***Hugh Clark*** — I first met Dixon over 40 years ago when I visited him at his Oak Ridge laboratory in connection with critical experiments he was doing for Savannah River. Later associations were within a group of personnel from various contractor sites that met from time to time to discuss data and calculations pertinent to criticality safety. Eventually the group concerned itself with nuclear criticality standards, but because it was inappropriate to limit this work to contractor personnel (and because much of what had been classified was now declassified) others were admitted. These meetings and the standards work have now been supplanted by the ANS Nuclear Criticality Safety Division and Standards Subcommittee 8.

A surprise meeting with Dixon occurred in 1966. My wife and I had driven to Mexico to tour the country. While lunching at a local restaurant in Taxco we encountered Dixon and his wife (they had taken the Copper Canyon tour). A couple of days later we had dinner with them in Mexico City.

Dixon was affable, considerate, and at least in his younger days, full of energy. He has made important contributions to the nuclear industry through his experiments, his involvement in standards, and his editorship of *Nuclear Science and Engineering*. He will be missed.

***E. Duane Clayton*** — I met Dixon Callihan many years ago, and it has been my privilege to have known him as a colleague and friend. We became acquainted through our associated work, Dixon being the manager of the Critical Mass Laboratory at ORNL, and I, of the Plutonium Critical Mass Laboratory at Hanford.

Dixon was one of the most dedicated persons I have met. He knew the value of the critical experiments being performed at ORNL and of the significant roll the data would play in the development of a safe nuclear industry. He was tireless and unbending in his efforts to provide guidance to this end. I can remember a number of meetings wherein he was truly the leader pertaining to the development of nuclear safety guides and American Nuclear Society Standards.

After meeting into the late evening, Dixon would observe that some of the younger persons were becoming a bit tired and no longer able to function effectively. At this point he would suggest the meeting come to a close until the next morning. Yet his enthusiasm, dedication, and energy seemed tireless. We don't know how he did it.

Dixon Callihan had come to Hanford on a number of occasions, and he mentioned that he had never seen Mt. Rainier, as it was always shrouded in clouds when he flew by. I told him how beautiful Paradise Park at Mt. Rainier was, with acres of alpine flowers, and I convinced him to come a day early to a meeting here, and we would go to Paradise Park on Sunday before the meeting. On that Sunday morning, before picking Dixon up at his hotel, I phoned Paradise Inn to check on the weather. It was beautiful—but they could see some clouds to the west. When we arrived at Mt. Rainier the clouds had moved in, and we were in dense fog. Not a glimpse of the mountain, nor the acres of beautiful flowers which I had so eloquently described to Dixon. We had a delightful dinner at Paradise Inn and nice visit. To my knowledge, Dixon never saw Paradise Park or Mt. Rainier in all its glory. I am sure, however, that he is now experiencing a much more beautiful 'place than could ever be envisioned here on earth.

Anyone is fortunate who has the opportunity to meet and know a person like Dixon Callihan. Not only was Dixon a dedicated scientist in his efforts to promote, nuclear energy—but also, above all, he was a true gentleman. We will miss him always.

***Charles Crume*** — Dr. A. Dixon Callihan was a man of high standards, great courtesy, and complete integrity. I am deeply indebted to Dr. Callihan (as most of us called him), both personally and professionally. He had a strong influence on my technical career from its earliest stages. First, as a member of the critical experiments staff at Pratt and Whitney's Connecticut Aircraft Nuclear Engine Laboratory (CANEL), I was trained to do reactor critical experiments by engineers and scientists who had been trained at the Oak Ridge Critical Experiment Facility (ORCEF) under Dr. Callihan's supervision. When I became involved in nuclear criticality safety (NCS), I turned primarily to a reference, the *Nuclear Safety Guide*, which he co-authored. When I needed critical experiments for NCS done, which we could not do at the CANEL Critical Experiment Facility because of equipment limitations, I turned to Dr. Callihan and the ORCEF. When I decided to obtain a Ph.D. in physics, Dr. Callihan helped make it possible for me to come

to Oak Ridge and start on the path to that goal. His traits of probity and precision in technical work and exposition were a good example to me, as was his generosity in the attribution of credit for technical work. Dr. Callihan also introduced me to the Oak Ridge Community Playhouse (ORCP), which he helped to establish. This introduction led me to several decades of involvement with that theater in many capacities. When the ORCP instituted its Lifetime Achievement Awards, he was one of the first recipients. I am very proud of my much later award, partly because of joining him on that roster.

