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Milton Levenson
ANS President

Levenson—improving technical credibility

The Levenson family in the mid-1930s: Fannie, Milt, Harry, and Norma.

As Milt Levenson sees it, there are two important criteria to consider in selecting a president for the American Nuclear Society:

- First, in terms of professional background, the president should be representative of a large segment of the ANS membership—someone with whom the members can identify.
- Second, the president should be interested in improving ANS as a technical society, both in meeting the needs of the membership and, in turn, in trying to use that membership to improve the society.

Meeting that first criterion is not as easy is it might seem. ANS members are not a homogeneous group. The 18 professional divisions and technical groups reflect the great diversity of interests among ANS members. Where and for whom they work also varies greatly—national laboratories, universities, utilities, industry, government. Recent ANS presidents have tended to represent predominantly one of these areas—Mel Feldman, Ed Hennelly, and Harry Lawroski, the national labs; Vincent Boyer, the utilities; Joseph Dietrich and Corwin Rickard, industry; William Kimel, the universities; L. Manning Muntzing, law and government. Milt Levenson, however, has a variety of experience that makes him representative of many ANS members: a nuclear career that began with the Manhattan Project; nearly 30 years with the national labs; seven years working with the utilities as director of the Nuclear Division at the Electric Power Research Institute; and now working in industry with Bechtel Power Corporation. There's no doubt that Levenson meets that first criterion.

Does he also meet the second, more significant, criterion? Before taking up that question, perhaps we should learn more about the man.

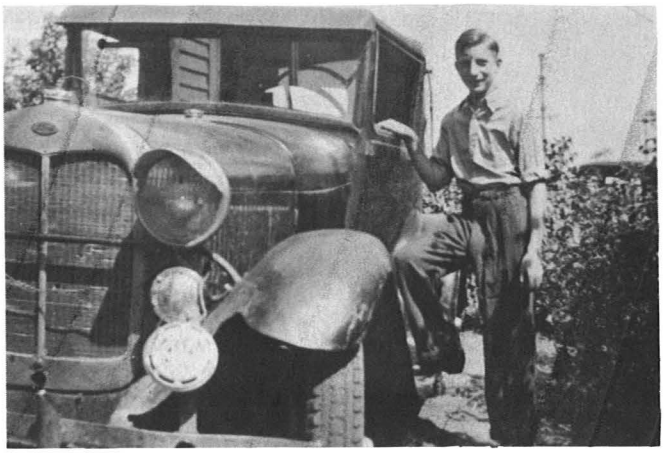
Getting started

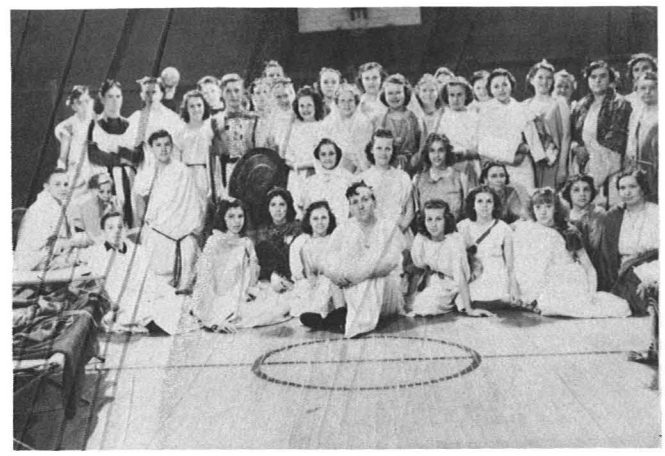
Milton Levenson was born January 4, 1923, in St. Paul, Minn., but grew up and attended schools in Northfield. His father, Harry, ran an auto wrecking yard. Harry died last year at the age of 94. Milt's mother, Fannie, just turned 90, still lives in Minnesota. A younger sister, Norma Lee Bronfman, now lives in New Jersey.

Northfield is the home of two colleges—Carlton and St. Olaf—but Levenson chose to attend neither after high school graduation, because, he says, "I had the ridiculous idea that I wanted to be a chemical engineer," and neither local institution offered an engineering program. So he chose the University of Minnesota.

