

## OAK RIDGE RECOLLECTIONS

By HAL BEHL

In wartime, you could not enlist, you had to volunteer to your local draft board, and they'd send you out with the next monthly quota that had room. I volunteered, but we had about a month before I went, during which I had a short temporary job making Engineering drawings for a machine manufacturer in NYC. You couldn't get a permanent job in wartime with the draft hanging over your head.

As soon as I knew when and where I was to be inducted, I notified the National Roster of Scientific and Specialized Personnel, who had assigned me an identification number when I graduated, and who were supposed to see that I ended up doing the thing that I was trained for, in the war effort. I went into the Army on August 18, 1944, and was sent to Camp Upton out on Long Island for induction processing - shots, tests, uniforms, waiting.

When I was interviewed for assignment, I told the interviewer that I wanted to get into the Army Air Corps, and produced a copy of my Aeronautical Engineering diploma and a letter from the Convair Chief Engineer saying that I knew everything there was to know about the bombers that they were currently building (B-24s, B-32s, PB4Y-2s, PBYS) (I didn't really). He assured me that I would be in the Air Corps, BUT, "by the way, have you had any military experience"? I told him that I'd had 4 years of Army Reserve Officers Training Corps (ROTC) in College, and had fooled around a little helping the San Diego company of the California State Guard when I was working for Convair. He then wormed out of me that the State Guard was an INFANTRY unit, and that in ROTC, when we weren't in class, we marched around with RIFLES. Needless to say, several days later I was on my way to Camp Croft in Spartanburg SC for 13 weeks of INFANTRY Replacement Training!

Having no great desire to be a Combat Infantry Private in a ground war, as soon as I arrived at Croft, I started to volunteer for anything that might have a higher priority than the Infantry, such as Paratroopers, Commandos, Mountain Troops, but nothing came of it. Because of my previous military training, I was assigned as "Company Guide", which meant that when we were hiking, I walked out front with the Company Commander, a Captain about my age - we got to be pretty good friends, and ended up running every morning before the troops got up.

One morning, while the Captain and I were out running, he said that he thought that I really should be an officer, and if I'd apply for Officer Candidate School, he'd endorse the application and send it on. I did, filling out the top choices as Air Corps and Ordnance. I took all the physicals, and a couple of weeks later, he told me that I had been accepted, and would be leaving for the Infantry School in a few days - I hadn't applied for Infantry, because the only thing I wanted less than being a Private in the Infantry was to be a Second Lieutenant! It turned out that someone had crossed out my "Air Corps", and replaced it with "Infantry" -I had a long series of discussions with the higher ups, explaining that the reason that I didn't have a commission in the Corps of Engineers from my college ROTC was that the Army had decided that I was a little color-blind in the red/green range, and thus could not be commissioned in a combat branch of the Army. They finally gave up, and I went back to training, where my San Diego Judo came in a little handy because I ended up instructing hand-to-hand combat after I threw a big clumsy

Sergeant across the demonstration pit in front of the whole company. I also ended up instructing on the machine gun range, which left me with a permanent high pitched whistle in my left ear (Tinnitus), and an equivalent loss of hearing in that same frequency range. The Army, at that time, didn't believe in ear protection.

At about the 12th week of the 13 week training cycle, I was called in from the rifle range for an interview. When I reported, there was a pudgy little Major sitting behind a desk - "Your application to go to college has been accepted" - I told him that I already had a Bachelor's degree and hadn't applied to go back to college, and he countered with "Well, how about a Masters?" I said "what in?" - He said "what would you like?" - I said "Mechanical Engineering" - He said "OK", and the next day I was on my way to Ohio State University in Columbus Ohio, where Reggie's sister Sue just happened to be studying. I was there for 3 months, November thru January, which had to be the coldest time and place in the entire world! As soldier students, we lived in a warm dorm under the seats in the stadium and had probably the best food in town - we actually had a guard on the mess hall to keep out other military people.

We had courses in Physics, math, and the first graduate level class ever given in jet propulsion (remember that this was 1944). The Jet Propulsion course started me on my post-Army career in the rocket, missile, and space systems business. Turned out that the master's degree was a ploy, OSU was a holding location for science graduates waiting for reassignment, but they did give us graduate level classes to keep us out of the cold. I kept volunteering to go to Wright Field, the Air Corps research and development center, which drew a lot of their people from OSU, but to no avail. I heard later that the people I took basic training with, were shipped over as replacements in the "Battle of the Bulge" the week after I left Croft.

