

PROFILES IN RADIATION PROTECTION:

Allen Brodsky

Laura Brady

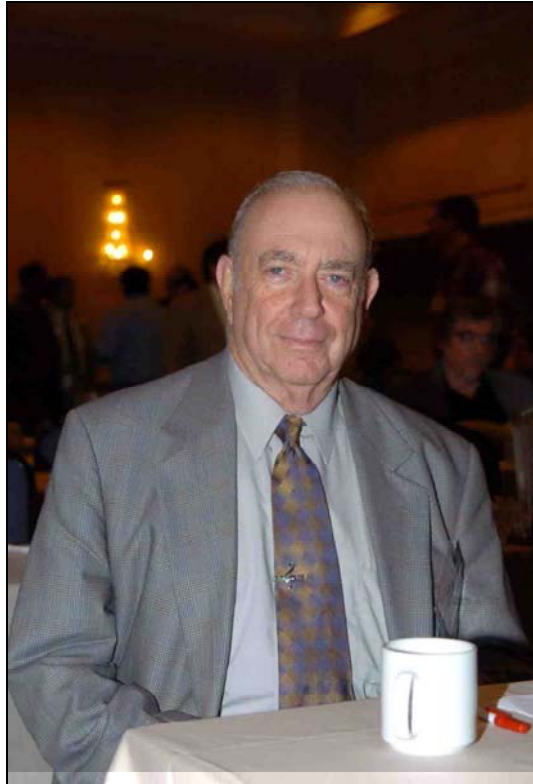


Photo courtesy of Casper Sun

The Singing,

He enjoys singing and playing in piano bars.

Swinging,

He is an avid tennis player.

Health Physicist-Activist

Just ask him about Homeland Defense.

If you have not yet met this man, odds are that you will soon. Dr. Allen Brodsky is a man with a message. And he wants to be sure that everyone hears it.

He is 76 years old and has started a personal campaign to educate the public about the real versus imagined dangers of potential terrorist incidents involving a release of radiation.

His expertise is in the broad areas of radiation dose determination, emergency response, and health physics practice. His extensive background includes measuring radiation signals and intensities at the first hydrogen bomb tests, training responders to save life in fallout fields, and evaluating and counseling patients of Dr. Niel Wald who were accidentally exposed in industry to high levels of external radiation and the uptake of plutonium, americium and fission products.

Dr. Brodsky recently served as chairman of the Ad Hoc Committee on Homeland Security for the Health Physics Society. Among a plethora of published works are included *CRC Handbooks of Radiation Measurement and Protection*, four volumes, 1979-82, *Coping with Radiation Emergencies* (M. Vince 1991), *Radiation Risks and Uranium Toxicity*, 1996, and the recent text of the HPS summer school, *Public Protection from Nuclear, Chemical, and Biological Terrorism,*” which he organized and co-edited, and for which he wrote nine chapters and appendices. (The ad for the HPS text, and a free view of his chapter on radiation accidents managed when he was on the University of Pittsburgh faculty, is on www.medicalphysics.com.) He currently teaches radiation dosimetry and health physics practices at Georgetown University.

His many honors include those of the Health Physics Society: Robley D. Evans Medal (2001) for contributions to research and education, Fellow Award (1992), Failla Memorial Award (1986), and Founders Award (1986); and the American Nuclear Society’s Radiation Science and Technology Award (1993).

I spoke with Dr. Brodsky on several occasions recently. He wanted to relate how chance events in life (some say luck) can require continual assessments of career opportunities and timely decisions. Read on to learn about the man and his message. This is what he had to say...

How did you get started? What got you interested in the field?

It was 1949. I was 20 years old and just graduated from Johns Hopkins University with a B.E. in chemical engineering and an ROTC (Reserve Officers Training Corps) commission as a second lieutenant. I could not get a job or fellowship in chemical engineering, but was lucky to learn about and obtain a one-year AEC-National Research Council Fellowship in Radiological Physics at Oak Ridge. I studied in Dr. Elda Anderson’s first program for a

year, in the same class as Herman Cember, Les Rogers, S.R. (Bob) Bernard, F.J. (Frank) Bradley, L.C. (“Doc”) Emerson, and others who became prominent in health physics. She taught atomic and nuclear physics and was a combination mother/sister/friend and advisor. Our class was disappointed that we did not get academic credit for that first fellowship year but “Andy” (as she liked to be called) did find us all jobs. The Korean War broke out during our summer Fellowship training and I expected to be headed for the front lines. I was single and training in the active reserve. I consulted Les, Bob, Doc, and Frank about their World War II experiences and how I might best lead my troops.

I had a job offer with Nuclear Science Abstracts in Oak Ridge after the AEC Fellowship, which would not have deferred me from service. When in Baltimore for a just a few days to see and become engaged to my betrothed before moving permanently to Oak Ridge, my Oak Ridge roommate called and said that Dr. F.N.D. Kurie (the prominent former Chair of Physics at Washington University) wanted me to stop at the Naval Research Laboratory (NRL) in DC for an interview. The interview resulted in an immediate job offer as Head, Health Physics, at NRL, to set up a radiation protection program for several thousand employees. (Fortunately for me, Doc Emerson had just turned down the NRL job.) I declined the Oak Ridge job and accepted the NRL offer. As it turned out, all of these events and last-minute decisions kept me out of Korea and changed (and probably saved) my life.

