THE CHESAPEAKE CHEMIST

MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

April, 1957

THE CHESAPEAKE CHEMIST

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A gravitometer being used to determine the specific gravity of a sample of vulcanized butyl compound suspended in distilled water. The test is part of a continuing program of research on butyl rubber.

THE APRIL MEETING

Date:
Friday, April 26
2:00 P.M. Plant Visit
Esso Standard Oil Company
Details on page 6
8:30 P.M. Lecture
Remsen Hall, Room 1
Johns Hopkins University

Speaker:
Dr. William J. Sparks
Scientific Advisor
Esso Research and Engineering Company
Linden, New Jersey

Subject:
Butyl Rubber

Butyl rubber is outstanding because of its extremely low permeability to gases, which makes it ideal for tire inner tubes. Also, when vulcanized it shows high tensile strength and good abrasion resistance. Recently, tires of butyl rubber have been introduced. Dr. William J. Sparks is one of the inventors of butyl rubber and has played an important part in its development.

Dr. Sparks was born in Wilkinson, Indiana, February 26, 1905. He received his A.B. degree from the University of Indiana in 1926, thereafter going to work with the Sherwin Williams Paint Co. in Chicago. In 1929 then returned to Indiana University for his M.A. degree. Following this, he joined R. & H. Electrochemicals (later E. I. du Pont de Nemours & Co.) at Niagara Falls, N. Y. and remained there until 1934, when he entered the University of Illinois for further graduate study. There he received his Ph.D. in Chemistry in 1936. That same year he joined the Esso Laboratories, Standard Oil Development Co. where he remained until 1939. During that time he was especially active in the field of polymers.

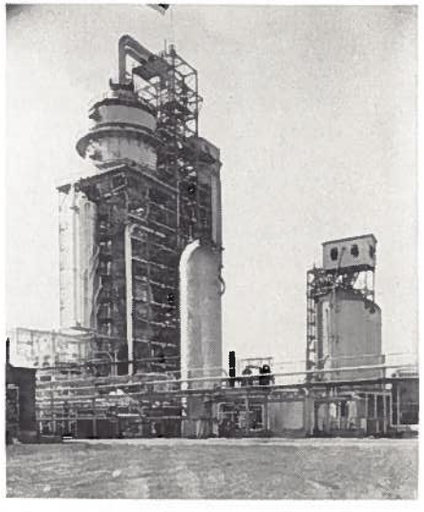
For a brief period in 1939-40, Dr. Sparks acted as Principal Chemist and Chief, Oil and Protein Division, of the Northern Regional Research Laboratories (U. S. Dept. of Agriculture) in Peoria, Illinois. In 1940, he returned to the Standard Oil Development Company to resume his role in the development of synthetic rubber, and there he has since remained. In 1940 he was made Assistant Director of the Chemical Division of Standard Oil Development. He became Associate Director in 1945, and Director in 1946. He was promoted to Scientific Advisor in 1957.

Dinner:
Levering Hall 6:30 P.M.

Reservations should be made by Monday, April 22 with Dr. Raymond M. Burgison, School of Medicine, University of Maryland, Baltimore 1. The cost is $3.25 and checks should be made payable to Maryland Section ACS.

Esso Standard Oil Company Baltimore Refinery

The story of the Baltimore Esso Refinery is the story of America—from the day in 1780 when wealthy Merchant Captain John O'Donnell, late of His Britannic Majesty's East India merchant service, arrived in the broad harbor of Baltimore, to live on a 2800 acre piece of property which he named Canton. Here, within sight of the sea he loved so much, he lived and died. His beloved Canton became part of an enterprise famed in American history. It was in this area that a young Baltimorean, Samuel Merritt by name, who after returning rich from the California gold rush in 1849, established his works for the manufacture of coal oil. In August of 1859, Col. Edwin L. Drake completed the first crude oil well in the world at Titusville, Pennsylvania. Merritt was said to be one of the first men to distill crude oil from the newly discovered Pennsylvania field. He won a silver medal from the Maryland Institute for the excellence of his product. In 1867 Mrs. Sylvia Hunt purchased ground and erected a refinery, which was followed within the next few years by a group of other small refineries, which operated 25 and 50 gallon stills. In 1877, most of them merged into the Baltimore United Oil Company, which was purchased along with the Merritt interests in 1892 by the Standard Oil Company. The entire Standard Oil Company Refinery in 1892 comprised about 50 acres, was operating 14 coke stills, had 75 to 80 employees and had a processing capacity of approximately 5000 barrels per day. Although a disastrous fire struck in 1895, destroying virtually the entire refinery, extensive rebuilding followed, with some modernization from time to time.