Why chemical engineering? He explains: "I really wasn't sure what I wanted to be. But a high school advisor said that if you start out in chemical engineering, you can switch to any other field during your four years and you won't have lost any time. It was a different environment at the tail end of the Depression, and you didn't take an extra quarter to find yourself. So I started out [in the fall of 1940] as a chemical engineer. Then, the war came, and I never switched to anything else because, during that period, you couldn't."

Also because of World War II, Levenson graduated early, receiving his





Evidence of the early engineer. At left, Milt and his first car, built from parts obtained from his father's wrecking yard. Above, high school Latin class in costume. Milt is the gladiator with the shield. The armor was also created with parts salvaged from the wrecking yard (a clear case of "junk mail"?).

bachelor's degree in chemical engineering in December 1943. With a few months left on his student deferment, he began looking for a job. "I answered a blind offer," he says. "I had no idea what the job was. And I figured it really didn't matter, since my deferment had only three months to go. It was a good offer, so I took it. It turned out to be the Manhattan Project."

The war and beyond

Levenson was assigned to Decatur, Ill., working for the Houdaille-Hershey Corporation as a junior engineer. In Decatur, there were several pilot plants testing different methods of making barrier for the Gaseous Diffusion Plant. Levenson's job was monitoring what was going on, he says, plus supervising a few nontechnical people. And, he adds, "trying to decide what the real world of chemical engineering was about, since it was somewhat different than the academic textbooks." Also working on the project at the time were Alexander Sesonske, now on the nuclear faculty at Purdue, and Abe Friedman, who, Levenson notes, later served for many years as science advisor for U.S. embassies in France and Japan.

The draft board had a rule during those war years that no one under the age of 22 could qualify for a deferment on grounds of a technical job. So when his student deferment ran out, Levenson was drafted, and trained with the combat engineers. But the Army was also concerned about the few people within its ranks who had worked on the Manhattan Project—should any of these people be sent into battle, be captured, and be tortured, the Army feared that sensitive information might be divulged. The problem was solved by simply reassigning these few people back to the Manhattan Project, but this time under Army auspices. Within a few months, Levenson found himself back in Decatur, doing the same job, but now in uniform, and, he adds, with a substantial reduction in pay.

In late 1944, Levenson was transferred to Oak Ridge, Tenn., where he was assigned to a development group under Miles Leverett (recently retired from General Electric and now with EPRI). His job there was to supervise the design and construction of a small chemical isolation plant at the X-10 laboratory at Oak Ridge (now Oak Ridge National Laboratory). Also assigned there at the time, he recalls, were Ed Nicholson (still at ORNL) and Harold Feder (now at Argonne). "In fact," he comments, "a fair number of the people assigned to Oak Ridge stayed on, and became the old timers of the business."

The war years were an interesting time at Oak Ridge, Levenson says, and he tells of the time, while he was working as a shift supervisor at an early chemical processing facility, when it was felt that he was becoming overloaded at work, and he was promised an assistant. He had just recently been promoted to private first class, but the assistant turned out to be an Army major awaiting discharge. Army majors do not often work for pfc's, but, Levenson explains, at Oak Ridge, job assignments did not always follow military rankings.

After the war, and following his discharge from the Army in 1946, Levenson was offered a job as a civilian at Oak Ridge, and so he stayed there, working as a pilot plant superintendent. He also worked on the production of carbon-14 for dating experiments by making and irradiating beryllium nitride, in the days, he notes, when beryllium was just beginning to be recognized as a hazardous material.

Oak Ridge remained a center of U.S. nuclear activity in those early post-war years. Several training courses in the fledgling science offered at the lab drew some stellar attendees. One of these was Admiral Hyman Rickover, who was gathering background on nuclear energy, and Levenson remembers giving a lecture to a class Rickover was attending. Also down at Oak Ridge for a time for nuclear training was Steve Lawroski, who subsequently became director of the Chemical Engineering Division at Argonne National Laboratory. Another prominent figure at Oak Ridge was Eugene Wigner, who, Levenson recalls, had the uncanny knack of bringing new insight into an old problem, even after only very limited acquaintance with the matter at hand.

In 1948, the Atomic Energy Commission restructured the whole nuclear research program, placing all work on nuclear reactors at Argonne, while keeping other fields of nuclear research at ORNL. Walter Zinn, then ANL director, and Steve Lawroski came down to Oak Ridge to talk to the people whose programs were being transferred to Illinois. Levenson wasn't in such a program, but when he was offered a job at ANL, he decided to take it and "go back north."

