

The NUCLEUS

OF THE NORTHEASTERN SECTION OF THE AMERICAN CHEMICAL SOCIETY

January 12, 1956

Thursday, 4:00 p.m.

Symposium, "Chemotherapy of Cancer"

HAROLD C. UREY

University of Chicago

"Abundance of the Elements"

January 12, 1956

Thursday, 8:00 p.m.

PLACES OF MEETINGS

Dinner, 6:30 p.m.

M.I.T. Faculty Club, 50 Memorial Drive, Cambridge

Symposium and Address in Huntington Hall (Room 10-250)

The Massachusetts Institute of Technology

77 Massachusetts Avenue, Cambridge

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THE FOUR-HUNDRED AND FORTY-NINTH MEETING
of the
NORTHEASTERN SECTION A. C. S.

THURSDAY, JANUARY 12, 1956

The Massachusetts Institute of Technology, Room 10-250
Entrance, 77 Massachusetts Avenue or the Eastman Laboratories

AFTERNOON MEETING

Symposium: "Chemotherapy of Cancer"

Sidney Farber, Children's Cancer Research Foundation, chairman

- 4:00 p.m. Edward J. Modest, Children's Cancer Research Foundation
"Organic and Biochemical Approaches"
- 4:40 p.m. Sidney Farber
"The Status of Biological and Clinical Research"
- 5:20 p.m. Questions and Discussion
- 5:30 p.m. Preprandial Hour, M.I.T. Faculty Club, sixth floor,
Sloan Building, 50 Memorial Drive, Cambridge
- 6:30 p.m. Dinner (reservations necessary) in the M.I.T. Faculty Club, Sloan Building,
50 Memorial Drive, Cambridge, 6th Floor.

Price \$2.50 per person (tax incl.)

Should you desire a place reserved, mail the enclosed post card, at once,
or, after 2:30 p.m., Thursday, call UNiversity 4-6900, Extension 2961.

EVENING MEETING

Room 10-250, Huntington Hall, M.I.T.

Arthur C. Cope, presiding

Harold C. Urey, The University of Chicago

- 8:00 p.m. "Abundance of the Elements"
- 9:15 p.m. Social hour in the Moore Room (6-321) M.I.T.

Signing and mailing the dinner card or telephoning for reservations must be regarded as an obligation.

All interested are invited.

After five-thirty o'clock, the Foyer of the M.I.T. Faculty Club, 50 Memorial Drive,
will be available for members of the Section planning to attend the dinner.

A Committee will be in charge.

NORTHEASTERN SECTION FUNDS

The Northeastern Section was incorporated May 26, 1926 under the laws of Massachusetts. The legal name of the corporation is The Northeastern Section of the American Chemical Society, Incorporated.

The Section has five funds, namely:

The Northeastern Section General Fund.

The Norris Award Fund.

The Permanent Trust Fund.

The Publications Fund.

The Richards Medal Fund.

The Northeastern Section will welcome gifts and bequests at any time. Checks payable to John T. Blake, Treasurer of the Board of Trustees, may be sent to his address, Simplex Wire and Cable Company, 78 Sidney Street, Cambridge, Mass.

Funds given to the Northeastern Section should be left in the following manner:

I give and bequeath the sum of dollars to the Northeastern Section of the American Chemical Society, Inc., for the Fund (s) checked below

- Northeastern Section General Fund
- Permanent Trust Fund
- Publications Fund

The NUCLEUS

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THE NUCLEUS is distributed to the members of the Northeastern Section of the American Chemical Society, to the secretaries of the Local Sections, and to editors of all local publications.

Forms close for advertising on the 15th of the month and for text on the 12th of the month preceding issue.

