

## **EARLY DAYS OF OAK RIDGE AND WARTIME Y-12**<sup>1</sup>

William J. (Bill) Wilcox Jr., Oak Ridge City Historian  
Retired Technical Director for the Oak Ridge Y-12 & K-25 Plants  
[During the Manhattan Project (from May 25, 1943) a Jr. Chemist, Tennessee Eastman Corp., Y-12 Plant]

A Veterans Day Talk at AMSE<sup>2</sup>  
November 11, 2007

The freedoms we enjoy today we owe to the brave heroes who bore arms to defend and serve our country. We pause in our busy lives to remember and honor those who served and sacrificed for us all over the globe in past wars; thinking especially of those who are serving in harm's way today.

It is fitting that we also remember and honor those who served in uniform for three long years in the Manhattan Project - that remarkable effort which saved hundreds of thousands of lives of Allied soldiers and millions of Japanese lives by bringing that awful war to a quicker end. Here in Oak Ridge, Colonel Nichols says he had a core group of some 300 regular army plus many other reserve officers directing operations going on all over the country, aided by 275 WACS (Women's Army Corps) in uniform and in addition about 1500 army enlisted men, also all in uniform, all technically trained and pulled from the ranks all over the country to come help do the technical work. These were the Special Engineer Detachment (the SED). And the Navy helped too, sending about 60 technically trained naval officers.

Then, too, today we remember the thousands of civilians who labored as front line soldiers without uniforms in the pioneering and desperate effort to unleash the power of the nucleus to help win the war. To all those who served our beloved country in uniform and out, we salute and give thanks for their patriotic service.

Now sixty years later the leaders of that amazing Manhattan Project are no longer with us. None of the decision makers are still live, only a few of us who were then youngsters, front line drummer boys and "spear carriers." We can only tell little stories of those days 60 years ago, not

---

<sup>1</sup> Copyright Wm. J. Wilcox, Jr., 2007

<sup>2</sup> And Book Signing for Cindy Kelly – "Manhattan Project."

the big decisive stories, and today as one of the survivors, I'm obliging Cindy who asked that I tell a few stories about my early days at Y-12.

#1 I was graduated in April 1943 from Washington & Lee University with a chemistry degree so I was soon offered a "vital war" job by a number of companies. The big companies that were brought in to run the plants here – Kodak, Carbide, DuPont, and Kellogg – were all looking for new college graduates with technical degrees, especially chemists and chemical engineers. I accepted Eastman's offer as a Jr Chemist. Their interviewer had stated it would be vital chemical war work. I asked doing what? – He said, I can't say that's secret. Will it be organic or inorganic chemistry, sorry that's secret. Well, where will I be working, sorry, secret. There was not much I could object to so I said yes!

#2 Because in May 1943 there were no buildings at all to work or live in at Oak Ridge, they sent the 50 or so of us they had hired up to Rochester New York. My badge number was #254 out of the 30,000 they eventually hired during Eastman's tenure at Y-12. We spent a long summer and fall there behind locked laboratory doors at "Kodak Park" learning uranium chemistry. The very first day we got lectured to about secrecy and were told the code name tuballoy was to be used for uranium from then on till war's end under penalty of firing and probable jail sentences for violation of the espionage act. As a 20 year old, that really 'registered.'

#3 Throughout that summer we worked hard, living in the center city YMCA that had been built, I'd guess, many years before the first World War! All the furniture was dark, dismal, and severely used; the beds the same. All summer we bugged our bosses with questions about where in Tennessee we were going to work in until they finally told us to knock it off, we'd find out soon enough. We started calling it "Dogpatch" after the comic strip then popular and speculated about whether there'd be any Daisy Maes down there.

#4 In October the word finally came to move to Tennessee. The chemistry building was ready as were dormitories to live in. Houses for the bosses with families were not ready, but we should go, get settled and get things started. Most of our Rochester gang were given train tickets to Knoxville – hey where's that?? But instead of the train, I lucked into a ride down with a car-full of buddies and we took two long days to get here. I sent a postal card home on arrival, which I found long afterwards that my Mom had kept, sadly reporting "we got here late last night in the

midst of pouring rain, Knoxville was dark and dismal, and I can describe Dogpatch in four words – mud, mud, mud and mud.

