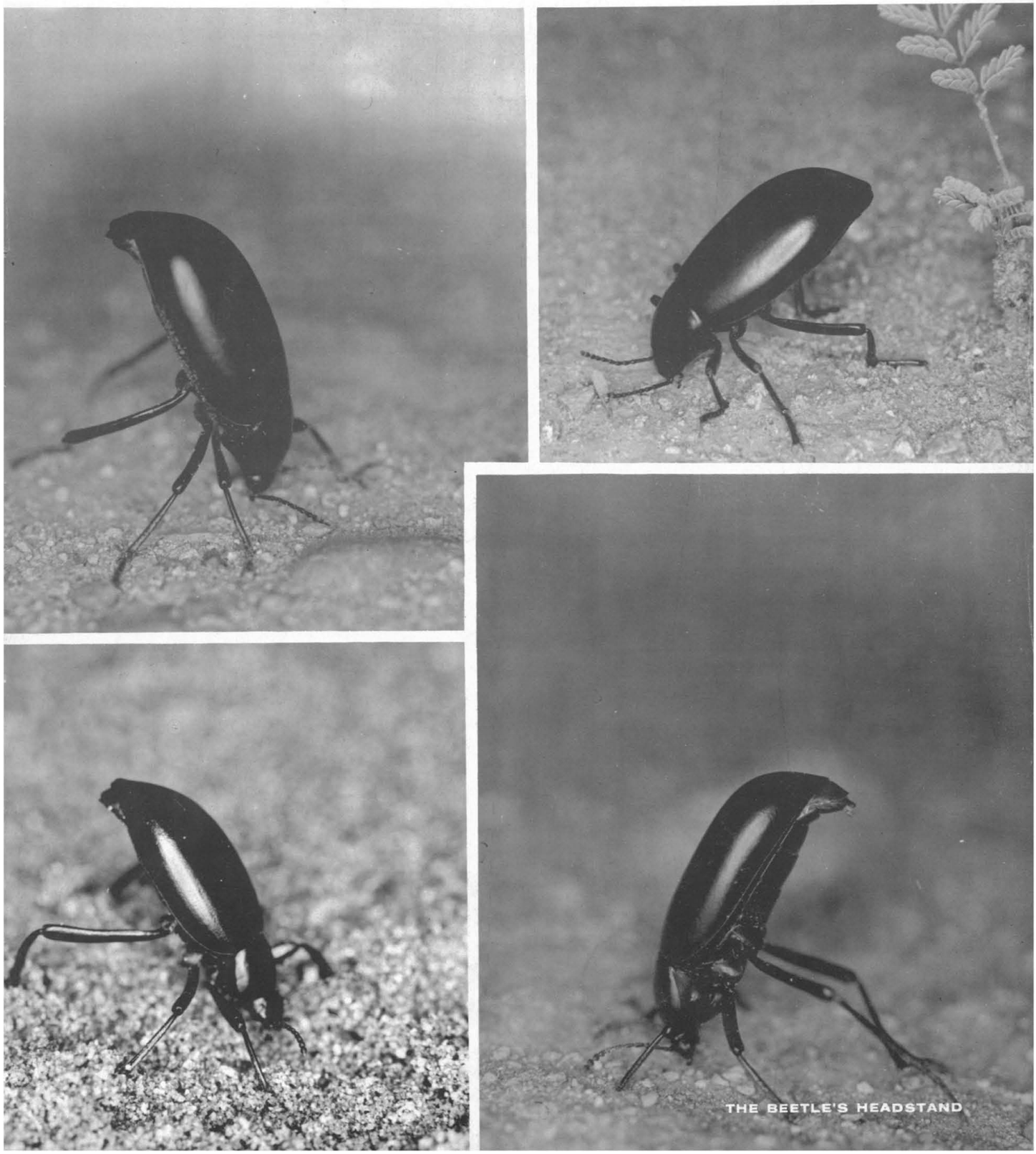
SCIENCE

16 September 1966

Vol. 153, No. 3742

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



THE BEETLE'S HEADSTAND

Show-Stoppers!

The new Beckman CPM-100™ and DPM-100™ Liquid Scintillation Systems literally stopped the show at a recent scientific meeting. And for good reason. These new systems electronically compute data and provide readout in CPM, DPM, or quench-corrected DPM with 2 sigma % error. And of equal significance, they now make it possible to achieve uncompromised performance and data quality from a room-temperature system with 100-sample capacity.

These three-channel systems attain an E^2/B of better than 100 with no refrigeration. The degree of quenching is accurately determined by external-ratio standardization, and the entire system is easily calibrated with the adjustment of only one control. They also feature a Command Tower Programmer™ which allows the personal selection of samples and channels of interest. The CPM-100 and DPM-100 Spectrometers represent a major advancement in the field of liquid scintillation analysis. Yet, the CPM-100 is priced at $7,995.00† and the DPM-100 is only $8,995.00†.

For more information on these advanced liquid scintillation counters, contact your Beckman Sales Representative today about a demonstration, or write for Data File LLS-266-Sp.

†Prices are stated in U.S. funds and are subject to change without notice.

Beckman® INSTRUMENTS, INC.

SCIENTIFIC AND PROCESS INSTRUMENTS DIVISION

FULLERTON, CALIFORNIA • 92634

INTERNATIONAL SUBSIDIARIES: GENEVA; MUNICH; GLENROTHES, SCOTLAND; TOKYO; PARIS; CAPETOWN; LONDON; MEXICO CITY

16 September 1966
Vol. 153, No. 3742

SCIENCE

SCIENCE is published weekly on Friday and on the fourth Tuesday in November by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with **The Scientific Monthly®**. Second-class postage paid at Washington, D.C. Annual subscriptions $8.50; foreign postage, $1.50; Canadian postage, 75¢; single copies, 35¢, except **Guide to Scientific Instruments**, which is $1. School year subscriptions: 9 months, $7, 10 months, $7.50. Provide 4 weeks' notice for change of address, giving new and old address and zip numbers. Send a recent address label. SCIENCE is indexed in the **Reader's Guide to Periodical Literature.**

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Beetle of the genus *Eleodes* assuming the headstand with which it characteristically responds to disturbance. The insect repels predators with a secretion containing guinone; the guinone is sprayed from the tip of its abdomen (actual body length, 2.5 cm). See page 1341. [T. Eisner, R. Alsop, R. Silberglied, Cornell University]

WASHINGTON, D. C. • 133rd AAAS

Order Your General Program

It provides complete, detailed information about all the sessions and symposia scheduled, the Annual Exposition of Science and Industry, and the Science Theatre.