Editorial

WELCOME TO AN OLD FRIEND

It is now twenty years since the Northeastern Section greeted Harold C. Urey as a speaker on its evening program. At that time, May 10, 1935, his Nobel Prize was only half a year old. Appropriately, he presented a discussion of the "Separation of Isotopes." Only older members of our Section will recall Huntington Hall in Rogers Building of Tech-on-Boylston-Street. In this far-famed Hall we gathered, on that occasion, not only to hear a Nobel Laureate speak with the voice of authority on the then not-so-old story of isotopes but, as well, to elect officers for the year 1935-1936. In those days the section numbered only a few hundred members and, with a circle of acquaintances nearly encompassing the entire membership, election was by voice vote. Now-a-days the printed ballot must be employed. Even the present Huntington Hall at M.I.T. with a capacity of 525, can seat less than a quarter of the present number of members.

Dinner, in those days,—was the Engineers Club at 2 Commonwealth Avenue, Boston. According to the custom, prevailing at that time, Professor Frederick G. Keyes was the dinner speaker. For his topic he chose "A Boarderline Science."

Now, in 1956, both Hall and Club have vanished from their long accustomed places. By contrast, the two speakers still remain with us to bear witness to the call of science. On this occasion the Northeastern Section of the A.C.S. takes pleasure in saying to both of our well-remembered guests, a "Happy New Year and many happy returns of the Day."

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JANUARY SPEAKER



HAROLD CLAYTON UREY

Harold Clayton Urey, the January speaker before the Northeastern Section of the A.C.S. was born in Walkerton, Indiana, April 29, 1893. For his higher education he journeyed westward. At the University of Montana, he won the B.S. degree in 1917 with a major in biology and a minor in chemistry. The doctorate was earned in 1923 at the University of California. This time chemistry was his major

study and physics his minor. Thus equipped with a Ph.D., he became an American - Scandinavian Fellow at Copenhagen for the year, 1923-1924.

Returning to the United States, he worked for five years as an associate in chemistry at Johns Hopkins University. Then, in 1929, Columbia made him an associate professor. Here he remained for sixteen years and here, too, he was engrossed by his researches on deuterium which were to lead to the Nobel Laureate in 1934.

Following the Nobel Prize have come many honors including ten doctor of science degrees and, recently, an LL.D. from the University of California. Honorary memberships and foreign memberships have been conferred by many learned societies. He holds the Willard Gibbs Medal of the American Chemical Society, 1934, the Davy Medal of the Royal Society of London, 1940, The Franklin Medal of the Franklin Institute, 1943, the Medal for Merit, 1946, the Cordoza Award, 1954, the Honor Scroll Award, Chicago Chapter, American Institute of Chemists, 1954, and the Joseph Priestly Award, Dickinson College, 1955.

In addition to many papers in scientific journals, Dr. Urey is the author, with A. E. Ruark, of "Atoms, Molecules and Quanta," 1930 and "The Planets," 1952. His principal fields of

(Please turn to Next Page)

(Continued from Previous Page)

interest embrace entropy of gases; atomic structure; absorption spectra and structure of molecules; discovery of deuterium; properties and separation of isotopes; exchange reactions; measurement of paleotemperatures; and chemical problems of the origin of the earth.

After the recent war, he withdrew from Columbia to join the Institute for Nuclear Studies at the University of Chicago. At the present time he is Martin A. Ryerson Distinguished Service Professor of Chemistry, Institute for Nuclear Studies, University of Chicago.

ANALYTICAL GROUP

STEPHEN M. NAGY, Chairman, M.I.T., UN 4-6900, Ext. 518

FRANK O'HALLORAN, Secretary-Treasurer, Water Laboratory, Commonwealth of Massachusetts, UN 4-6900, Ext. 3306

The January meeting of the Analytical Group will be held at 8:00 p.m., Wednesday, January 18, 1956 in Room 2-131, M.I.T.

Elkan R. Blout of Polaroid Corporation, will speak on

"Microspectroscopy"

Prior to the meeting, there will be a dinner at 5:45 in the M.I.T. Faculty Club on the sixth floor of the Sloan Building at 50 Memorial Drive, Cambridge. Reservations may be made by telephoning Mr. Frank O'Halloran, UN 4-6900 Ext. 3306.