In the spring of 2001, Mr. Calvin Hopper and Dr. R. M. (Mike) Westfall of the Oak Ridge National Laboratory arranged a videotaping program to try to recapture and preserve the history of the ORCEF. As part of the program, Dr. Callihan presented an overview of critical experiment work at Oak Ridge, some of which predated the construction of the ORCEF. In this overview, Dr. Callihan demonstrated once again many of the important traits for which he was well known: a gracious demeanor; well-organized, precise, and careful exposition of technical material; and generosity in attribution of credit for work. His recollection of the details of his work and his colleagues, looking back over more than 50 years, was exceptional. These videotapes are an invaluable resource, both for their historical content and for the glimpse that they provide of Dr. Callihan and others with whom he was associated during the highly productive period of critical experiment operation in Oak Ridge. I hope that they will be made widely available, so that others can learn from and about Dr. Callihan .

***Paul Ebert*** — I made the acquaintance of Dixon Callihan on my arrival in the mysterious “Secret City” in the spring of 1950, having been hired to direct a play for the Oak Ridge Community Playhouse. At first I knew him only as a Playhouse Patron whom I met socially I soon discovered that here was a genuine “Man For All Seasons” -- an opinion continually reinforced over the next forty-some years.

An enthusiast for The Arts, he was a continuous and active Playhouse presence from the time of World War II to his departure to North Carolina in 1993. He became a member of the Playhouse Board of Directors, and from 1952 to 1955 was its President. From 1964 to 1969 he was the Board's Treasurer. Though he didn't show much interest in appearing on-stage, he was invaluable in the many complications of theatrical production -- building scenery, manning the ticket counter, sweeping the sidewalks, encouraging new Members. He was for me a dear friend who did me many favors; finding me living quarters in one of the city's wartime dormitories when I was single, and later when I married he scouted around town for larger quarters. (His searching system was to peer into the windows of apartment buildings until he located us on Hillside Road. I don't know how he managed to escape arrest as a Peeping Tom.)

Dixon was in every way a consummate gentleman -- but I do remember an incident in which he came pretty close to “losing it.” We were producing a large cast musical and on one of the performance days a heavy snowfall began to tangle traffic by Show Time. Dixon was working the ticket counter and he was becoming increasingly exasperated by the non-stop ringing of the phone with requests to know if there would be a performance that evening. His usual cool was becoming warmer until he decided he'd had enough. He was heard to say FIRMLY to one timid lady, “The CAST got here, the STAGE CREW got here, I got here, and YOU CAN GET HERE. (SLAM.)”

***Reg Gwin*** — My first encounter with Dr. Callihan was in a telephone conversation in 1952. He seemed somewhat formal, spoke slowly and distinctly. After joining his group at the ORNL Critical Facility in 1956, I noted he was patient, conservative and dedicated to his work.

Dixon was generally at his desk reading or writing when you passed his office, once I observed that he was writing on slightly abused paper and that both sides were used. When I asked Joe Thomas why he was using old paper for his writing he replied,” it's a rough draft and he's writing on the back of some else’s rough draft.”

Dale Magnuson and I, with other staff members, were involved in experiments which we hoped would yield important nuclear parameters pertinent to the critical conditions for aqueous solutions of the fissile isotopes. During this period the support and encouragement of Dr. Callihan kept us motivated.

At informal parties, such as the Union Carbide “smokers” Dixon enjoyed the fun with his colleagues. At one such party, I was late in arriving. Entering the door I saw Dixon at the bar smiling, raising his glass and

saying, “Come on in, Reg we are one up on you, and I have a cigar for you.” Small moment but still a clear memory.

***John W. Landis*** — Dixon Callihan was one of the stalwarts of the global nuclear community for more than five decades. I knew of his invaluable contributions to critical-experiment design and operation from colleagues Milt Edlund and Dave Williams before ever meeting him. When a mutual interest in nuclear standards brought us together in 1957 I quickly realized that the many good things Milt and Dave had said about him were, if anything, understated. We toiled separately, but often on the same boards, committees and panels, as contributors to the nuclear-standards cause for the next 30 years.

Dixon was not only an outstanding experimental physicist but also a highly competent engineer and a remarkably effective diplomat. He could get people with different backgrounds, attitudes and goals to work together as well as anyone I've ever met. That's one of the chief reasons he was so successful in the voluntary standards movement.