Program Highlights

Moving Frontiers of Science: Lynn White on The Historical Roots of Our Ecologic Crisis; Th. Dobzhansky on the Changing Man; Thomas F. Malone on Weather Modification; D. S. Greenberg on Problems of Securing Constructive Legislation.

Washington Academy of Sciences Invited Address: P. M. S. Blackett, Nobel laureate in physics, president of the Royal Society, "The Ever-Widening Gap."

Interdisciplinary Symposia: Science in International Perspective with P. M. S. Blackett, Sir Lawrence Bragg, Victor F. Weisskopf; Political Aspects of the Population Explosion; Scientific Exchange and Use of Information; Systems of Pollution Control.

Special Sessions: AAAS Presidential Address by Henry Eyring, "Untangling Biological Reactions"; the Joint Address of Sigma Xi and Phi Beta Kappa by Walter Orr Roberts, "Science, a Wellspring of Our Discontent"; the Seventh George Sarton Memorial Lecture by George Wald, "Color Vision: Model or Reality"; and the National Geographic Society Illustrated Lecture.

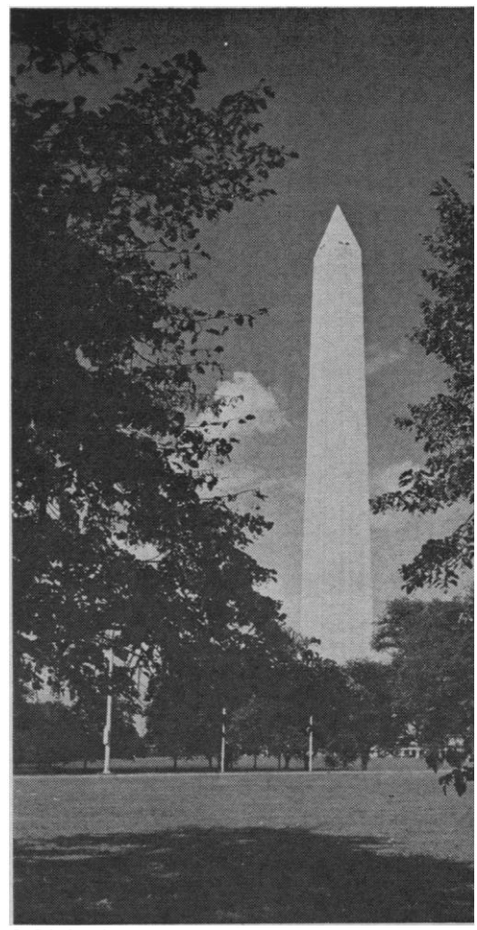
AAAS Committees: Committee on Arid Lands symposium on Migration to Arid Lands; Committee on Science in the Promotion of Human Welfare symposium on Utility of the Construct of Race; Commission on Science Education.

Sections and Societies: The 20 AAAS Sections and some 90 participating societies are scheduling specialized symposia and papers.

AAAS Science Theatre: The latest foreign and domestic films.

Exhibits: The Annual Exposition of Science and Industry is in the Exhibit Halls of the Sheraton-Park Hotel, AAAS Headquarters.

Advance Registration: By registering in advance, you avoid delay at the Registration Center on arrival; you receive the *General Program* in time to plan your dates at the meeting; and your name is posted in the Visible Directory of Registrants when the meeting opens. Use the coupon below.



J. Stinchcomb

AAAS
1515 Massachusetts Ave., NW
Washington, D.C. 20005

Date of Application .....

(Check 1a or 1b) 1a. ☐—Enclosed is $5 Advance Registration Fee. This brings me the **General Program** and a **Convention Badge.**
1b. ☐—Enclosed is $3 for the **General Program.** (If I attend the meeting, the Badge, which I need to obtain the privileges of the meeting, will cost me $2 more.)

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

3. OFFICE ☐ OR HOME ☐ ADDRESS .....
(For receipt of General Program)

CITY ..... STATE ..... ZIP CODE .....

4. ACADEMIC, PROFESSIONAL, OR BUSINESS CONNECTION .....

5. FIELD OF INTEREST .....

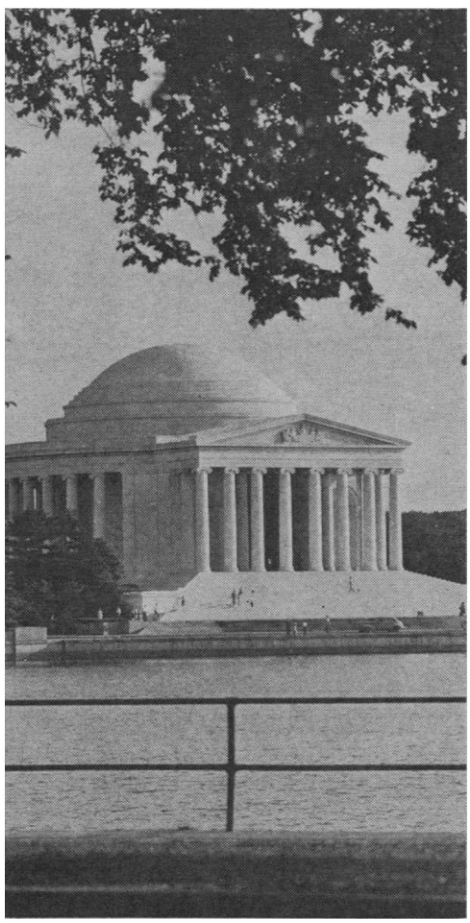
6. CONVENTION ADDRESS .....
(May be added later, after arrival)

Please mail this coupon and your check or money order for the total amount to the AAAS in Washington, D.C. (address as shown).

MEETING • 26-31 DECEMBER

Reserve Your Hotel Room

Make sure you have the accommodations you prefer. The AAAS headquarters is the Sheraton-Park; the other hotels are co-headquarters.



National Park Service

The hotel sleeping accommodations are for your convenience in making your room reservation in Washington. **Please use the coupon below and send it directly to the AAAS Housing Bureau in Washington.** Give a definite date and estimated hour of arrival, and also your probable date of departure. The Housing Bureau will make the assignment and promptly send you a confirmation.

