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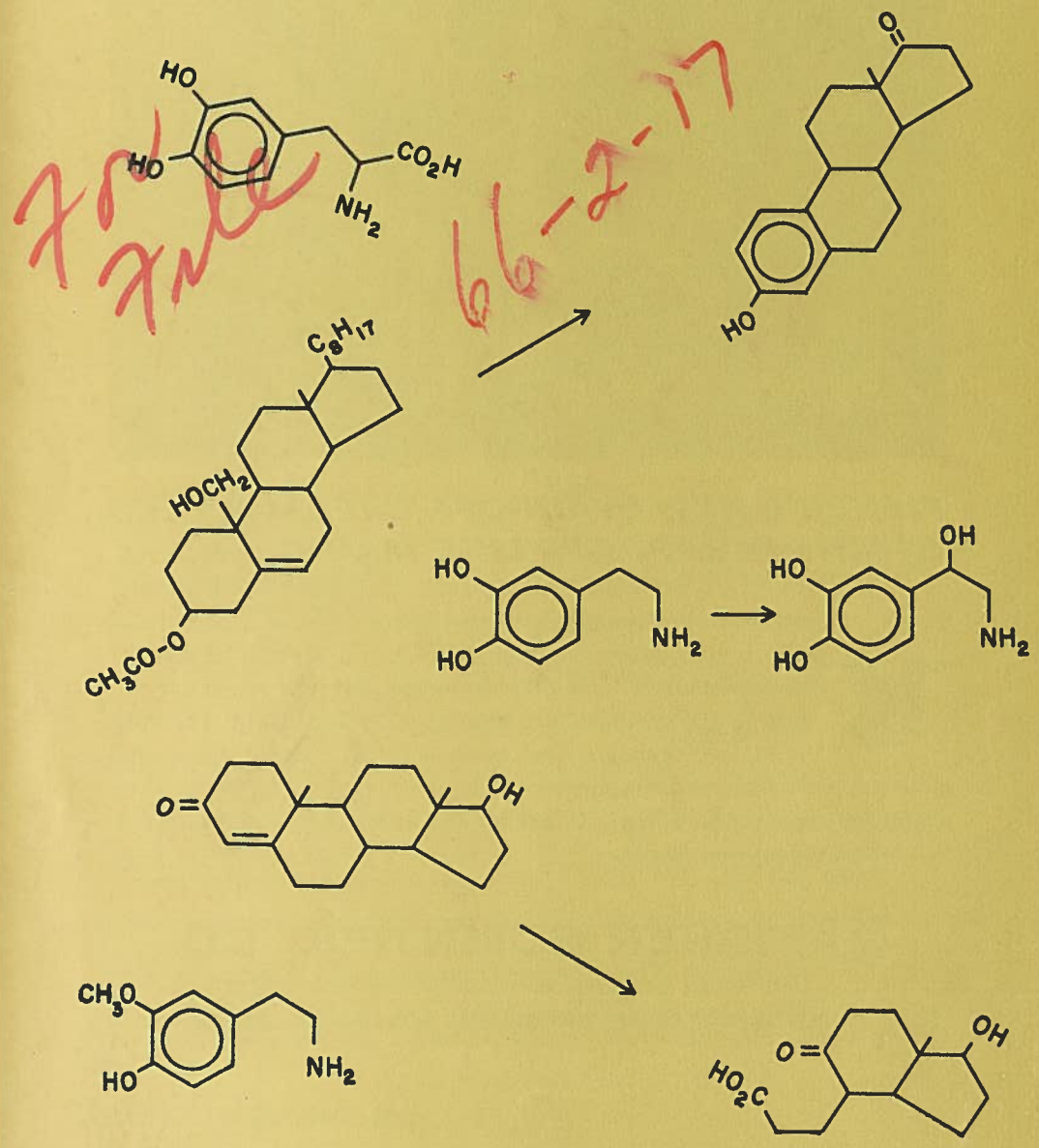
# THE CHESAPEAKE CHEMIST

MARYLAND SECTION  
AMERICAN CHEMICAL SOCIETY

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FEBRUARY, 1966





# THE CHESAPEAKE CHEMIST

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Kenneth S. White ..... Editor  
 James Leslie ..... Associate Editor  
 University of Maryland  
 636 W. Lombard Street  
 Baltimore, Md. 21201

R. J. Allgeier ..... Assistant Editor  
 U. S. Army Biological Laboratories  
 Fort Detrick, Frederick, Md. 21701

Alvin Bober ..... Assistant Editor  
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 103 S. Gay Street  
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 Fort Detrick

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 Edgewood Arsenal

Ernest Levens  
 Douglas Aircraft Company, Inc.