All interested persons are welcome to attend both the dinner and the meeting.

ANALYTICAL SPEAKER

Elkan R. Blout was born in New York, New York, on July 2, 1919. He was awarded an A.B. degree from Princeton University in 1939 and a Ph.D. in chemistry from Columbia University in 1942. Following the doctorate he held a National Research Council Fellowship at Harvard and



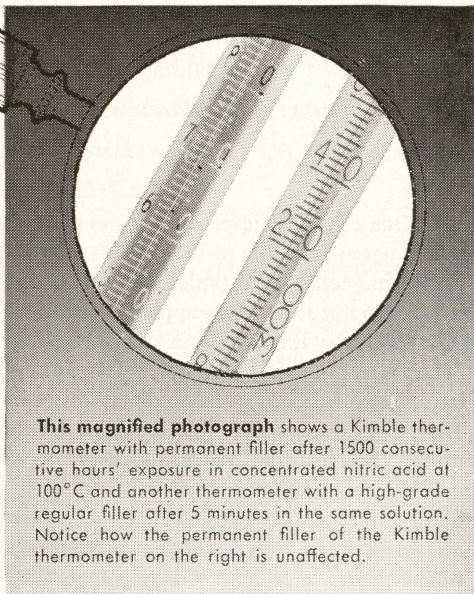
ELKAN R. BLOUT

then joined Polaroid Corporation. He was Research Associate at Harvard Medical School from 1950 to 1952, and has been consultant in chemistry at the Children's Medical Center since 1952. He is now Associate Director at Polaroid.

Dr. Blout has been active in research in infrared and ultraviolet spectroscopy, especially relating to nucleic acids and proteins. He has developed infrared microspectroscopic techniques and methods for the determination of the infrared spectra of organic compounds in aqueous solutions. His work has also involved the synthesis of organic compounds, especially those related to photographic processes. Recently his research has included work on the synthesis and properties of very high molecular weight poly- α -amino acids and a comparison of their properties with those of proteins.

Dr. Blout is a member of the American Chemical Society, The Chemical Society, American Association for the Advancement of Science, and the Optical Society of America. He has been elected a Fellow of the New York Academy of Sciences and a Fellow of the American Academy of Arts and Sciences.

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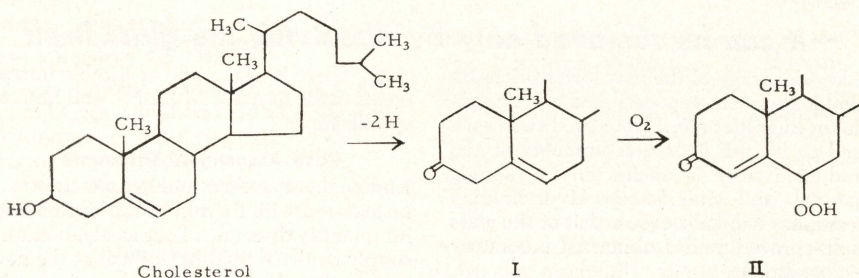
CHOLESTEROL AND CANCER

By LOUIS F. FIESER, Harvard University

Abstract of an address before the Northeastern Section, A.C.S.

December 8, 1955

One chemical approach to the cancer problem is to search for chemotherapeutic agents capable of destroying wild-growing cancerous cells without damage to normal cells, from which malignant cells differ in lacking a control mechanism to stop growth at an appropriate stage. Another approach is in the direction of preventive medicine. A number of chemical compounds are now known capable of inducing tumors in test animals; if any such carcinogenic chemical can be shown likely to be formed in the body, and hence a possibly endogenous carcinogen, measures might be found to inhibit its formation. The hydrocarbon methylcholanthrene was produced in 1933 by chemical degradation of desoxycholic acid, a normal component of human bile, and it was soon found to be a highly potent carcinogen. Present evidence, however, discounts the initially attractive hypothesis that methylcholanthrene can arise as a product of abnormal metabolism and is a causative agent in spontaneous cancer.