At Argonne

For the next several years, working as a development engineer at ANL, Levenson did research in the field of reprocessing, and also delved into waste disposal, including some work on such advanced concepts as the fluoride volatility process for separating uranium from fission products. Working for Levenson for a time was a young chemical engineer named Octave Du Temple, who later was tapped to become the executive secretary of the fledgling American Nuclear Society.

In the summer of 1949, Levenson met Mary Novick at an Argonne picnic. Mary, originally from Toledo, Ohio, had

Groundbreaking for the A^2R^2 project, with a five-handled shovel devised—and gilded—for this express purpose. From left: William B. Harrell, University of Chicago vice president for special projects; Kenneth A. Dunbar, manager of the AEC's Chicago Operations Office; Levenson; Winston M. Manning, ANL acting director; and Philip N. Powers, president of the Argonne Universities Association. (Levenson still has the shovel.)

graduated from the University of Toledo with a degree in chemistry, and had been working in the ANL Chemistry Division since October 1947. Despite some competition from his lab colleagues, Levenson charmed Mary, and they were married August 27, 1950.

One of Levenson's early work assignments was to determine whether the first experimental breeder reactor, EBR-I, was actually breeding. (EBR-I, built at the Argonne-West site in Idaho Falls, Ida., was the first reactor to produce electricity, achieving this feat in December 1951.) Levenson began a program to measure, by chemical means, some basic physical constants, such as "alpha"—the ratio of parasitic captures to fission in uranium-235 and plutonium. These were the first measurements made by chemical means on those values, he says, and they helped enable the determination that EBR-I was, indeed, a breeder.

In the mid-1950s, the decision was made to build a second experimental breeder, the EBR-II, which was to be a prototype power plant. It was to be quite small by today's standards—60 MWt, 15 MWe. The EBR-II Project was designed to test not only the reactor itself, but also the accompanying fuel cycle. Heading the original project crew were Len Koch (recently retired as vice president of Illinois Power Company), as project manager; Harry Monson, as project manager for the reactor itself; Wally Simmons, as project manager for the sodium and turbine part of the plant; and Levenson, as project manager for the fuel cycle facility.

Working with Levenson during the building process on the fuel cycle facility was Mel Feldman, who later became superintendent of operations at the facility, with Don Hampson and Norb Grant both assisting in the facility operations. (All three are now at ORNL.) Also, Levenson notes, the EBR-II became a kind of family project, since the director of the ANL division at Idaho responsible for the reactor's operation was Meyer Novick, Mary's brother.

The fuel cycle facility, the first of its kind in the world, Levenson points out, was built for the purpose of remotely reprocessing spent fuel from the reactor, making new fuel, and putting that fuel back into the reactor, with no one ever entering the facility because of the high radiation levels.

The fact that Levenson was based at ANL in Illinois, while the EBR-II and the fuel cycle facility were located in Idaho, made for some interesting commuting problems, he recalls. In addition, the architect-engineer for the project was located in Cleveland. So, for many years, Levenson spent one day a week in Cleveland, one week a month in Idaho, and a few other days a month with various vendors around the country. And, he notes, this was before the days of commercial jet travel. Finally, in 1961, when the fuel cycle facility was close to being finished and operations were due to begin, Levenson stopped commuting and moved his family out to Idaho for a year. When the facility was ready to start, John Schraidt took over the project, and the Levenson family moved back to Illinois.

Almost 20 years have passed since EBR-II was started up, and it has not been cooled down to room temperature in all that time. "That should answer the questions that have been raised about what we know about breeder technology, what we know about sodium, and what we know about long-term effects," Levenson says. As for the fuel cycle facility, he adds, it ran for five years, providing all the fuel needed for the EBR-II. The only reason fuel fabricating activities were halted, he notes, was because the facility turned out to be even more valuable for the study of radiation damage of materials.

In 1962, back in Illinois, Levenson resumed research on advanced processing techniques and other chemical engineering problems. Then he was asked to take over Argonne's very high flux reactor project, the Argonne Advanced Research Reactor (A^2R^2), for use in research in solid-state physics. He thus became a reactor engineer by edict of then lab director Al Crewe (now at the University of Chicago).