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 Baltimore, Md. 21203

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 Chase and Charles Streets  
 Baltimore, Md. 21201

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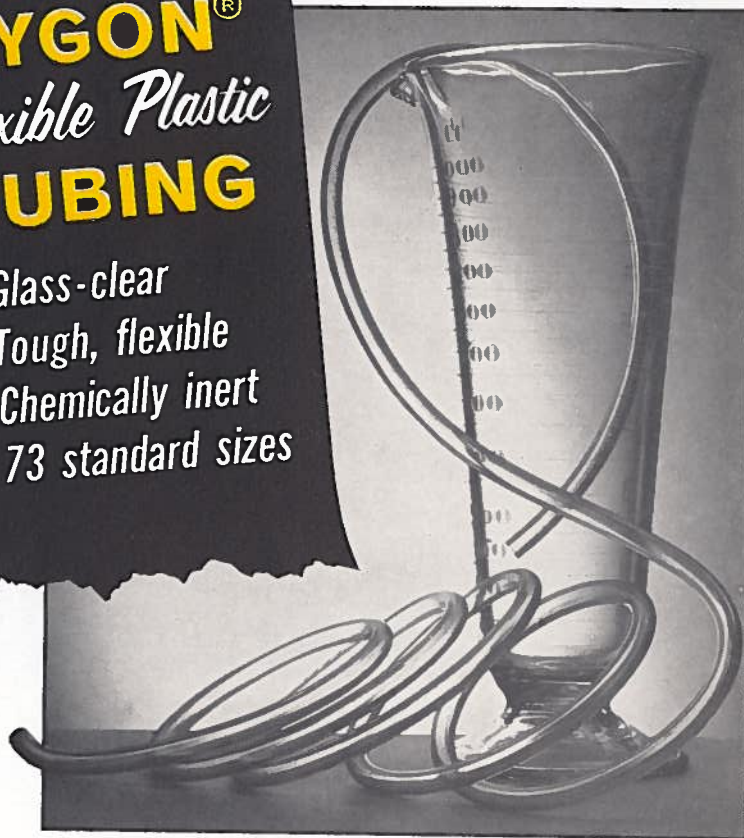
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## FEBRUARY MEETING

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DR. CHARLES J. SIH



DR. BERNHARD WITKOP

**DATE:**

Wednesday, February 16, 1966

**PLACE:**

Eudowood Gardens Lecture Room,  
Eudowood Plaza, Joppa Road near  
Goucher Blvd.

**SPEAKERS AND TOPICS:**

5:30 P.M. Dr. Charles J. Sih, School of Pharmacy, University of Wisconsin, Madison, Wisconsin. "Recent Advances in Microbiological Transformations of Steroids" (see page 8).

8:30 P.M. Dr. Bernhard Witkop, National Institutes of Health, Bethesda, Maryland. "Recent Advances in the Chemistry and Biochemistry of Catecholamines" (see page 9).

A biography of Dr. Sih is presented on page 8 and that of Dr. Witkop on page 9.

**COCKTAILS AND DINNER:**

Eudowood Gardens Dining Room. Price is \$2.75 per person for cocktails (6:45 7:15 P.M.) and dinner (7:15 P.M.). Free parking. Reservations must be received no later than February 11. Use reservation form on page 10. We encourage you to bring your wife and friends to both the dinner and the meeting.