I lost track of Dixon in the late 1980s. His significant scientific, technical and organizational accomplishments in the nuclear field are indelible, however. He made life better for his myriad friends and indeed for the entire world.

***Dale Magnuson*** — I first met Dr. A. Dixon Callihan in June of 1942. Our lives intertwined in New York City and then in Oak Ridge for six decades. For 18 years, I worked under his guidance. After his semi-retirement, we were welcomed to his homes in Davidson, North Carolina and Huntington, West Virginia.

We met in the basement of Pupin Physics Bldg., Columbia Univ. in New York City. After Pearl Harbor, Dixon joined the research group investigating the gaseous diffusion process for the separation (or enrichment) of the U-235 isotope, one of the research projects directed by Prof. John R. Dunning. After completing my first year of graduate study, I taught lab experiments for the undergraduate physics class lectured by Prof. Dunning. Dixon and I crossed paths daily for 2 ½ years, though we never discussed details of our work because of secrecy. Callihan led a group that was testing a certain characteristic of small samples of barrier membrane, and I was a technician for another group. He reminded me last May that I used his sink at Pupin Physics Laboratory in 1942 to wash silver-solder flux off of various soldered joints.

In late 1944, I was asked to transfer to Union Carbide and work at the Gaseous Diffusion Plant (K-25) then under construction in Oak Ridge, Tenn. In 1946, following termination of the enrichment research at Columbia, Dr. Callihan came to the K-25 laboratory. We renewed our friendship and shared a new interest in hiking in the Smoky Mountains National Park. Overnight trips to Mt. Le Conte Lodge with the Callihans were the highlights of hiking in the park.

The production of greater quantities of enriched uranium at the K-25 Plant created a need for handling and processing enriched uranium safely. Plutonium production required similar data. Dr. Callihan led the group selected to pursue this new endeavor (now called nuclear criticality safety). The Oak Ridge group designed and built a critical experiment facility, which became the Oak Ridge Critical Experiment Facility (ORCEF). Other national laboratories were involved informally to share information. The Nuclear Criticality Safety Division of the American Nuclear Society was sponsored by this collaborative group.

Although Dr. Callihan left City College of New York to do research, he never stopped educating. The ORCEF trained and educated many nuclear safety personnel from other installations. The Columbia University staff and Dr. Callihan provided much encouragement for me to continue my education on a part-time basis. I was awarded a Ph.D. in physics by the University of Tennessee in 1951.

I accepted a position working for Dr. Callihan at ORCEF in 1955. We worked together for the next 18 years. He was very supportive of acquiring new equipment, developing new techniques, and improving old ones. He welcomed and educated personnel from other laboratories. He was the “pioneer” who acquired most of the data for water-moderated systems at several enrichments. He broadened our expertise by conducting experiments with U-233. He widened our abilities with uranium metal experiments. He served the needs of reactor designers by making reactor mock-ups. He opened the door in order to proof-test reactor designs. He contributed to the development of nuclear knowledge by serving as editor of *Nuclear Science and Engineering*. He was respected by his community.

We shared many things in our careers, and we also shared an interest in European folk dancing and American square dancing.
He was interested in others. He took time to visit my mother and sister in Mesa, Arizona, and he frequently inquired about our five children. Sometime before the Callihans moved to Davidson, Dixon called to suggest a trip to Roan Mountain to see the rhododendron display. That last impromptu trip with them was a perfect outing.
On our last visit to his home, he gave Doris and me the ultimate complement. As we prepared to leave, like the perfect host and Southern gentleman he was, he pleaded with us to stay another day, "But Dale, you're family."

***Fred Maienschein*** — As you well know, Dixon was the long-term leader of the Critical Experiments Facility, where much basic research and essential applied work was carried out. He also became the long-term editor of the lead ANS journal, *Nuclear Science and Engineering*. We worked together when the Critical Experiment Facility was part of our division. Dixon was clearly dedicated to excellence in everything that he was involved in.
My wife, Joyce, recalls that Dixon was the first male Girl Scout Leader of record in Oak Ridge. With his first wife Alva, he made trips in the early 50's with the girls - camping and hiking in the Smokies. They used to laugh and say "We borrow them and then send them home, an ideal arrangement after a long weekend."