Reg came out to Columbus over Thanksgiving vacation, stayed in Sue's room, used her student card for the library and health services, and, as a wife, was allowed to eat in our mess hall. While there, we met Martha and Gene Zukas, and Jean & Doug Crossland, who had just gotten married. (Many years later, Doug ended up as Rockwell's Facilities Head at Rocky Flats, and Gene retired as one of the country's top Plutonium Metallurgists, at Los Alamos.)

After a couple of months of not being interviewed by any of the many visiting organizations, I was called in to meet my now familiar pudgy little Major again. "I've got a great assignment for you, which you'd really like" - "What is it?" - "Can't tell you" - "What will I be doing?" - "Can't tell you" - "Where is it?" - "Can't tell you, but we only take volunteers" - "You are out of your mind - I don't volunteer" - "OK". The next day, I was on a train to Oak Ridge, Tennessee and the Atomic Bomb project. Gene and Doug showed up a little later on. When I bumped into the Major about a year later in Oak Ridge, I reminded him about the "volunteer" conversation. He said "Are you happy with what you are doing?" - "Yes" - "Then, if you knew what you do now, you would have volunteered, wouldn't you?" - "Yes" - "See, those who volunteered, are happy because they did, and those who didn't are just as happy".

Doug remembers a different kind of interview based on whether your wife had a skill needed at Oak Ridge, and whether she intended to join you and work - Jean had been working as a secretary and ended up working in the K-25 Process Area. Gene Zukas says he doesn't remember

any special interviews - He thinks that if you had a degree, and an Army IQ (AGCT) of over some baseline, you were in!

Oak Ridge was in a fascinating location - about 100 fenced in, and heavily guarded, square miles near the Smoky Mountains, Knoxville, and the TVA lakes. Half of the 75,000 or so, workers lived on base, and the rest commuted. Base housing was cheap, with the quality of the accommodations varying according to the worker's importance, but with none available to the members of the Army Special Engineering Detachment (SED), no matter what jobs we, or our wives, had, because we couldn't leave.

The SED was made up of about 1250 "enlisted men", almost all with at least one degree in Science or Engineering. We had a couple of officers, and an administrative staff of WACs, our own Barracks Area, with a club/store, and had a lot of unique privileges - because we worked shifts, there always were people sleeping, and goofing off, in the barracks at any time of the day; we had permanent passes which allowed us to be away from Oak Ridge for up to 3 days at a time without specific permission; while working, we got paid by check; and did not have to stand formations, or do much of anything military, except to attend an occasional meeting.

There was a "ceremonial" SED military unit which drilled at some regular interval, and was used for parades and ceremonies - I think that it was voluntary, because I do not remember being part of it - We called it "the Commandos". Because there were no military mess facilities - only civilian cafeterias, we received \$2.25 per day for "rations and quarters" in addition to our \$50 per month pay as Army Privates. We, also couldn't get any promotions until we were on the project for a year - then, and only then did I get my first stripe (Private First Class, at, I think \$56 per month) - Once we got that, if we didn't really screw up, we got another stripe about every 2 months.

In addition to Oak Ridge, there were smaller SED groups at newly organized Los Alamos and Hanford, at some Universities (Chicago-Berkeley-Columbia), and the Uranium mining facilities. The SED was organized when the major organizations concerned with the Manhattan (A-Bomb) Project (Columbia University, Universities of California and Chicago, Union Carbide, DuPont, Kodak, etc) screamed at the Army that while they could find all the low level hillbillies, and 60+ year old PhD's, they could find no young middle Technical/management people - they all had been drafted or were working in "essential" areas!

So the reason we all were there, and had not been allowed to stray into other military assignments, was that the National Roster had actually been watching over us all along, and had allocated us to the A Bomb project. The time at OSU was also spent by the security people doing a detail check into our backgrounds - In Long Beach, they interviewed my neighbors, my school teachers, the Mayor, and the Police and Fire Chiefs! People kept coming to my parents with roundabout polite questions asking whether I was in Jail, or had done something horrible.

The Oak Ridge group of the SED put out a "Yearbook", something like those that colleges put out every year - It included pictures and a short background of all the "GIs" - The NAM library has a copy of mine.

I was assigned to Union Carbide Corporation's operation at the K-25 area (Tennessee Eastman and DuPont were at other locations on the reservation). Each of the 3 plants were following a distinctly different method of extracting Uranium 235 from Natural Uranium (there is only about 0.7% of the 235 isotope). I went into the Engineering Department of the K-25 Laboratory, which at that time consisted only of one civilian, the Supervisor. Naturally, as the second person, I became the Assistant Supervisor!

