Vol. I No. 3

THE CHESAPEAKE CHEMIST

OCTOBER 1945

PUBLISHED BY THE
MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

THE OCTOBER MEETING

Dr. Earl L. Warrick, of the Mellon Institute of Industrial Research, will address us on "Organosilicon Polymers" at our next meeting, Friday, October 26, 1945. Organosilicon polymers are new engineering materials the development of which was accelerated by the war. Peacetime uses, however, are numerous and expanding. Chemically, these polymers have a silicon-oxygen-silicon backbone to which may be attributed their unusual thermal stability and their good electrical insulating qualities. The organic portion of the polymers seems to be responsible for their good water repellency characteristics and, in the fluids, for the very slight change in viscosity with change in temperature. The forms in which these polymers may be produced range from distillable liquids through polymer fluids to high polymer resins and rubbery elastomers. Dr. Warrick will discuss the unusual combinations of properties found in these interesting materials and will point out their various applications.

Dr. Warrick attended Carnegie Institute of Technology and following his graduation in 1933 carried on postgraduate study at this institution. He was awarded the M.S. degree in 1934 and the D.Sc. degree in 1943. Since 1935 he has been associated with the Mellon Institute. Dr. Warrick has conducted research on the composition of glasses, on glass block edge coatings and, since 1938, on organosilicon polymers. A number of patents have been issued to him for his developments in the field of organosilicon compounds.

The meeting will be preceded by a dinner, which should be as great a success as the dinner which about ninety members enjoyed in September.

Section Officers
Chairman W. F. Reindollar Vice-chairman Giles B. Cooke
Secretary C. W. Wilson Treasurer C. W. Wilson

Please direct all correspondence pertaining to THE CHESAPEAKE CHEMIST to Dr. Belle Otto, Goucher College, Baltimore 18, Md.

The Chesapeake area has been the scene of numerous activities related to the war effort. The end of hostilities makes it permissible, now, to discuss some of these hitherto secret projects. THE CHESAPEAKE CHEMIST proposes to present from time to time brief accounts of such of these as are of general interest.

The first of these reports, which appears below, was prepared by Dr. F. Y. Wiselogle, in charge of the office of the Survey of Antimalarial Drugs. This survey was an activity of the Division of Chemistry and Chemical Technology, Dr. W. Mansfield Clark, Chairman. Dr. Clark (Professor in the Hopkins Medical School), Dr. Wiselogle (Associate Professor at Homewood) and many of their associates are members of our local section.

SURVEY OF ANTIMALARIAL DRUGS

The potential seriousness of malaria from a military standpoint was emphasized early in the war by the repeated warnings of the Surgeons General that malaria would be the number one medical problem of our armed forces. The problem became most acute early in 1942 when the sources of the main supply of quinine, the drug of choice at that time, were cut off by the Japanese blockade. The best use of the synthetic substitute, quinacrine, although now known to be superior to quinine in the suppression of malaria, had at that time still to be developed by researches in the clinic and in the field. Neither of these drugs had any curative action against benign tertian malaria, caused by Plasmodium vivax.

Accordingly, the Committee on Medical Research of the Office of Scientific Research and Development (OSRD) set up an intensive, coordinated program of research seeking new, improved antimalarial drugs. Large animal testing units were set up in the leading medical schools of the country as well as in the United States Public Health Service; arrangements were made to provide for clinical material and an appeal was broadcast to Universities and to the chemical and pharmaceutical industries for the preparation of compounds of potential antimalarial interest. The response of chemists throughout the country was immediate and generous; during the past four years about 13,000 different drugs have been screened in one or more avian infections and nearly one hundred of the more promising have been given rigidly controlled clinical trials.

In order that the rapidly accumulating data could be made available promptly to all participating groups, a central agency was set up in the Welch Medical Library under the

(to 3rd page

from 2nd page) Division of Chemistry and Chemical Technology of the National Research Council. To this agency, the Survey of Antimalarial Drugs, fell the tremendous task of cataloguing, organizing and distributing the chemical and pharmacological data as fast as received from the various participating groups. The magnitude of the overall program during the four war years has already exceeded, by far, the entire efforts of the German industry along similar lines from 1918 to the present date.

