

NATIONAL ACADEMY OF SCIENCES

EDWARD LULL COCHRANE

1892—1959

A Biographical Memoir by
JEROME C. HUNSAKER

*Any opinions expressed in this memoir are those of the author(s)
and do not necessarily reflect the views of the
National Academy of Sciences.*

Biographical Memoir

COPYRIGHT 1961
NATIONAL ACADEMY OF SCIENCES
WASHINGTON D.C.



E. L. Cochran

EDWARD LULL COCHRANE

March 18, 1892–November 14, 1959

BY JEROME C. HUNSAKER

A BIOGRAPHY dealing with the life of Vice Admiral Edward Lull Cochrane could be based on an impressive record of accomplishments, fully documented in the files of the Navy Department, the U.S. Maritime Commission, the Federal Maritime Board, the Massachusetts Institute of Technology, the American Society of Naval Architects and Marine Engineers, and many other organizations with which he had important and constructive relations.

These records would show outstanding professional competence as a naval architect, as well as administrative capacity and leadership in fields of action somewhat remote from his profession. Exceptional native intelligence and exceptional opportunities for experience, recognized by his superiors, brought him to his professional summit as Chief Constructor of the Navy in the greatest naval war of all time.

Nevertheless, intelligence and experience alone cannot fully account for Cochrane's outstanding service in many capacities involving merchant shipping, labor relations, education, and industry. After his retirement from the Navy his advice and counsel were in great demand. At the time of his death he was a director of five industrial corporations, on the advisory board of five educational institutions, a member of eleven engineering societies and five social clubs, in addition to his duties at M.I.T. as special aide to its president.

One can only offer, as a partial explanation, that Cochrane's wide

range must have resulted from sterling character, intense concentration of energy, and intuitive judgment of people and their motivation. All this was superimposed on quick apprehension and warm human sympathy. Leadership is a mysterious quality, and Cochrane possessed it in high degree.

Cochrane's virtues and capabilities were outstanding, but his meticulous concern for the professional work of his immediate subordinates was sometimes a cause of delay in final release of designs. To some this appeared like mistrust, to others it showed interest and encouragement. The over-all effect was to drive Cochrane into double duty and to keep him constantly under pressure.

There were more than 6,000 people in the Bureau of Ships in World War II. Cochrane organized them effectively, and added the stamp of his own personal judgment on the character and quality of a vast number of ships. His leadership impressed all hands with the importance of what they were doing and inspired them with the desire to give their best.

For example, it was his practice during the war years to work seven days a week and, on most days, well into the night. He took important correspondence home and drafted a reply there. Next morning, his draft was gone over carefully with the subordinate having cognizance.

Cochrane, as a vigorous administrator, was quick to decide on policy, but insistent on thorough staff work on technical matters. He was basically a naval architect with an intense desire for perfection.

There is no doubt that Cochrane felt an overriding sense of personal responsibility for the design and construction of every ship for which his Bureau was responsible. This was possible only by the expenditure of extraordinary energy.

Cochrane was appreciated as a naval architect of the highest professional stature. The American Society of Naval Architects and Marine Engineers voted him their David W. Taylor Medal "for notable achievement" in 1945.

Also in 1945, Cochrane was elected to the National Academy of Sciences. There was some difficulty at first because election to the

Academy depended largely on the number and quality of published scientific contributions. The following statement was submitted to the membership prior to the vote:

“Because of the nature of his duties, his professional papers are of a highly confidential nature and are circulated only within the Navy. The nature and titles of such papers cannot be cited here.

“Cochrane is mainly responsible for the designs of our modern submarines and new types of battleships, cruisers, carriers and destroyers and has taken a leading part in designs for the conversion of cruisers and merchant ships to aircraft carriers. As an engineer and designer he has introduced advanced methods of strength computation, modern instrumentation for analysis of impact and explosion effects, machinery vibration, and other dynamic phenomena. He has applied effectively the theory of similitude, using models, with full-scale experiments carefully planned for verification.”

Cochrane's naval record indicates that, after graduation from M.I.T., his assignments concerned ship design, construction and repair, as was usual for a junior officer of the Construction Corps, but he had an unusual opportunity to observe ships in operation for two years at sea with the Fleet. Furthermore, he had served as technical advisor to the International Conference on Safety of Life at Sea held in London in 1929. This experience probably stimulated his later very active concern with the habitability and safety of combat ships, especially in damaged condition.