**SOCIAL HOUR:**

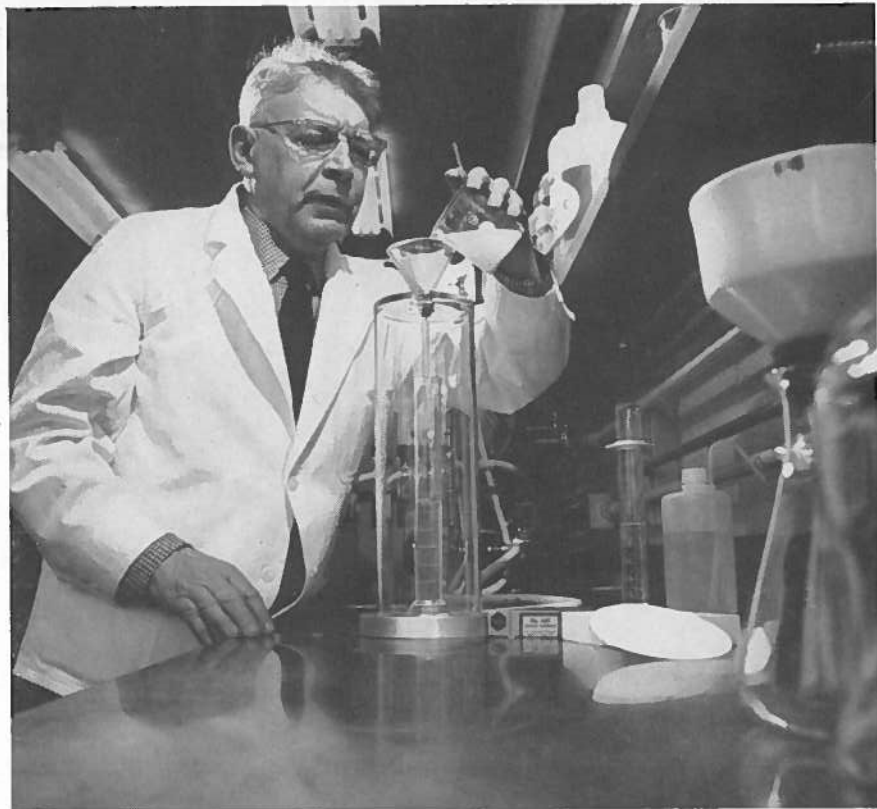
There will be a social hour after the meeting. Refreshments will be served. All are welcome.

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# CHEMICAL SAFETY NEWSLETTER

## CHEMICAL LABORATORY FUME HOODS

The laboratory fume hood, an essential factor in the safe conduct of chemical experimentation, is unfortunately often poorly designed or located and, more often, improperly used. All too frequently seen are: attempt to exhaust ether fumes into a hood located 10 feet away; hood jammed with stored chemicals and obsolete apparatus; maladjustment of hood baffles; hood placed next to a swinging door so that turbulence from every passerby disrupts its proper functioning; and, most seriously, operation with the sash wide open so that the hood is least effective and the protection of the safety glass in case of accident is lost.

Basic requirements for the design and location of laboratory hoods include the following (1):

1. Exhaust volume: 100 cfm per sq. ft. of face opening for nuisance, corrosive or moderately toxic materials, or tracer quantities of radioisotopes; 150 cfm/sq. ft. of opening for highly toxic materials (threshold limit value of 5 ppm or less; 0.2 mg/m<sup>3</sup>) or low MPC radioactive materials; glove box preferred (use bench hood with extreme caution and only under ideal conditions) for very highly toxic materials or pathogenic organisms.
2. Provide uniform exhaust air distribution in hood. Adjustable baffles and slots are acceptable, but subject to tampering. Avoid obstructing air flow with stored materials or non-essential apparatus.
3. Locate hood away from heavy traffic aisles, doorways and supply grilles.
4. Use corrosion resisting materials for expected use (hoods for perchloric acid service require special precautions).
5. Locate exhaust fans outside of buildings. This reduces fan noise,

but, more importantly, places the duct system within the building under negative pressure to prevent loss of contaminants in case of duct leakage.

6. Avoid sharp corners at jambs and sill. Flanges and rounded hood inlets are desirable.
7. Provide filters for radioactive materials (and highly toxic particulates) in greater than "exempt" quantities.
8. A by-pass opening in the hood is desirable to avoid excessive indraft under partially-closed sash and to simplify laboratory air flow balance.
9. Adjust air flow for  $\pm 20\%$  variation in face velocity, using suitable velocity measuring instrument. Inspect hood periodically; monthly for new or critical installation, quarterly or semi-annually for others.
10. Provide tempered air to laboratory. Make-up air volume to be selected for slight indraft of air from corridor or adjacent rooms.
11. Conserve conditioned air by use of glove box, by use of sliding sash on large hoods (a growing trend for improved personnel protection and air flow) or by introduction of outside air (tempered in winter) above hood area.