The present Baltimore Esso Refinery covers an area of 250 acres. To its 525-foot docks come tankers from Texas, Louisiana, and Venezuela, with more than 2 million gallons per day of sweet and sour crudes (sour being that kind which has a high sulphur content) for processing in the maze of pipe stills. Out of its pipes, towers and stills annually comes more than 35 major products. Principally these consist of gasolines, kerosene, diesel oils, fuel oils, asphalts, fluid coke, liquefied petroleum gas, special naphthas, aviation gasoline components and jet fuels. Including greases and asphalts, which have many types and grades, Baltimore Refinery's

(Continued on page 8)

PLANT VISIT

ESSO STANDARD OIL COMPANY

2:00 P.M.

For the first time in several years the Program Committee has arranged a plant tour for the Section. Esso Standard Oil Company will be our hosts.

Those participating in the tour will meet at Shriver Hall, Johns Hopkins University, Charles and 34th Streets at 2:00 P.M. Here a brief discussion of the tour will be given by a Standard Oil official. Buses, provided by the Company will then take the members to the Esso Standard Oil Refinery. There are no parking facilities at the Esso plant for private cars.

At the plant, the chemists will be divided into small groups for the conducted tour. Following the tour buses will return the chemists to Levering Hall, Johns Hopkins University, where they can relax before the 6:30 dinner.

Members may bring a guest and all who plan to visit the Esso Refinery are requested to complete and mail the enclosed card. Please do so promptly and help our hosts in arranging buses and guides.

(Continued from page 6)

list of manufactured items approaches 300.

The Refinery employee group includes men who operate and maintain process equipment as well as chemists, chemical engineers, lab technicians and other service groups.

The laboratory facilities at the Refinery are primarily for quality control involving chemical and physical tests of raw material and products in various stages of processing.

The first step in refinery operations at the Baltimore plant after the crude is pumped over plant docks from the tanker into the refinery's own storage tanks is the separation of crude into fractions through distillation. The end products of distillation of the crude are normally hydrocarbon gas, straight cut naphtha, heavy naphtha, kerosene, diesel oils, heavy gas oil and crude residue. It is with these first cut products that the refinery really begins its task.

The "straight out gasoline" needs more refining before it flows to the tank farm for blending with other component parts.

The heavy gasoline is taken from the crude distillation unit and fed to a Powerformer, a platinum reforming process developed by Esso Research and Engineering Company. Using this process, the anti-knock and volatility qualities are improved.

Gasoline as we know it is a carefully blended combination of four to six components, namely butanes, naphthas from distillation of crude oil, naphthas from catalytic cracking and Powerformed naphthas. These components must be blended to make a gasoline with enough volatility to provide easy starting and good acceleration, but not enough to cause vapor lock. The kerosene and diesel oils which are produced during the distillation need little further processing before being marketed.

The heavy gas oil provides a feed stock for the famous catalytic cracking unit. The heavy residua in crude oil is used for manufacturing asphalt or for feed stock to the refinery's newest process unit, the Fluid Coker. Here it is converted to naphtha, gas oil for catalytic cracking, and coke. The coke is formed in minute particles which, through aeration, can be handled as a fluid. This characteristic is responsible for the name fluid coke, one of the refinery's latest products. In refinery operations, the aforementioned processes are carried out simultaneously. The products are made continuously.

Grease making is a specialty at the refinery, and more than 300 grades of lubricants are turned out for shipment to many parts of the world. The world's machines need an indefinite variety of lubricants, thin or thick, dark and light, heavy duty, extreme pressure, heat absorbing and many others.

A share in the responsibility for the sliding, whirling and turning of at least a part of the world's machines belong to Baltimore's Grease and Specialties Plants, where more than 50 million pounds of lubricants are turned out annually. Greasemaking is one of the proudest arts of the petroleum industry. Grease makers, craftsmen who formerly learned their arts in years at the kettle, and relied on sensitive fingers and an eye for color now have improved equipment and technique to aid them in scientifically producing products of quality for modern industry.

The first step in grease making consists of cooking a soap base in a kettle or pressure vessel. Then oils are added. Most soap bases contain either lime, soda or a combination of both. Lime bases are used where the grease is to be exposed to moisture and a soda base is used where the grease is to be subjected to temperatures above 175°F. The process varies in length of time, in the amount of oil added and in the several materials which go into the making of greases. The characteristics of the product to be manufactured determine whether the batch method or continuous method will be used.

Esso Baltimore has a storage capacity of 4,000,000 barrels of finished and unfinished products, and serves as a distribution center for Maryland, Delaware, District of Columbia, the Carolinas and the Virginias.

F. T. Parr

The Remsen Memorial Lecture will be given Monday evening, June 3, in Shriver Hall, Johns Hopkins University, by Dr. Melvin Calvin of the University of California.

