The MacMichael Viscosimeter operates on the torsion principle. A plunger of standard dimensions is suspended in the sample by a torsion wire. The sample is held in a cup which is revolved at a constant speed on a motor-driven platform. The amount of torque imparted to the wire is read on a graduated scale.

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Write for Bulletin 16 G

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GENERAL ELECTRIC people say—

P. C. BOGIAGES
General Engineering & Consulting Laboratory

AIRCRAFT ELECTRICITY: The advent of World War I brought definite demands for auxiliary power in aircraft. Its main purpose was to supply radio and instruments. Experience gained by the automotive industry with the 6-volt system was utilized to adapt it to aircraft service, using an 8-volt charging generator. About 1925 use of a 12-volt system, originally developed for truck service, was inaugurated.

The trend toward very large multiengined planes began in 1939. . . . It soon became apparent that the 12-volt system was inadequate to supply the additional loads essential to flight in these craft. . . . A lighter, more efficient 24-volt system was the outgrowth of these difficulties.

Experience with the 24-volt system led to the development of the 120-volt system, for which great expectations are held. This system is particularly applicable to large aircraft and may well become universally accepted as the standard d-c system of the future.

General Electric Review, July, 1949

* *

F. P. WILSON, Jr.
Apparatus Department

MATERIALS AND PROCESSES: The layman can hardly appreciate the extent to which materials and processes control and limit the development, design, and manufacture of electrical apparatus. Only by continual development of new and better materials, and by processing them ever more precisely and economically is it possible to continue producing "more goods for more people at less cost." For example, the life of a turbine is limited by the creep of an alloy steel, the safety of a ship may depend on the fatigue strength of a highly stressed gear, and the quality of the electric refrigerator requires the most exacting chemical control of the materials sealed into it for life.

These requirements, which become more pronounced with the improved performance of established products and the ever-growing variety of new products, constitute a challenge to the chemist, chemical engineer, metallurgist, physicist, and other scientists who can contribute in the field of materials and processes.

Chemistry provided the film on Formex wire, which, because of its toughness, permitted the elimination of cotton covering. This reduced the space required in coil windings and eliminated 6,000,000 lb of structural materials per year in apparatus because of reduced size. This saving in space has also permitted the design of equipment to meet exacting requirements which otherwise would have been impossible.

Tungsten carbide led to the formation of a new company. Alkyd resins set the stage years ago for the growth of what is now the Chemical Department. Askarel revolutionized capacitor design; improved silicon steel reduced the size and cost of transformers; high-temperature alloys permit higher temperatures in steam-turbine operation and made the gas turbine possible; improved lubricants, new finishes, and synthetic insulation are only a few examples of laboratory activity in the materials field.

General Electric Review, July, 1949

39 Years Ago

CONQUEST OF NATURE: Who can enumerate the many conquests of man over Nature's forces: the unlocking of the treasure house of knowledge of the universe around us? Through it man at last acquires the ability to navigate the air itself, an achievement which the most sanguine of us could scarcely have thought would come so soon. Let us hope that all this is the beginning of an age of still greater advances, in which man will build more and more upon the foundations already laid.

Elihu Thomson, 1910

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CONTENTS

Selection and Eugenics: Curt Stern

Research Publication: A Federal Responsibility: Marion A. Jurgens

Technical Papers

Cysteine Protection against X Irradiation: H. M. Patt et al.

