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THOMAS GORDON THOMPSON

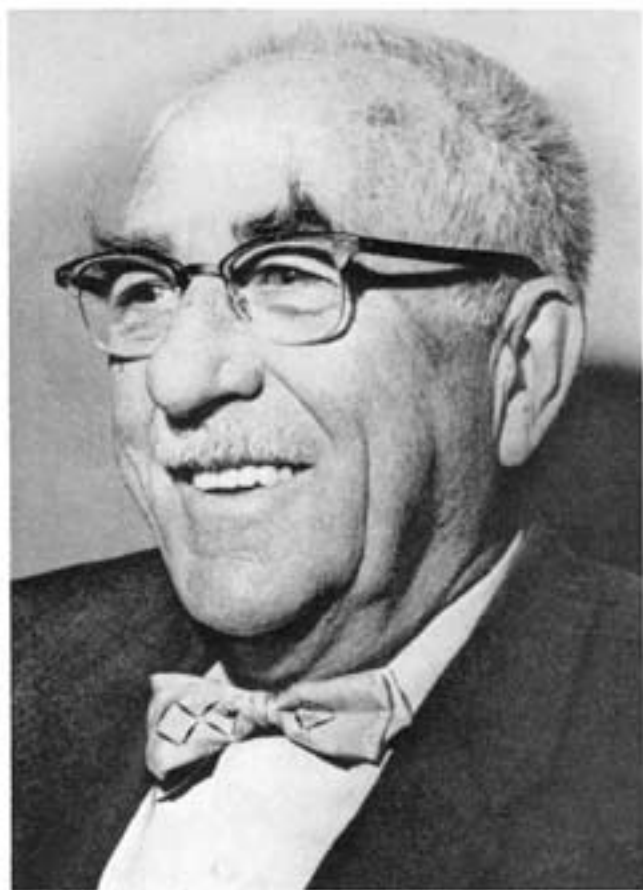
1888—1961

A Biographical Memoir by
ALFRED C. REDFIELD, CLIFFORD A. BARNES AND
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Biographical Memoir

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Samuel J. Thompson

THOMAS GORDON THOMPSON

November 28, 1888–August 10, 1961

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THOMAS GORDON THOMPSON was the first American chemist to devote his major efforts to investigating the chemistry of sea water. As such, he played a pioneering role in initiating in this country interest in an aspect of oceanography which had previously been examined primarily by European investigators. His influence in the establishment of the Oceanographic Laboratories at the University of Washington placed him and that university among the leaders in the recognition of the teaching of oceanography as a proper function of institutions of higher learning.

Thompson was born in Rose Bank, Staten Island, New York, on November 28, 1888, the son of John Haslam Thompson and Mary Elizabeth Langdon. His father born in Jersey City, New Jersey, died when Thompson was nine. His mother, born in Elizabeth, New Jersey, died in 1934. There was one brother, John Headen Thompson.

On June 22, 1922, Thompson married Harriet Galbraith, born in Winnipeg, Canada, on February 3, 1893. She preceded him in death on July 31, 1951. They had three children: Thomas Gordon, Jr., born October 3, 1923; John Souter, born September 8, 1925; and Harriet, born April

30, 1931. On July 14, 1954, Thompson married Mrs. Isabel Harris Costigan, and he legally adopted Mrs. Costigan's two younger children, Gary and Charles.

His last public act in science was the reading of two papers at the International Oceanographic Congress in New York in August and September, 1959, the year of his retirement. A slow physical deterioration began soon after which ended in his death on August 10, 1961.

Thompson's youth was spent in Brooklyn where he attended the Brooklyn Commercial High School. Although his adult career was in the State of Washington, he retained to the end of his life an accent that testified to his youthful environment. His "Brooklynese" was a distinction that he carefully cultivated, even correcting his children's pronunciation from time to time. They, however, resisted and they speak as do their western neighbors.

On graduating from high school in 1906 he secured a job as assistant chemist in the control laboratories of the American Brass Company. This experience evidently turned his attention to analytical chemistry—a discipline which dominated all his later work. He subsequently entered Clark University, graduating with a Bachelor of Arts degree in 1914. With the support of a Carnegie scholarship from the British Iron and Steel Institute, he then went to the University of Washington for graduate study. He received the degree of Master of Science in 1915 and of Doctor of Philosophy in Chemistry in 1918. His doctoral dissertation, "Preservation of Iron and Steel by Means of Passivifying Factors," was prepared under the direction of Professor Horace G. Byers.

Thompson was appointed Acting Instructor of Chemistry at the University of Washington in 1918 and Assistant Professor of Chemistry in 1919; he was promoted to Associate Pro-

fessor in 1923, to Professor in 1929, and retired as Professor Emeritus in 1959.