#5 That was on a Friday. The sun came out for a perfect weekend: bright blue October sky, the mud dried, and we hiked all over town, awed by all the newness, the construction going on everywhere even on Saturday and Sunday. And we succeeded in deciphering our first military codes: our dorm number was M-2 and one of our gang astutely observed that the dorm just across the street was named W-5 and was swarming with girls. That first weekend we took a census that revealed there were 10 of these W dorms and just 5 M's which of course seemed a reasonable ratio to us. Also the rent was just \$10 /month, and the furniture was all very nice and brand new oak and maple with brand new beds—so after the YMCA in Rochester our first weekends attachment was that Dogpatch was pretty much A-ok. I even wrote home that the Army cafeteria food was fine! My good opinion lasted a couple of weeks. By the way, if you want to see a 1943 dorm room come to life again go see the re-creation of one at the MidTown Community Center. It's entirely authentic.

#6 My first days at Y-12 were another new world for this 20 year old. Our Rochester team took over the two chemical buildings 9202 and 9203. Mine was 9203. Daily I parked my muddy galoshes at the change house out front, put on my inside shoes, and lab coat. My boss didn't get here for a couple of weeks – waiting for his “cements” home up on the ridge to be finished –he was an old man with kids, at least 35 or 40. My orders were to furnish and equip our process lab. I got a half dozen scientific supply company catalogs and a tablet and went to work ordering glassware, instruments, furnaces, reagents, pH meters, common chemicals, etc Three years later my fine boss was leaving Y-12 to go back to his job in Rochester. Before leaving he called his “boys” all together not to say goodbye but he felt he should explain to us some facts of life in industry. The essence of his sermon was that Industrial Research was all about things we never dealt with or even heard of during the war like Budgets, Program Proposals, Progress Reports, Publications, Patents, Performance Appraisals, and Purchase Requisitions. It was all Greek – and “no fun,” In that 1943 wartime-he rule was get the job done. During my days of furnishing the Labs, I never saw a form - all I had to do was to write down the item and catalog number in the Fisher Scientific Catalog and trotted my list up to Marie in the front office. Big boxes arrived in a week or so back on the loading dock and I unpacked. Boss Brigham laid it on the line, we were really spoiled, and indeed we had been – our job for two years had been getting a job done, sooner if possible.

#7 Three unconnected incidents that first fall at Y-12 convinced me we were seriously involved in very important war work. First was a discussion a group of us got into eating lunch at the Y-12 cafeteria one day. One of the guys in the lab next door joined our table and after a while started talking about how Communism really was the right answer, the better political system, and our country was not doing right by Russia. We all got uncomfortable, not able to fend him off easily and talked a little about his fervor in the lab that afternoon. With no explanation ever from anyone, a couple days later (to our relief) he was gone. A second incident involved a notice that appeared on a Safety bulletin board on our main hall we had never seen the like of at Kodak Park, so it struck us as a little odd. It stated that Horseplay could lead to accidents and would Not Be Tolerated. I had no idea what brought that on, but found out the next day. One of our Rochester gang of new college grads – all of us single and 20-21 years old – came running out of the lab next door chasing a female technician squirting her with fine stream from a wash bottle. That was a glass flask filled with distilled water having a squeeze bulb, we made them up and used them to rinse glassware when pouring uranium containing solutions from one vessel to another so as to be sure to get it all. Wouldn't you know she was giggling and watching her pursuer over her shoulder and slammed right into one of the big bosses coming down the hall? Though my good friend doing the squirting was one of the smartest chemical engineers of our whole group, he had to be made an example of and was transferred out of our building posthaste. We all felt terrible, but sure learned that lesson. The third incident was the day my boss sent for me to say that I should report to room so and so up in the 9704-2 building to see a Mr. so and so. What's about, I asked. Mr. Brigham said, "Hey Bill, just go." So I went to the room, and found the man alone with a perfectly clean desk, no files, no paper. He closed the door and said, "We have reviewed your background files and are impressed with your background during and before college. Your government would like to know if you'd be willing to help assure this vital war work we're engaged in gets done. Of course I jumped at it. He said he wanted to enlist my help in keeping my eyes and ears open to expressions of disloyalty, prying questions, or curiosity beyond the normal need to know criteria. I assured him I'd do so. He then gave me a stack of envelopes with 3x5 cards inside addressed to the Acme Credit Company at a Knoxville address and said mail him a report every Friday, blank card if nothing to report, and I did so; never having anything to report. Perhaps a dozen years after the war, in late 1950s, Bob Dunbar was chairing the second meeting of the just organized "1943 Club", and someone said they had a question, and then told the same story I've just told you. They asked if anyone else had that experience. I'd guess about a quarter to a third of us raised our hands! What a surprise that was.

