The action on aviation gasolines is threefold: (a) Branched-chain hydrocarbons which have the highest anti-knock characteristic are preferentially attacked with the liberation of some methane, (b) microbially produced sulfides precipitate tetraethyl lead, and (c) peroxides produced by the bacteria catalyze the deterioration of tetraethyl lead.

(8) There is a report in the literature which ascribes an explosion of a kerosene tank to the production of a mixture of methane and hydrogen from the bacterial decomposition of kerosene in water storage.

(9) The growth of hydrocarbon-oxidizing bacteria in medicinal and pharmaceutical preparations having hydrocarbon bases has resulted in discolored and otherwise altered products. Allergies have been traced to the use of such products. Cooling oils have also been unfavorably affected by the profuse growth of hydrocarbon-oxidizing bacteria.

Little is known regarding the end-products which result from the bacterial utilization of hydrocarbons, except that carbon dioxide and bacterial protoplasm are always produced. There are reports in the literature on the production of methane, hydrogen, ketones, aldehydes, alcohols and organic acids. The products of metabolism will depend upon the bacterial species, the hydrocarbons and the experimental conditions. The observation that fatty acids result from the bacterial oxidation of petroleum hydrocarbons suggests exploring the possibilities of using microbial catalysts to convert hydrocarbons into much needed edible fatty acids. More extensive and intensive studies on the products of hydrocarbon utilization can be expected to yield interesting information on bacterial physiology.

In conclusion and to clarify my own views on the subject, it should be emphasized that while bacteria probably play an important role in the formation and transformation of petroleum, geological, geophysical and geochemical factors are also believed to be of importance in the origin of oil. The bacterial synthesis of certain petroleum hydrocarbons has been demonstrated, but it seems doubtful if it will ever be practical to produce by bacteria any hydrocarbons except methane on a commercial scale. The fondest hope for the future now entertained is that intensified microbiological studies coupled with other investigations on the origin of oil may eventually provide information which will aid in the discovery of existing pools of petroleum. Geomicrobiological prospecting and refined methods of "soil analysis" may prove to be a step in this direction. Microbiological processes may find practical applications in the petroleum industry, the most promising of which appears to be the use of bacteria in the recovery of petroleum from oil-bearing materials, in certain refinery processes and in the disposal of various waste products. Wherever petroleum or its products are stored in contact with water, the possible effects of hydrocarbon-oxidizing microorganisms must be taken into account. The multiple effects of bacteria on the formation and transformation of petroleum hydrocarbons is a new frontier of learning which presents a challenge to the petroleum industry and to the microbiologist.

OBITUARY

EDMUND BURKE DELABARRE

EDMUND BURKE DELABARRE, one of the pioneers of American psychology in the days when it was transforming itself into an experimental science, died in Providence on March 16, 1945. He was born in Maine in 1863. His influential teachers were Garman at Amherst, James at Harvard and Münsterberg at Freiburg, where he obtained the Ph.D. in 1891. He established the psychological laboratory of Brown University in 1892 and remained there as active professor for forty years and as emeritus (but still active) for the remaining years of his long life. His investigations were principally concerned with vision and with muscular movement and the sensations of such movement. An ingenious apparatus man, he designed pieces for continuous registration of respiratory and circulatory movements (as in emotion) and of automatic hand movements. He was the first, in 1898, to obtain an objective record of eye movements, and his method of mechanical registration, though soon superseded by photographic methods, gave accurate and important results. He attacked the difficult problem of explaining how the visual field can be transformed from a mere aggregate of color patches into a well-organized field of objects in space, and showed that a fairly comprehensive theory could be based on sensations of tension in the eyeball muscles. His work on this problem and others has not been fully published. As an avocation he did much intensive work in New England archeology and is especially noted for his decipherment of the famous "Dighton Rock." Dr. Delabarre was a man of sparkling eyes and cheerful disposition and of wide interests, a man whom it was always a pleasure to encounter.