For more details on all of the above facilities and services, and for a list of the headquarters of each participating society and section, see the 22 July issue of Science, page 437.

HOTEL RATES* (Per Day)

Hotel	Single	Double	Twin	Suites†	Parking
Sheraton-Park (1260)	$12–14	$16–18	$16–18	$30	Free for registered guests
Motor Inn (214)	15	19	19		
Shoreham (900)	12–14	16–18	16–18	35	$2
Motor Inn (100)	15	19	19		Free for registered guests
Washington Hilton (1200)	14–16	18–20	18–20	50–75	$2

*All rooms are subject to a 4% District transient room tax.

†One-bedroom parlor suites; rates for larger suites available upon request.

There is no charge for children at any of the hotels.

AAAS Housing Bureau
1616 K Street, NW
Washington, D.C. 20006

Date of Application .....

Please reserve the following accommodations for the 133rd Meeting of the AAAS in Washington, D.C., 26–31 December 1966

First Choice of Hotel ..... Second Choice..... Third Choice .....

Type of room: Single ☐ Double ☐ Double, twin beds ☐ Suite ☐ Rate desired ..... Maximum rate.....

Number in party ..... Sharing this room will be: .....
(List name and address of each person, including yourself. Attach list if space is insufficient.)

.....

.....

DATES: ARRIVAL ..... A.M. ..... P.M. ..... DEPARTURE .....
(These must be indicated—add approximate hour, A.M. or P.M.)

NAME .....
(Individual requesting reservation) (Please print or type)

ADDRESS .....
(Street) (City and State) (Zip Code)

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

The problem with buying (or *selling*, for that matter) soluble RNA is that it is extremely hygroscopic. It can easily absorb atmospheric moisture totaling 5-10% of its weight. How do you avoid paying for this water? And how do you know exactly how much sRNA you're getting?

Don't buy it on a *weight* basis. Consider a more revealing characteristic: its ultraviolet absorption at 260 $m\mu$. *We* did, and now offer—exclusively, it should be noted—sRNA from both yeast and *E. coli B* which is actually sold on the basis of A_{260} (OD) units. And this is determined in a magnesium buffer which tends to give values some 15% lower than one gets in water. We do it this way to achieve maximum secondary structure and the most reproducible A_{260} values. Goodbye ambiguity.

We really go much further too. Every batch of sRNA you receive will have our oft-mentioned (and really quite essential) Product Analysis Report. This will disclose: UV absorption, of course; sedimentation coefficient; amino acid acceptor activity; DNA content; heavy metals; nuclease activity; and biuret.

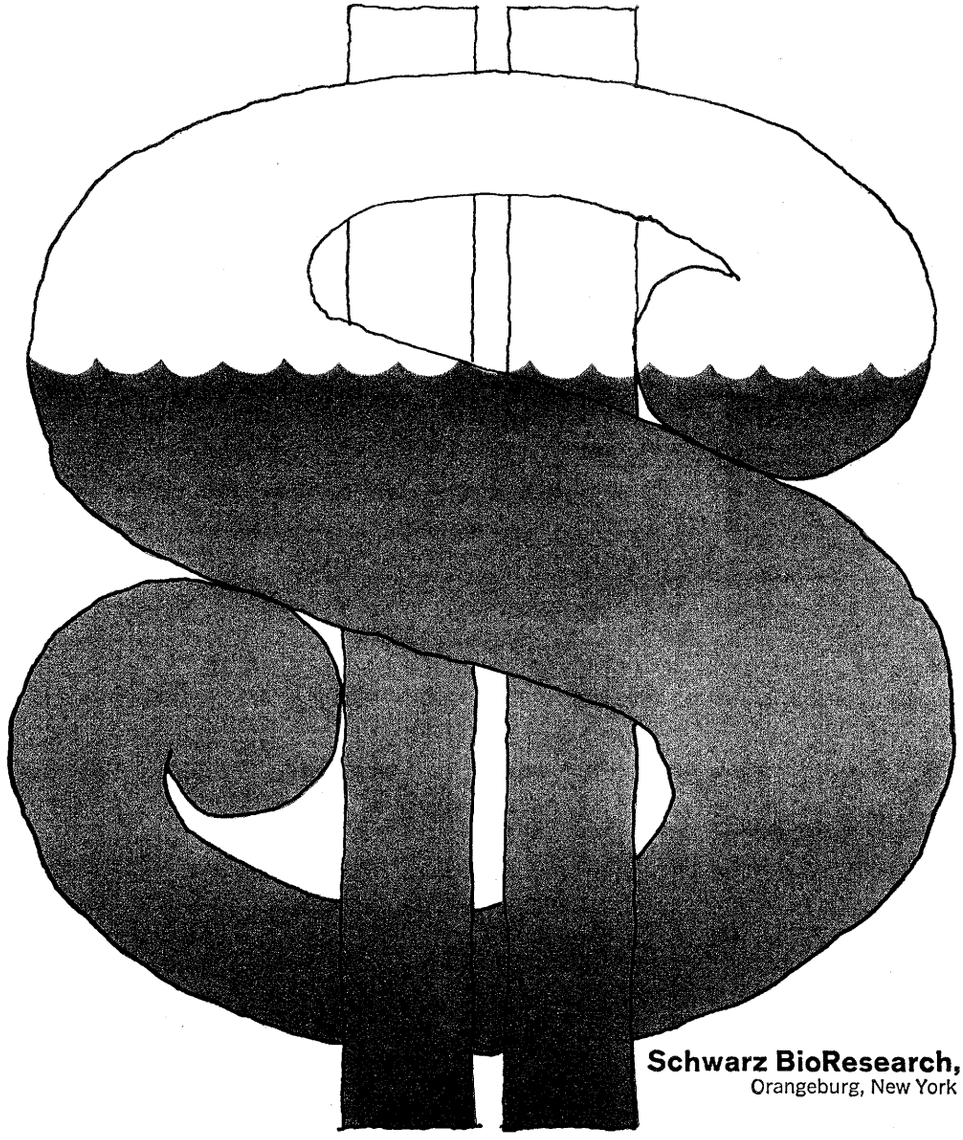
Now, price:

sRNA, Yeast	1,800 units	18,000 units	90,000 units
(Cat. #1110-50)	$10	$55	$230
sRNA, *E. coli B*	4,000 units	10,000 units	20,000 units
(Cat. #1110-40)	$20	$48	$85

(All units on basis of A_{260} in magnesium buffer.)