Experiments by I. Hieger (London), and more particularly by Fritz Bischoff (Research Institute, Santa Barbara Cottage Hospital, 1946) suggested the possible existence of a steroid carcinogen derived from cholesterol. Under encouragement from Sir Ernest Kennaway, and with the able cooperation of Bischoff in conducting biological assays, the author initiated in 1950 an active search for such a substance. A number of known and a few new products of oxidation of cholesterol were submitted to Dr. Bischoff for testing. Initial results were consistently negative. A succession of hypotheses enlivened the work, but none of them panned out. However, Δ^5 -cholestene-3-one (I), one of the suspects, had such interesting reactivity that oxidation with air in a neutral solvent was tried and found to give the hydroperoxide II. This first known hydroperoxide of the steroid series was found by Bischoff to be a potent carcinogen. There is as yet no evidence that it can arise by oxidation of body cholesterol, but this is a possibility. It would also seem possible that such a transformation can be inhibited by an antioxidant, such as α -tocopherol. Hence an experiment is under way to see if the cancer incidence of pure strain mice can be lowered by maintenance of a diet enriched with α -tocopherol.

SCIENCE AND THE MODERN WORLD CONCEPTION

By GERALD HOLTON
of Harvard University

Abstract of an address before the Northeastern Section, A.C.S.

December 8, 1955

The fundamental thesis, in brief outline, is this: Our modern culture rests on concepts which arose primarily out of the science of the 17th and 18th centuries. Yet the revolutions in science during the last 2 or 3 generations have limited or even made obsolete some of the key concepts, and so have indirectly undermined the foundations of the world view on which our society was built. The reaction, as exhibited for example by some contemporary humanist, has been the rise of a new obscurantism and anti-intellectualism which threatens both the position of science and the conditions under which pure science may flourish. This reaction, in turn, is threatening to drive scientists and humanists into opposing camps. Such a polarization would cut off the possibility of a synthesis of these two great approaches to knowledge in a new Common Understanding such as that which characterized the great Age of Reason and Enlightenment in the 18th century. If this course of events is even faintly probable, we, as scientists and as intellectuals, stand under a double obligation to take definite preventive steps.

Two specific steps toward a solution may be cited: First, to make contact again with the intellectual leaders who have turned their backs on science, we should prepare the type of explanatory treatises on the position of modern science which, in the 18th century, were often prepared by the humanists themselves. And secondly, we should be careful that science is taught not as an enterprise subservient to some utilitarian interest but above all as a great adventure of the intellect. Courses in science should not gloss over the difficult points but should challenge the student's full abilities, in order that he may gain faith in his own intellectual powers, and also that he may encounter those new concepts which society will have to digest if western man is to find once more an intellectual home.

MEETING OF THE DIRECTORS

The December meeting of the Board of Directors was called to order at 4:30 P.M., November 29, 1955, in the Moore Room, M.I.T., Chairman Arthur C. Cope presiding. The following members were present: Avery A. Ashdown, Edward R. Atkinson, Robert D. Eddy, Laurence S. Foster, Ernst Hauser, Lawrence J. Heidt, Arno H. A. Heyn, J. Philip Mason, Martha B. Thomas and George B. Walker, Jr. The minutes of the November meeting were approved as distributed.

There was no report from the Chairman.

The Treasurer's report was read by Martha B. Thomas. During the period from October 29 to November 29, 1955, there was an income of \$18.00.

The total expenses were \$523.01, leaving a balance of \$2,816.00. The report was accepted.