***Jack McLendon*** — Dixon Callihan was my teacher, my mentor, but, most of all, my friend. It was my pleasure to spend both business and social hours with him and members of his criticality experiments program. He was a thoughtful, kind and caring person, who treated me as a member of his extended family.
In l946, or thereabouts, I was a member of the Y-12 Criticality Safety Department. Dixon invited me to participate in his program to perform critical experiments in a makeshift facility at Bldg. K-1095 in the K-25 Power House area. In this facility, he exhibited his ingenuity, dedication and persistence under trying conditions. His work ethic was to do what was necessary to get the basic critical features of U-235 systems for use in manufacturing, shipment and storage. This information was used to facilitate our safety work at Y-12. As time progressed, these data became the basis for National and International Criticality Safety Standards.
In 1965, I undertook chairmanship of American Nuclear Society Standards Subcommittee ANS-8, under Dr. Callihan's direction. This relationship lasted 19 years, until my retirement in 1984.
Dixon's contribution to the Nuclear Criticality Safety field remains active in today's nuclear activities and will remain so as long as needed.
He will not be forgotten.

***Dr. Raymond L. Murray,*** (Professor Emeritus, North Carolina State University) — A brief vignette about my association with Dixon Callihan. Back in early 1946 Dixon and I were colleagues in a team from Oak Ridge that visited Los Alamos to perform critical experiments on enriched uranium "green cubes." The program was in behalf of K-25, Y-12, and X-10. We learned the hands-on technique from Louis Slotin. His tragic death using methods he taught us prompted a complete revision of our critical mass program back at Oak Ridge. Dixon went on to become the leading expert in the field, with a distinguished career over half a century.

***Jean and Hugh Paxton*** — Dixon Callihan and I met at Columbia University before we joined the new-born Manhattan Project in 1942. A 50-year collaboration began seven years later in a field that became nuclear criticality safety. Dixon was head of the Oak Ridge Critical Experiment Facility and I was assigned to a similar facility at Los Alamos. Dixon and I exchanged Oak Ridge information on the criticality of enriched uranium and similar Los Alamos data for metallic enriched uranium and plutonium.
This exchange of criticality data expanded to include information from Hanford and other sites. Organization

and declassification of criticality data led to nuclear safety guides, and in turn, standards for general use by criticality-safety specialists. It is for our part in this process that Dixon and I became known as pioneers in criticality safety.
Other activities that brought us together were professional meetings, especially of the American Nuclear Society, and work with some governmental committees. Dixon added to the pleasure of meetings with a travel-guide-like knowledge of each site.
Socially, Dixon was a gentleman and with unobtrusive humor he enlivened mixed groups. As Jean attests, we always enjoyed being with Dixon and Mildred. I came to regard Dixon as a brother.
As a railroad buff, Dixon encountered a Los Alamos colleague at a rail station in the Balkans. On a return trip from the northwest, he glided by me as I waited day and night at airports because of intense fog. The only derailment he experienced was one that we shared on the Cumbres and Toltec scenic railway out of Northern New Mexico.

***Bob Seale*** — Dixon was one of the most remarkable people I ever met. He was kind and considerate, and at the same time, always showed a devotion to precision and rigor in his writing and statements. His contributions to nuclear science were broad based and marked by practicality and utility. As Editor of *Nuclear Science and Engineering* for many years, Dixon established a standard for rigor and quality that identified the scientific virtues of the society and challenged the efforts of all other ANS publications. He led by example along the path of quality, daring others to follow. Dixon was a leader in the definition and evolution of the science of criticality safety, and insisted on the practical utility of results in the field. His leadership and influence during the time of intensive experimental efforts at the national laboratories was significant to the accumulation of results of benchmark quality that supported the development of the workable computational codes that are the base for our current analysis capabilities.


Dixon and Mildred at the train station in Chama, N.M. in September 2000, with Norman Pruvost (center).

My closest work with Dixon was in the preparation of the review (in English) of the results of the solution criticality experiments done by the French CEA in the 1960's and early 1970's under the leadership of Pierre Lecorche. I was with the Critical Assemblies Group at Los Alamos during the summer of 1971 and learned of the experiments that had been performed in Valduc through a series of individual reports in French. I prepared a summary of the results of about 20 of these experiments and shared them with Hugh Paxton and Dixon. Dixon asked me to prepare a more complete report for the Criticality Data Center series published at Oak Ridge. In the dialog that followed, his suggestions and criticisms were insightful and helpful leading to the publication of CDC-Y-012 (1973).
Dixon worked on many things. His efforts in behalf of the development of ANS and ANSI Standards were extensive. These Standards are important to the industrial community, their clarity a real value to the user. Dixon understood this need.