Humidifying Apparatus for Small Test Rooms: Theodore C. Scheffer and Oscar W. Torgeson


Plasma and Liver Protein Levels in Rats Fed the Carecinogen 2-Acetylamino-6-fluorene: James H. Leathem

Correlation of Browning, Fluorescence, and Amino Nitrogen Change with Destruction of Methionine by Autoclaving with Glucose: W. D. Graham, Peng Tung Hsu, and James McGinnis

Comments and Communications

Characteristics of Some Disease-free Ornamental Plants

Association Affairs

News and Notes
Amino acids, the nitrogenous components of proteins, are of vital importance to adequate growth, maintenance and repair of tissue. As a service to nutritional research, GBI offers the following products in convenient-sized packages at an economical price:

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Amino Acid</th>
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<tbody>
<tr>
<td>DL-alpha alanine</td>
<td>DL-leucine</td>
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<tr>
<td>Beta alanine</td>
<td>L-leucine</td>
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<tr>
<td>L-asparagine</td>
<td>L-lysine monohydrochloride</td>
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<td>DL-aspartic acid</td>
<td>DL-methionine</td>
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<td>L-arginine monohydrochloride</td>
<td>DL-norleucine</td>
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<td>L-cystine</td>
<td>DL-ornithine</td>
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<td>L-cysteine hydrochloride</td>
<td>DL-phenylalanine</td>
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<tr>
<td>L-glutamic acid</td>
<td>L-proline</td>
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<td>Glutamine</td>
<td>DL-serine</td>
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<tr>
<td>Glycine</td>
<td>DL-threonine</td>
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<td>L-histidine monohydrochloride</td>
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<td>Hydroxy-L-proline</td>
<td>L-tyrosine</td>
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<td>DL-isoleucine</td>
<td>DL-valine</td>
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authority has been added which will settle all doubts.

CHAPTER HEADINGS

Introduction
Unicellular Animals
Introduction to the Study of Multicellular Animals
The Sponge
Hydra and Obelia
The Starfish
The Earthworm
Flatworms and Roundworms
The Crayfish
Insects
The Clam

From Achordates to Chordates
Amphioxus
The Vertebrate
The Perch
The Frog
Hormones and Vitamins
Mitosis, Spermatogenesis, and Oogenesis
Hereditv, Genetics, and Evolution
Appendix
Glossary
References

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1. You avoid congestion and delay at the Registration Desks in the hotel foyers. All indications point to a record-breaking attendance since all of the Association's seventeen sections and subsections, and more than fifty societies, will have sessions; also this is the first meeting in New York City since 1928.

2. You receive the General Program early in December in ample time unhurriedly to decide among the events and the sessions of the societies that you wish to attend.

3. Your name and hotel address will be in the Visible Directory the first hour of the first day of the meetings, since it will be posted in Washington as soon as processed.

4. Advance Registrants will have the same privileges of receiving a map and directory of points of interest of New York City, literature, radio broadcast tickets, etc. At the convenience of Advance Registrants, these will be distributed from the Main Registration on the Penn Top of the Hotel Statler, the location of the Annual Science Exposition, the Visible Directory, and the Science Theatre. Admission to the excellent series of latest scientific films will be free to all Registrants.

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New York City, December 26-31, 1949

The list of hotels and the reservation coupon below are for your convenience in making your hotel room reservation in New York City. Please send your application, not to any hotel directly, but to the Housing Bureau of the New York Convention and Visitors Bureau to avoid delay and confusion. The experienced Housing Bureau will make assignments promptly and the hotel will send a confirmation directly to you in two weeks or less. Mail your application now to secure your first choice of desired accommodations.

<table>
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<th>HOTEL**</th>
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** A New York City Hotel-room Tax of 5% is not included in this schedule of rates.
** A list of the headquarters of each society appeared in The SCIENTIFIC MONTHLY for August, pages iv and v, and in Association Affairs, SCIENCE, August 26, page 220.

---

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<table>
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<tr>
<td>Single Room</td>
<td>Rate</td>
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<tr>
<td>Double Room</td>
<td>Rate</td>
</tr>
<tr>
<td>Other</td>
<td>Rate</td>
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</tbody>
</table>

Number in Party

Sharing this room will be: [enumerate and attach list giving names and addresses of each person, including yourself]

**CHOICE OF HOTEL**

First choice | Second choice | Third choice

**DATE OF ARRIVAL** | **DEPARTURE DATE**

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