During the war, welding was introduced to replace riveting, to speed up merchant shipbuilding. There were serious failures and, as is usual, a Board was appointed to consider the matter. What was not usual, however, was that Cochrane, a naval officer, was appointed to this Board. With characteristic energy and competence he got to the root of the trouble. Secretary Forrestal's letter of commendation contains these sentences:

“The Secretary desires to express his gratitude for the able manner in which you contributed to the solution of the problems which confronted the Board.

“It is noted with satisfaction that the epidemic of structural failures has been successfully curbed.”

Cochrane had spent four years (1929–1933) at the Portsmouth Navy Yard building submarines and in the winter of 1940–1941 was sent to the British Admiralty to study British submarines and British methods of antisubmarine warfare. This experience was later reflected in our World War II submarines, designed under his supervision, and in the mass production of the destroyer escorts and escort aircraft carriers which checked the German submarine menace in the Atlantic.

He also developed revolutionary types of landing craft for the amphibious warfare which swept the Japanese from the islands of the Pacific. His professional interests extended from huge *Midway* class aircraft carriers to self-propelled surfboards used for underwater demolition work.

A unique opportunity for Cochrane to observe in person damaged warships came when the late Frank Knox, Secretary of the Navy, had Cochrane fly with him to Pearl Harbor to survey the disaster and to plan the rehabilitation of crippled ships.

Cochrane’s keen interest in battle damage led him, when Chief of the Bureau of Ships and under enormous administrative pressures, to fly to the South Pacific in 1944 to see for himself how our ships stood up, and to go in with the Palau invasion.

His concern for the end effects of his decisions may account for his being known as “The Shirt Sleeves Admiral.” This came from his practice of leaving off his coat and cap with the gold braid to visit drafting rooms and shops in shirt sleeves, to see how his jobs were going.

Probably this interest and intimate contact led naturally to his appreciation, as Chief of Bureau, of the importance of able and willing labor to achieve the results required by the shipbuilding program. Older building yards were vastly expanded, new government-financed facilities provided, and a horde of inexperienced mechanics collected. Labor standards and pay scales were chaotic among

different plants and between different trades and skills. Labor organizers were fighting for control, while work was stalled or botched. As the vast majority of the building contracts were at government cost, government action at the highest level was required to pacify and stabilize the working force. This was effectively accomplished, at an increased cost of course, but the great shipbuilding program advanced with record speed.

Cochrane's position as Chief of the Bureau of Ships placed him with Vice Admiral E. S. Land of the Maritime Commission, along with representatives of shipbuilders and labor unions, before the War Production Board to devise proper scales of wages and incentives.

That Cochrane's actions in the field of industrial relations were characteristically intelligent, fair, and diplomatic may be assumed from the fact that in 1950 he was made an Honorary Life Member of the A.F. of L.

In 1952 the Industrial Union of Marine and Shipbuilding Workers adopted a resolution containing these words:

"He promulgated a program which made the American commercial fleets the pride of the nation . . . his exceptional ability and drive in taking hold of an organization that became demoralized and scandalously inefficient and re-established its efficiency and morale . . . his fairminded, impartial approach to the problems confronting the industry and its personnel during the postwar period will live long in the memories of all who have been fortunate enough to have cooperated with him . . . consideration and courage in applying democratic principles of fair play to the Industrial Union of Marine and Shipbuilding Workers of America, C.I.O., and its officers, singles him out for our heartfelt gratitude and esteem."

A record of tremendous accomplishments does not disclose the inherent quality of a man. He must have been a hard driver, intolerant of clumsy procedure. Nevertheless, Cochrane was well known to his colleagues as relaxed and humorous off duty. He was, of course, a hard driver but he drove no one as hard as himself.

An anecdote apparently of little significance at the time may be illuminating. About the time of the New York World's Fair, the new cruiser *Indianapolis* with F.D.R. on board started for a southern cruise. She had aviation gasoline (for a seaplane) in stainless steel tanks. The tanks sweated out gasoline (with no holes to be seen) and frightened the captain, who persuaded F.D.R. to let him turn back.

A naval Court of Inquiry was called to investigate and fix blame. Commander Cochrane had been in charge of outfitting the *Indianapolis* and might be blamed. The trouble was found to be due to "intergranular corrosion" of stainless steel, caused by sea water pumped under the gasoline to keep the tanks full. The cross-examination of witnesses by Cochrane was of a high-pressure nature. Afterwards, Cochrane apologized and, with a smile, explained that his name was on a list before a Selection Board for Captains. While before a Court of Inquiry, he would be automatically "passed over." Fortunately, the court finished its job in time and Cochrane was promoted. Otherwise, he might not have had the opportunity to become the leader he proved to be.

