1. In order to compare the output waveform of three different line voltage regulators, a DuMont Type 304-H oscillograph was connected to the output of each in turn. Regulators A and B were loaded with 250 watts while Regulator C was loaded by an additional 550 watts, since it is rated for much greater loads.

2. Each of the wave forms was recorded with an oscillograph record camera.

3. The RC filters of Figure 1 were connected between the regulator outputs and the CRO Y input and the wave forms were again recorded for comparison.

Results:

Fig. 2 shows the signal waveform of output of three different line regulators without external filter displayed on a DuMont Type 304-H.

Voltage Regulator A Voltage Regulator B Voltage Regulator C

Fig. 3. Improvement of output wave form of Regulator B using filters of Fig. 1.

No External Filter Filter A Filter B

Photography makes a sine wave’s signature indelible

The oscillograph traces analyzed in this report leave no doubt as to results. Every detail of waveform is captured by photography for quick, accurate reference. A similar test need never be set up again because of inaccurate drawings or faulty memory.

Team your oscillograph with photography and you make it a recording device that gives you clear, sharp, incontrovertible records. It saves time and money, and makes your work much easier. Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N.Y.

Photorecording... an important function of photography
REGISTER NOW

for the Philadelphia Meeting of the AAAS

AVOID CONGESTION AND DELAY
GET YOUR GENERAL PROGRAM –
BY FIRST CLASS MAIL – EARLY IN DECEMBER

Registration in advance of arrival at the 118th Annual Meeting of the AAAS in Philadelphia, December 26–31, 1951, has several striking advantages:

1. You avoid congestion and delay at Registration Desks at time of arrival. All indications point to a large attendance since all of the Association's eighteen sections and subsections, and more than forty societies, have excellent programs, and, in addition to paper-reading sessions, there will be the important symposia, conferences, and addresses for which an AAAS Meeting is noted.

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

3. Your name 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 received. (Hotel address can be added later, if necessary.)

4. Advance Registrants have the same privileges of receiving a map and directory of points of interest in Philadelphia, literature, radio broadcast tickets, etc. At the convenience of Advance Registrants, these will be distributed from the Main Registration in the Municipal Auditorium—the location of the full-scale Annual Exposition of Science and Industry, the Visible Directory, the AAAS Science Theatre, and the Biologists' Smoker.

To insure its prompt receipt, the General Program will be sent by first class mail December 1–6, 1951—which last is also the closing date for Advance Registration.

----------- THIS IS YOUR ADVANCE REGISTRATION COUPON -----------

1. Advance Registration Fee (the extra quarter covers part of the first class postage) enclosed:
   □ $2.25 AAAS Member (check one) □ $2.25 College Student
   □ $2.25 Wife (or Husband) of Registrant □ $3.25 Nonmember of AAAS

2. FULL NAME (Dr., Miss, etc.) ..........................................................
   (Last) (First) (Initial)
   (Please print or typewrite)

3. ACADEMIC, PROFESSIONAL, OR BUSINESS CONNECTION

4. OFFICE OR HOME ADDRESS ....................................................
   (For receipt of Program and Badge)

5. YOUR FIELD OF INTEREST ......................................................

6. CONVENTION ADDRESS ..........................................................
   (If not known now may be added later)

7. DATE OF ARRIVAL ....................... DATE OF DEPARTURE .................

Please mail this Coupon and your check or money order for the fee, $2.25 or $3.25, to
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
1515 Massachusetts Avenue, N.W., Washington 5, D. C.
HOTEL RESERVATIONS
118th AAAS MEETING
Philadelphia, December 26-31, 1951

The list of hotels and the reservation coupon below are for your convenience in making your hotel reservation in Philadelphia. Please send your application, not to any hotel directly, but to the AAAS Housing Bureau in Philadelphia and thereby avoid delay and confusion. The experienced Housing Bureau will make assignments promptly; a confirmation will be sent you in two weeks or less. **Share a room with a colleague if you wish to keep down expenses.** Mail your application **now** to secure your first choice of desired accommodations.

<table>
<thead>
<tr>
<th>HOTELS AND RATES PER DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel*</td>
</tr>
<tr>
<td>ADELPHIA★</td>
</tr>
<tr>
<td>BARCLAY</td>
</tr>
<tr>
<td>BELLEVUE–STRATFORD★</td>
</tr>
<tr>
<td>BENJAMIN FRANKLIN★</td>
</tr>
<tr>
<td>DRAKE</td>
</tr>
<tr>
<td>ESSEX</td>
</tr>
<tr>
<td>JOHN BARTRAM★</td>
</tr>
<tr>
<td>PENN SHERATON</td>
</tr>
<tr>
<td>RITZ–CARLTON★</td>
</tr>
<tr>
<td>ROBERT MORRIS</td>
</tr>
<tr>
<td>ST. JAMES</td>
</tr>
<tr>
<td>SYLVANIA★</td>
</tr>
<tr>
<td>WARWICK</td>
</tr>
</tbody>
</table>

Cots added to a room are $2.50 each; dormitory style rooms (for 5 or more) are $3.50 per person.

