

## **Dr. Googin and his early days at Y-12, part 8 — Googin made improvements in the Bulk Treatment process**

We last saw John Googin learning from the University of Tennessee library what he needed to know regarding inorganic chemistry. He wanted to make improvements in the Bulk Treatment process of preparing uranium as feed material for the Y-12 calutrons. Using the information from the Mellor's Handbook of Inorganic Chemistry he proceeded to do just that.

His first "assault" on the chemical process, as he called it in his biography, was on the peroxide precipitation. He wanted to make the process handle more material and easier to filter. His first experiments told him that the pH of the process material was most important.

He also realized quickly that the precipitation should be done under very constant conditions with the solutions at hand. I am sure he tried several approaches, but soon settled on "simultaneous additions of peroxide and ammonium hydroxide, with good agitation in a baffled vessel." This produced a solution that would settle better and filter faster.

John said, "The final peroxide precipitation was modified with a settling tank and a continuous filter to increase the throughput of the process. The filter washed and dewatered much better than the continuous centrifuge, and the throughput of the little plant increased substantially. Similar emphasis on precipitation control increased the throughput of the diuranate precipitation."

It had taken John only three months into the job to bring production up to meet the current need for feed material. This must have impressed John's superiors for the next thing he knew, he was given an increase in pay and a promotion. He went from 95 cents per hour to \$1.20 per hour!

He was given a higher level of security access which made his technical troubleshooting even more productive. He was also given training in management, employee relations, statistics, and the merit pay plan. John was feeling pretty good about himself until he quickly realized he had actually just experienced a net cut in pay. You see, he had been working extensive overtime, and the new scale had no overtime provision.

John also mentioned something called the "Kodak period." There were 13 of them in a year. He said this became more natural than the regular 12 month period. I have seen the reports submitted in these four week periods. The equal distribution of weeks and thus days and hours made for a simplified accounting system as no extra days or hours were ever needed to be calculated. Each Kodak Period was four weeks long, period.

The change in pay rate not only resulted in John losing money, it also increased his working hours from five days a week to seven days per week. He called it "a shift and a fraction for most of seven days a week."

The food in the Oak Ridge cafeterias had begun to bother John. This has been mentioned by others as well. Evidently many people were being made sick by the food in town at least at some of the cafeterias. John's remedy was simple. He just took all his meals at the Y-12 Cafeteria. His general health, "showed an immediate improvement."

John next looked at the Gunk solution being received for recovery. It was dilute and hard to get to settle. It also came with an iron-copper combination that catalyzed the decomposition of hydrogen peroxide. He knew this had to be improved drastically if the processing stream was to keep pace with the demand for feed material.

What he did through experimentation was to find a flocculating agent that would work in the Gunk. This allowed the entire recovery process to be accomplished in one step. This also allowed the operation to make full use of all available equipment for the single step, thus increasing capacity significantly.

With John's improvement to the Gunk recovery process the 9202 Bulk Treatment operations were then able to keep pace with the expanding requirements for feed material in the Alpha Calutron buildings. Again, he had proven the value he brought to the operation.

John's process improvements were talked about outside the immediate laboratory in Building 9202. The planners who were designing the new recovery systems for the Beta Calutron buildings that were being constructed sought him out and asked for some experiments with their typical solutions.

He showed them the details of what had been done with the Alpha recovery process and the experiments on the typical solutions that would be used in support of the soon to be installed Beta Calutrons proved to work just fine. This was a major design improvement.

It was about this time that Ted Sprague came to work in the Bulk Treatment laboratory. John said that many more improvements resulted from the collaboration of Ted and himself. They continued to streamline the process eliminating many steps and minimizing waste product.