As head of the division of analytical chemistry, Thompson established courses in qualitative and quantitative analysis which set a standard of care and precision that has indelibly marked the character of the hundreds who came under his watchful eye. His inexorable demand for integrity during the student's first contact with chemical experiments was an object lesson that all remember. Let the budding analyst caught in poor technique or sloppy procedure beware. "Never in my wildest dreams did I ever expect to see such a thing" was his cry when an innocent student was caught violating good analytical procedure. Unforgettable though the chastisement may have been, it was always kindly; its purpose was to correct, not to scold or punish. Though he was a strict taskmaster, the humanity of his personality was always present to encourage the disheartened young man. As a tribute to his work in chemical education, the Thomas Gordon Thompson Fund for graduate fellowships in chemistry was established at the University of Washington by Samuel G. Baker, one of his students.

In later years, as Thompson became more exclusively concerned with the sea, he expressed regret that many of his students had not continued their work on the chemistry of sea water. The fact was that until after World War II very little support was available to chemical oceanographers. Up to that time, the number of sea water chemists in this country could be counted on the fingers of one hand. Thompson's students were trained primarily to be chemists, and as such many found attractive positions in the academic world and in industry. They retain a nostalgia for their earlier association with oceanography and for their personal relationship with "Tommy,"

as they all think of their Professor. Others, however, have attained influential positions in oceanography as he desired.

Fifteen students obtained their doctoral degrees under his direction: Devadattish Devaputra, 1931; Lacey H. Evans, 1932; Bertram D. Thomas, 1933; Henry E. Wirth, 1935; Iver Igelsrud, 1936; Clifford A. Barnes, 1937; Raymond W. Bremner, 1937; Joseph R. Goodman, 1941; Randall E. Hamm, 1941; John P. Tully, 1948; Francis A. Richards, 1950; Seth D. Reeder, 1951; Tsihwa J. Chow, 1953; Kurt H. Nelson, 1953; and James A. Gast, 1959.

An outstanding characteristic of Thompson was his interest in the scientific and personal careers of his students. He realized that his colleagues and underlings were human and he felt that their lives were a part of his life. The pride he took in his graduate students and the contact he retained with them was characteristic of his warm personality. An album of photographs of his students was his cherished possession, and his records as to their wives, children, and well-being were complete, so far as he could keep them. His concern was for them as people as well as for them as students and colleagues.

The Oceanographic Laboratories at the University of Washington were established as a result of a recommendation by a committee of the National Academy of Sciences in 1931 and Thompson was selected as director. To increase his effectiveness in this position, he was given a grant by the Rockefeller Foundation for six months' travel to study oceanographic and marine laboratories throughout northern Europe. This trip, and a similar one made possible by a travel grant from the Academy in 1933, to visit laboratories in southern Europe and northern Africa, helped shape many of the policies and procedures of the new institution in Seattle.

The Oceanographic Laboratories were an interdepart-

mental institution, the staff of which was drawn from the departments of physics, chemistry, bacteriology, botany, and zoology in the University. Graduate degrees were granted by these departments to those who worked in the Laboratories. Thompson served as director for twenty years, until 1951 when Oceanography was established as a department in the University.

Under Thompson's thoughtful guidance a small research vessel, the *Catalyst*, was built for the Laboratories and was put into operation in 1932. Into her 75-foot length were packed accommodations for a crew of three and bunks for thirteen "scientists," together with a laboratory for chemical work and the special gear required for collecting samples at sea. The head was convertible at need to serve as a bacteriological laboratory. One of his students has written:

"The final result was a trifle top-heavy, which accounted for the great amplitude of roll and prevalence of *mal de mer* among the devoted passengers and crew. Tommy—sometimes called "The Admiral" under these circumstances—was a man of courage, the first to master his discomfort and to carry on in the face of adverse winds and waves. Seeing him in oilskins on the somewhat perilous platform hanging over the ship's side, superintending the collection of a water sample from the depths was to sense his persistent interest in the mystery of the sea."¹

In spite of her limitations, the *Catalyst* served admirably for her intended purpose, to take students to sea and give them firsthand experience with the problems of scientific work in that unstable medium. In this, Thompson was somewhat before the times—female students were encouraged and sometimes even recruited to share the experience of cruises in the inshore waters of the coast.

¹ B. D. Thomas, *Journal of Marine Research*, 17 (1958):11.