The NRL military command arranged several delays from reporting for Army duty until Lou Garcia, whom I had interviewed as my replacement, finished his thesis. I had been married and my son was to be born in March 1952, when I was to finally report to the Army.

A few weeks before reporting for duty on March 1, I saw a bulletin board announcement about a need for Army personnel with a background in science. Although willing to

serve as a platoon leader in Korea, I thought I might be a better husband and father working as a scientist in the States. I called the Corps of Engineers and drove to a requested interview at Fort Belvoir. There I met with a colonel whose chest was covered with war ribbons. He seemed tough, and told me that new officers were sent to Korea before ordered to duty in the States, but he did interview me about my background. He then sent me to the Pentagon to meet with another colonel in charge of special assignments. I got lost on the spaghetti-like roads to the Pentagon. By the time I got there the first colonel had already arrived, and I was asked to wait in the hall. I did not expect good fortune, because there was a joke going around in those days that if you had a background in science, they most likely made you a cook.

To my surprise, the first colonel must have been very sympathetic. The Pentagon colonel said he knew I was about to become a father and wondered if I would like a job as a scientist at Los Alamos. I immediately straightened up and told him firmly that I would serve wherever my country needed me. Still, he went further and said, since I was about to become a father, I might prefer to stay in the DC area. I was incredulous. He pulled out a file and asked, “Do you know Drs. Strain and Krause at NRL?” I said sure, I responded whenever they need some radiation safety service, but never asked about their secret project.

He sent me for an interview with Dr. Strain the same day. Dr. Strain asked about my knowledge of nuclear radiation interactions, and said he would have me assigned to his project at NRL as a scientist. Thus, to make a long story short, I served 2.5 years in the Army working for the Navy like a civilian to satisfy my service requirements.

Entering the Army at Fort Meade on March 1, and after further tough talk from some colonels, I was finally sent to work for Dr. Strain the third week of March. I found myself with a top group of scientists and engineers, and a deadline to help develop and

calibrate special detectors to measure with nanosecond resolution the changes in radiation signals emitted from the first hydrogen “device” (MIKE shot at Operation IVY). These signals were interpreted by theoretical physicists at Los Alamos to diagnose the progression of the fusion process and the performance of the device. The deadline for detonation was November 1 at Enewetak, and all needed to be done by that time. No changes in deadline were allowed. The entire operation was successful, including the development and construction of new oscilloscopes with nanosecond resolution – something not available commercially at that time. I was amazed at what can be accomplished by a group of scientists lead by a physicist such as Dr. Ernst Krause in a short time, given the highest priority of support. I wish such efforts could be devoted to informing our public about radiation and protecting them in the event of a terrorist attack without panic over the insignificant radiation levels that would cover most areas.

During my service as an Army scientist, a few more fortunate events occurred. After double shifting for over 5 minutes, I was able to drive a truck over a muddy beach onto an island at Enewetak to calibrate with a multi-kilocurie source the detectors that measured the basic signals from MIKE shot. If I had failed, imagine how my reputation would have sunk with the truck into the lagoon. Back at NRL, while helping write and edit the volumes on the MIKE shot, I discovered an article in *Physical Review* that allowed me to adapt moment generating functions to show the theoretical physicists that at some late times they were vainly trying to decipher what was down to the photomultiplier noise level in nanosecond intervals.

On the second H-bomb test (Operation CASTLE) I had my own little project to electrodeposit four fissionable elements onto platinum. However, nothing in the literature gave me hard stable deposits until one week after my initial deadline to leave for Bikini. My boss, Tom Hanscome, left and gave me one more week at my NRL laboratory.

Realizing my own terrible experiences in blowing up things in chemistry lab in college, and that chemistry is part witchcraft and art as well as science, I used some intuition to devise my own procedure just in time to make a ship to Bikini a week later. I arrived just in time to place my neutron threshold detectors on an island before the 15 and 11 megaton detonations of CASTLE in March 1954. What a close call after working on the procedure for months!!! My method was later published as a "Short Procedure for Electrodepositing Fissionable Elements," in the first issue of *Health Physics*, 1958.

These lucky successes helped me to obtain references that admitted me to top graduate school programs in physics despite my mediocre undergraduate grades. (This shows how you can always overcome a poor academic record.) Soon after my discharge from active duty, I enrolled in September 1954 at JHU's physics Ph.D. program. However, two years later, after successfully completing the coursework and some of the exams, I settled for a master's degree when my wife had another child and the Federal Civil Defense Administration (FCDA) offered me more than a Ph.D. paid in those days.

After 15 months with FCDA, having provided radiation instruments and trained in all seven States and DC to which I had been assigned, I called Dr. Forrest Western at the AEC to tell him I would be ready to accept the position he had offered to me only a couple of months into my FCDA job. I had not allowed myself to leave a job before completing major tasks to which I was assigned. One must reward those who provide employment.