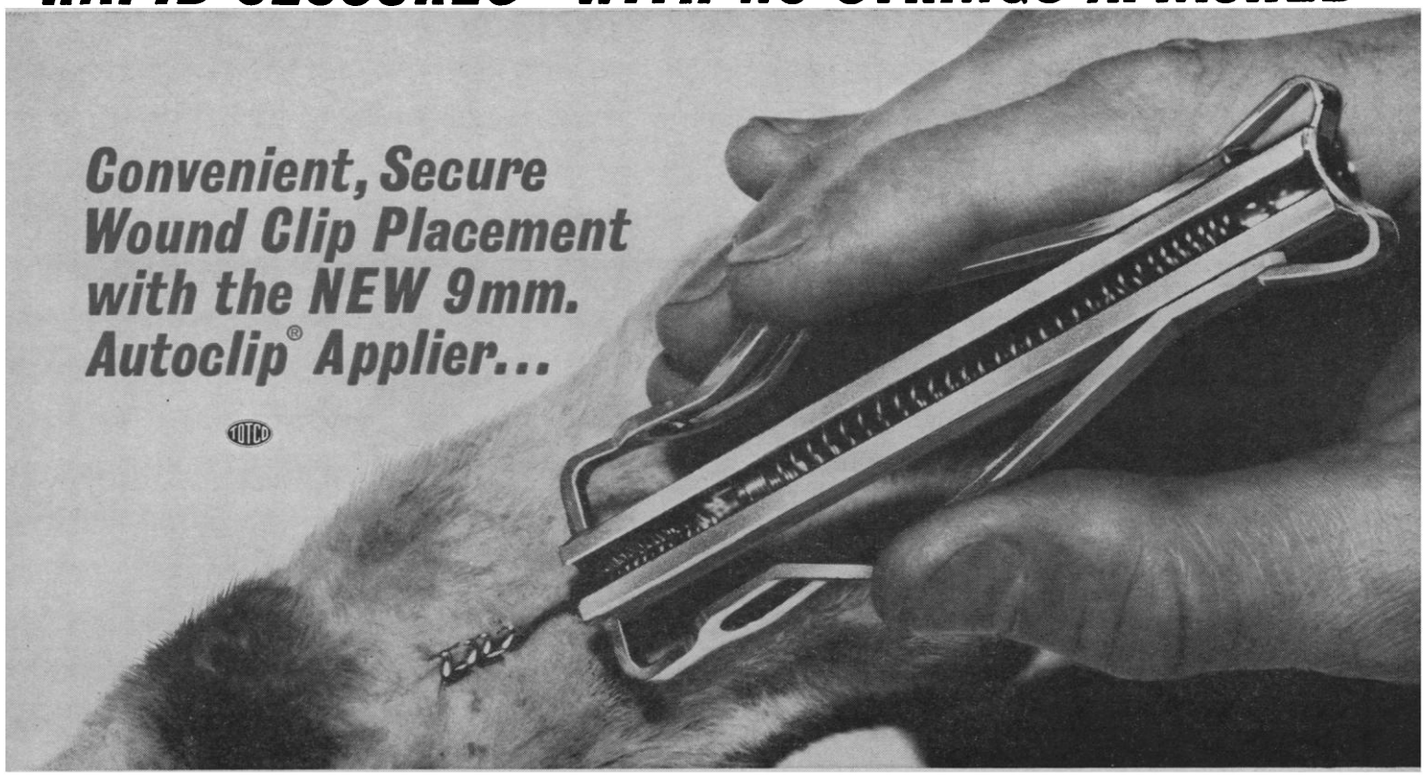
Complete specifications are yours for the asking. Another offer: if you promise not to *buy* sRNA by weight, we'll promise not to *sell* it that way. (Nevertheless we are not beyond revealing the following to curious readers: 18,000 OD units of sRNA, Yeast and 20,000 OD units of sRNA, *E. coli B* are equal to 1 gram *approximately*—which is really the point of the whole piece.)

sRNA
How to buy it without buying water



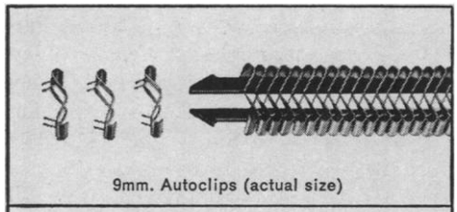
Schwarz BioResearch, Inc.
Orangeburg, New York 10962

RAPID CLOSURES—WITH NO STRINGS ATTACHED

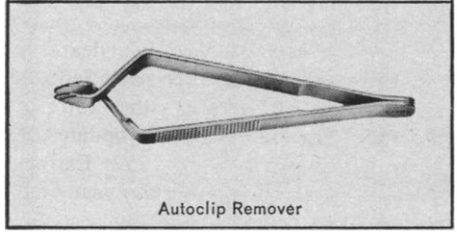


NOW—a modern method for closing surgical incisions—ideal for use on laboratory animals. The new Autoclip Applier makes other tedious, time-consuming techniques obsolete.

The precision-engineered, Autoclip Applier automatically spring feeds Autoclips for placement as fast as the skin edges can be approximated. The stainless steel Applier holds a rack of 20 Autoclips. Reloading is fast and easy. The Applier complete with Autoclips can be conveniently autoclaved.



9mm. Autoclips (actual size)



Autoclip Remover

Autoclips are small—only 9mm.—suitable for work with practically all animals. Autoclips are actually double clips. They approximate the fascia as well as the skin and provide maximum holding power with minimum trauma—fewer Autoclips are required for adequate closure. Autoclips only partially penetrate the skin—eliminating causes of trauma and infection. The stainless steel Autoclips will not twist or turn and do not come in contact with the wound itself.

The stainless steel Autoclip Remover provides for quick, easy, non-traumatic removal of Autoclips. The Remover expands the Autoclip by forcing apart the clips' outer edges. The Remover never touches the wound itself.

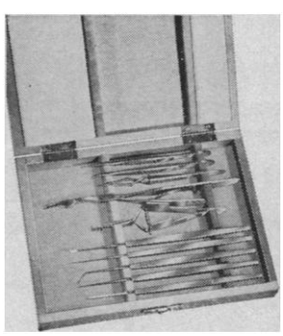
The 9mm. Autoclip instruments are available in a convenient Kit containing an Applier, a Remover, and 100 Autoclips. Instruments and Autoclips may also be ordered as separate items.