By the time I left Oak Ridge, we had about 5 Engineers, a secretary/draftslady, a scientific glass shop with 2 glassblowers, and a precision machine shop with 3 master machinists - about half of our people being military - Our main job was designing and building specialized Laboratory, Health Physics, and process equipment. The SED people were truly integrated within the 3 operating organizations, working as civilians-that is, working for military and/or civilians, and having military and/or civilians reporting to them. Doug Crossland remembers Bill Stinson, our civilian boss, as being a very petty character. Must have been the 7 daughters he had. I remember being invited home to dinner a few times with the comment "with all the people eating, another mouth isn't a problem - I don't even have to call and warn my wife".

The work was fascinating - As a member of the Lab Director's staff, I got to hear, and meet, Nobel prize winners like Fermi, Urey, Lawrence, and to work on things that most College Physics professors of the day had never even heard of, or imagined. We designed, built, and patented an adjustable mass spectrometer tube and a high vacuum selector valve.

Almost none of the people working on the Project had any idea of what they were working on - The huge plants, miles of piping, tremendous care taken in not allowing any of the chemicals to touch people (the K-25 plant used Uranium Hexafluoride, which was extremely corrosive), and the fact that the commercial operators were essentially chemical companies, had the uninitiated believing that it was a poison gas operation. The 3rd day I was in the Lab, someone called me into his office, closed the door, and asked me what I thought we were up to. I told him that I thought we were working on some sort of Atomic Energy - "For What?" - "Transportation, maybe - ships, trains, etc." - ""You poor fool, you're a civilian at heart like the rest of us - WE'RE MAKING A BOMB!!"

Reg was teaching at Long Beach, NY High School, and I checked to see if the local school system could use a super Art Teacher - They could, and Reg wrote to Dr. Blankenship, the Superintendent, thinking that she'd be in a little red schoolhouse at a Tennessee crossroads - He needed her right now, Long Beach released her, and when she arrived, she was shocked to find that there were actually 10 elementary schools, and a 3,000 student High School on the reservation. (she became the head Art Teacher for the system before we left).

The 2nd day there, while she was still living in a transient dorm, she made the mistake of eating in a nearby contractor cafeteria, and spent the next few days in the hospital with ptomaine poisoning. Martha Zukas was already nursing in the hospital, so she had good care. The schools were great - Reg had all the supplies that she asked for, and her huge art room was adjacent to the music room, so that they were able to coordinate their activities. She had about 1,000 kids per week coming through.

As I mentioned, married Soldiers couldn't have their own houses, but did have the privilege of renting rooms from civilians, usually for about the same rent that the civilians paid the government for the whole house. We lived in about 3 places, one of which we had all to ourselves (plus a few cats, chickens, etc) while a teacher friend went home for the summer. Much later on, after everyone was housed, including even the blacks (remember that this was 1944 in a southern state), there were a few plywood "Victory Cottages" left over that were rented to SED people for \$14/month.

The rent included the cooking/heating kerosene delivered to a 50 gallon drum at the edge of the road (we also used it as antifreeze for cars, and diluted our rationed gasoline with it), and electricity. The buildings sat on the side of a hill, partially on stilts, on Raccoon Avenue - They were about 25 feet on a side, and divided into 2 "apartments" - Each had a living room/kitchen with a large cast iron wood stove, converted to kerosene, which heated the area, cooked the food, and heated the hot water!

Thus, in summer, if you wanted hot water and food, you also got heat. There was a bedroom, and a tiny bathroom with shower. We shared the building with the Crosslands (Jean was working as a secretary in the K-25 process area, and Doug was with me in the Lab Engineering Dept). The Cottages weren't furnished, so we were given permission for a one time scrounge of furniture from a dorm that was closing - Several of us borrowed an Army 6x6, which I drove, because I was the only one with an Army License (allowing me to drive nothing larger than a Jeep), filled it up with beds, chests, chairs, pillows, mattresses, anything that was loose and we could move, and brought them back - I had never driven a vehicle with power brakes, and stopped abruptly at an intersection and saw people and furniture drawers flying over my head. The mistake had been in loading the chests of drawers facing forward, and letting the other members of the scrounging crew ride on top. None of them slid any further than the hood, fortunately.

We made double beds by sewing single mattresses together (Reg & I owned the only large curved needle, which was used by at least 10 couples). We got sheets, towels, and blankets illegally from the Barracks area supply Sgt. Other furniture was made from crates which Reg's school art supplies had come in.