The design and location of fume hood exhaust stacks is almost uniformly poor, either through ignorance of good stack design criteria, the desire for an architecturally pleasing roof line unbroken by tall stacks, or both. This will be appreciated by anyone who has experienced contaminants released into the building from a leaky duct under positive pressure, stack effluent preventing work on the roof or re-entering the building around the stack petticoat or via the air conditioning intake, other operations being disrupted by inadequately diluted fumes sweeping around and into the building, and similar unpleasant occurrences.

(Continued on page 10)

66-2-22

### CHARLES J. SIH

Charles J. Sih was born in Shanghai, China. He received an A.B. degree from Carroll College, Montana in 1953, an M.S. from Montana State College in 1955, and a Ph.D. in microbiology from the University of Wisconsin in 1958. He then spent two years as a senior research microbiologist at the Squibb Institute for Medical Research. In 1961 Dr. Sih returned to the University of Wisconsin as assistant professor in the School of Pharmacy, and became associate professor in 1964. His research interests include microbial physiology and biochemistry.

### RECENT ADVANCES IN MICROBIOLOGICAL TRANSFORMATIONS OF STEROIDS

Considerable knowledge has accumulated over the past decade in the field of microbiological transformations of steroids. Microorganisms are now known to catalyze a variety of reactions such

as: hydroxylations, cleavage of carbon-carbon bonds, epoxidation and cleavage of epoxides, interconversion of hydroxyl groups to ketones and aldehydes, introduction and reduction of double bonds, cleavage of aromatic rings, etc. Among these, the hydroxylations at C<sub>11</sub> and C<sub>16</sub>, and the introduction of a double bond at the 1, 2-position are transformations currently used for the preparation of pharmacologically-active steroid hormones.

Since many of these organisms are capable of oxidizing the steroid molecule completely to CO<sub>2</sub> and H<sub>2</sub>O, the fermentation conditions must be carefully controlled for the desired product to accumulate in the medium. For the past five years, our research efforts have been devoted to the study of the mechanism by which microorganisms degrade the steroid nucleus to CO<sub>2</sub> and H<sub>2</sub>O. By the application of this basic knowledge, an efficient synthesis of estrone and 19-norsteroids from cholesterol has been achieved.

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### DR. BERNHARD WITKOP

Bernhard Witkop was born in Freiburg, the center of the Black Forest, in 1917. He graduated from the University of Munich in 1938 and two years later received the Ph.D. degree in chemistry (Dr. rer. nat.). His thesis work was on phalloidin, the highly toxic cyclopeptide from *Amanita phalloides* (deathcap), Europe's most poisonous mushroom. His postdoctoral work with Heinrich Wieland, professor of chemistry at Munich and 1929 Nobel Laureate, was on the toxic alkaloids from Calabash curare, studies which led him into indole alkaloids at an early stage. He served one year as professor of Chemistry at the Weihenstephan Agricultural and Technical College (U. S. Third Army). During the period from his graduation in 1938 until 1946, he served as private assistant to Prof. Wieland. During the year 1946-47 he was Privatdozent for Organic Chemistry at the University of Munich.

In 1947, he came to the United States as Matthew T. Mellon Fellow in Chemistry at Harvard University, where he remained until 1950 as instructor and lecturer. Since 1950 he has been at the National Institutes of Health, first with the Heart Institute and, since 1952, with the Institute of Arthritis and Metabolic Diseases. Since 1954 he has also served on the staff of the NIH graduate school. In 1957 he succeeded Lyndon F. Small as Chief of the Laboratory of Chemistry.

Dr. Witkop is author or co-author of over 200 papers. These have included many collaborative studies with workers both in his own and in other laboratories. His contributions within recent years have been to the selective modification and cleavage of peptides and proteins by non-enzymatic methods, to the fundamental chemistry and biochemistry of amino acids, especially of known and new building stones of collagen and their biosynthesis, to the photochemistry of amino acids and nucleic acids and to the field indicated by the title of his lecture.

### RECENT ADVANCES IN THE CHEMISTRY AND BIOCHEMISTRY OF CATECHOLAMINES

Norepinephrine, the key neurochemical transmitter of nerve impulses, was not discovered until 1948. Knowledge about the enzymes and steps in its biosynthesis has come to us only in recent years. Hydroxylation of the nucleus and of the side chain of catecholamines are achieved by non-enzymatic and enzymatic methods. Novel metabolites have been anticipated and found in this way. Selective tritiation of catecholamines and their precursors has made possible a detailed study of the mechanism of these hydroxylation reactions, a rapid assay of tyrosine hydroxylase and dopamine  $\beta$ -hydroxylase and a convenient technique for measuring the release of peripheral norepinephrine *in vivo*.