MARYLAND SECTION NEWS

ACADEMIC

Johns Hopkins University

Dr. Donald H. Andrews, Professor of Chemistry, gave a series of talks entitled "Chemistry and a Broader Base for Education" before the Association of Science Teachers in the Independent Schools of New England. Dr. Andrews who is also an authority in calorimetry and thermodynamics will be chairman of a committee arranging the Calorimetry Conference to be held on September 3 to September 7 at Wentworth-by-the-Sea in Portsmouth, New Hampshire.

Dr. Alsoph H. Corwin, Professor of Chemistry, spoke before the Southeastern Pennsylvania Section of the A.C.S. on February 28 on "Allergies and Allergens."

A paper entitled "An Investigation of the Species Existing in Nitric Acid Solution Containing Cerium III and Cerium IV" by **Bernard Blaustein** and **John W. Gryder** appeared in J. Am. Chem. Soc. 79, 540 (1957). Dr. Gryder is Assistant Professor of Chemistry. Dr. Blaustein was recently a graduate student in chemistry and is now working for U. S. Steel in Pittsburgh.

Dr. Dayton E. Carritt, Assistant Professor of Oceanography, Chesapeake Bay Institute, will preside over a symposium on The Chemistry of Sea Water sponsored by the Division of Chemical Education at the Miami ACS Meeting.

Mr. Calvin Menzie of the Biochemistry Department will present a paper "Determination of Meta-Dinitrophenolic Pesticides" in the Symposium on Methods for Analysis of Pesticide Resins at the Miami ACS Meeting.

Dr. Walter S. Koski, Professor of Chemistry, will present a paper "Nuclear Magnetic Resonance Study of the B_2D_6-B_5H_9 Exchange Reaction" by **Walter S. Koski, Joyce J. Kaufman** and **Paul C. Lanterbur** before the Division of Physical and Inorganic Chemistry at the Miami ACS Meeting.

Dr. Paul H. Emmett, Professor of Chemistry, is presenting three papers at the ACS Meeting in Miami which deal with work completed while he was at the Mellon Institute in Pittsburgh. The titles are: "Alkane Adsorption on Silica, Alumina, and Silica-Alumina Catalysts" by **D. S. MacIver, P. H. Emmett** and **H. S. Frank;** "Mechanism Studies of the Fischer Tropsch Synthesis. The Addition of Radioactive Methanol, Carbon Dioxide and Gaseous Formaldehyde" by **W. K. Hall, R. J. Kokes** and **P. H. Emmett;** "Fischer Tropsch Synthesis Mechanism Studies. The Addition of Radioactive Ethanol to the Synthesis Gas" by **R. J. Kokes, W. K. Hall** and **P. H. Emmett.**

Dr. Emmett was also one of the lecturers in a series entitled Advances in Catalysis sponsored by the Esso Research Center at Linden, New Jersey. His talk, entitled "New Techniques in Catalytic Research," was give on March 26.

Loyola College

Dr. Frederick D. Rossini, Head of the Chemistry Department of Carnegie Institute of Technology, was a guest at Loyola College on April 1. He delivered a talk to science majors and interested undergraduates on the nature of research. Dr. Rossini is an outstanding authority on thermodynamics.

Woodstock College

Dr. J. E. Wallen, Assistant Director of the Science Teaching Program of the AAAS, who is currently on leave from the Biology Department of Oklahoma A and M visited Woodstock College on February 6. His lecture on the current attempts to improve science teaching was attended by about 30 high school and college teachers studying at Woodstock.

GOVERNMENT

ARMY CHEMICAL CENTER

Dr. Frederick M. Lane, assistant for technical coordination in the Directorate of Development, Chemical Warfare Laboratories, at the Army Chemical Center, Maryland retired recently after 37 years of government service, 29 at the Chemical Center.

An alumnus of MIT, he also has a Ph.D. degree from Yale. During his many years of government service he did research on protective clothing, decontaminating agents, gas masks, filter materials and detector kits. It was through his work that protective clothing became an item of defense.

During the time he has been associated with the Chemical Corps he was author or co-author of approximately 35 technical reports dealing with subjects related to his work.

Dr. Leo Finkelstein, physical chemist and consultant in the field of aerosols and incendiaries at the Chemical Warfare Laboratories at the Army Chemical Center, Maryland, retired recently after completing more than 38 years of government service, 33 of them at the Army Chemical Center.

An alumnus of the Illinois Institute of Technology he also has a doctor's degree in physical chemistry from the University of Chicago.

His principal work has been concerned with fundamental research on aerosols-smoke filtration, screening smokes, colored smokes, and incendiary fuels for flame throwers.