During Thompson's directorship, the laboratory at Friday Harbor, off the mouth of Puget Sound, became the summer field station of the Oceanographic Laboratories. Courses were given in oceanography, as well as in the usual divisions of marine biology, with frequent day trips to observe and study the rich life and the active movement of the local waters. The Director made his residence among the students and they came to know him more intimately than was possible at the University in Seattle. One of the courses instituted at Friday Harbor was a general oceanography course to which the instructors in the various disciplines contributed. Typical of Thompson's delight in naming things and people was his reference to the course as "Omnology."

In the days before large-scale federal sponsorship of research in universities, research budgets were often minuscule or nonexistent. To ensure that he could carry out viable research, he and Mrs. Thompson budgeted one-tenth of his salary for his research—an investment that brought both of them much satisfaction.

The bibliography indicates that Thompson's first papers were on somewhat unrelated problems in inorganic and biological chemistry—subjects evidently dictated by the varied interests of his masters. In selecting a specialty in which to pursue chemical research that would benefit his newly chosen home in the Pacific Northwest, he and Dr. H. K. Benson looked over the promising opportunities for research in the area. Benson chose the chemical problems of the forest and forest products and Thompson those of the sea. His interest in the sea and its chemistry was aroused in part as the result of the construction of the Lake Washington Ship Canal, which allowed sea water to flow into the Lake. His first publication on the consequences of this development appeared in 1925. Three years later he was writing on the sea water

of the San Juan Archipelago and in 1930 on the hydrography of the Gulf of Alaska and on ionic ratios in the waters of the North Pacific Ocean. Thus, in half a dozen years the analytical chemist became an oceanographer. This expansion of his interest was by no means an abandonment of his primary discipline, but rather a recognition of a field ripe for its application.

Thompson's most important contribution to the data of science is his work on the minor elements in sea water. These substances occur in such small concentrations in the ocean that their determination presents difficult analytical problems. Thompson developed and applied improved methods for the study of the concentrations of these elements and their variation in the waters of the sea. His work included studies on aluminum, boron, copper, iron, manganese, nickel, strontium, silicon, bromine, iodine, phosphates, and nitrates. As a superb analytical chemist, he achieved results that have not been subject to successful challenge.

He was also interested in the relation of the chemical properties of sea water to its physical properties; namely, its specific gravity, refractivity, and electrical conductivity. His work with B. D. Thomas and C. L. Utterback on the last-named provided the basic data for the development of modern methods for determining the salinity of sea water. He contributed to physical chemistry by examining the equilibria in saturated solutions of the major salts of sea water. His study of the isotopic composition of sea water, made in 1935, before the mass spectrometer had superseded densiometric methods of determination, evidenced his readiness to explore new fields as they were opened up by scientific advances. On the practical side, he made inquiry into the possibilities of desalting sea water by freezing.

In addition to these varied chemical studies, Thompson

published in collaboration with others many papers on the descriptive oceanography of the North Pacific Ocean and of the local coast. It is noteworthy that most of his publications appeared under joint authorship, a circumstance which testifies to his pleasure in collaborating with others and which perhaps explains the diversity of the subjects on which he published.

Thompson served in the Chemical Warfare Service of the U.S. Army during both world wars. In 1917 he served as a private for a month at Camp Lewis, Washington, and for two months with the Gas Defense Service in the laboratories of the National Carbon Company of Cleveland, Ohio. Commissioned as First Lieutenant, he worked on the chemistry of war gases in the Geophysical Laboratory at Washington, D.C., in the laboratories of Ohio State University and Johns Hopkins University, and at the Edgewood Arsenal. In July 1918 he was transferred to the Chemical Warfare Service with the rank of Captain.

Following the outbreak of World War II, he was commissioned Colonel in the Chemical Warfare Service in 1942 and was a member of the Chemical Warfare Board during 1943-1944. He was Technical Director of the San Jose Project, a secret investigation on jungle warfare conducted in Panama, in 1944-1946. He was also a member of a committee of the Office of Scientific Research and Development, U.S.N.

In many ways a most unmilitary man, Thompson took his military role seriously. His final promotion to Colonel was recognition of the chemist's contribution to the defense of his country. His career was an example of the willing sacrifices of scientists to that end.

Among his services to the scientific community, Thompson was a representative of the National Academy of Sciences-National Research Council at the meetings of the In-

ternational Geodetic and Geophysics Union in Stockholm (1930), Lisbon (1933), Edinburgh (1936), and Washington (1939), and was Chairman of the International Committee on Oceanography for the Pacific Science Congress from 1935 to 1953.