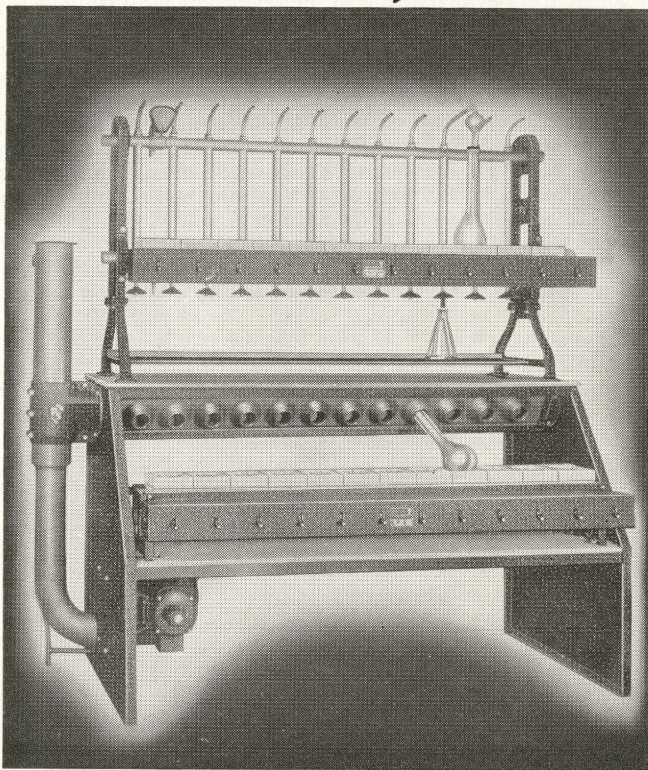
According to J. Philip Mason, Auditor, the record book, check book, cancelled checks and vouchers dealing with the business management of the NUCLEUS, have been examined. All data are correct through October 4, 1955.

Robert D. Eddy reported that the Board of Publications has found that present operations are proceeding satisfactorily. Avery A. Ashdown disclosed that few student affiliate groups have requested copies of THE NUCLEUS. The Chemistry Education Com-

(Please turn to Page 85)

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DIRECTORS

(Continued from Page 83)

mittee is to advise student groups about this offer.

Arno H. A. Heyn advised the Directors that the funds initially allocated to the Membership Committee have been spent. On a motion duly made and seconded, it was

VOTED: That the budget of the Membership Committee be increased from \$50.00 to \$100.00 due to unforeseen expenses.

According to Arno H. A. Heyn the committee hopes to get the new membership drive underway by February 1, 1956.

The subject of a speakers' bureau with permanent secretarial assistance again came up for discussion. George B. Walker, Jr. agreed to follow up the special committee formed last year to consider this proposal.

Chairman Arthur C. Cope announced that the Richards Medal Committee has elected Paul D. Bartlett as Chairman and will meet shortly to choose a medalist for the May meeting.

Lawrence J. Heidt reported on a meeting with the Director of the Science Museum about assistance to the Museum by the Northeastern Section. At present the Museum is experiencing a shortage of space and is unable to present a chemistry exhibit. The Museum is interested in obtaining information about a chemical exhibit at the science museum in Munich, Germany. It is believed that the Section can provide this information from a member planning to visit Germany. The member would act as an official representative of the Museum and would be supplied with credentials. Chairman Arthur C. Cope indicated that he had a candidate in mind.

There being no further business, the meeting adjourned at 5:30 P.M.

Respectfully submitted,
RIDGLEY G. SHEPHERD, JR.