The architect-engineer for the A^2R^2 was located in New York, and so Levenson began commuting east one day a week. In 1965, however, Congress canceled the authorization for the project, and soon all that was left of the A^2R^2 was, as Levenson notes, "the biggest hole in the ground ever dug at the lab site—excavation had already begun—and what was at that time the largest single piece of beryllium ever produced—to be used as the reflector for the reactor core—sitting in a vault at Argonne."

And so—back to chemical engineering. Levenson was named associate division director of the Chemical Engineering Division, serving under Dick Vogel, the division director.

Between 1968 and 1972, Levenson was assigned to work as director of the EBR-II project. Up until that time, the project had been running under somewhat divided management, with the operation of the reactor and the fuel cycle facility being an Idaho responsibility, while metallurgy, new fuel development, and engineering were overseen in Illinois. Levenson's assignment was to pull all these operations into a single project. Working as associate directors in this endeavor were Harry Lawroski, responsible for operations;

Paul Schuman, in charge of materials work; Ken Winkleblack, responsible for engineering; and Walt Loewenstein, on safety and analysis. It was during this time that EBR-II was converted from a power reactor prototype to an irradiation facility.

During all his years at Argonne, Levenson also served on the lab's safety committee. In the early 1950s, after an accident at a critical facility, then lab director Walter Zinn established an independent safety committee at ANL to review all experiments being done by people at the lab. At that time, Levenson explains, there was no Nuclear Regulatory Commission, and the Advisory Committee on Reactor Safeguards was just coming into being and was not involved in details. Levenson served as chairman of the safety committee for "a couple of decades."

All committee members were employed full-time in "real" jobs at the lab. Levenson explains: "The Reactor Safety Committee was founded on the principle that the people most competent are the ones actually doing the job. Other technical people could review the job, but making them full-time reviewers might reduce their technical competence. So the safety committee was made up of people from allied fields—metallurgy, chemistry, chemical engineering, physics, etc.—all of whom worked full-time, or almost full-time, at their own jobs but, on a part-time basis, did a safety review, not to second-guess the people who knew best, but rather to make sure they hadn't overlooked anything. It was a system that worked very well and went on for decades.

"We were lucky also," he continues, "because we had the support of the lab directors, especially Norm Hilberry. This meant that our committee carried the authority of the lab director's office, and it made our work much easier."

As committee chairman, Levenson says, he had the "interesting job, for instance, of reviewing some of the experiments being done by Enrico Fermi." In addition, the committee "did safety reviews for EBR-I; for the EBR-II; for the first boiling water reactor experiments, the so-called Borax experiments; for the first prototype BWR, the EBWR; and for many different concepts and small reactor experiments."

In 1972, when Levenson became associate director for energy and environment at Argonne, the electric utilities were forming a new research entity to be called the Electric Power Research Institute. Chauncey Starr, dean of engineering at the University of California at Los Angeles, was named EPRI president, and be began to scout around for people to join the institute. In the spring and summer of 1973, he talked to Levenson several times, and evidently was a successful persuader, for in the fall of 1973, Levenson, after 25 years at Argonne, left the lab to become the director of EPRI's Nuclear Division.

EPRI

"When EPRI was originally organized," Levenson explains, "there were perceptions that there would be energy crises coming down the road. The matter of an adequate supply of electricity was a politically sensitive issue, and it wasn't very clear whose responsibility it was. So the utilities formed EPRI in an attempt to deal with this issue. This was quite new to the utilities. Historically, the development of new products for the utility industry came about through their purchasing—a utility would ask a vendor to develop a product, which it in turn would buy. But it was becoming clear that the amount of money that was going to be required for the new energy options was so large and had such a long payout that it couldn't be handled simply through a vendor.

"So the original intent was that EPRI would be involved in bringing into being new sources of energy, long-range things—fusion, magnetohydrodynamics, new methods of utilizing coal, coal liquefaction, etc. But nuclear technology was not all that mature a technology, and, in fact, it required significant research directly in support of the power plants that were then being built—new analytical tools, new computer codes to allow utilities to operate the plants more efficiently, better understanding of fuel management, better understanding of corrosion products.

