27. Dr. C. H. Bailey is president of the congress. The chairman of the program committee is George Garnatz, chief chemist of the Kroger Grocery and Baking Company, Cincinnati.

THE thirty-third annual meeting of the Southern Society for Philosophy and Psychology was held in Knoxville, Tenn., on April 15 and 16. Eighteen papers in philosophy and thirty-six in psychology were presented. New officers elected were: Frank A. Geldard, University of Virginia, *president;* C. Paul Heinlein, Florida State College for Women, *Secretary-Treasurer.* Elected to the council were: Herbert C. Sanborn, Vanderbilt University; Emily S. Dexter, Agnes Scott College, and James B. Miner, University of Kentucky.

SUBJECTS discussed at the Washington meeting of the Institute of Radio Engineers and the International Scientific Radio Union (American Section) included ionosphere and transmission phenomena and other phases of radio communication. On Thursday evening, April 28, there were semi-popular lectures with experimental demonstrations at the auditorium of the Department of Commerce, including "The Electric Performance of the Electric Eel" with demonstration, by C. W. Coates, of the New York Aquarium, and R. T. Cox, of New York University, and "Electromagnetic Waves in Free Space, in Metal Pipes and in Dielectric Wires" with an experimental demonstration, by George C. Southworth, of the Bell Telephone Laboratories.

THE conference of the Museums Association of Great Britain will be held in Belfast, Ireland, from July 4 to 9, under the presidency of Dr. R. E. Mortimer Wheeler. Information can be obtained from the Secretary, Chaucer House, Malet Place, London, W.C. 1.

AN International Engineering Congress will be sponsored at Glasgow, Scotland, from June 21 to 24, inclusive, by a number of engineering societies. This will be held during the progress of the Empire Exhibition. A detailed program, including several technical sessions, is being prepared. Those planning to attend the congress can obtain further details by writing to P. W. Thomas, honorary general secretary, 39 Elmbank Crescent, Glasgow, C. 2, Scotland.

THE International Congress on Technical Education will be held in Berlin from July 25 to 29 under the presidency of M. E. Labbé. It is proposed to discuss the following subjects: "The Human Aspect of Labor," "The Organization of Practical Training in Industry," "Contact between Methods of Work Employed in Technical and Vocational Schools and the Business and Technical World," "Recruitment of Principals of Vocational Schools," "Commercial Training of the Technician and the Technical Training of the Business Man," "Complementary Technical Instruction for Adults" and "The Technical Press and Technical Education." Those wishing to become members of the congress should notify M. R. Harlé, 2 Place de la Bourse, Paris, prior to June 15.

THE Committee on Scientific Research of the American Medical Association invites applications for grant of money to aid in research on problems bearing more or less directly on clinical medicine. Preference is given to requests for moderate amounts to meet specific needs. For application forms and further information, please address the committee at 535 North Dearborn Street, Chicago, Illinois.

DISCUSSION

INCITANTS OF HUMAN BOTULISM[1]

Cl. botulinum types A and B are apparently the only incitants of human botulism thus far described; types C and D have been reported only in outbreaks among various animal species. The identification of two type E strains, incitants of two fatal cases of human botulism in New York State, therefore, seems of interest.

One of the cultures was isolated from German-canned sprats, the other from smoked salmon which came from Nova Scotia; these strains have been found to be similar in cultural and biochemical properties. Their identification was made possible through the kindness of Dr. K. F. Meyer of the Hooper Foundation, San Francisco, who furnished neutralizing serum as well as transfers of two type E cultures which had been isolated from fish in Russia, where a considerable number of cases of botulism have resulted from eating improperly preserved fish. This information as well as the fact that our strains were obtained from fish prepared in Germany and Canada suggests that type E strains are widely distributed.

The possibility that such strains may have been overlooked in the past seems likely, since methods which are suitable for the detection of types A or B toxins in foods or for the production of toxin in broth cultures were found to be inadequate in this study.

Feeding large doses of the emulsion of the food substance to guinea pigs did not indicate the presence of botulinus toxin in the food, while small subcutaneous doses of the filtrate of the material produced symptoms of botulism in the animals, followed by death. The ratio of the fatal *per os* dose to the fatal subcutaneous

[1] From the Division of Laboratories and Research, New York State Department of Health, Branch Laboratory, 339 East 25th Street, New York, N. Y.

dose of the toxin for the fasting guinea pig was subsequently found to be roughly 220:1. Thus the importance of using the subcutaneous route of inoculation in addition to oral administration for detection of type E toxin in food substances is apparent. Cultures prepared from the German-canned fish and incubated at 37° C. were non-toxic for mice and guinea pigs in large doses. Only those which had been maintained at a temperature of 25–30° C. proved toxic to the animals.