SYMPOSIUM CHAIRMAN



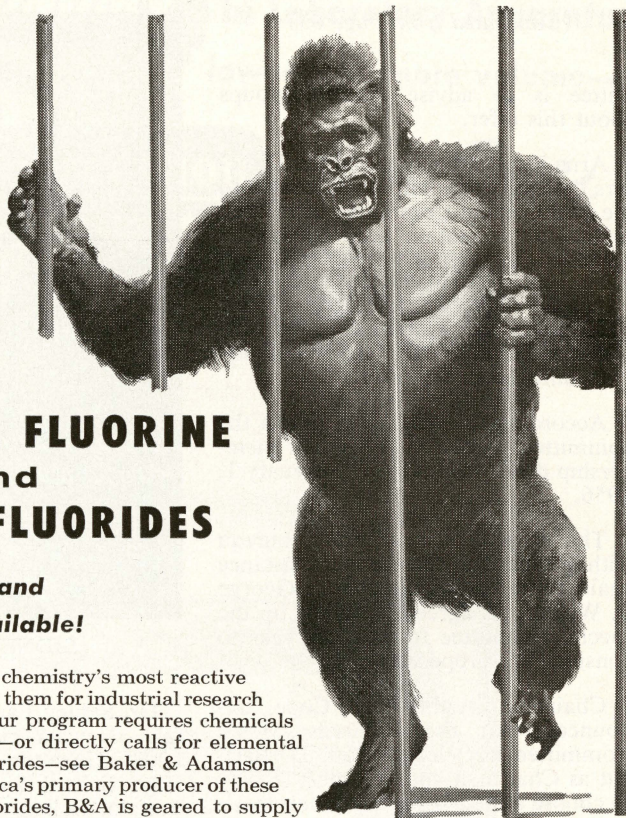
SIDNEY FARBER

Dr. Sidney Farber was born in Buffalo, New York on September 30, 1903. He attended the Masten Park High School and the University of Buffalo, College of Arts and Sciences. Further scientific training was begun in Heidelberg and Frieberg, Germany. He graduated from Harvard Medical School in 1927 and has been a member of its teaching staff and faculty since that time.

In 1927 Dr. Farber joined the staff of the Children's Hospital in the Department of Pathology. He has been in continuous charge of this department since that time and has increased his responsibilities to include the newly organized Division of Laboratories and Research of which he became the first Chairman in 1947. In 1948 he became Professor of Pathology, Harvard Medical School at The Children's Hospital and in the same year founded the Children's Cancer Research Foundation, whose activities are integrated with the Children's Medical Center and the Harvard Medical School. He serves as Director of Research of this

(Please turn to Page 87)

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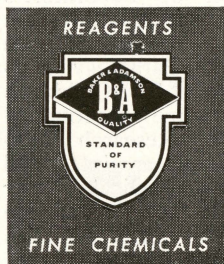
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SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

SIDNEY FARBER

(Continued from Page 85)

Foundation which is housed in the magnificently equipped Jimmy Fund Building.

His chief interests have been in the study of health and disease in infancy, childhood and adolescents. His avocation since 1931 has been the planning and development of the Children's Medical Center. His chief professional concern has been the development of the field of pediatric pathology.

He is a pioneer in the development of basic approaches and their application to the problems of incurable disease in the young. This has led him to advisory participation in the Muscular Dystrophy Research Advisory Board.

In 1950 he was asked to organize a Research Advisory Board for the newly created United Cerebral Palsy Association. He served for five years as Chairman of this Board and has just been elected to life Honorary Chairmanship of this Board.

He serves as Consultant to the Armed Forces Institute of Pathology, and to the National Institutes of Health and is a member of the Advisory Boards of the Cancer Research Institute of the New England Deaconess Hospital and of the Sloan Kettering Institute. As a member of the National Advisory Cancer Council he is concerned with the development of cancer research throughout the country.

His own research in cancer of early life led to his discovery of the action of a folic acid antagonist on acute leukemia in children. This research was responsible for stimulating a new attack on both leukemia and other forms of disseminated cancer. For this Dr. Farber received the Katherine Berkan Judd Award in 1953.

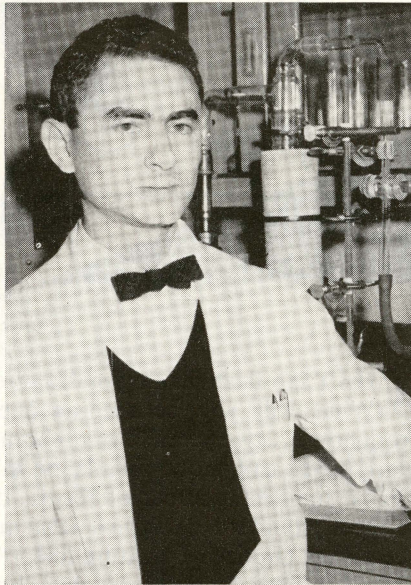
In the Jimmy Fund Building the Children's Cancer Research Foundation has carried out a "vertical program" of research in the chemotherapy of cancer. Here the disciplines of organic chemistry, biochemistry, biology, experimental pathology, bio-