#8 In February 1944 the frantic efforts to start up the Alpha Calutrons had succeeded in making altogether about a half pound of about maybe 10 to 12% enriched U-235. Los Alamos (I learned much later) was pleading for the first enriched U-235, urgently needed to make nuclear measurements. As the most experienced hand in this particular operation, I was responsible for final purification of this very first batch of about 200 grams of tuballoy tetroxide (UO<sub>4</sub>). I did my thing and filtered the batch out on a glass frit funnel and put the beautiful cheesecake looking product into a calcining oven with the glass funnel sitting in a stainless steel beaker for the three or four hour overnight bake to convert it to tuballoy trioxide. Then I dashed home to a date, already very late.

Next morning I came in whistling, proudly looking forward to seeing the bright orange product, but one of my buddies intercepted me out in the change house saying, "Bill, you'd sure better hide, everyone's looking for you and they're all mad." What? No, he didn't know why, so I snuck into my boss Brigham's office to face whatever and he really reamed me out good, the glass funnel had dropped down into the steel beaker when it got hot and expanded – then when it cooled off and shrunk again it crushed the funnel and my beautiful product was all mixed up with crushed glass. The whole purification process had to be repeated costing another day or more in shipping it. My boss told me to be sure to get out and stay clear of his boss, Al Ballard, who was set to fire me on sight.

#9 That summer, when lots of the alpha calutrons were finally producing, our beta chemical operations outgrew 9203 and we moved to much bigger quarters in 9206. By then I was in charge of a process troubleshooting lab in the front end of 9206, solving problems that came up almost daily in our purification processes. One day our crew of five was hard at work when we heard a huge uproar just down the front hall – girls shrieking and a sound like Niagara Falls. Rushing out in the hall we saw a mixed deluge of water and women pouring out of the records office and ran to help. The water and wailing both stopped before too long, but the explanation didn't come till the next day. It seems that the engineers in designing the roof of this brand new building did us the favor of building a wall around the roof edge that would allow the roof to stay flooded with several inches of water, resulting in evaporation that brought a cooling effect on the building below – much appreciated in those days before air conditioning. What had happened was that someone had sampled the roof water, detected a few ppm of uranium, and thought that should be recovered. So they brought a tank truck up along side the ground floor, got a big Tygon hose, and

started a siphon to take off the water. All went well till the guy holding the siphon up on the roof would daydream and lift the hose a little above the water level sucking in air and then they'd have to refill the tube with water and start all over. After this happened several times to everyone's chagrin, the guy on the roof thought, look, I just need to make a deeper hole in these gravels, then put the end in this deeper hole and it will be easier all around. So he hits the nice roof gravels a couple of licks and before long poked a hole right thru, letting thousands of gallons thru pour down on the girls and ledgers below. So much for that particular recovery operation.

#10. With my Jr. Chemist's pay of \$1.27/hour and \$310 /month in the middle of 1944, I decided I was so flush I ought to have a car, so I took my vacation and went back home to Pennsylvania and bought a sweet 1938 Chevy business coupe for \$450, of course on the installment plan. I drove it down to Tennessee at the government mandate of 45 miles per hour, with rationed gas and recapped tires. I hadn't had it long when one morning as I approached the guard station on bear creek road, the military policeman jumped on my running board and shouted, "Go get that car, pointing to a government sedan pulling away just ahead of me. "Move it," he shouted as he unclasped the 45 from his holster. "Blow your horn and run that blank blank guy off the road." What a thrill. I did just as asked, and before I even came to a stop he jumped off shouting at the driver, a Captain, "Who do you think you are driving through a military gate without stopping, and on and on." I eased over into the North Portal parking lot and went to work. That was the only time I ever got into the Y-12 area without showing my badge!

