyphoids: John Weldin and A. G. Ajwani.

Food preservation and so-called "food poisoning": G. G. DeBord.

The need of organizations of those engaged in laboratory diagnosis: Ross L. Laybourne.

A proposed grouping of the yeasts common in dairy products: M. P. Baker.

Variations in the S. lactus group: B. W. Hammer.

The present status of Wildier's bios: E. I. Fulmer.

Theory of dye utilization in bacteriological media: Demonstration. C. H. Werkman.

Notes on the fungus flora of Iowa soils: E. V. Abbott.

Home economics bacteriology as a field for research: Clarissa Clark.

A schematic arrangement for the classification of laboratory media: H. W. Schoenlen.

A green nonfluorescent organism isolated from creamery wastes: Lulu Soppeland.

Acidity as a factor in the purification of creamery wastes: Max Levine and Lulu Soppeland.

Botany

The work of Dr. Pammel at the State College: A. T. Erwin.

The house fungus, Merulius lacrymans: W. H. Davis.

The genus Physalis in Iowa: O. E. Elmer.

Quercitron oak and its relation to soils: Raymond J. Becraft.

Distribution of plants on upper Skunk River, Iowa: Raymond J. Becraft.

Ecological notes in the Arapahoe Mountains near Frazer, Colorado: L. H. Pammel.

The Uredinales of Iowa: J. C. Arthur.

The tropograph and flectograph: Walter J. Himmel.

The physiological barometer: Raymond Wallace.

The physiology of growth: Clifford H. Farr.

Certain features of the vegetation in Kansas sand hills: Fred W. Emerson.

A ten-years' phenological record of the spring flowering plants: H. E. Jaques.

Further studies of the germination of woody plants: L. H. Pammel and Charlotte M. King.

Viability tests of stored corn of different ages: Miss Charlotte M. King.

Comparative anatomy of Hubam and biennial sweet clover: Miss Alice M. Crozier.

The Polyporaceae of Iowa: Robert E. Fennell.

Comparative rates of imbibition in apple wood tissue: Charles F. Rogers.

[1] Abstracts of these papers will be found in the *Journal of Bacteriology.*