

## Yale and the Atomic Bomb Casualty Commission

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This is a description, based largely on personal discussions, of the contributions of men from the Yale University School of Medicine to the saga of the immediate and long-term studies on the medical effects of the atomic bombs at Hiroshima and Nagasaki. They played key roles in the immediate studies of bomb effects, in the creation of long-term studies of delayed effects, and in elevating the Atomic Bomb Casualty Commission after 1955 to a position of excellence in its studies and relations with the Japanese. The accumulation of the information presented in this paper derives from research for the preparation of the history of the Atomic Bomb Casualty Commission. In 1975, the commission was passed to Japanese leadership as the Radiation Effects Research Foundation.

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Yale holds a rich tradition of involvement in the Orient, extending for one and a half centuries. An important contribution was a major role in the creation of the Atomic Bomb Casualty Commission in 1946 and its resurgence to a position of major strength in the late 1950s.

The significance of Yale in the Orient goes back to September 1834 when Peter Parker, who had trained in theology and medicine, arrived in Canton as the first American medical missionary. He is said to have chosen Yale instead of Harvard, because he had been advised that Harvard was not the proper place for a young man with pious intentions. Yale was said to be a truer school of the prophets. Parker is acknowledged as the man who introduced surgery to China, including mastectomies, lithotomies, and hysterectomies; in 1847, he performed the first operation under a general anesthetic, sulfuric ether.

With religious fervor sweeping American campuses early in the twentieth century, Yale, Harvard, and Pennsylvania established oriental programs in medical education. Yale-in-China at Changsha, Hunan Province, was by all odds the most successful with its keen, scholarly leader, Edward Hume, who had completed undergraduate studies at Yale followed by medicine at Johns Hopkins. The school thrived until 1916, after which hostility toward foreigners mounted steadily. Hume was forced to depart in 1926, and the school closed the following year.

After the atomic bombs were dropped on Hiroshima and Nagasaki in early August 1945, Emperor Hirohito announced an unconditional surrender on August 26. An Army Headquarters group, including Colonel Ashley W. ("Scotty") Oughterson, M.C., sailed from Manila for Tokyo. With Scottish forebears, "Scotty" had studied medicine at Harvard and, after graduation in 1924, trained with Harvey Cushing at Peter Bent Brigham Hospital. In 1928, he moved to Yale and advanced

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to the ranks of assistant and associate professor of surgery. Oughterson's principal interest in clinical surgery and in research concerned malignancy—its nature and diagnosis as well as surgical relief.

In 1942, Oughterson entered the U.S. Army Medical Corps as a Lieutenant Colonel, and after a period at Yale's 39th General Hospital advanced to chief surgical consultant to the U.S. Armed Forces in the Pacific Theater. This made him directly responsible to General Douglas MacArthur.

During the six-day voyage to Japan, Oughterson wrote to Brigadier General Guy Denit, Chief Surgeon, recommending a study of the bomb's medical effects, including location of casualties, evidence of blast, burns, and residual radiation damage. The group landed in the Tokyo area on September 1, 1945, and were followed shortly by the Manhattan District mission led by Brigadier General Thomas Farrell, with Colonel Stafford Warren, as leader of the medical studies. They agreed to unite with the army group led by Oughterson. In late September, the navy mission under Shields Warren, assigned to Nagasaki, joined the group to form the "Joint Commission for the Investigation of the Medical Effects of the Atomic Bomb in Japan."

Oughterson inspected both Hiroshima and Nagasaki with the Manhattan District team. On September 6, 1946, the full report of the Joint Commission was completed, totaling 1,300 pages in six volumes. As a follow-up, Oughterson and Shields Warren edited and published *Medical Effects of the Atomic Bomb in Japan*, published by McGraw-Hill in 1956, it is considered today to be a primary reference source on this topic.

In 1946, Oughterson became executive vice-president of the American Cancer Society. He then returned to practice in New Haven for eight years. In 1956 he joined the Rockefeller Foundation to study medical education in Columbia and other South American countries. On November 18, 1956, Oughterson boarded an aircraft at Cali, Colombia, for Buenaventure; the weather was fierce and the plane crashed into a mountainside, killing all 29 passengers and the two crew members.