An 18mm. Autoclip and Applier are also available for closure of incisions requiring a larger clip.

Clay-Adams
New York 10, N. Y.

Available from your dealer

For MICRO SURGERY and MICRO DISSECTION



Precision-made instruments to fill most of your needs for delicate work in experimental animal surgery, and also in cytology, entomology, embryology, and tissue culture. Hand-crafted from the highest quality surgical steel and representing the finest examples of the instrument makers' art, these delicate, yet rugged, instruments will measure up to your most exacting demands.

These Clay-Adams instruments include fine and extra-fine scissors, scalpels, forceps and retractors of virtually every type and description needed in micro surgery. They are available individually or in sets, as illustrated. For a complete description, fill out and mail the coupon.

CLAY-ADAMS, INC., Dept. 9166
141 E. 25th St., New York 10, N. Y.

- ☐ Please send me a full description and specifications.
- ☐ I would like a demonstration in my laboratory.
- ☐ AUTOCLIP INSTRUMENTS
- ☐ MICRO SURGERY and DISSECTION INSTRUMENTS

Name_____

Institution_____

Address_____

City_____ State_____ Zip_____

"LE BAIN A TOUT FAIRE"

A versatile general laboratory water bath

EVERY LABORATORY NEEDS ONE!

Temperature control from 0 to 50° C., with ± .04° C. accuracy for **stationary incubation:** flasks, bottles, test tube racks, etc., or **flasks or vessels may be shaken** — both the rate (75 to 150 oscillations per minute) and the amplitude (0 to 5 cm.) are continuously variable.

Versatile clamps will hold a 750 ml. flask or a 25 ml. flask equally well.

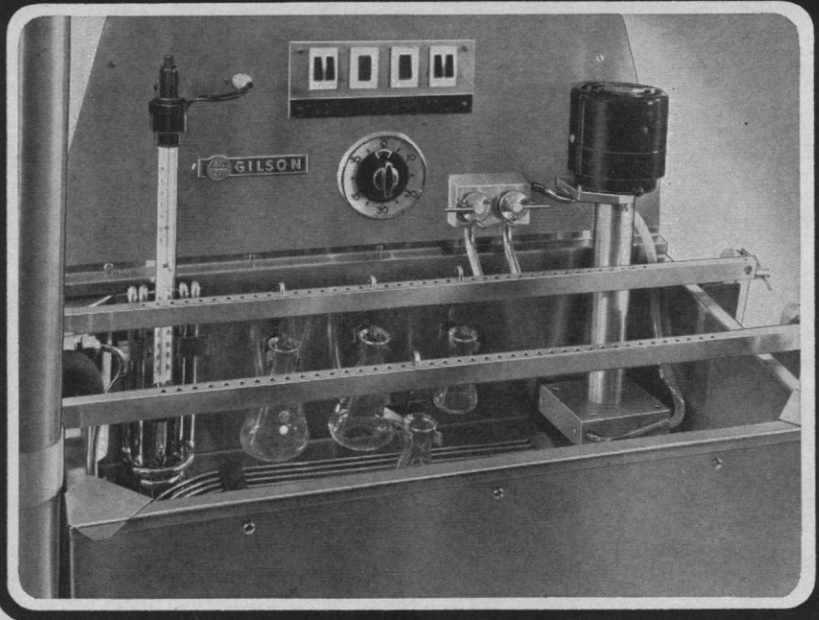
The temperature-regulated water from the bath may be circulated externally where desired, e.g. to some water-jacketed equipment. (The maximum pump head is 7.5 ft. at zero flow; 4.5 ft. at 2 liters per minute; 6 in. at 5 liters per minute.)

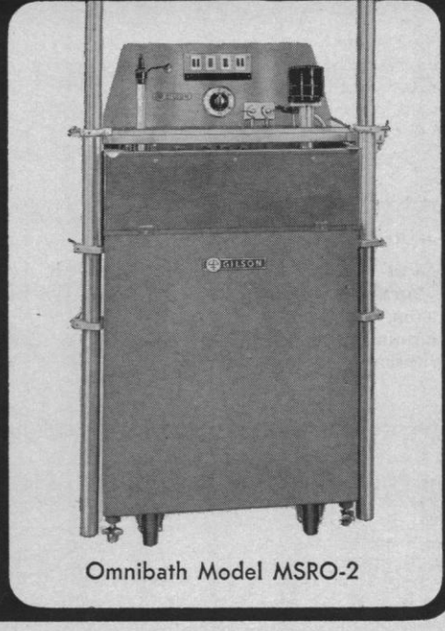
Available with a refrigeration unit and available also with cooling coil only to circulate tap water.

Built-in 5-hour signaling timer.

Two masts and a plate available for holding things.

The Omnibath can do many things. But it will also do only a few — if you choose — and each model is priced accordingly.





Omnibath Model MSRO-2

WRITE!
GILSON MEDICAL ELECTRONICS
Middleton, Wisconsin 53562
or telephone: 608/836/1551

GILSON

16 September 1966, Volume 153, Number 3742 **SCIENCE**

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE 6-1858.

Commitment to Science

In an essay entitled "Science, Scientists, and Politics,"* the historian Lynn White, Jr., has pointed out that public attitudes toward science have always been closely related to the basic religious, social, and esthetic values of a culture. Thus science flourished in Greece and for four centuries in Islam, but was ignored in Rome and deliberately abandoned in Islam when the focus of Islamic culture changed in the 12th century.

In its earlier years, the European scientific tradition was strongly supported by the congruence of scientific attitudes and the Protestant ethos—the similarity of their cosmic views, the Christian belief in good works, and the use of science to increase man's understanding of the works of the Creator. Now, as White explains, "the motive force of natural theology has long been spent, and it does not seem to have been replaced with any other idea of equal power."

What has developed is a strong commitment to the practical values of science. Within available means, the United States and many other countries are willing to support research that gives promise of useful application. In fact, the announced policy of the present U.S. administration is to place even greater emphasis than in recent years on research designed to achieve useful objectives. The recent vote of the House of Representatives denying funds for continuation of the Mohole Project is relevant. The controversy that has surrounded this project almost from its beginning makes it easy to sympathize with congressional feelings of irritation and to understand the intrusion of political arguments into the debate. Nevertheless, the vote should be interpreted not only as a rejection of a particular, and meritorious, research program but also as a sign of a serious flaw in the American commitment to science. That commitment is so largely to the practical values of science that other values tend to be forgotten. Contributions of the Mohole Project to the improvement of drilling techniques have not been much stressed, and geophysical studies of the earth's crust and the Mohorovičić discontinuity have neither medical nor military appeal. Given our emphasis on practical results, such projects become easy targets when the going gets a little rough.