#11. Months later, in the spring of 1945, the word came down for us to scrape the bottom of the barrel for every milligram of U-235. 9206 became a beehive of activity, reprocessing drums of liquids, extraction raffinates, and salvaged solids of all kinds. I believe that even our Department Heads did not know the climax of our Manhattan Project efforts was approaching. Los Alamos was begging for every bit of U-235 Y-12 could send, and we did our part. Of course the climax did come August 6<sup>th</sup>. The way we got the word that morning was that my boss's wife called him with the startling news she heard over the radio and he passed it on to us with the order to keep right on working. But it was not long before some long repressed guy ran down the front hall of 9206 shouting: Tuballoy is uranium!

#12. Without knowing any thing about the coming Era Ending Events of Aug 6<sup>th</sup>, 9<sup>th</sup> and VJ day, a small group of us Rochester gang had rented cottages up at Norris Dam State Park for a week's commuting that would get us away from the Army Cafeteria, rec hall-bowling alley-movies

routine. And by 1945 we all had some reasonably steady girl friends and talked them into renting cottages, too. But lest you think this final story about early days at Y-12 is meant to titillate you, let me state that neither Emily Post nor the girls' mothers would find much fault with our behavior – we spent our evenings there after work cooking up wartime haute cuisine, playing cards, telling tall tales, and singing the old camp songs.

The story I'll never forget about Norris, centers around one of our Rochester gang who was with us, a brilliant MIT chem engineer from New York named Warren Fuchs, no relation to Klaus. Warren marched to a drummer none of us ever knew - a hippie long before their time. That week he manifested his uniqueness by eating for his breakfast each morning a massive dill pickle and slice of raisin pie. Late that week at breakfast Warren startled us all by shouting. "I've lost my darn badge!" Well we all sympathized, so turned the cottages upside down before giving up.

Then, of course we all collaborated on a sensible plan for getting him a badge – stop at Elza, let him out and we'd go in and get a tempo pass, etc. But he would hear none of it – said he was scheduled to make an important report to the Dept. Heads meeting at 9, couldn't be late, and anyway the guards hadn't checked trunks so far any day that week, so he'd just ride in the trunk of one of the cars we had up there with big enough trunks – sadly that meant my car or in Floyd Culler's coupe that had a rumble seat. "Nothing doing Floyd and I cringed." But the non-car owning majority thought this would be a great lark and a reasonably sure bet, so Floyd and I were outvoted. We flipped a coin and he lost.

Warren climbed in his rumble seat with his new portable radio; then these were a big battery operated gadget with a whip antenna and off we went, three in each car's front seat plus Warren in Floyd's rumble. When we approached Elza, we were all about crazy! We each crossed everything we had – fingers, arms, legs, everything. I was as close behind Floyd's car as I could get. The guard checked their badges carefully – starting off his new day being super careful! And you guessed it, back around he came and pulled open the rumble. Out pops Warren, screaming, "I'm not a spy, don't shoot", waving his portable radio around in true spy fashion.

The guards started unbuckling their cannons and all of us piled out of both cars, circling the guards, trying to convince them this is an important Y-12er, we'd all vouch for him, he had to get to work, of course all falling on deaf ears. After a while some security brass arrived from uptown,

hauled off both Floyd and Warren. And the rest of us went to work. Our two pals showed up at 9206 after lunch looking uncharacteristically humble, and to our lasting chagrin neither one would ever tell us what treatment they suffered through nor what if any penance had been exacted. As you might imagine the rest of the vacation week at Norris was a little more subdued.

What a remarkable opportunity that wartime Manhattan Project experience was for us. As just fresh college graduates, we were able to serve our country as "soldiers without uniforms" when it so needed us to help in such a unique a way. We had the privilege of being part of the team that developed never-before-even-contemplated technologies for the vitally important Y-12 Plant of the Manhattan Project. The complex Beta chemical process we worked out during the summer of 1943 in Rochester, NY was replaced that very winter by a very different, much better one, and that for an even better one in the spring of 1944! We learned to live with change and like it. After the war when our bosses left Y-12 to return to their old jobs, we kids took over as then the "old" experts in uranium chemistry – at just 23 or 24 years old. Most of the great Rochester gang stayed on, married gals we met here, and spent long careers here working in that Dogpatch town we fell in love with that bright October weekend so long ago.