Thompson served also as Chairman of the Puget Sound Section, American Chemical Society (1915); as President of the Pacific Division, American Association for the Advancement of Science (1946-1947); as Chairman of the Standing Committee on Oceanography of the Pacific Science Congress (1929); as Chairman of the Committee on Methods and Units for Chemical Oceanography of the International Association of Physical Oceanography (1936); as a Representative to the Pacific Science Congresses in Vancouver (1933), San Francisco (1936), and New Zealand (1949); as President of the Oceanography Section of the American Geophysical Union (1934-1937); on the Foreign Relations Committee of the National Research Council (1935); as President of the Oceanographic Society of the Pacific (1935-1942); on the Editorial Board of the *Journal of Marine Research* (1937 until his death); as Chairman of the U.S. Committee on Oceanography of the Pacific of the National Research Council (1948).

Five outstanding honors were tendered to Thompson: the award of the Alexander Agassiz Gold Medal of the National Academy of Sciences "for his original contributions to the science of the ocean" in 1948; election to the National Academy of Sciences in 1951; the publication in 1958 of a volume of scientific papers "dedicated to Thomas Gordon Thompson on the occasion of his seventieth birthday by some of his friends and associates in appreciation of his profound influence on the development of oceanography";² the presenta-

² Published as Vol. 17, 1958, of the *Journal of Marine Research* by the Sears Foundation for Marine Research.

tion to him on May 25, 1960, of a Certificate for "distinguished service to the people of Washington" by Governor Albert Rossilini; and the christening of the Auxiliary General Oceanographic Research Ship No. 9 as the *Thomas G. Thompson*. The ship is a 209-foot vessel especially designed and built under U.S. Navy auspices for oceanographic research at the University of Washington.

Thompson carried the warmth, earthy humor, and good fellowship which marked his dealings with students and colleagues into his off-campus life. Children and enormous ice cream confections were both passions of his, and, to the kids' great delight, he chose to enjoy them simultaneously. There were no happier occasions at the Friday Harbor laboratory than when, in the midafternoon, the call would go out, "Come on, kids, let's go," and all in sight were loaded into Tommy's car for a trip to the drugstore for sodas, sundaes, and banana splits—all as guests of the director.

A gifted storyteller, he had an anecdote for every occasion, sometimes irreverent, sometimes macabre, sometimes highly topical, but always funny, never unkind, and frequently repeated. In World War II, he lost his hearing in one ear, but he claimed always to have been tone-deaf. He would remark that his ear for music was so bad he couldn't tell the difference between "Nearer My God to Thee" and "The Star-Spangled Banner," so he always stood up for both.

Card games—particularly bridge and cribbage—were a great joy to him, and he played with extreme skill as well as a highly amusing running commentary on the poor quality of his hand. "How would God play a hand like this?" Although not highly active politically he was a staunch Democrat and was one of those few who predicted, within a few electoral votes, the unexpected election of Truman over Dewey in 1948.

Philately was a serious hobby of his and he accumulated a large and valuable collection. A special interest was Central American air mail stamps, but he probably most enjoyed his exchanges with foreign scientists and the receipt of foreign covers mailed to him by friends. When on trips out of the country, he delighted in writing his friends back home and decorating the envelopes with collections of stamps.

During World War II, McConnell Island, a 33-acre island in the San Juan Archipelago, became available for purchase, and by the judicious sale of some of his more valuable stamps, Thompson raised money to buy it. After his return from army duty, he and his family began to develop the island, finally building a home of native stone and driftwood. The island was a place of beauty and delight to Tommy, and to his many visitors. In one of the last summers he spent there, over 700 visitors were recorded in the guest book—a fair indication of the friendship and esteem in which he was held.

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KEY TO ABBREVIATIONS

- Am. Coll. Soc. Mag. = American College Society Magazine
 Am. J. Sci. = American Journal of Science
 Anal. Chem. = Analytical Chemistry
 Bot. Gaz. = Botanical Gazette
 Bull. Nat. Res. Council = Bulletin of the National Research Council
 Deep-Sea Res. = Deep-Sea Research
 Ind. Eng. Chem., Anal. Ed. = Industrial and Engineering Chemistry,
 Analytical Edition
 J. Am. Chem. Soc. = Journal of the American Chemical Society
 J. Chem. Educ. = Journal of Chemical Education
 J. Conseil, Conseil Perm. Internat. Exploration Mer = Journal du Conseil,
 Conseil Permanent International pour l'Exploration de la Mer
 J. Ind. Eng. Chem. = Journal of Industrial and Engineering Chemistry
 J. Marine Res. = Journal of Marine Research
 Proc. ——— Pacific Sci. Congr. = Proceedings of the ——— Pacific Sci-
 ence Congress
 Publ. Puget Sound Biol. Sta. = Publications of the Puget Sound Biologi-
 cal Station
 Trans. Am. Geophys. Union = Transactions of the American Geophysical
 Union
 Univ. Wash. Publ. Oceanogr. = University of Washington Publications in
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