Averill A. Liebow; M.D., an academic pathologist at Yale, of Austrian ancestry, had joined the 39th General Hospital in 1942; he was also serving as the historian for the Yale unit. In August 1945, the hospital had moved to Saipan in the Mariana Islands chain, south of Tokyo and a major base for air attacks on Japan. The stunning news of the peace announced by Emperor Hirohito provoked a long night's festivity. On September 18, 1945, Liebow was informed that he had been assigned to the atomic bomb study team in Japan. He was accompanied by Jack D. Rosenbaum, an instructor of medicine at Yale and a student colleague of John P. Peters in studies on metabolism. On September 19, they flew into the Tokyo area via Guam; they landed at Kiserazu airfield, as directed by General MacArthur. The following day Liebow and Rosenbaum held a session with "Scotty" Oughterson, who briefed them on his proposed studies of atomic casualties. Liebow was assigned to Hiroshima with Colonel Verne Mason from California as the group leader.

Averill Liebow contributed an important document on the immediate effects of the bomb while he was still in Tokyo. A number of Jesuit priests and Japanese men training for the priesthood were based at a Novitiate at Nagatsuka-mura, about two kilometers from Hiroshima, halfway up the side of a broad valley into the mountainous hinterlands. The Father Rector, Pedro Arrupe, a Basque from Bilbao in northern Spain, had completed premedical studies at Valladolid and Madrid before joining the Society of Jesus. The priesthood included a significant number of Ger-

mans, one of whom, Father P. Siemes, wrote a most vivid account of the bomb disaster in his native language for the Holy See in Rome. It includes a grinding description of physical effects and the efforts of the Jesuits to aid the thousands of injured.

Stafford Warren of the Manhattan medical group obtained a copy of Siemes's report, and requested Liebow to translate it into English. Averill did so in an excellent and accurate version, which he dictated to an army sergeant-typist who completed the report in fine form [1].

After completing his translation, Liebow decided to visit the International Catholic Hospital, Seibo Byoin, in Tokyo where several injured priests from Hiroshima had been admitted. He was ushered into the room of Father Kleinsorge, who had been at the mission church sufficiently close to the hypocenter for irradiation injury. At Liebow's request, Father Kleinsorge, who suffered from a leukopenia, told of his experience with the bomb; he was amazed at the accuracy and frequency of Liebow's comments, "until I tell him of the translation of the Siemes document and then he has a good laugh" [2].

John Hersey, a graduate of Yale in 1936, had spent the war years as a writer for *Time-Life* and *The New Yorker*. In 1946, an issue of *The New Yorker* presented, as its only document, Hersey's famed "Hiroshima," a dramatic account of the bomb based on his interviews with survivors. He selected the final paragraph on philosophical interpretations of the bomb, as written in Liebow's translation, for the closing paragraph of this story which soon became a bestseller. "The crux of the matter is whether total war in its present form is justifiable even when it serves a just purpose. Does it not have material and spiritual evil as its consequences which far exceed whatever the good that might result? When will our moralists give a clear answer to this question?" [3].

The study at Hiroshima was completed on November 27; Liebow returned to Tokyo, and in January 1946 to Washington, D.C., where he completed the substantial six-volume report of some 1,300 pages for the military. He then returned to his academic career at Yale. In 1949 Liebow, as the senior author, was joined by Shields Warren and Elbert DeCoursey, an army pathologist, in publishing "Pathology of atomic bomb casualties," in the *American Journal of Pathology* [4].

In 1946, Oughterson pressed for a long-term study of the effects of the atomic bombs under the guidance of the Committee of Medical Sciences, National Research Council (NRC), National Academy of Sciences (NAS). The director, Lewis H. Weed, with a distinguished career as an anatomist in research on the genesis of cerebrospinal fluid, had served as dean at Johns Hopkins. In 1946, he was a member of the Yale Corporation and a close friend of John Fulton. Weed strongly endorsed Oughterson's suggestion, but the initiation of the program languished until November 1946, when Shields Warren submitted a draft letter to Secretary of the Navy James Forrestal. It recommended the creation of studies; Forrestal signed a letter to President Truman which was based on Warren's draft and on November 26, 1946, it was approved by Truman.

Through his association with the Division of Medical Sciences, NAS/NRC, Dean Milton C. Winternitz ("Winter") of Yale strengthened the development of the ABCC. He was a member of the Committee on Growth, which he was instrumental in founding in 1946, and succeeded C.P. "Dusty" Rhoads as its chairman in 1948. In 1949, Weed was found to have bilateral pulmonary tuberculosis and left his position.

With Weed's departure for Saranac Lake, "Winter" became acting chairman and succeeded to the chairmanship in 1950. Until his retirement in 1953, Winternitz became a strong supporter of the ABCC; he made an important move by insisting that the Atomic Energy Commission play a more direct role in the commission's development. This brought to the advisory committee such excellent men as Ernest J. Goodpasture, A. Baird Hastings, and Joseph T. Wearn.