The release of cardiac tritiated norepinephrine provides a new pharmacological parameter for the characterization and classification of a large number of pressor amines, adrenolytic and CNS agents. A differentiation between tranquilizers and antidepressants rests on the suppression of norepinephrine release. A logical extension of this work, carried out by Drs. John W. Daly and Cyrus R. Creveling, is the first *in vivo* assay of inhibitors of aromatic (or dopa) decarboxylase.

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### COPY DEADLINE

Material for publication in the March issue must be received by Editor by February 10.

(Continued from page 7)

A straight stack, terminating a minimum of 6 feet above the roof and located downwind of the air-conditioning intake, is preferred. The conventional "Chinese hat" weather cap does little good, often harm; if deemed necessary, it should be fixed at least one stack diameter above the top of the stack (1). Excellent design information for determining the stack type, height and location to prevent re-entry of exhaust fumes can be found in two recent publications (2, 3).

REFERENCES

1. American Conference of Governmental Industrial Hygienists, "Industrial Ventilation, A Manual of Recommended Practice", Committee on Industrial Ventilation, P. O. Box 453, Lansing, Michigan 48902, 8th edition, 1964.
2. Halitsky, "Estimation of Stack Height Required to Limit Contamination of Building Air Intakes," Amer. Ind. Hyg. Assoc. J., 26, 106-16 (1965).
3. Clarke, "The Design and Location of Building Inlets and Outlets to Minimize Wind Effect and Building Re-entry of Exhaust Fumes," Amer. Ind. Hyg. Assoc. J., 26 242-8 (1965).

Ernest Levens  
ACS Committee on Chemical Safety  
Director of Safety  
Douglas Aircraft Company, Inc.  
Santa Monica, California

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Edgewood Arsenal, Md. 21010
- Counts, Jules B.,  
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- Freedman, Eli, 2411 Diana Rd.,  
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- Klein, Joseph H.,  
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- Lee, Hanji,  
5325 Jamestowne Court,  
Baltimore, Md. 21229
- Woolridge, Alfred L.,  
3503 Edgewood Rd.,  
Baltimore, Md. 21215

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- Kauser, Dennis E., Box 757,  
Edgewood, Md. 21040

(Continued on page 14)

**Tear-Out Dinner Reservation Form**

There is enclosed \$ \_\_\_\_\_ (\$2.75 per person)\* for cocktails and dinner at Eudowood Caterers, Eudowood Plaza, on Wednesday, February 16, 1966 for the following persons.\*\*

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\*Make checks payable to Maryland Section, ACS and mail together with reservation form to Dr. F. Marion Miller, School of Pharmacy, University of Maryland, Lombard and Greene Sts., Baltimore, Md. 21201.

\*\*Return by February 11. Please be prompt. If required, it is possible to accommodate a few late reservations.

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Johns Hopkins University

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\*\*If fee exempted, please indicate category: High school teacher, student, military enlisted person.

Registration form submitted by .....





## ACS MEETING - IN - MINIATURE

A bi-sectional ACS regional meeting will be held on Friday, May 6, 1966 at the University of Maryland, College Park, Maryland. The Washington Section and the Maryland Section will be co-sponsors for the Meeting-in-Miniature. Dr. Kenneth Henery-Logan of the staff of the Chemistry Department at the University of Maryland and Mr. Alvin Bober of the U. S. Customs Laboratory, Baltimore, Maryland will be the general co-chairmen.

Seven concurrent sessions will be held on Friday, the 6th. These sessions will include programs in Analytical, Biochemical, Inorganic, Organic, Physical, Polymer, and Instrumentation Methods for Determining Organic Structures. There will also be a separate Women's Program. Papers are invited, and the details for submission of papers are given below. For the meeting to be a success, we request your papers.

**GENERAL PAPERS**—Members are cordially invited to present papers at the various sessions of the Meeting-in-Miniature and their attention is called to the following details.

A. Titles and names of authors accompanied by a short abstract not exceeding 200 words or the equivalent should be sent directly to the chairman for the appropriate session in time to reach him no later than March 11, 1966. Please note this deadline. It must be strictly observed because of the time required for making up of the program and for the printing of this information in Chemical and Engineering News.