R. S. WOODWORTH

FRANK W. COLLIER

DR. FRANK W. COLLIER, formerly dean and professor of philosophy at the Graduate School, American

University, Washington, D. C., died on August 31. He was born at Elliott's Mills, Maryland, on January 5, 1870. He was educated at the Johns Hopkins University, from which he was graduated A.B. in 1896, and at Boston University, where he received the degree of S.T.B. in 1899. Following his ordination to the Methodist Episcopal ministry, he served as pastor to several churches in Massachusetts, meanwhile pursuing graduate work at Boston University under the eminent American philosopher, Borden P. Bowne, being graduated Ph.D. in 1910.

With the organization of the curriculum at the American University in 1914, Dr. Collier was called to take charge and served as dean of the Graduate School and professor of philosophy until 1928, when he relinquished the deanship, retaining the chair of philosophy. He retired from active teaching in 1936.

Dr. Collier's courses in philosophy were of unusual appeal to the scientific students at the Graduate School. He was broadly versed in the literature, history and method of science and had a deep and competent grasp of fundamental scientific principles. His discussions of the foundations of scientific knowledge were revelations to his students, developing new concepts and presenting points of view of great educational value. Collier's approach to a problem was liberal and receptive. His appeal was ever to the intellect; mere authoritarianism he detested. After a course with Collier the scientific student could be called educated as well as trained.

Dr. Collier rendered a service to biology and biologists at the time of the assault on the teaching of evolutionary theories during the middle 1920's. His book, "John Wesley among the Scientists," described the evolutionary opinions of that divine and was credited with persuading the Methodist Episcopal Church to withhold support from the fundamentalist cause.

A generation of students mourns his passing.

JAMES F. COUCH

ERMON DWIGHT EASTMAN

DR. ERMON DWIGHT EASTMAN, professor of chemistry at the University of California, died suddenly on May 19 following a heart attack. He was fifty-three years old. He had been associated with the University of California since 1917, the year in which he received his Ph.D. from that school. In 1932–33 he held a Guggenheim Memorial Fellowship for research at the University of Munich.

Dr. Eastman made many outstanding contributions in the field of chemical thermodynamics. By experimental data and theoretical considerations he aided in the exact statement of the third law of thermodynamics. His research on the specific heat of hydrogen at low temperatures gave a highly important experimental value. He called attention to the entropy of transfer in electrolytic cells, a quantity which had not been recognized, and his work on thermal cells gave values for the absolute entropies of the aqueous ions which is noteworthy as one of the few reasonably accurate absolute values for any property of a single ion in solution. He also published a number of papers relating to the structure of the atomic nucleus.

At the time of his death Dr. Eastman was director of a war research program for the Army.

W. M. LATIMER

RECENT DEATHS

DR. HERBERT EUGENE WALTER, professor of biology, emeritus, of Brown University, died on October 1 at the age of seventy-eight years.

DR. W. S. DYER, associate professor of physical chemistry in the University of Arkansas, died on September 27 at the age of forty-four years.

DR. HERBERT O. CALVERY, for the past nine years chief of the division of pharmacology of the Food and Drug Administration, Federal Security Agency, died on September 23. He had been directing also a number of research projects under the auspices of the Office of Scientific Research and Development.

DR. P. DEL RIO HORTEGA, formerly director of the Instituto Nacional del Cancer at Madrid, and more recently head of the laboratory of histology and histopathology at Buenos Aires, died on June 1 at the age of sixty-three years.

SCIENTIFIC EVENTS

THE SPRING MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

UPON the removal of restrictions on the holding of conventions by the Office of Defense Transportation, the officers of the association at once began to explore the possibilities of holding a meeting during this coming winter or spring.

After an extended investigation of the possibilities, it has been decided to hold a general meeting of the American Association for the Advancement of Science in St. Louis, Missouri, in the period March 27–30, 1946. A conference of the secretaries of the sections of the association and of the principal affiliated societies who live in the East will be held at the Pennsylvania Hotel in New York City at 10 o'clock A.M., on