With three generations of Cochranes in the Navy, it is not unexpected to find him as Chief of the Bureau of Ships supporting the views of Dr. Vannevar Bush and Fleet Admiral E. J. King on postwar policy regarding interservice relations.

Dr. Bush had advised the Congressional Select Committee on Postwar Military Policy on January 26, 1945, as follows:

"Whatever interlinkage of the Services is ultimately provided, it should not be allowed to inhibit the *esprit de corps* and the pride in organization which is at the heart of much of our military strength. . . . The significance of the uniform should not be diluted in the name of economy."

King endorsed Bush's advice and ordered the posting of the complete statement. Cochrane added a footnote: "The observations quoted herein are so full of understanding of human psychology as

to be worthy of very careful reading. Do not destroy until section personnel concerned have read.”

NAVAL SERVICE

Background. Edward Lull Cochrane was born at the Mare Island Navy Yard, San Francisco, March 18, 1892, son of Brigadier General Henry Clay Cochrane, USMC, Retired, and Mrs. (Elizabeth Ferguson Lull) Cochrane, both now deceased. He attended Chester (Pennsylvania) High School and the University of Pennsylvania prior to entering the U.S. Naval Academy, on appointment from the Seventh District of Pennsylvania in 1910.

From 1901 to 1910, while General Cochrane was on duty in China and the Philippines, the family returned to their home in Chester, in the shadow of the shipbuilding industry, and with many friends at the Navy Yard in Philadelphia. Young Cochrane saw a good deal of ships and shipping and occupied his spare time with boatbuilding and boating under sail and oars. Early motivation is evident.

As a Midshipman he won his letter in fencing, was manager of the fencing team, sabre fencing champion (1913 and 1914), and was vice-president of the Intercollegiate Fencing Association (1914). His name was engraved on the cup presented to the Naval Academy by the Sons of the American Revolution as the Midshipman most proficient in practical ordnance and gunnery.

Graduated with distinction, second in a class of one hundred and fifty-four members, and commissioned Ensign, June 6, 1914, he was transferred to the Construction Corps of the Navy in the rank of Lieutenant (junior grade) on June 6, 1917. He received temporary promotion to the rank of Lieutenant during World War I, and was commissioned in that rank on July 30, 1919. In June, 1940, when the Construction Corps amalgamated with the line of the Navy, he was designated for Engineering Duty Only and thereafter received periodic promotions, attaining the rank of Vice-Admiral from April 3, 1945. On November 1, 1947, he was transferred to the retired list of the Navy.

Early Service. Following graduation from the Naval Academy in 1914, Cochrane was attached to the U.S.S. *Rhode Island* while she was on special service protecting American interests at Vera Cruz. Selected for the Construction Corps, he reported in January, 1916, to the Postgraduate School, Annapolis, and later to the Massachusetts Institute of Technology where he was undergoing instruction in naval architecture when the United States entered World War I. His course of instruction interrupted due to the emergency, he was assigned throughout the war period to the Hull Division at the Navy Yard, Philadelphia.

In October 1919, he re-entered M.I.T., and in June, 1920, received the degree of Master of Science in Naval Architecture. He then returned to the Hull Division at the Philadelphia Navy Yard, where he served, first with construction of two battle cruisers and later in charge of repairs. In April, 1924, he was assigned to the Design Division (submarines) in the Bureau of Construction and Repair, Navy Department. In 1929 he served as technical advisor to the United States Delegation to the Conference on Safety of Life at Sea held in London. After returning to the United States in September of that year, he had duty until May, 1933, in connection with submarine construction at the Navy Yard, Portsmouth, New Hampshire. He next served two years at sea as Force Constructor on the staff of the Commander Scouting Force, U.S. Fleet.

Later Career. In September, 1935, Cochrane returned to the Bureau of Construction and Repair and was assigned again to the Design Division where he served until September, 1940, with the exception of three months at the Naval War College, Newport, in 1939. In September, 1940, he was ordered to London, as Assistant Naval Attaché. During the winter blitz of 1940-1941 he studied battle damage to British warships and also made a survey of antisubmarine warfare, returning to the United States in January, 1941. From January, 1941, until November 1942 he was Assistant Head of the Design Division of the Bureau of Ships.