B. The chairman for each session is as follows:

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DR. VICTOR S. FRANK  
W. R. Grace Research Center  
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C. The committee has set the time for contributed papers at 15 minutes, which must include at least 5 minutes for discussion. This procedure is intended to improve the presentation and discussion of contributed papers.

### MEMBERSHIP CHANGES

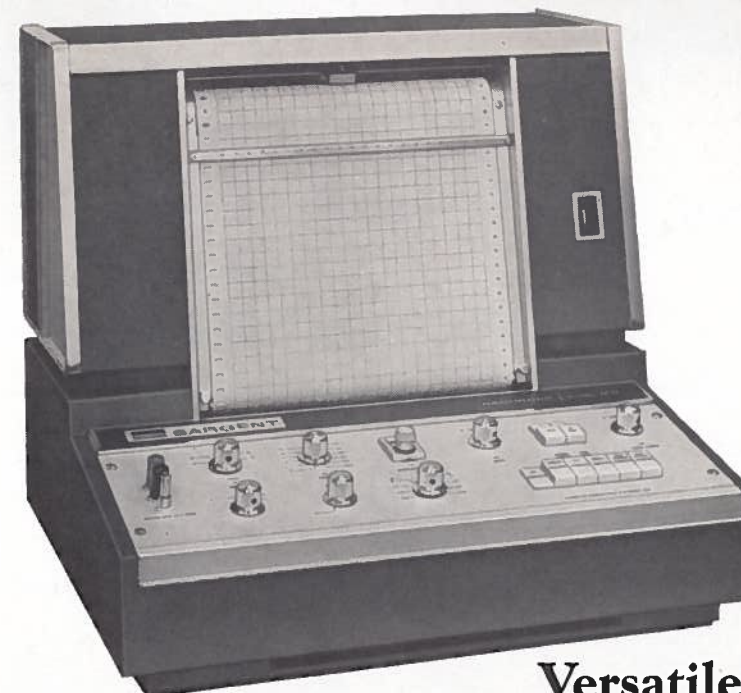
(Continued from page 10)

Koontz, Jesse Lenker,  
Department of Science,  
US Naval Academy,  
Annapolis, Md. 21402

Mason, Walter A., Jr.,  
Dept. of Science,  
US Naval Academy,  
Annapolis, Md. 21402

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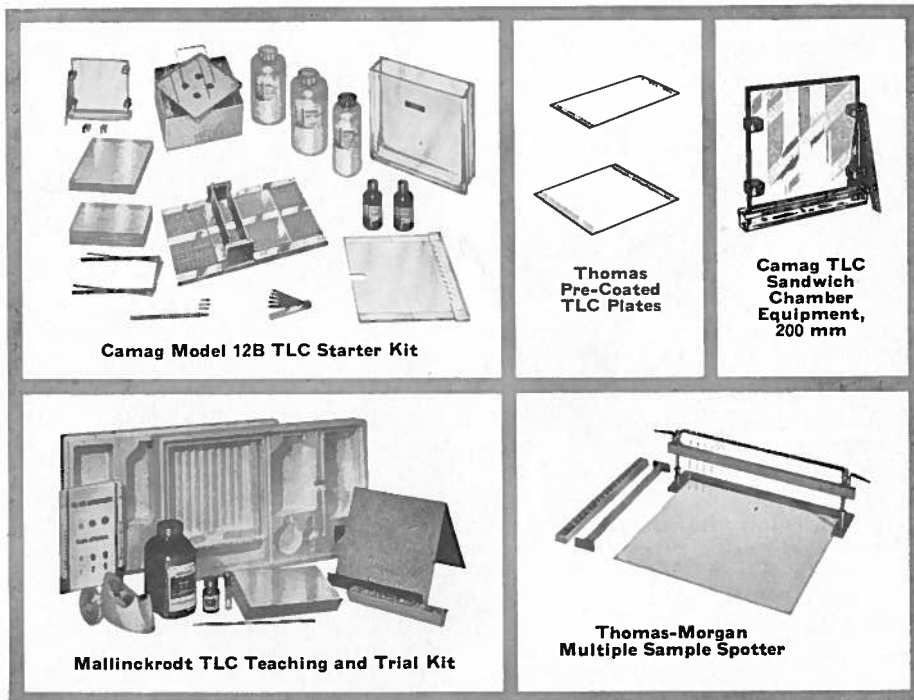


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