After a variety of positions and tasks at AEC that broadened my interest further, I accepted a position in 1961 with Dr. Niel Wald to co-direct a number of research projects, teach health physics, and work for the Sc.D. in biostatistics and radiation health from the University of Pittsburgh. Biostatistics had become of interest to help understand the epidemiologic and biological sciences underpinning the estimation of radiation risks.

I have many more lucky events and persons in my 55-year career who have influenced my life, but I have already gone on too long. The lessons that I have given to my students and other young professional from these experiences are:

1) Always be sure to return something of value to whoever hires you, even if you leave a job too early. Finish your projects or reports on your own time if you must, and return them to the previous employer.

2) Nevertheless, do not turn away from fortunate events or opportunities. In a field so broad as health physics, you never know from where or from whom a new opportunity to go in an unexpected but exciting direction will come.

3) Be active on committees and chapter offices of the HPS and other professional societies. Not only do you learn leadership skills, but you also make interesting and valuable friends who become like family. Some of my best jobs were offered to me by HPS members who already knew me well from associations within the HPS.

4) Send in to journals such as this one what you have learned on the job, practical or scientific methods, and share them with others in the radiation safety community. You will not only receive satisfaction from this sharing, you will also grow as a professional and interact with an additional community of great people.

What in your opinion has changed in the field since 9/11?

Our first responder training as conducted at present could have unfortunate consequences. People could be panicked about low intensities of radiation –walking around with pager-detectors that alarm at a couple of times background. I jumped into about a million times that, 30,000 mR/hour, to retrieve my neutron spectrometers at Operation CASTLE. I received a mean body exposure of 2.5 R (on my present job I found film badge records showing that my exposure was within a few percent of that of Don Willett, who accompanied me on the recovery). I'd do it

again for five minutes each, to save the lives of at least 10 good health physicists. My 50th anniversary of this exposure was last March 31, and I am still here and healthy so far.

The American public who vote must be exposed to the proper facts. You can't control all areas that might peg a Geiger counter if there is an attack. What are we health physicists waiting for? We need to get the important facts and training to the public and officials in charge of homeland security programs. We need a much higher priority grassroots effort also. I gave some papers at the midyear HPS meeting containing some of my suggestions, and invite calls from anyone who has ideas to help on this matter. Get out and talk to the people. Use the material in the HPS summer school text and get officials and responders in your communities to obtain copies.

If you had the opportunity to take your message to the President of the United States, what would you say?

I would provide a demonstration that I gave to public audiences, and to my Congressman Wayne Gilchrest, that makes some main points. I would hold a Geiger counter over a uranium plate so he could hear all the click-clicks. Then I would put my hand in and say, "Ouch, ouch, ouch. All that radiation is hitting me." But then I would point out the low level of risk from such exposures, and indicate how the public needs to understand the wide range of exposures and risks, both for our energy independence and homeland protection. I would turn to him and say, "Am I crazy in doing this? No. My chances of getting cancer from this are so small." Then, I would show him how easy it is to estimate with simple arithmetic the very low risk of exposing myself to the many clicks. I would present him with complimentary copies of my Radiation Risk book (RSA Publications) and the HPS summer school text. I did this for my wonderful Congressman Gilchrest; he understood and supported some of my efforts.

We need to educate the public so they don't panic. They need to be prepared – not panicked.

Do you have any recommendations for RSOs today?

In addition to the four career suggestions above, I would offer:

All should get involved in homeland security and public information and education programs in their local chapters. Start them if they do not exist. (See my paper on the Hart Model.) Don't be shy. If I can do it, anyone can do it. Nobody started in this career more shy than I. I still need to force myself to get up in public when I feel I have a significant message. Get out and talk to people. RSOs have the background to talk to people. Repeated presentations perfect your personal style and comfort level, and clarify your message.

Also, read the journals. Be sure you get the staff you need to do the job you need to do. List all the jobs you need to do to meet regulatory requirements and document the staffing needed to meet those requirements.

On the Lighter Side...

Favorite Color?

Red. Or blue maybe. My eyes are blue, but speckled with red from too many nights studying in graduate schools. When I roll my eyes, I am waving the red, white and blue.

Favorite Hobbies?

Singing at the piano. I didn't really sing alone out in public until I was my mid-40s, I was so shy. Now I enjoy singing and playing the piano for myself and others.

Tennis. I played in high school and the first year of college. I should've kept at it at least once a week. My career became too

interesting. In my 70s, I am still trying to revive some of my best shots of high school and college days. But just trying to improve and enjoying the game is exhilarating and keeps me healthy.

Favorite Food?

Favorite Food: Martini, with the Grey Goose vodka that George Anastas introduced me to when he was HPS President.

Personal Tidbits?

Author of the song, "I'm Just a Little Electron," designed to teach the use of Bragg-Gray theory in the measurement of tissue doses with cavity ion chambers.



Photo courtesy of Casper Sun

Dr. Brodsky continues to bring his message to the people in a number of forums, including television and print interviews. He continues to hold out hope for an audience with the President of the United States, or at least the Secretary of Homeland Security.

Thank you, Dr. Brodsky, for sharing this information about yourself with our readers.