physical chemistry, pharmacology and clinical investigation are brought together in voluntary cooperative programs ranging from basic completely theoretical approaches to practical application of the results of research to more than 270 patients with incurable cancer under treatment at one time.

Dr. Farber is known for his development of the conception of "total care" for the patient with disease said to be incurable with clinical investigation as part of the total care.

In 1954 Dr. Farber was asked to be Chairman of a Committee on Chemotherapy of the National Advisory Cancer Council which has organized a voluntary cooperative research program, truly national in scope to make possible more rapid progress in this field.

SYMPOSIUM SPEAKER



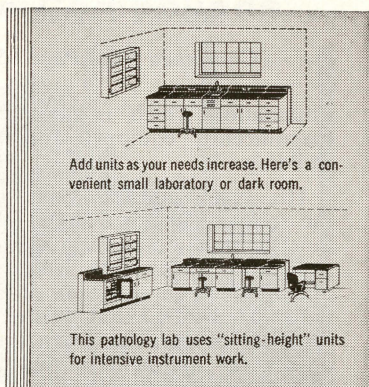
EDWARD JULIAN MODEST

Edward Julian Modest, who will address the afternoon session of the Northeastern Section on January 12, 1956, was born in Boston on September 9, 1923. After high school days in the Cambridge High and Latin School, he entered Harvard University

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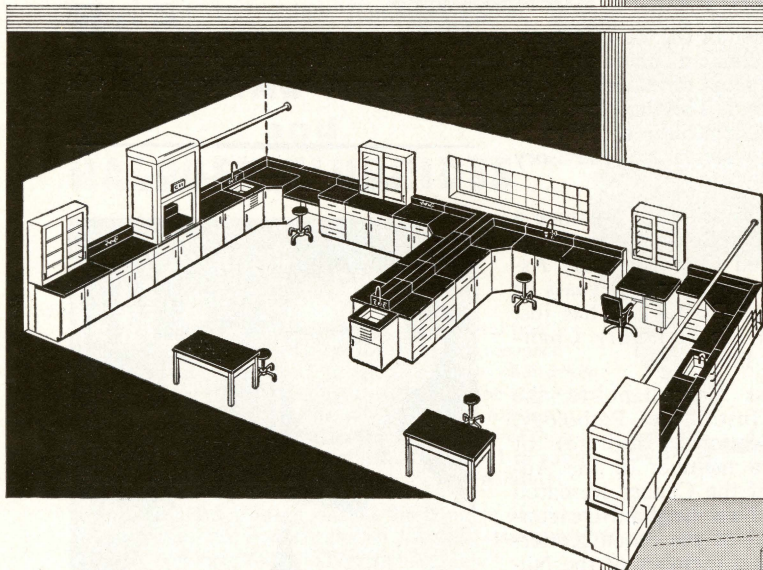
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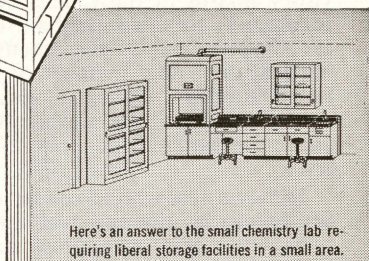
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EDWARD J. MODEST
(Continued from Page 87)

where he received the A.B. degree, cum laude, in 1943. He continued at Harvard for graduate work. In 1949 he completed the requirements for the Ph.D. His thesis was carried out with Professor Louis F. Fieser on the Condensation of Phenyl- and Thienyl-cycloalkenes with Maleic Anhydride.