★ Hotels starred have sessions in their public rooms. For a list of the headquarters of each participating society and section, please see Association Affairs, *Science*, August 24, or *The Scientific Monthly*, September.

---

THIS IS YOUR HOTEL RESERVATION COUPON ---

AAAS Housing Bureau
Architects Building (1st Floor)
Philadelphia 3, Pa.

Please reserve the following accommodations for the 118th Meeting of the AAAS:

**TYPE OF ACCOMMODATION DESIRED**

- Single Room(s) Desired Rate ... Maximum Rate ...
- Double Room(s) Desired Rate ... Maximum Rate ... Number in Party ...
- Twin-Bedded Room(s) Desired Rate ... Maximum Rate ...
- Suite(s) Desired Rate ... Maximum Rate ... Sharing this room will be: ...

*Enumerate persons here and attach list giving name and address of each person, including yourself*

**CHOICE OF HOTEL**

First Choice ... Second Choice ... Third Choice ...

**DATE OF ARRIVAL** ... **DEPARTURE DATE** ...  
(These must be indicated)

**NAME**  
(Please print or type)

**ADDRESS**  
(Street) (City and Zone) (State)

*Mail this now to the Housing Bureau. Rooms will be assigned and confirmed in order of receipt of reservation.*

November 9, 1951
COLLEGE PHYSICS. New 2nd Edition
Presents the basic ideas of physics for students of science and engineering at the college level. Simple, direct, and concise explanations and solved numerical problems help the student acquire exact knowledge of physical principles. The second edition has been carefully revised in accordance with improvements suggested by a teaching of the first edition.

GENERAL NETWORK ANALYSIS
By Wilbur LePage and Samuel Seely, Syracuse University. McGraw-Hill Electrical and Electronic Engineering Series. Ready in December
A text designed to lay the foundation for most phases of network analysis, this study also gives some of the background for network synthesis. Slanted neither toward power or communications specialists, General Network Analysis covers lumped and distributed networks in the steady state, and lumped networks in the transient state.

ELECTRIC TRANSMISSION LINES. Distributed Constants, Theory and Applications
A presentation of the theory of circuits with distributed constants, which is valid at all frequencies, followed by chapters on the application of this theory to radio-frequency lines, power lines, telephone lines, filters, and wave guides. Written for the more general type of course, this treatment is suitable for power and communications students.

FRENCH-ENGLISH SCIENCE DICTIONARY. For Students in Agriculture, Biology and Physical Sciences. With a Supplement of Terms in Aeronautics, Electronics, Radar, Radio, Television
By Louis DeVries, Iowa State College. Ready in November
This popular dictionary has been enlarged and revised in order to increase its value by the inclusion of a supplement of terms which have come into use within the past ten years, as the result of recent developments in the above-mentioned fields. Minor changes and revisions have been made in the original text.

Send for copies on approval
photomicrography via "Visicam"

Readily attachable to any standard microscope, the versatile "Visicam" provides easy, economical 35mm black & white or color photomicrographs of the finest quality.

Available with roll-film carriers or the popular "Single-Shot" camera back. Details on request.

Erb & Gray

854 South Figueroa Street
Los Angeles 17, California

---

Time's Arrow and Evolution
By HAROLD F. BLUM. Dr. Blum uses "time's arrow" the second law of thermodynamics as a key concept to show how the nature and evolution of the nonliving world place limits upon the nature and evolution of life. "A most stimulating analysis of the physical and chemical conditions which seem required, as far as present knowledge goes, for the origin of life."—Sewall Wright.

Illustrated, $4.00

Stellar Evolution
AN EXPLORATION FROM THE OBSERVATORY
By OTTO STRUVE. One of the world's great astronomers discusses the results of centuries of speculation on the evolution of stars, and gives a full report of his own conclusions. "No one is better qualified to write on the evolution of the stars than Dr. Struve."—Sky and Telescope. "This book will influence appreciably the astronomical research of the next decade."—Science.

Illustrated, $4.00

---

GLASS ABSORPTION CELLS made by KLETT

Klett Manufacturing Co.
179 East 87 Street, New York, New York

---

November 9, 1951
PERSONNEL PLACEMENT

YOUR ad here reaches over 32,000 foremost scientists in the leading educational institutions, industrial laboratories, and research foundations in the U. S. and 76 foreign countries—at a very low cost

CLASSIFIED: 15¢ per word, minimum charge $3.00. Use of Box Number counts as 10 additional words.