"So with these facts in mind, I set up the Nuclear Division. I recruited Ed Zebroski because of his outstanding expertise in the materials and applications area; Walt Loewenstein for his knowledge of safety and analysis; and Larry Minnick, who had been a vice president at Yankee Atomic Power, to head the engineering part of the Nuclear Division. That was my original technical staff, and, with Frank Arrotta, the administrative assistant, they made a powerful team. We built the Nuclear Division to be a very substantial contributor to the technology of reliability and safety of nuclear reactors."

In the beginning, three-fourths of the nuclear budget was directed toward long-term research, and the remainder was aimed at the near-term problems of nuclear plants. As the years have passed, however, budget priorities have shifted, with less and less going into long-term projects as problems have begun to show up in operating reactors, and as projects have been mounted to address them. "In fact," Levenson says, "now it isn't so much research as it is finding a solution to current problems. And because, in many cases, finding a solution was going to take more money than was available in the EPRI budget, we began to organize owners group projects that were funded directly by the utilities but that were managed by EPRI. And perhaps the unique thing about those projects is that they were not limited to American utilities. Foreign utilities contributed their money for the Nuclear Division to manage, which indicated that EPRI had developed a good deal of credibility."

The Nuclear Division was originally divided into the Safety and Analysis Group, the Systems and Materials Group, and the Engineering and Operations Group. The accident at Three Mile Island in 1979 led to the formation of the Nuclear Safety Analysis Center, which originally had an autonomy within EPRI, but which now is part of the Nuclear Division. Also

Testifying at Senate hearings on the Clinch River breeder reactor, June 9, 1977. From left: Edward Teller, Theodore Taylor, Alvin Weinberg, Levenson, and Manson Benedict. (Photo courtesy of *Physics Today*.)

under the auspices of the Nuclear Division is the Steam Generator Project Office. By 1980, Levenson says, the Nuclear Division alone was almost as large as all of EPRI had originally been projected to be.

In 1980, Levenson had been with EPRI for seven years, the longest he had ever spent on one project, he says. Thus, he was ready for a change when Bechtel Power Corporation offered him a job. The fact that the job would free him of administrative responsibilities made it doubly attractive. This job, as technical consultant to Harry Reinsch, the president of Bechtel, began in January 1981.

Today

With Bechtel, Levenson serves on the management review teams for various Bechtel projects, is involved in the Bechtel Power Management Group, which sets internal policies and standards for design and construction of nuclear power plants, and has been involved in communications problems among government, utilities, and the public over the question of electricity capacity and reserve margin. Much of his time now, however, is spent traveling around the world speaking on the source term. ("Source term" is technical jargon for the quantity of radioactive material that might escape the protective containment building in which a nuclear reactor is housed.)

International travel has long been a part of Levenson's work. For example, in 1957, he was a member of the U.S. delegation to the United Kingdom to exchange information on the breeder reactor. He participated in the Geneva Atoms for Peace conferences in 1958, 1964, 1971, and 1974. In 1968, he spent a month in Korea as a consultant to the Korean government under a "sister labs" agreement. And in 1975, he traveled to the USSR as a member of the U.S. delegation at a breeder reactor information exchange meeting.

But Levenson's travel on the source term has become almost a personal crusade. He explains: "The most important lesson from the accident at Three Mile Island—one badly overlooked except for the people deeply involved in the technical aspects—is that, in spite of everything that occurred, and as badly as the fuel was insulted or mistreated, not only was there no public risk, there never could have been.

"After the accident, Frank Rahn [of EPRI] and I began to look at why all the projections and computer codes gave such wrong answers. And in the more than three years since we've begun to study this, many other groups around the world have begun to study the source term as well. And, it turns out, we let science fiction creep into our computer codes.

"I guess there's an inherent desire in people to want to be scared. That's why disaster movies make so much money. But there was no scientific basis for all these horror projections as to what can happen in the case of an accident. TMI was just one accident in hundreds of data points (which included six core-melt accidents—TMI doesn't appear to have been a core-melt accident), but its most important impact was that it started us rethinking, reassessing, the source term. Was TMI a public disaster? The answer is no. It wasn't, and it couldn't have been. The nuclear accident is not an event of *low* probability, it's an event of *zero* probability. The big disaster just can't happen."