He was appointed Chief of the Bureau of Ships which had been

formed in 1940 by the consolidation of the Bureau of Construction and Repair and the Bureau of Engineering, with the rank of Rear Admiral, on November 1, 1942. In July of 1945 he accompanied the Secretary of the Navy, the late James Forrestal, to Germany and England, where he visited industrial plants and technical centers.

"For exceptionally meritorious service . . . in the Design Division of the Bureau of Ships from December 7, 1941 to November 2, 1942, and as Chief of the Bureau of Ships from November 23, 1942 to August 31, 1945," he was awarded the Distinguished Service Medal. The citation continues in part:

"An administrator of foresight, judgment and extraordinary professional ability, Vice Admiral Cochrane achieved distinctive success in this skilled direction of the design and construction of a vast number of vessels, many of new and revolutionary types during a period of critical urgency. Inspiring in his subordinates his own high standards of accomplishment in the performance of exacting duties, he was directly instrumental in enlarging the United States Fleet and in fitting it for combat at a rate unprecedented in the history of naval warfare. His distinguished service throughout this period contributed essentially to the successful prosecution of the war."

In November, 1946, he became Chief of the Materiel Division in the Office of the Assistant Secretary of the Navy, and in March, 1947, he had additional duty as a member on the President's Advisory Committee on the Merchant Marine, a committee to develop a merchant marine policy. He was relieved of all active duty on his retirement November 1, 1947.

U.S. Maritime Commission (World War II). Relations between the Navy and the U.S. Maritime Commission (Vice Admiral E. S. Land) were inherently competitive for ship- and engine-building facilities and initially inadequate for the war program of each. Thanks largely to mutual respect and confidence between Land and Cochrane, reasonable adjustments were made, and each great building program was brilliantly successful. Land had been Cochrane's

sponsor for appointment as Chief of the Bureau of Ships. Both men were naval architects and M.I.T. graduates.

Cochrane presumably influenced Admiral King and the Secretary of the Navy; Land influenced the War Production Board and the White House. The result was that the Navy occupied all existing shipyards and steam turbine plants, while the Maritime Commission adopted reciprocating steam engines for its Liberty Ship program, and built new shipbuilding facilities for the quantity production of some 5,600 ships.

The "Baby Flattops" afford another example of effective cooperation between Land and Cochrane on a vital issue. These Escort Carriers were urgently needed for protection of convoys. It was agreed that the Maritime Commission would design and build fifty converted merchant ships (C-4 type) at a new yard in Vancouver, Oregon, and that the Navy would be responsible for airplane-launching catapults, arresting gear, etc., together with the complement of airplanes and bombs. Cochrane willingly gave over a major job under his cognizance to save vital time.

Admiral Land writes: "Winning the war as quickly as possible was the uppermost thought in all my relations, both personal and professional, with Admiral Cochrane. Any differences were readily and equitably worked out; compromises made harmoniously."

POSTWAR ACTIVITIES

M.I.T. Cochrane retired from the Navy in 1947 at the age of fifty-five, to become Head of the Department of Naval Architecture and Marine Engineering at the Massachusetts Institute of Technology. For five years he headed the Department in which he had been a graduate student thirty years before. This service was interrupted for two years by the call of President Truman for further duty in Washington on postwar merchant marine problems.

Returning to M.I.T. in 1952 he was appointed Dean of Engineering with administrative responsibility for coordinating the programs of all of the Engineering Departments, including budgets, promo-

tions, and personnel generally. In 1954 he became Vice-President for Industrial and Governmental Relations. In this position, he had charge of a vast range of sponsored research projects, some classified on security grounds and not open to students. He got most of the classified work moved out of the Departments into the separate Lincoln and Instrumentation Laboratories and into an independent systems engineering organization set up in Lexington as the non-profit Mitre Corporation.

Cochrane was elected to the Board of Trustees of Associated Universities, Inc. (Brookhaven National Laboratory and National Radio Astronomy Observatory) on nomination of M.I.T. in October, 1952. He served, including one year as chairman, until his death. The minutes of the Executive Committee of the Board on November 20, 1959 contain this statement: "Admiral Cochrane's distinguished services to his country and to the great educational institution which he joined on his retirement from the Navy require no recapitulation here. His services as a trustee of the Corporation were of the same high caliber. He brought to the deliberations of the Board sound judgment, derived from native intelligence reinforced by varied experience."