STATE OFFICE OF THE CHIEF MEDICAL EXAMINER

A paper entitled "Alcohol and Highway Fatalities" by **H. C. Freimuth, Ph.D., S. R. Watts** and **R. S. Fisher, M.D.** was presented at the annual meeting of the American Academy of Forensic Sciences in Chicago, Illinois on February 28, 1957. Dr. Freimuth also presided at the meeting of the Toxicology Section at this academy and was re-elected chairman of the Section for the coming year.

During the month of March, Dr. Freimuth spoke on the subject "Chemistry and Sudden Death" at the American Institute of Chemists, Baltimore Chapter March 14; at the Reading Chemists Club, Reading, Pennsylvania on March 19; at the Catonsville Kiwanis Club on March 25.

INDUSTRIAL

CHIPPEN & ERLICH LABORATORIES, INC. SUBSIDIARY OF FOSTER D. SNELL, INC.

Raymond C. Crippen attended the A.S.T.M. Committee meeting at the Shoreham Hotel in Washington, D. C. on February 22nd. He is an active member of committee D-1.

The Crippen & Erlich Laboratories, Inc., were recently granted a contract to do research in electro chemical reactions both in organic chemicals and inorganic chemicals.

PENNIMAN & BROWNE

Penniman and Browne, consulting engineers and chemists, are in the primary stages of relocating their facilities from downtown Baltimore to 6252 Falls Road, Bare Hills. This is about one mile north of Mt. Washington. The Research and Bio-Chemical Departments have made the most recent move. At present a large building is under construction which will house the Engineering and Physical Testing Departments. Already established at this new site is the Industrial Radiography Division.

MARYLAND SECTION AMERICAN CHEMICAL SOCIETY OFFICERS

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C. W. Laboratories
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Louise Kelley, *Secretary*
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Baltimore 4

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Alternate Councilors: Edward M. Hoshall, 1957, Richard L. Hall, 1957-58, Raymond L. Costa, 1957-58-59, John W. Gryder 1957-58-59.

Executive Committee, Elected Members-at-Large: Lester Corrsin, Raymond C. Crippen, Samuel L. Goldheim, Richard J. Kokes, Raymond E. Vanderlinde.

Executive Committee, Past Chairmen (not referred to above):
Donald H. Andrews, W. Mansfield Clark, H. A. B. Dunning, Sr., Fitzgerald Dunning, Paul H. Emmett, Henry C. Freimuth, Wilton C. Harden, John A. Herculson, Edward S. Hopkins, John C. Krantz, Jr., H. Huntley Lloyd, Duncan MacRae, S. T. Powell, E. Emmet Reid, William F. Reindollar, C. P. VanGundy, Channing W. Wilson.

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2. *Chemical Education:* John W. Gryder, Johns Hopkins University, Baltimore 18; HO 7-3300.
3. *Council of Engineers Club Associated:* Edward S. Hopkins, 306 N. Charles St., Baltimore 1; SA 7-5588.
4. *Committee on Guidance for Maryland, E.C.P.D.:* Channing W. Wilson, 4122 Westwood Road, Baltimore 18; BE 5-4141.
5. *Finance:* Lloyd C. Felton, Hynson, Westcott & Dunning, Baltimore 1; VE 7-0840.
6. *Hospitality:* Mrs. Joyce J. Kaufman, Johns Hopkins University, Baltimore 18; HO 7-3300.
7. *Membership:* Raymond E. Vanderlinde, University of Maryland, Baltimore 1; PL 2-1100.
8. *Nominations and Awards:* William H. Summerson, 501 University Parkway, Baltimore 10; TU 9-8787.
9. *Program:* Raymond E. Burgison, School of Medicine, Univ. of Md., Baltimore 1; PL 2-1100.
10. *Publicity:* Winslow H. Hartford, Mutual Chemical Company, Baltimore 31; OR 5-0555.
11. *Public Relations:* Raymond L. Costa, Mutual Chemical Co., Baltimore 31; OR 5-0555.
12. *Radio and TV:* Mrs. Joyce J. Kaufman, Johns Hopkins University, Baltimore 18; HO 7-3300.
13. *Remsen Award:* Alsoph H. Corwin, Johns Hopkins University, Baltimore 18; HO 7-3300.

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AMERICAN CHEMICAL SOCIETY
MARYLAND SECTION

Plant Visit and Meeting **April 26, 1957**

Dr. Raymond M. Burgison, School of Medicine
University of Maryland, Lombard and Greene Streets
Baltimore 1, Maryland

I desire registration for the visit to Esso Standard Oil Company by bus from Shriver Hall, Johns Hopkins University, at 2:00 P.M.

Names of persons in my party:.....

.....

.....

I enclose check for $..... for..... reservations for dinner. (Subscription price $3.25, payable in advance.)

Imperial Crab ☐ Indicate Choice Return by Monday
Steak ☐ This cannot be changed April 22, 1957

Make check payable to Maryland Section ACS.

Name .....

Address .....*Phone* .....