The expectation of practical results is a thoroughly sound reason for supporting research; scientists and government officials both talk of "investment in research." But this is not society's only justification for supporting research.

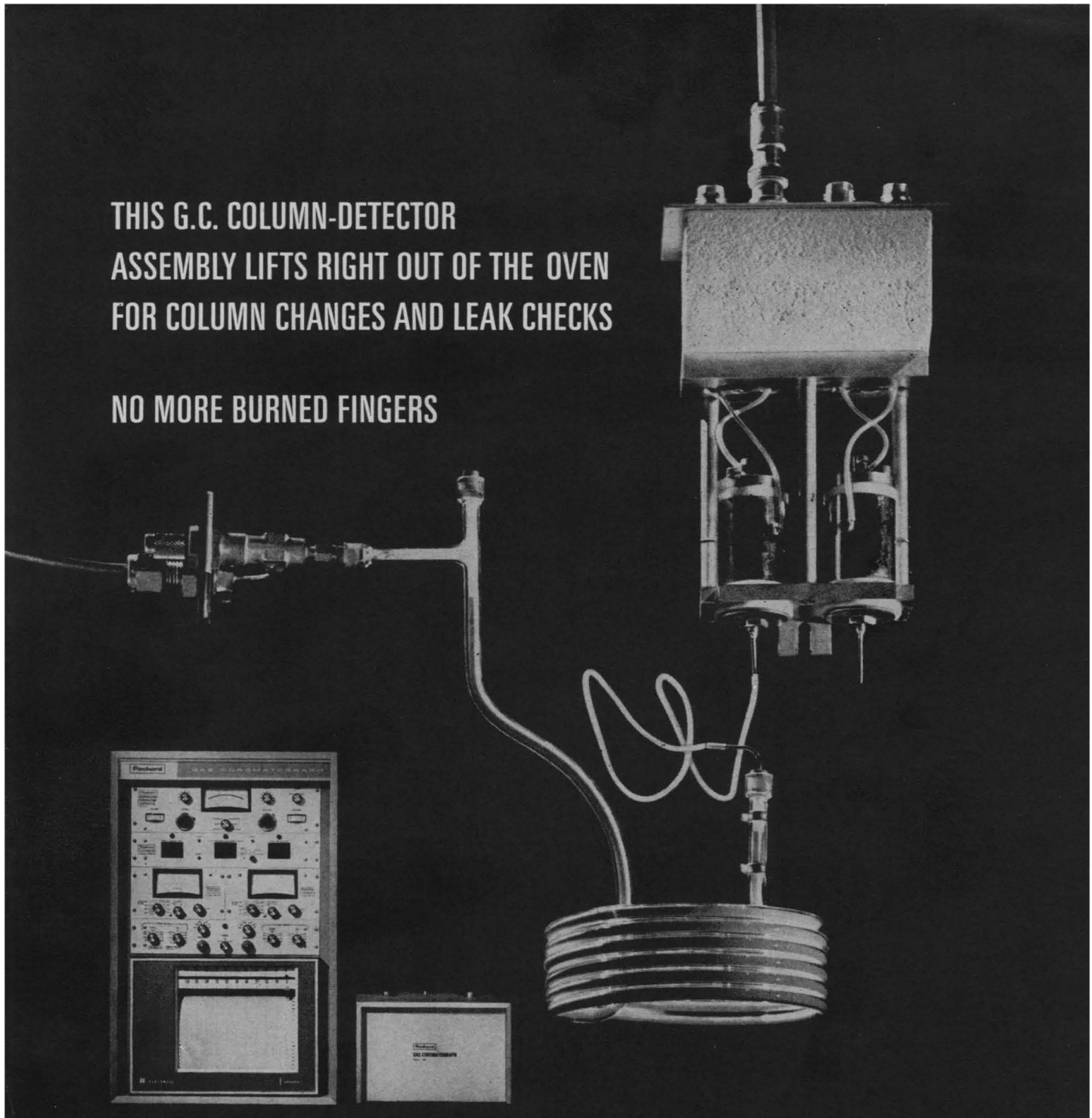
"Science for its own sake" provides the scientist with enthusiasm and motivation, but does not have strong public endorsement. It can be hoped, however, that current efforts to improve the teaching of science and to increase public understanding of science will gradually develop a firmer and more widespread understanding of the nature of scientific work and of the intellectual and esthetic benefits to society that result from a vigorous scientific program. In this effort it seems appropriate to place special emphasis upon the better education of students who are not themselves expecting to become scientists but who will shortly become the cultural, political, and business leaders of the country.

Another kind of effort is also necessary. We who are living in this time and this culture find it difficult to view our science and its relations to other aspects of our culture from an external vantage point. Yet is it not a responsibility of scientific statesmen to look at science objectively and scientifically, to study the ecology of scientific work, and to analyze the reasons for, the nature of, and the weaknesses in, the current national commitment to science? To do otherwise is to leave the future of science to the vagaries of social fashion.—DAEL WOLFLE

*Prepared for the Center for the Study of Democratic Institutions, Santa Barbara, California.

THIS G.C. COLUMN-DETECTOR ASSEMBLY LIFTS RIGHT OUT OF THE OVEN FOR COLUMN CHANGES AND LEAK CHECKS

NO MORE BURNED FINGERS



You can remove the entire column-detector assembly from a Packard Gas Chromatograph in about 30 seconds . . . without tools . . . without touching heated oven surfaces. (Putting it back is just as easy.) This lets you work *outside* the heated oven area when you change columns and detectors, replace septums or make leak checks. And columns can be changed without disconnecting carrier gas lines, eliminating the risk of column contamination. ■ Other features of this modular line of instruments include: programmed temperature or isothermal operation; separate heat controls at inlet, outlet and detector; interchangeable argon ionization, flame ionization, electron capture and thermal conductivity detectors; water-cooled oven. ■ Every Packard Gas Chromatograph is installed by a trained factory representative and carries a full one-year warranty. For complete information call your Packard Sales Engineer or write Packard Instrument Company, Inc., 2200 Warrenville Road, Downers Grove, Illinois.