***Dave Smith*** — I first got to know Dr. Callihan at the ANS meeting in Salt Lake City in the early 1960's. I became involved in ANS-8 under his chairmanship and profited greatly from this introduction to the codification of criticality safety practices. His respect for words and dedication to their proper use made a great impression. Later I was privileged to serve as his deputy chairman on Consensus Committee N16 and with his support eventually was able to serve as chairman of that committee for many years. Dixon was also responsible for my becoming involved with the Nuclear Standards Board and the International Standards Organization.
My overall impression is that he was always a gentleman, always considerate of his


Photo provided by David Smith.

associates, and inspired great loyalty in his colleagues. His friends were all aware of his deep affection for rail transportation, and one of our last interactions with him and Mildred was when we shared a ride on the Cumbres and Toltec Railroad, an old narrow-gauge line operating in the mountains of northern New Mexico and southern Colorado. At one point the combination of ancient equipment and the imperfect roadbed resulted in a derailment, but the train was so slow there was little danger. Dixon was elated! In all his years of train travel, this was his first derailment.

***Jack Taylor*** — I was aware of the reputation of A. D. Callihan in the scientific community but until I joined his Critical Experiments Facility (CEF) in 1963, I had yet to experience what a delight it was to be a part of his safety conscious and very important experiments. To mention a couple (of many) special experiments would be "SORA" and "Aberdeen Pulse Reactor." Of course there were hundreds of basic criticality experiments throughout the years with which I was intimately involved and enjoyed. On a more personal note, he was known for his homemade chocolate fudge and enjoyed it when the group at Bldg 9213 had dinner together.
He showed a personal interest in all of us and our families for which I was grateful. Dr. Callihan's impeccably good manners stood out and will also be kindly remembered.

***Melvin L. Tobias*** — I became acquainted with Dixon in the rather formal fashion of his asking me to act as an occasional "peer reviewer" or referee for technical papers submitted to *Nuclear Science and Engineering*, the research journal of the American Nuclear Society of which he was the long-time editor. From time to time, the journal also published reviews of scientific books. Dixon sent me a copy of the 1960 edition of *The Handbook of Chemistry and Physics* for this purpose. To get at its huge collection of unrelated topics, I wrote from the standpoint of Lewis Carroll's famous Walrus and cited out of its "many things" something, however far-fetched, about each of "ships and shoes and sealing wax, of cabbages and kings." Dixon liked my trick and published the review. As time went by, I continued to serve as a referee whenever he asked me, and now and then I would submit papers or technical notes of my own to him for publication. In 1975, to my great surprise, he asked me to assist him as Associate Editor. I worked with him and his good humored and diligent secretary, Ms. Marge Taylor, on the journal for about 7 years until he decided to retire from editorial duties. He told me that his model for *NS & E* was the high standard of the *Physical Review*, by which I understood that his goal was to publish only high-quality technical papers. No author, however great his reputation, got a "free ride" to publication. At the same time, he would not finally reject a paper until he had made every effort to allow its author to rebut criticisms. To ensure frank and fair comment from referees, their reviews were always kept anonymous (except for the rare cases in which a reviewer wished to communicate with an author directly.)
I discovered that I shared with Dixon a love for grand opera. He regularly went to Atlanta to hear "The Met's" road performances of Verdi, Mozart, Puccini, etc. Unfortunately, I never asked him how he acquired his taste for great vocal music. I should have, for after all, it is a long way from West Virginia to concert halls in Manhattan or the stage of La Scala in Milan. It is an interesting side to his nature, for he was never a man who talked about his emotions, outwardly an exemplar of scientific precision, whereas opera plots are all emotion and the very opposite of precise.
When he and his wife Mildred were in Oak Ridge last spring, they stopped by to visit us. It was plain that his great age was weighing on him, yet he would not accept any assistance whatever in walking about, remaining as rigidly erect as always. His deep voice was just as I knew it, as was his dignified sense of humor. That is how I shall always remember him.

**Alvin M. Weinberg**, *Distinguished Fellow Oak Ridge Associated Universities* — Dixon Callihan was by personality superbly suited to be the founder of the field of systematic criticality experimentation. In addition to his brilliance, he was methodical and unflappable – qualities that every person doing critical experiments must possess!

In addition to founding the discipline of systematic critical experimentation, Dixon served as a member of the Advisory Committee on Reactor Safeguards, and he was the founding editor of *Nuclear Science and Engineering*.

Much of the steady increase in reactor and nuclear safety must be attributed to Dixon's efforts over his long and distinguished career.