At home

During the Argonne years, Milt and Mary Levenson lived in the Chicago area (in Downers Grove, Ill.). With the job change to EPRI, however, the Levensons moved to Menlo Park, Calif., where they live today.

The five Levenson children are grown and away from home. Jim, the oldest, is a psychiatrist and teaches at the Medical College of Virginia. He and his wife, Janet, are parents of the first Levenson grandchild, Zachary Brett, born May 2, 1983. Barbara Levenson is vice president of financial analysis at a Los Angeles bank; Richard is a computer programmer; Scott, the "Idaho potato" —so dubbed because he was born the year the Levensons spent in Idaho— is a pre-med major at college. The youngest, Janet, is a college sophomore, majoring, for now, in the social sciences.

For recreation, the Levensons enjoy music, reading, and the theater. When the children were younger, they enjoyed family skiing trips. Now, however, Milt says he gets most of his exercise walking between his San Francisco office and the city train station.

ANS

Levenson joined ANS in 1959, and was elected a Fellow in 1966. He was general chairman of the 1975 Winter Meeting in San Francisco, and served on the Board of Directors from 1977 to 1980. In addition, he has been a member of the NUCLEAR NEWS Editorial Advisory Committee. He also holds membership in the American Institute of Chemical Engineers—receiving its Robert E. Wilson Award in 1979—and is a professional engineer, licensed in Illinois. And he has been elected to the National Academy of Engineering.

Returning to the second criterion for choosing an ANS president—the ability to advance the organization as a technical society—we have these comments from Levenson:

"I'd like to start restoring the credibility of the nuclear community as a technical community," he begins. "We have done so many things in a reaction mode, we have calculated so many things that we know aren't so, we've become so enamoured of science fiction 'what ifs,' that it's no wonder that the lay public can't separate out what is reality from what isn't. I think the ANS has to take a leadership role in saying that, for example, it really isn't good science to do an analysis you know can't happen. And we've done lots of things like that. At meetings, you listen to some of the papers on risk assessment, and you ask 'Can that really happen?' and you hear 'Oh, no.' The next logical question might be: 'Then why are we doing it?'

"It's very easy to blame somebody else for doing things. Nuclear power plants have gotten very expensive, and

The Levensons today. Above, Mary and Milt. At left (l-r): Richard, Janet, Jim, Barbara, and Scott.

it's easy to blame somebody else. But the people in the industry have to accept a significant part of the blame. We've added so many bells and whistles, we can't hear it when something creaks.

"So, I think we have a serious problem of having lost credibility with ourselves, with the technical community, and with the lay public. We have to look at what we say at national meetings, at the standards we produce, and at the papers we write. It's always fun to conjecture. But we've done the nuclear business a great disservice by not separating out what is pure conjecture from what is science."

In addition, Levenson has other goals he hopes to address while ANS president. He continues: "The makeup of the nuclear community in this country has really changed. When ANS was started, almost all of its members were in some field of research. Over the years, the professional divisions have increased in number and scope, but I think there's still a large section of the technical people involved in the nuclear area—in the nuclear field—whose needs are not necessarily being fulfilled by ANS. These are the practitioners of nuclear science, including designers, builders, and the technical people that support the operation of power plants. We need to find a way to meet these people's needs."

A third goal for Levenson concerns the international area: "Nuclear power is a unique thing. If a Russian airliner should crash, no one would suggest grounding 747s or the Concorde. But a nuclear accident anywhere in the world has an impact on all nuclear plants. The whole matter of nuclear safety cannot know international boundaries.

"Nuclear power in one sense doesn't really suffer the restraints of competition. EdF, the French utility, is never going to sell electricity in the United States or Japan. American utilities are not going to sell electricity to Germany or Italy. Therefore, there is a basis for really being able to work together that is not true in many industries. We have to make sure that we *all* do everything we can in the nuclear safety area, not because of the public risk—because the public disaster of killing thousands of people just won't ever happen—but rather to avoid another TMI, which, although it wasn't a public risk disaster, did come very close to being a financial disaster for its owner utility, and, of course, was a public relations disaster."

Can one man really achieve so much? "One year is a very short time to achieve a significant impact on a large organization," Levenson cautions. Maybe so, but Milt Levenson is a man used to success. It should be a very good year.—*Nancy Zacha Godlewski*

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