The termination of the war has also terminated the routine functions and services of the Survey of Antimalarial Drugs. The Survey staff is now devoting full attention to the preparation of a comprehensive monograph summarizing the data collected in the coordinated program.

* * * *

from 4th page) grown because through research it has improved manufacturing technology and has developed new uses for, and better methods of using, its products. To the comparatively few chrome chemicals and processes known in 1908, there have been added other pigments, dyes, dye intermediates and dye fixatives; a greatly improved process for the tanning of leathers; and high-purity chromic acid for chromium plating.

During the recent war, an urgent need arose for developing the chromic acid process of anodizing aluminum alloys and for expanding enormously the production of chromic acid. By increasing its facilities for manufacture, both at Baltimore and Jersey City, and by pushing fundamental research at Baltimore, Mutual played a major role in filling this need. Its booklet on anodizing has become the commonly used handbook for aircraft manufacturers.

Another very important application of chromium chemicals developed by Mutual is in the preparation of corrosion-preventive finishes. Magnesium alloys, zinc, copper and brass receive a dichromate treatment. Paints designed for camouflage and for heat and weather resistance are based on chromic oxide; those applied to military equipment contain zinc chromate. The pipes in recirculating water and brine systems and in air conditioning units are protected by use of chromates.

Mutual's research laboratories have made important contributions to the scientific literature: new chromium chemicals have been prepared and their properties described; the properties of old chromium chemicals have been reexamined and reported in detail. In Mutual's research library are data on the equilibria and other physical and chemical constants of chromium chemicals, determined with a higher degree of precision than those given in the International Critical Tables.

* * * *

The AMERICAN INSTITUTE OF CHEMISTS will meet at 8:30 P.M. on October 18th in the Chemistry Lecture Hall, Loyola College, to hear a speaker from the Baltimore Refinery of Standard Oil of New Jersey discuss the processing of high-test gasoline.

Dr. Warrick

NEXT MEETING October 26 TIME 8:30 P.M.
SPEAKER Dr. Warrick
PLACE Room 101, Remsen Hall, Johns Hopkins
Charles & 34th Streets

BRING ANOTHER CHEMIST
This is the only notice of this meeting which you will receive.

Save the dates November 16 and December 14 for future meetings.

ONE HUNDRED YEARS OF CHROMIUM CHEMICALS
1845-1945

(Courtesy of Marc Darrin, Mutual Chemical Company of America)

The manufacture of chromates from costly Russian ore was started in a small way in England early in the last century, but it was not until high-grade ore was discovered near Baltimore that this industry began to assume importance. The discovery was made by Isaac Tyson, an apothecary's apprentice and son of a wealthy Baltimore merchant. One day, on the Tyson estate at Bare Hills, an English gardener showed young Isaac some black stones and explained that "these are what we used to make chrome yellow out of in the Old Country". Sensing the possibilities, Isaac set out to develop the find and actually succeeded in collecting enough of the chromite to ship several cargoes to England; but the deposits proved to be meagre and he was obliged to abandon the project. His interest in pigments then prompted him to start a paint manufacturing business, which turned out to be fairly successful.

Some years later (1827) while walking through the Belair Market, Tyson again saw and immediately recognized the same kind of "black stones". They were being used to chock a cider barrel on a farmer's two-wheeled cart. He promptly traced them to the vicinity of Jarrettsville, found workable deposits and reserves there and elsewhere, and for thirty years was the world's principal supplier of this ore.

Besides exporting chromite, Tyson attempted to manufacture chrome yellow and other chrome colors; but he was unsuccessful because of technical difficulties and the highly competitive state of the market. In 1845, however, he turned to the manufacture of dichromate, for which there was a growing demand, and engaged as his technical expert a Yale graduate named Blake--probably the first instance of the employment of a trained chemist in a distinctively chemical industry. Since 1845 the chrome works started by Tyson have been in continuous operation--since 1908, as the Baltimore plant of the Mutual Chemical Company of America.

Like other successful industries, Mutual has (to 3rd page