Keith Cannan, chairman of the chemistry department at New York University College of Medicine, succeeded "Winter" in 1955 as director, Division of Medical Sciences. It is only fair to say that, at that time, the ABCC continued to face a multiplicity of problems including the scope of the program, the lack of continuity of leadership, the recruitment of a professional staff, the lack of adequate facilities, and the level of financial support from the AEC. It became clear to Cannan that a survey of the program by epidemiologist-statisticians was absolutely essential in order to identify unified study groups at Hiroshima and Nagasaki. As the leader of the study, Cannan selected Thomas Francis, Jr., an epidemiologist who had graduated from Yale's medical school in 1925.

After an extended period at the Rockefeller Institute, primarily with research on influenza, in 1938 Francis had become professor and head of bacteriology at New York University. He had a close association with Cannan until he moved to the University of Michigan School of Public Health as professor of epidemiology three years later. In the fall of 1955, with Seymour Jablon, Felix Moore, and Cannan as the study group, supported by Baird Hastings and Charles Barnett, the Francis team recommended a unified study program which was adopted with minor revisions. This gave ABCC, for the first time in the nine years of its existence, an organized program of research with specific target areas.

The clinical laboratories had suffered from a lack of effective leadership until 1956 when Howard Hamilton, a graduate of Yale University School of Medicine in 1947, was assigned to the ABCC by the U.S. Air Force. His special interest in Japan had begun in 1953 when he spent the year at Tokyo University as a fellow in endocrinology with biochemical research on steroids and the thyroid. The clinical laboratories have general responsibility in biochemistry, hematology, bacteriology, serology, and parasitology. Hamilton's laboratories are also involved in programs in cytogenetics and biochemical genetics; the latter is a search for protein mutants in children of the exposed; the former, manifestations of radiation damage in blood cells, primarily lymphocytes.

During his year at Tokyo, Hamilton had attended a number of Noh and Kabuki performances with a faculty member who was an avid fan of these two contrasting types of Japanese theater. Soon after his arrival at Hiroshima, Hamilton decided to study Noh and with his unique ability became a leading performer in Japan.

Yale also played a key role in the creation of long-term leadership for the ABCC. This became another challenge for Keith Cannan and it was resolved in a most satisfactory manner with the appointment of George B. Darling, Ph.D., as director in June 1957.

After earning a Ph.D. at the University of Michigan School of Public Health, Darling had joined the Kellogg Foundation at Battle Creek and served as president, 1940-1943. During World War II, Darling worked at the NRC; he became aware of the Yale medical school's financial plight at the end of the war. The central question for the medical school, public health, and nursing were costs at the Grace-New Haven Hospital, Yale's primary clinical center. Darling was appointed Director of

Medical Affairs at Yale and played a major part in stabilizing the financial situation. After Vernon W. Lippard became the dean in 1952, Darling remained at Yale as professor of human ecology. He attributes his selection for the position at the ABCC to Detlev W. Bronk, for whom he had deep admiration. Darling remained at the ABCC until his retirement in 1972; he was the right man at the right time. Research was placed on an organized basis with preparation of protocols and all reports in both English and Japanese. The bilingual technical reports designed by Darling and published annually represent an invaluable account of the research programs. Relationships with the Japanese government at national and prefectural levels were richly enhanced by Darling; he deemed these relationships of high importance and enjoyed them thoroughly. He received tributes from the Atomic Energy Commission, the U.S. State Department, and the Japanese Medical Association. As an example of the respect in which he was held by Japanese officials, Darling was invited to Emperor Hirohito's Garden Party in November 1968. He was on leave from Yale throughout his 15 years with the ABCC.

With leadership firmly based under Darling, the most urgent problem continued to be the need for continuity of leadership in medicine and pathology. Here again, Yale played a key role by supplying first-rate chiefs in the department of medicine, through the interest of Paul Beeson. In a conversation in March 1982, Paul and I recalled that he had led a medical mission for the Unitarian Church to Japan in the summer of 1951. The 12 to 14 members made presentations at a number of medical schools. They did not have time to visit either Hiroshima or Nagasaki, but Grant Taylor, director of the ABCC, came to Tokyo for a session with Beeson's committee. He briefed them on the commission's programs.