Civic. While at M.I.T., Cochrane lived in Cambridge and was promptly drawn into civic affairs including the Cambridge Planning Board. Governor Christian A. Herter wrote at the close of his administration in December 1956: "I do want you to know how greatly I appreciate your fine help and cooperation." Just what advice Governor Herter got from Cochrane may be unknowable but it was, no doubt, very sound.

Federal Maritime Board. Appointment by President Truman as Chairman of the Federal Maritime Board and also as Maritime Administrator in the Department of Commerce gave Cochrane the opportunity to initiate the design and construction of the big Mariner-class 20-knot freighters, at one time called "Cochrane's Folly," but now giving effective world-wide service against international competition. In addition to other heavy responsibilities, he had the

unglamorous job of mothballing surplus merchant ships, scrapping obsolete vessels and disposing of wartime shipbuilding facilities no longer useful. An associate has said, "His two years at the Maritime Board left behind a vapor trail of accomplishments."

United Seamen's Service. United Seamen's Service was organized during the war to help merchant marine personnel as the U.S.O. helped members of the armed forces at home and abroad. Cochrane took over as president while he was at M.I.T. and held office until his death. With his usual energy and administrative ability, Cochrane put the U.S.S. on a going basis, self-supporting and broadly recognized by the U.S. Merchant Marine as a necessary and permanent organization.

Safety of Life at Sea. In 1957, Cochrane was appointed by the Committee on Merchant Marine and Fisheries (House of Representatives) with Professor H. L. Seward of Yale, Commander E. M. Webster, and Rear Admiral H. C. Shepard to investigate the *Andrea Doria-Stockholm* collision with regard to the adequacy of navigation and warning devices, including radar, construction standards for passenger vessels and matters involving safety of life at sea. All four of these experts had previously served on the *Morro Castle* investigation.

It is to be noted that Cochrane, as a professional naval architect, had a background of service with the International Conference on Safety of Life at Sea (1929) plus wartime experience with battle damage on an immense scale.

Death. Cochrane was returning by train from a professional meeting in New York when stricken by a heart attack. He died in New Haven, November 14, 1959.

Vice Admiral Cochrane is survived by his wife, the former Charlotte Osgood Wilson, whom he married in 1916, and two sons, Captain Richard Lull Cochrane, U.S.N., and Commander Edward Lull Cochrane, Jr., U.S.N.

Funeral services were in the Fort Myer Chapel, Washington, with burial in Arlington National Cemetery. A memorial service was conducted by the Episcopal Chaplain at M.I.T. on December 9, 1959.

HONORS AND DISTINCTIONS

Edward Lull Cochrane, Vice Admiral, U.S.N. (retired)

Honors:

Mexican Service Medal, 1915
Victory Medal, World War I
American Defense Service Medal
Victory Medal, World War II
Distinguished Service Medal, 1946
Asiatic-Pacific Campaign Medal
American Area Campaign Medal
Knight Commander, Order of the British Empire, 1946
Gold Medal, Department of Commerce, 1952

Honorary Degrees:

LL.D., Hahnemann Medical College, 1943
D.Eng., Polytechnic Institute of Brooklyn, 1946
Sc.D., Tufts College, 1950
D.Eng., Stevens Institute of Technology, 1954

Director:

Babcock and Wilcox
Wm. F. Clapp Laboratories
Moore-McCormack Lines
Newport News Shipbuilding and Dry Dock Company
Raytheon Company

Advisory Board:

U.S. Merchant Marine Academy
U.S. Coast Guard Academy
Naval Historical Foundation
Massachusetts Maritime Academy
Experimental Towing Tank, Stevens Institute of Technology
Boston Dispensary

Member:

National Academy of Sciences
American Academy of Arts and Sciences (Fellow)
Newcomen Society of England

American Society of Mechanical Engineers

American Society of Naval Engineers (President 1946)

Institute of Marine Engineers (London)

Institution of Naval Architects (London)

Steamship Historical Society of America

The Society of Naval Architects and Marine Engineers (President 1947)

United Seamen's Service (President 1954-1959)

Sigma Xi

Clubs:

Army and Navy, Washington

Cambridge Club, Cambridge

Chevy Chase, Washington

Country Club, Brookline

University Club, New York

NOTE

No bibliography is included for Vice Admiral Cochrane because of the nature of his duties, as explained by the author in the foregoing biography.