Packard

Better film, how and why

"Improved Type" is now surprinted on the 135- and 120-size cartons of KODAK High Speed EKTACHROME Film. After a year we'll probably drop the surprint, on the assumption that the unimproved type will have been forgotten. Yet we have good reason to believe the unimproved type had pleased its users mightily despite alternatives offered them from other quarters. Shunning the windiness that generally accompanies such righteous proclamations, let us specify just what has been improved:

1. Color reproduction—particularly of reds, yellows, and flesh tones—has been altered the better to fit more people's perceptions of reality. This is an incredibly complex matter. The pigment in a nasturtium is really not the same as the dyes that must be synthesized inside a few cubic microns of gelatin matrix that has been pointed at a nasturtium.

2. Sharpness.

3. Resistance to deterioration of photographic properties in storage before processing, particularly at high humidity.

4. Elimination of the special high-intensity re-exposure step during the processing that converts the camera film to a positive transparency.

5. Less sacrifice in quality when the processing is adjusted to raise the effective exposure index above normal (160 for Daylight Type and 125 for Type B).

That last point goes straight to the reason for existence of this EKTACHROME Film: to serve those who, either from preference or necessity, want more individual process control over their photographs than they can get with KODACHROME Film and other popular color films. Though this supersensitive clientele constitutes a somewhat rare species, we see nothing wrong in currying favor with them and even improving our response to their desires. The fight is fairer and success is sweeter when achieved because more people like you. Which is a pretty righteous proclamation.

What's an isomer, Jim?

2',7'-Bis(acetoxymercuri)fluorescein (EASTMAN 9963), or fluorescein mercuric acetate (FMA), as it is called by the sensible people who discovered that its fluorescence is quenched by a thiol group or at high pH by a disulfide group, has become the reagent for detecting 10^{-10} mole of disulfide by spraying an alkaline solution on a paper chromatogram. Their publication (*Anal. Biochem.*, 9:100 (1964)) slightly predated the advent of the EASTMAN® CHROMAGRAM® System of thin-layer chromatography, which may well turn out to yield faster and better resolved separations for this visualization technique. They also describe a procedure with a solution of the reagent for the continuous assay of cystine-containing peptides in column effluents. Interest runs high in such peptides. Disulfide links are important in giving proteins their immunologically significant shapes.

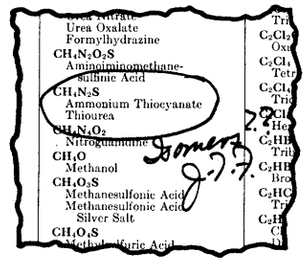
EASTMAN *9963 is one of 1173 new items by which the brand new List No. 44 of* EASTMAN *Organic Chemicals is richer than its predecessor. A copy of List No. 44 is obtainable free from Eastman Organic Chemicals Department, Distillation Products Industries, Rochester, N. Y. 14603 (Division of Eastman Kodak Company).*

A grandfather named Jim Fuess runs the department. One measure of what he has accomplished by investing much of his life in his job is the number of authors in the world's chemical literature each year who see fit to mention Eastman as their source of compounds, despite having paid full catalog price for them.

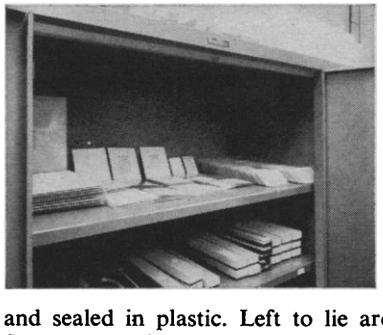
For List No. 44 Jim decided on a new attack against the nomenclature problem that so often frustrates buyers and sellers of organic compounds as they seek each other. The approach is characteristic of the guy: uncomplicated, unpretentious, and if nobody is dazzled by the brilliant originality of the concept, so much the better.

Let us, said Jim, triple the number of "see" references in the alphabetical listing and follow the alphabetical listing with a complete list of empirical formulas arranged according to numbers of atoms of each element in the molecule. Where several names fall under the same empirical formula, customers ought to know enough chemistry to pick the right name.

And that's what you'll find in List No. 44. As it happens, intramural busybodies occasionally intrude into Jim's communications with his customers. One such, an advertising copywriter by trade, has slipped into the catalog a statement about how the empirical list "offers the old concept of isomerism as the bridge from a structural formula to a choice among EASTMAN Organic Chemicals of the same empirical formula." Old dictionaries notwithstanding, Jim doubts that his friends regard ammonium thiocyanate and thiourea as isomers.



Optical memory, ready for shipment, cheap



This is our stock of KODAK IR Phosphor Screens. Business was fine as long as we advertised them, but then we got to wondering if the game was worth the candle. When the advertising slacked off, so did the sales.

They are cards coated with SrS:Eu,Sm and sealed in plastic. Left to lie around under daylight or fluorescents, they store up energy which is re-emitted as an orange glow when the card is hit by infrared. The infrared stimulation spectrum peaks around 1 μ. Well worth the price* when interested in making an infrared laser beam visible.

*2" x 3"—$25 | 4" x 5"—$49 | 8" x 10"—$ 95 | 14" x 17"—$195 | 20" x 24"—$375
Prices subject to change without notice.

Now comes a new reason for interest in the item. *Proceedings of the IEEE* (54:425, 1966) carries a letter to the editor that beefs up its importance somewhat. Dr. Richard A. Soref of the Sperry Rand Research Center has been inspired to look at it as an erasable optical memory offering random access, high capacity, destructive readout (when the infrared hits it), and several hours of storage time. He comes up with the following estimates, which† we hope will be regarded as tantalizing:

With 1.15μ emission from a He-Ne laser focused to 3000 W/cm^2, 5 x 10^5 bits of data per second could be serially read out and erased. With 1.06μ Nd^{+++} emission, the erasure efficiency should double. Spatially, the phosphor has a minimum element size of 4 x 10^{-4} cm^2. Writing to exploit this packing density would take 0.8W at 0.488μ from an argon ion CW laser, and the reading would take 1.2W of CW Nd^{+++} laser light.

Order KODAK IR *Phosphor Screens from Eastman Kodak Company, Apparatus and Optical Division, Rochester, N. Y. 14650 (716-325-2000, ext. 5166).*

†In combination with electro-optic light deflectors (*IBM J. Res. Dev.*, 8:64, 1964; *Bell Sys. Tech. J.*, 43:821, 1964).