As Paul Beeson explained developments in medicine at the ABCC, "from us to them." Each week, Beeson and the members of his department, which he described as "small," had a luncheon together. The development of Sputnik by the Russians and possibilities of nuclear thrusts in other nations became a favorite topic of discussion for bright young men in the fields of science. Paul continued, "We decided that the department should do something and the word reached Keith Cannan . . . [about] our unease about the state of the world and we decided to take on the ABCC as a departmental contribution" [personal discussion, 23 March 1982].

When this welcome information reached Cannan, he hastened to New Haven, and, after a discussion with Beeson, they joined his faculty in the departmental library to discuss the possibilities. From the beginning it was made clear by Paul that his colleagues had no commitment; it was entirely their choice. But after Cannan's presentation, three younger faculty members, J. William Hollingsworth, Stuart C. Finch, and Lawrence R. Freedman, volunteered. Finch explained, "We decided Bill Hollingsworth with his wife Dorothy, also a doctor, should go first; I would be next, followed by Larry Freedman. Each would go for a period of two years." There would usually be two men from Yale; one junior representative, Gerry Burrow, who studied *in utero* exposure disease at Nagasaki during Hollingsworth's and Finch's periods at Hiroshima, became chairman of medicine at the University of Toronto [S. Finch, interview, 25 January 1982].

Bill and Dorothy Hollingsworth arrived at Hiroshima in July 1958 to open the excellent Yale contributions. While Bill played a key role in launching the Adult Health Study, Dorothy, a graduate of the University of Virginia, made the first report on the incidence of thyroid tumors in persons exposed to the bomb at Hiroshima. In addition to his work on organizing the Adult Health Study, Bill Hol-

lingsworth had been informed before his departure for Japan about the possibility of premature aging in A-bomb victims. This became another research area, as well as studies on achlorhydria as a premonitory sign of gastric cancer [J.W. Hollingsworth, interview, 15 May 1982]. Today he is professor of medicine at the University of California, San Diego, and chief of medicine at the VA Hospital, La Jolla.

After two years, Hollingsworth was succeeded in 1960 by Stuart Finch, whose special interest was hematology. He conducted studies on leukemia, continued Hollingsworth's work on the Adult Health Study designed from the Francis report, and, with Seymour Jablon, designed a Growth and Development Study. Stuart Finch and his wife and children developed a special devotion to Japan; they mastered the language as well as aspects of its great cultural traditions. They returned in 1974 for six months to assist in the transition from ABCC to Radiation Effects Research Foundation (RERF) under Japanese leadership. From 1975 to 1977, Stuart Finch served as chief of research and one of the four permanent directors at RERF, and from 1977 to 1979 as vice-chairman and chief of research [interview, 25 January 1982]. On his return to the United States in 1979, Finch became professor of medicine at Rutgers and chief of medicine at Cooper Medical Center, Camden, New Jersey, a clinical arm of the medical school.

The third man from the Beeson department, Lawrence Freedman, from 1962 to 1964 maintained the Adult Health Study and investigated urinary tract infections and the epidemiology of diabetes. He has alluded to his two years at Hiroshima as "transforming him as a physician." As did his predecessors from Yale, Freedman visited the Nagasaki program at monthly intervals. This was essential for keeping well informed on the parallel studies by both Japanese and Americans in Hiroshima and Nagasaki. Freedman's studies on diabetes found a higher incidence of it in Hiroshima than Nagasaki; the disease was more frequent in males, while the reverse was true in America [interview, 7 October 1981]. After several years as professor and head of medicine at the University of Lausanne, Switzerland, Freedman became a professor of medicine at UCLA, and chief at the Wadsworth VA Hospital in Westwood.

Kenneth G. Johnson of Yale followed Freedman, from 1964 to 1967, for a two-year stint as head of medicine. He studied and reported on radiation effects and on leukemia. For two years, 1967 to 1969, Benedict Harris, who had graduated from Yale University School of Medicine in 1922, served as chief of medicine.

So it is that Yale leads all medical schools in its contributions to the development and success of the ABCC, extending from the work of Oughterson and Liebow in 1945 to that of Hamilton, who continues today as director of clinical laboratories, Hiroshima; a total of 38 years. Oughterson was a leading figure in initiating the program, Liebow, in his report on the immediate effects of the bomb. Howard Hamilton is credited with being the founder of the clinical laboratories, an excellent scientific leader, and a splendid Noh actor. Paul Beeson and his medical men created a first-rate department of medicine. George Darling was the first permanent director with a special knack for gaining the support and respect of the Japanese.

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