DISPLAY: $17.50 per inch, no charge for Box Number.

Correct payment to SCIENCE must accompany all ads. Insertion usually made 2 or 3 weeks after receipt of ad.

SCIENCE • 1515 Mass. Ave., N.W., Wash. 5, D. C.

POSITIONS WANTED

Bacteriologist, M.S., Ph.D. soon (Biochemistry minor) desires academic or research position anywhere U. S. Available January. Box 32, SCIENCE.

Pharmacologist-Chemotherapist, M.D., Ph.D. with broad scientific and industrial experience, now in responsible position, soon available as department head, research director or equivalent. Box 33, SCIENCE.

Woman Physician, several years experience research and clinical endocrinology and internal medicine, seeks academic or industrial position, Box 26, SCIENCE.

Zoologist—Entomologist: Ph.D., age 36, research publications, wide and varied experience. Teaching or research position desired, college, university or institution; preferably California or South West. Box 14, SCIENCE.

POSITIONS OPEN

Biochemist—Ph.D. with experience in basic research on intermediary metabolism. Background in enzymes and organic chemistry essential. Drug industry, Central New York State. Box 29, SCIENCE.

Microbiologist: Ph.D. or equivalent training in Microbiology, Bacteriology, or allied field plus educational training in Biochemistry. Pharmaceutical background helpful. Age 30-40. This position, with a well-established eastern pharmaceutical company, will involve responsibility for planning, directing and coordinating research and product development. Send complete personal, educational, and experience data to Box 33, SCIENCE.

11/23, 12/7

BIOCHEMIST, Ph.D.

Attractive research position in Division of Biochemistry of Pharmaceutical Company expanding research activities. Location, Central New Jersey.

Background in physical chemistry and in vitro metabolism studies desirable. Please give details of education and references. Box 30, SCIENCE.

11/16

Entries in the Fifth International Photography-Science Salon, sponsored annually by The Scientific Monthly and the Smithsonian Institution, should be sent (prepaid) to the Editor, The Scientific Monthly, 1515 Massachusetts Ave., N.W., Washington 5, D. C., Nov. 1—Nov. 27. All accepted photographs will be shown at the AAAS meeting in Philadelphia Dec. 26-31, and later throughout the U. S. For entry blanks and full information write to the address given above.

The MARKET PLACE

BOOKS • SERVICES • SUPPLIES • EQUIPMENT

YOUR ad here reaches over 32,000 foremost scientists in the leading educational institutions, industrial laboratories, and research foundations in the U. S. and 76 foreign countries—at a very low cost

CLASSIFIED: 20¢ per word, minimum charge $5.00. Use of Box Number counts as 10 additional words. Correct payment to SCIENCE must accompany ad.

DISPLAY: Rates listed below—no charge for Box Number. Monthly invoices will be sent on a charge account basis—providing satisfactory credit is established.

Single insertion $17.50 per inch
7 times in 1 year 16.00 per inch
13 times in 1 year 14.00 per inch
26 times in 1 year 12.50 per inch
52 times in 1 year 11.00 per inch

For PROOFS on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of each week).

LANGUAGES

Listen and Learn a Language by LINGUAPHONE

At home learn to speak Spanish, French, German, Russian, the Asian languages by quick easy Linguaphone Conversational Method. Save time, work, money. Send for free book today.

Approved for VETERANS’ Training

LINGUAPHONE INSTITUTE • 8411 Rockefeller Plaza, New York 20

AVOID DELAY . . . . Cash in Advance payment MUST be enclosed with ALL classified ads.

See “Charges and Requirements”

BOOKS

Your sets and files of scientific journals are needed by our library and institutional customers. Please send us lists and description of periodical files you are willing to sell at high market prices. Write Dept. ASS, J. S. CANNER, INC.

Boston 19, Massachusetts

SCIENTIFIC BOOKS and PERIODICALS WANTED

Complete libraries—Sets and runs—Single titles. Also, please send us your want lists.

STECHERT-HAFNER, INC. • 31 East 10th St., New York 3

WANTED TO PURCHASE . . . . Sets and runs, foreign and domestic. Entire libraries and smaller collections wanted.

WALTER J. JOHNSON • 125 East 23rd St., New York 10, N. Y.

SCIENCE, Vol. 114
PROFESSIONAL SERVICES

**FOOD RESEARCH LABORATORIES, INC.**
Founded 1922
Philip B. Hawk, Ph.D., President
Bernard L. Quer, Ph.D., Director
Research + Analyses + Consultation
Biological, Nutritional, Toxicological Studies
for the Food, Drug and Allied Industries.
48-14 33rd Street, Long Island City 1, N.Y.