From 1943 to 1946, he was on active duty, U.S. Navy, principally as Lt. (j.g.), USNR, chief engineering officer, USS George E. Davis (DE 357). In the summer of 1942 he carried out synthetic work on a synthetic rubber project at the Frederick S. Bacon Laboratories, at Watertown, Massachusetts. After receiving the doctorate in 1949, he found employment as a research assistant in pathology, at the Children's Medical Center, working with Dr. Sidney Farber. His present position came in 1952. He is a Research Associate in Pathology, Children's Medical Center and the chemist in charge of the Laboratories of organic chemistry, Children's Cancer Research Foundation.

Dr. Modest joined the American Chemical Society in 1948. He is a member of the American Association for Cancer Research and of the Association of Harvard Chemists.

The principal research activities of Dr. Modest in the cancer chemotherapy program at the Children's Cancer Research Foundation are studies on the synthesis and mode of action of new chemical compounds designed as potential anti-tumor agents. The work has consisted mainly in the synthesis and investigation of nitrogen heterocycles (triazines, pyrimidines, pteridines, purines) which are antimetabolites of folic acid and purines and inhibitors of nucleic acid biosynthesis. Studies on the mechanism of action these compounds and elucidation of structure-biological activity relationships are conducted jointly with the biological investigating groups of the Foundation. Other research interests have included the Diels-Alder condensation, synthesis of polycyclic hydrocarbons and derivatives thereof, desulfuration reactions, and ultraviolet spectrophotometry.



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The third meeting for the year, 1955-1956, will be held at 8:00 p.m. on Tuesday, January 17, 1956, in Science Park, Charles River Dam, Boston, Massachusetts.

Under the chairmanship of Prof. Ernst A. Hauser of M.I.T., the meeting will be a symposium on

"Specialty Latex Applications"

There will be two speakers on this occasion.

Neil H. Sherwood, B. F. Goodrich Chemical Co.

"Hycar Latex as Applied to Textiles"

Robert Shaw, Rohm and Haas Co.

"Latex Applications in the Leather Industry"

At 6:00 p.m. there will be a pre-prandial hour followed by a dinner at Science Park. Reservations will be required and they must be received by 9:30 a.m. Monday, January 16th, by Secretary Max Taitel — Union Bay State Chemical Company, 491 Main Street, Cambridge, Massachusetts. The total cost will be \$2.75. Dinner reservations are binding.

All interested persons are welcome to attend both the dinner and the technical meeting.

PLASTICS GROUP SPEAKER

NEIL H. SHERWOOD

Neil H. Sherwood is senior Development Engineer in the Products Application Laboratory of the B. F.

Goodrich Chemical Company, Avon Lake, Ohio.

Mr. Sherwood obtained his B.Ch.E. degree from the University of Minnesota in 1939. After two years with General Mills Research Laboratories in Minneapolis, working on Vitamin D production, he joined the B. F. Goodrich synthetic rubber training program in Akron in 1942. In the fall of that year he went to Louisville, Kentucky, to help start up a G-R-S unit. The summer of 1943 found him in Port Neches, Texas, for the opening of a G-R-S plant in that area. He remained in charge of quality control work until 1946.

Returning to Akron, Sherwood was engaged in synthetic rubber polymerization development until 1950. In that year he was transferred to the Products Application Laboratory. Since 1952, he has been a senior Development Engineer, in charge of the Textile Finishing Group.

PLASTICS GROUP SPEAKER

ROBERT SHAW

Dr. Robert Shaw, the second speaker at the January meeting of the Plastics Group, is a native of Scotland. Both his B.S. degree and his Ph.D. were won at the University of Edinburgh. After obtaining the doctorate in 1930, he came to Rohm and Haas Company in Philadelphia. At the present time he is Head of the Leather Finishing Laboratories of his company. In his address he will discuss the use of Latices in the leather finishing field.

THE NORRIS AWARD

The James Flack Norris Award will be presented on February 9, 1956.

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