The hope of doing each other some good prompts these advertisements

Kodak

lap between these "hadal" and abyssal faunas. The great hydrostatic pressure is a factor restricting the diversity of the hadal fauna while intensive sedimentation creates favorable feeding conditions. Holothurians dominate in both number and biomass, with bivalve mollusks and polychaetes ranking second. Belyaev concluded that, owing to narrow specializaton, the hadal fauna has no further evolutionary prospects and is incapable of evolving into higher taxons.

R. Hessler and H. Sanders (Woods Hole Oceanographic Institution) reported on an elegant and intensive study of the deep-sea benthic fauna and arrived at some rather unorthodox conclusions. About 100,000 specimens were collected along a transect from New England to Bermuda. They found that great diversity in fauna is characteristic of deep-sea assemblages and suggest that the deepsea is not the harsh environment it usually is assumed to be. By the very constancy of the regime, they suppose that the abyss can and does support a highly diversified fauna. They find no diminution of species with depth. The fauna is strongly layered with depth but there is a continuum of change. An abrupt break was observed only at the shelfbreak where eurythermal shallow-water forms are almost entirely replaced by deep stenothermal species.

G. L. Clarke (Harvard) reported that bioluminescence is a virtually universal oceanic phenomenon both geographically and in depth. This living light is constantly present, but variable in its manifestations. The maximum display is in the upper 100 meters (because of dinoflagellates), with a secondary display at about 900 meters. However, even at a depth of 3740 meters, bioluminescence was detected by a sensitive bathyphotometer. Flashes occur at rates from 1 to more than 100 per minute. It was inferred that in the clearest water deep-sea fish can detect ambient daylight down to 1300 meters. Similar results were presented by I. I. Guitelson (U.S.S.R.), who noted that the role of luminescence remains undetermined and not at all clear.

In the euphoric, popular mind the ocean is a vast cornucopia, an untapped reserve of food and mineral resources. J. Strickland (Scripps Institution of Oceanography) took issue with this rosy-hued view. He seriously doubts that we will have the requisite ability to describe, or sufficient understanding to manipulate, the marine environment by the time mankind is faced with the ultimate need for large-scale aquaculture and waste disposal, unless we bring about a revolution in our approach to the study of the ecology of the open sea, both in technique and the magnitude of manpower and financial resources.

The congress ended at the Palace of Congress, within the Kremlin walls, with a summing up of impressions and results by a dozen or so leading scientists in the various oceanographic disciplines, a sumptous Russian banquet, and a presentation by the Bolshoi Ballet in which the rising ballerina was, of all things, the daughter of a professor of geophysics. A third congress will be convened about 5 years hence. Many of us prodded the British to host this meeting to suitably commemorate the 100th anniversary of the sailing of the Challenger Expedition (1872–76) which founded scientific oceanography. The only offer announced at the meeting, however, was an invitation to meet in Valparaiso, Chile.

Field trips after the congress included visits to Leningrad, the Black Sea region or the Lake Baikal area. The highpoint of the Baikal trip was the visit to the Limnological Institute on Lake Baikal at the southern toe of this great crescent-shaped lake. Lake Baikal is the deepest (1620 meters) lake in the world and, although smaller in surface area than Lake Superior, Lake Michigan, or Lake Huron, it contains more water than all of the Great Lakes combined. It contains 23,000 km^3 of fresh water, or about 20 percent of the world supply.

Geologically, Baikal is a rift valley like the rift valleys of Africa and is presumably related to some type of mantle activity which has placed the sialic crust under tension. One wonders if this isolated rift may somehow be an extension of the world-wide, mid-ocean rift system, as the African rifts seem to be. However, the Soviets are inclined to regard the Baikal rift as a portion of a closed system in central Siberia only 1000 kilometers in length.

The ecology of Lake Baikal is exceedingly interesting, for it is an ancient lake formed in the Miocene about 20 million years ago. Two-thirds of its 1800 animal species are endemic. There is an especially rich collection of endemic gammarid amphipods; 230 species are found here, or more than one-half of all those known in the

world. Especially famous is the herd of 30,000 endemic Siberian seals or nerpa (*Foca siberica*). The geologic setting of Baikal is much like that of Lake Tanganyika in Africa, but the ecological situation of the oligotrophic lake offers a strong contrast.

The congress was organized by the U.S.S.R. Academy of Sciences through special agreement between Unesco and the Soviet government. It received financial support from the scientific Committee on Oceanic Research, the Food and Agriculture Organization of the United Nations, the World Meteorological Organization, and the International Atomic Energy Agency.

We may hope, and even expect, that with the next congress we will see more input from sophisticated theory, more problem-oriented rather than survey-oriented ship programming, and better and more thorough data reduction, all of which should yield a more perceptive insight into our deep and wide ocean.

ROBERT S. DIETZ
Institute for Oceanography, Environmental Science Services Administration, Silver Spring, Maryland 20910

Forthcoming Events

October

16–20. **Planned Parenthood** Fed. of America, annual mtg., New York. (Planned Parenthood—World Population, 515 Madison Ave., New York 10022)

17–18. **Bioengineering Education**, symp., Rose Polytechnic Inst., Terre Haute, Ind. (R. M. Arthur, Rose Polytechnic Inst., Terre Haute)

17–18. **Systems Science and Cybernetics**, conf., Inst. of Electrical and Electronics Engineers, Washington, D.C. (J. E. Matheson, Stanford Research Inst., Menlo Park, Calif. 94025)

17–19. **Automation in Analytical Chemistry**, intern. symp., Technicon Corp., New York, N.Y. (J. E. Golin, Technicon, Ardsley, N. Y.)

17–19. Chemical Inst. of Canada, 16th Canadian **Chemical Engineering** conf., Windsor, Ont. (P. M. Reilly, Polymer Corp., Sarnia, Ont., Canada)

17–19. **National Acad. of Sciences**, autumn mtg., Duke Univ., Durham, N.C. (Home Secretary, NAS, 2101 Constitution Ave., Washington 20418)

17–19. **Plastics**, intern. congr., "Processing Polymers to Products," Amsterdam, Netherlands. (Congress Bureau Royal Netherlands Industries Fair, Vredenburg 49, Utrecht)

17–20. **Cellular Chemistry**, intern. symp., Ohtsu, Japan. (S. Seno, Biwako Hotel, Ohtsu)