It is important perhaps to mention that the two strains reported here, although similar immunologically and culturally, are not identical. They show distinct agglutinative properties. Furthermore, their toxins react differently in the chicken; young white leghorn chickens are highly susceptible to the toxin of the salmon strain but apparently insusceptible to that from the German-canned sprats.

ELIZABETH L. HAZEN

ANENT PARTHENOCARPIC APPLES

NAVEL apples[1] *Malus apetala,* falsely called bloomless or seedless, have gynomonoecious (purely pistillate) flowers, which have small green petals (hence are inconspicuous), lack nectaries (hence do not attract insects) and bloom after normal apples are normally through blooming. Navel apples, thus, stand slight chance of being pollinated, though a few belated normal blossoms may still persist to give pollen which the wind sometimes may waft to a navel flower. Navel apples are usually parthenocarpically developed. The Spencer (Seedless) navel is extremely fruitful in this way, the Wellington navel and the Navel No. 3 much less so, though over 90 per cent. of the fruit of these trees is also parthenocarpic. Yet, in three successive years at Arlington, Va., and one at Geneva, N. Y., over two thousand buds of Spencer, bagged (no pollination possible), *not one* fruit was parthenocarpically developed! A. B. Stout at Geneva, N. Y., during 1928 and 1929 had the same results: not one fruit developed from bagged buds. A similar test with Wellington and Navel No. 3 showed the same, save that those bags of Navel No. 3 which became aphid-infested set fruit 100 per cent. One year, a deliberate aphid infestation was made of bagged Spencer and Navel No. 3 buds. Not one Spencer developed, but Navel No. 3 set every bud of every spur! It was evident that the parthenocarpy was stimulative, but what was the stimulus? In 1934 I tried spraying trees with aphid extract, acetic and citric acids of varying concentrations. The results were nil.

In the spring of 1937, obtaining the suggestion from the work of Gustavson[2] like Gardiner and Marth,[3] I sprayed apple trees, my work being done at the Geneva, N. Y., station. The growth-substances were obtained from Dr. P. W. Zimmerman, of the Boyce Thompson Institute. The older Wellington trees having been destroyed and the younger trees too young to bear, I was limited to using only Spencer Navels of the parthenocarpic types, so I included such normal types as McIntosh, Sereda, Turley and Red Astrakhan. Of these forms the flowers were emasculated before blooming, before spraying and before bagging. Some branches with complete flowers left open were also sprayed. Indolacetic and naphthalene acetic were used in varying concentration even up to normal strength. In no case did fruit set occur, even with flowers left complete and open for pollination, among the Spencer navels or normal types. This corroborates the work of Gardiner and Marth, above mentioned.

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THE SPEED OF INSECTS IN FLIGHT

IN a recent issue of SCIENCE[1] Langmuir has called attention to a story "going the rounds over the whole country" relative to the almost incredible speed of 800 miles per hour supposed to be attained by a deer botfly (*Cephenomyia pratti*). He has very effectually challenged the contention that this insect can attain such a speed. The present writer would like to call attention to certain experiments and observations that have been made in recent years relative to the speed of insects in flight.

Outstanding among the attempts to determine the speed of insects in flight is the work of Magnan.[2] He determined the maximum speed of 32 species belonging to 8 orders. This was done by two methods. One was to attach to the insect a thread that was wound around a small drum mounted on ball-bearings so as to allow the thread to be unwound by the insect in flight. Each revolution of the drum was electrically recorded along with the records of a chronograph. Since the length of thread unrolled at each revolution was known, it was easy to compute the speed of the insect in flight. The other method employed was to time the insect in flight as it passed between two markers at a measured distance using a chronometer, aided with the cinematograph.

Of the 32 species of insects employed by Magnan, the greatest speed was attained by *Anax parthenope,* a dragonfly, which traveled 8 meters per second, or approximately 17.9 miles per hour. The next highest

[1] A. B. Stout, N. Y. Bot. Garden *Bull.* No. 9, 1929.
[2] L. G. Gustavson, *Proc. Nat. Acad. Sci.,* 22, 622–636, November, 1936.
[3] Gardiner and Marth, SCIENCE, September 10, 1937, p. 246; *Bot. Gazette,* September, 1937, pp. 184–195.
[1] I. Langmuir, SCIENCE, 87: 233–234, 1938.
[2] A. Magnan, "La Locomotion Chez les Animaux," *I–Le Vol des Insectes,* Hermann et Cie, Editeurs, Paris: 71–72, 1934.