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Hans R. Griem: My Early Years and Career
(as related to Ray Elton in 2010)

Born in October 1928, I was 16 years of age in early 1945 and living in Kiel, Germany, when I was drafted for military service by the Third Reich. First in glider training to be a Luftewaffe pilot, I was transferred to the infantry when it was learned that only one of my eyes focused at distances and hence I could not look to the rear on one side. I was assigned to the tank corps fighting in Bernau , a suburb of Berlin in Eastern Germany, and was determined to stay alive by following the tanks.

Morale among the troops was very low, and not improved by President Roosevelt's death on April 12 of that year. The end of World War II was imminent. We learned of Hitler's suicide on April 30th; and the command was assumed by a naval officer, Admiral Doenitz. The troops were much relieved that the end of hostilities was near.

A group of about 20 of us deserted, not without some fear of reprisal from fanatics which included our non-commissioned officer. We headed west on foot to escape being captured by the Russians advancing from the East. We traveled at night to avoid strafing by airplanes from all sides, including German. I alone knew about the north star, and hence navigated for the group.

In all, we walked approximately 200 miles in 10 days (nights). We had rifles but no ammunition, food or water. Locals fed us along the way, as they themselves began to migrate westward. At one point we located my father's brother in my father's home village, who cared for us and gave me a bicycle.

Fortunately the British under Field-Marshal Montgomery pushed further east than agreed to at Yalta, into the Russian zone. We finally came upon what we thought was a British camp and threw our weapons into a pile and surrendered. I am not certain just where this was located. In fact, it was a brigade of Afro-Americans operating under orders from Montgomery. I had only once seen Africans previously (during the sailing Olympics in 1936), and was at first afraid that they might abuse us! As it turned out they were quite kind.

I was a bit frustrated that they could not understand my classic English nor I their American dialect. They let us pass and I walked another 50 miles to my home in Kiel. Needless to say, my parents were surprised and happy to see me. They had no idea where I had been. They had been bombed out for the second time, Kiel being a major naval base.

After the surrender, for my continued education I needed to finish 2 more years of high school. However, there was no school left in the rubble for a year.

I later attended Kiel University, and did graduate studies under Herr Dr. Professors Lochte-Holtgreven (experiments), a former student of Nobelist James Franck at Gottingen, and Unsold (theory), a former student of Sommerfeld and Heisenberg at Leipzig. I obtained a PhD degree in physics early in 1954 at the age of 25 in the area of H-β line broadening in an arc plasma. The Kiel physics department at that time included about 10 graduate students. I had already participated in experiments on magnetic-field generation in conducting fluids.

In 1954 I accepted a Fulbright scholarship to come to the University of Maryland as a Post-Doc. This was initiated by Prof. S. Fred Singer upon a visit to Kiel, who was at that time working in the London branch of the Office of Naval Research (ONR). This one-year appointment began in Sept. 1954 and was to involve astrophysics and upper atmosphere sounding rocketry Upon arrival, I was welcomed personally by Prof. John. Toll, the first Physics Department chairman, who rescued me from a blisteringly hot room over the Rossborough Inn into his parents' spacious home in Chevy Chase, Maryland.

Within the University of Maryland physics building, I was assigned to a desk in a rather large laboratory along with second-year graduate research assistants K. Y. Chen, Bob Wentworth, John Corrigan and a newly arrived first-year graduate student Ray Elton, all reporting to Prof. S. Fred Singer. (Later, Drs. Wolfgang Wiese and Einar Hinnov and students Carl Reber and Richard Bettinger, Hans Berg, Goetz Oertel and Reimer Lincke were to join the team.) Ray recalls that I had been advertised only as a theorist* (as was K.Y. Shen and Bob Wentworth) until Ray asked me for some help in setting up an experiment and we quickly forged a collaboration and friendship that has grown and flourished now for some 56 years!

Towards the end of my one-year appointment, I traveled across the United States in the summer of 1955 with K.Y. Shen and two exchange students (one of whom was Hans Arnold and the other an Austrian whose name I cannot recall). I then returned to Kiel, West Germany.

Meanwhile I had met Alan Kolb, who was attempting to finish his thesis at the University of Michigan under the famous Prof. Otto Laporte (often absent) that overlapped my thesis work. He had taken a job at the Naval Research Laboratory (NRL) prior to completing his thesis and was involved in the still-classified Sherwood controlled nuclear fusion project. He also shared with me an intense interest in the broadening of spectral lines in and by plasmas, e.g., in theta-pinches. Alan helped to make it possible and persuaded me to return to the University of Maryland in 1957 as a Research Assistant Professor with consulting time at NRL, in return for my assistance in completing his thesis. We would later co-author a series of seminal papers in modern line-broadening theory in the Physical Review that ultimately defined my career at the University of Maryland, resulting in 40 thesis projects (including Ray's) over the years, on the average one per year. One even involved a PhD student at Johns Hopkins University whose advisor had unfortunately passed away.