Doug and I made some of the kitchenware, like spun nickel pots, Pyrex glasses, and scrounged some others - Reg and Jean did most of their cooking in Pyrex Laboratory glassware (retorts, flasks, etc.)! While making a set of stem glasses in the glass lab one time, I got a little careless, and ended up with severe burns in the palm of my right hand - My only war wound. I think that we have one Pyrex stem glass left - a pretty crude thing made from tubing.

About the only sidewalks there were in town were those at "Jackson Square", sometimes called "townsite", the town center, and they were of wood! - I always had mud on my Army boots, and Reg almost always wore her boots. It was fun for us, learning about rural living - For instance, when we splurged, and had chicken for dinner, we had to buy LIVE ones, and kill, pluck, and clean them, before cooking - You should have seen Reg gingerly carrying them home, holding them by the feet! "Don't move chickens, please don't move". We did a lot of hitch hiking, both in town, and out, and of course used the pretty good bus service most of the time.

The "permanent" housing came in all sizes, and were mostly made with wood frames enclosing Transite panels. Heating was forced air from manually stoked coal furnaces, with the coal supplied as part of the rent. The better homes, and areas, were in the north of town, on a ridge overlooking the Cumberlands. This is where Reg's school, Highland View, was located. The quality, and size, of the houses, and their location, were directly related to the rank or job title of the tenant.

More about chickens, and hitchhiking. One day, when we were living for the summer in the borrowed house on Outer Drive, Reg got a hitch down to the market with an old farmer. While wandering around looking for things, she noticed that he was following her around. She was scared silly, but asked him what he wanted. It turned out that he couldn't read, and wanted her to help him by reading the labels on the packages. He was so grateful, that the next day he came to our house with 3 live chickens. Reg put them into the coop with our landlady's chickens, who immediately attacked the intruders, causing them to "fly the coop". When I got home, she was in tears, because she had not been able to find, or recapture them.

More about our "Secretary/draftslady", Margie Cotter - She was a very energetic, vivacious young lady who lived with her parents in nearby Norris, at the site of the Tennessee Valley Authority's (TVA) Norris Dam, which was the headquarters of the TVA, and also the site of the Bureau of Mines Chemical Labs. Her Dad was the Chief Chemist, or something like that, in the lab. Reggie and I were more or less adopted by them, and spent many great weekends at their house with them and their friends. Margie eventually married another SED Engineer, Al (Bill) Batten who worked in the K-25 Process Area, and they later ended up in Orlando working for Martin. When Bill retired, they sold out and moved onto their sailboat, based in the Florida Keys. Margie recently died of Cancer, and Bill is still on the boat. We keep in touch. He and the Crosslands made it to the SED 50th Anniversary celebration at Oak Ridge in 1993, but we couldn't.

We were on leave in NY, when I was shocked to see the unmentionable words "Atomic Bomb" in the headlines after the first one was dropped. Reg, up to that time, really didn't know what had really been going on at Oak Ridge - I still have copies of a couple of the newspapers which I have given to the National Atomic Museum. Once the world knew about us, the Army created a non-combat unit citation and awarded the SED 2 of them at once, so forever, if I am foolish enough to ever get into another uniform, I am entitled to wear a gold wreath, with a star in it, on my lower right sleeve. It was immediately tabbed by the irreverent SED as the "Order of the Golden Toilet Seat" I'm not sure, but I think its real name was the "Meritorious Unit Citation", or something like that. They also authorized us to wear distinctive shoulder patches with a bolt of lightning cracking an atom - I think there's a couple in my top drawer somewhere and on exhibit at the NAM. NAM volunteers wear replicas on their "volunteer vests".

After the war ended, I was given the opportunity of going to Bikini for the tests because of seniority, and the fact that I had been working in the Health Physics instrumentation area. However, after finding out that the alternative to going was to get out of the Army, I opted for a discharge. Bill Batten went, and because of scheduling delays for the tests, spent almost another year in uniform. He told me that he had also been on the SED team sent into Hiroshima. About Hiroshima - I had a sort of adopted Uncle, who was very close (Hank Levin - the brother of my

Mom's sister's husband). Hank, an ex-Marine, was a civilian Radar expert who worked for the Army, and traveled around a lot. Right after the Hiroshima drop, he was on a plane, going somewhere, and talking to a Colonel, who he discovered was in the Manhattan District at Oak Ridge. He said that he had a nephew there, and asked if he knew me. The Colonel said that he didn't know me personally, BUT that he did know that at that time, I wasn't in Oak Ridge, I was in Hiroshima on an evaluation mission. Hank told the whole family, but it turned out that I was an alternate, and as no one had gotten sick, I stayed home, and didn't even know about the mission until they all came back.