PROFESSIONAL SERVICES

**SUPPLIES AND EQUIPMENT**

**PROPER** Select Quality MICRO COVER GLASSES

Squares, Rectangles and Circles

Proper Select Quality Micro Cover Glasses are non-corrosive, non-fogging, and entirely free from flaws... meet or exceed all Federal specifications.

- Largest and most complete stock in the U.S.A.
- Special sizes of any dimension made to order.
- Complete range of circles also available.

Write for details, prices, and samples.

**PROPER MANUFACTURING CO., INC.**
10-34 44th Drive, Long Island City 1, New York

**HYPOPHYSECTOMIZED RATS**
Shipped to all points via Air Express
For further information write
HORMONE ASSAY LABORATORIES, Inc. - 808 E. 58th St.
Chicago 37, Ill.

**automatic Washers**
for Pipettes - Animal Cages - Laboratory Glassware
Please send for literature
HEINICKE Instrument Corp. - P.O. Box 2872
Hollywood, Florida

**MICRO BEAKERS**
WRITE FOR LEAFLET MB-S
R. P. CARGILLE
118 Liberty St.
New York 6, N. Y.

Are YOU seeking...

a new position, or new personnel?

41 replies received from ONE classified ad in SCIENCE...
Your ad here will get results!

Send your ad NOW!
Your ad here reaches over 32,000 foremost scientists in the leading educational institutions, industrial laboratories, and research foundations in the U. S. and 76 foreign countries—at a very low cost. 

**CLASSIFIED:** 20¢ per word, minimum charge $5.00. Use of Box Number counts as 10 additional words. Correct payment to SCIENCE must accompany ad. 

**DISPLAY:** Rates listed below—no charge for Box Number. 

Monthly invoices will be sent on a charge account basis—providing satisfactory credit is established. 

- 200 per word, minimum charge $5.00. 
- For PROOFS on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of every week). 

Keep your copies of SCIENCE always available for quick, easy reference in this attractive, practical binder. Simply snap the magazine in or out in a few seconds—no punching or mutilating. It opens FLAT—for easy reference and readability. Sturdily constructed—holds 26 issues. 

This beautiful maroon buckram binder stamped in gold leaf will make a fine addition to your library. Only $2.75 postpaid (personal check or money order please). Name, 60¢ extra—year of issue, 35¢ extra. ORDER YOURS NOW!
STAINLESS STEEL UTILITY CARTS
Ideal for Transporting Laboratory Equipment

These sturdy carts, supporting up to 200 pounds weight, find dozens of uses in the modern laboratory . . . save valuable time by freeing your personnel for more important work. Use them to eliminate numerous trips to the stock room, autoclave, etc. Simply stack glassware, chemicals and equipment on the shelves and safely transport to the laboratory table or work bench. Utility carts have also proved useful mobile supports for special or heavy equipment, such as a mill that is used intermittently or in various departments.

The carts are made entirely of stainless steel with riveted joints. To protect equipment, shelves are fitted with guard rails or a combination guard rail and turned rim. Insulation under shelves deadens noise. Swivel ball-bearing casters and handle make these carts easy to maneuver. Shelves measure 17½ by 27 inches. Over-all size, 18 by 30 by 32½ inches. Height to top surface, 30½ inches.

Supplied in Two Convenient Types

<table>
<thead>
<tr>
<th>Cart Type</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>JL51920—Utility Cart, with center shelf, each</td>
<td>$54.50</td>
<td></td>
</tr>
<tr>
<td>West of Rocky Mountains, each</td>
<td>61.50</td>
<td></td>
</tr>
<tr>
<td>JL51922—Same, without center shelf, each</td>
<td>$49.50</td>
<td></td>
</tr>
<tr>
<td>West of Rocky Mountains, each</td>
<td>55.00</td>
<td></td>
</tr>
</tbody>
</table>

aloë scientific
DIVISION OF THE A. S. ALOE COMPANY
5655 Kingsbury • St. Louis 12, Missouri
**GRADUATED QUARTZ WEDGE**

*in One Compact Unit*

Wedge ... eyepiece ... holder ... all three essential units are combined in a single assembly. That is why the Spencer Graduated Quartz Wedge is so simple, compact and convenient to operate.

The wedge unit is graduated in 10 μm intervals from -500 to +2500 μm, engraved in a semi-transparent metallic coating. For ease and accuracy of measurement, the lines appear bright on a grey area at the edge of the field.

The holder unit, with cross lines and Polaroid discs, clamps on top of the Spencer Polarizing Microscope body tube. A Ramsden eyepiece focuses on both scale and cross lines.

Further information about this convenient unit for measuring retardation may be obtained by writing Dept. Y2.

American Optical

INSTRUMENT DIVISION - BUFFALO 15, NEW YORK