Professors John Toll and Richard Ferrell and others were attempting to build up the Physics Dept. Plasma physics was not yet recognized as a scientific discipline. Fortunately, John Toll had been an assistant of Lyman Spitzer on the Matterhorn stellarator project while a student at Princeton University, and was very supportive.

Upon my return in 1957 I was accompanied by my almost 24-year old bride Irmgard, who knew virtually no conversational English, with the promise that it would only be for one or two years. With such backing, both professionally and by Irmgard, I--sometimes single mindedly I suppose--managed to rapidly advance to full professor status in a few years upon completion of the first of my three books in 1964 on "Plasma Spectroscopy". While offers continued to flow from Germany, we decided that I should continue my career at the University of Maryland and raise our children there, with Irmgard's blessing as she adjusted to her new land and language. However, as Ray recalls, she often reflected "home is home."

The next seven years were particularly exciting, as we published twenty journal papers, gave seven invited talks at national and international conferences, and completed my first book "Plasma Spectroscopy". Alan DeSilva and Eduard Hintz joined our experimental plasma physics group near the end of this period. Seeking other senior personnel in the Physics Department, Alvin Trivelpiece, Bob Greig, Bob Pechacek and Achim Kunze, all experimentalists, as well as Nick Krall and Ron Davidson (theory) were recruited, creating quite a powerhouse, and writing more articles and books. This led to the formal establishment of a Joint Program for Plasma Physics with the Naval Research Laboratory, thereby making possible the free exchange of personnel, equipment, and ideas.

Besides my own continued theoretical* work on spectral line broadening, our team was involved with large machines, such as theta-pinch devices for controlled fusion and the study of collision-free shock waves ("Thor"), spherator-tokamaks ("spheromaks"), and most recently rotational stability through Centrifugal forces (MCX). Smaller electromagnetic shock tubes ("T-tubes") and theta-pinches provided essential test beds for diagnostic devices for the larger, less-accessible machines and even for x-ray laser development. Always, it was the goal to adequately train graduate students (40+ in my case) to take their place professionally in what is a most complicated and challenging world of physics. Many went on to careers in universities, government laboratories, and administration, rising to levels of great responsibility and respect. That was our product of which we are most proud.

I personally managed to consult at National Laboratories at Los Alamos, NM and Livermore, CA, sometimes on highly-classified projects that required top secret security clearances. I was also on advisory and review panels for the directors at various times.

Along the way, I was honored early-on by selection to be a Fellow of the American Physical Society and later served as Associate Editor of the Journal of Quantitative Spectroscopy and Radiative Transfer. In 1987 I received the Meggers award for spectroscopy by the Optical Society of America. In 1991 I also received the Maxwell

prize for outstanding performance by the APS Division of Plasma Physics, an award initially founded and endowed by Alan Kolb who had left NRL in 1970 to become President of the Maxwell Corporation. In all, I authored or co-authored about 200 articles in various professional journals to date.

Throughout my career, I have managed to never miss a sabbatical opportunity (every seven years), including a Humboldt fellowship. These took our family to Germany (Munich/Garching), Italy (Rome/Frascati), England (Culham) and Israel, enriching all of our lives including mine professionally. On one of these sabbaticals I completed my second book in 1972 entitled "Spectral Line Broadening in Plasmas".

In 1993 Ray retired from NRL and joined me at U. Maryland and I did what I once described to him as a "brain dump". With his and Dottie Brosius' help on by-then computerized art, composing and editing, I completed my third book entitled "Principles of Plasma Spectroscopy", updating my first book, which by then was over 30 years old. I managed to do that after formally retiring from teaching and enjoying the pleasures of emeritus status as a Senior Research Scientist. This continues to the present as a daily collaborative and advisory role with Ray Elton, Alan DeSilva and numerous colleagues on many topics related to plasmas and spectroscopy thereon. Besides my continued enthusiasm for physics, I currently (2010) enjoy happy times with my four children and their spouses and 8 grandchildren, sadly without my beloved Irmgard who passed away prematurely in 2008.

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*footnote: Ray reports that someone once commented that he could never be sure if I was a theorist or an experimentalist, to which Ray responded "both--superbly !"