

7-1-1971

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### Recommended Citation

Cason, Cleo and Stroup, Winona (1971) "The Early Years of Redstone Arsenal," *Huntsville Historical Review*. Vol. 1: No. 3, Article 12.

Available at: <https://louis.uah.edu/huntsville-historical-review/vol1/iss3/12>

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# THE EARLY YEARS OF REDSTONE ARSENAL

By CLEO CASON and WINONA STROUP

In early 1941 the Chemical Warfare Service had only one chemical manufacturing installation--Edgewood Arsenal, Maryland. As World War II drew closer to involving the United States, the Chief, Chemical Warfare Service, requested the War Department to acquire additional facilities capable of furnishing an Army of 2,800,000 men with necessary offensive chemical munitions. Included in the supplemental appropriations that Congress passed to finance the Munitions Program of June 30, 1940, was over \$57,000,000 for the Chemical Warfare Service, of which more than \$53,000,000 was for procurement and supply.

The selection of Huntsville as the site for a CWS arsenal stemmed from a visit by Maj. Gen. Walter C. Baker, a former Chief of the Chemical Warfare Service. On June 8, 1941, Lt. Col. Charles E. Loucks, soon to be Executive Officer of OC CWS, and a civilian engineer visited Huntsville, Alabama. Upon returning to Washington, they filed a twenty-page report with Maj. Gen. William N. Porter, Chief, Chemical Warfare Service. The following week-end, General Porter and Col. Paul X. English reviewed the proposed location. From nine sites surveyed, ranging from West Virginia to Missouri, the Chief, CWS recommended the one near Huntsville. Characterizing the Huntsville site as "more desirable, considering the matter as a whole, than any other location considered," he cited the avail-

ability of 33,000 acres of land "reasonably priced," the excellence of transportation facilities, labor conditions, construction materials, power supply from the Tennessee Valley Authority, operating personnel and raw materials, fuel, water supply, climate, health, living conditions, and sewage disposal. He conceded, however, that "as at all the sites seriously considered, it will be necessary to have a housing project."

On July 3, 1941, the Huntsville Times announced the decision by the War Department to construct a Chemical Warfare Manufacturing Arsenal near the city to produce smoke materials and other chemical warfare required by the military establishment. The announcement stated that:

"Information received by The Times from Washington states that there will be two plants -- separate and apart but adjacent. One will be the Chemical Warfare Service Plant, while the other will be the Ordnance plant for storage and care of the shells." The Chemical Plant will cost \$41,000,000, while the other will cost \$6,000,000. It was also reported that approximately 5,000 men will be required to operate the plant and approximately the same number of men for construction purposes."

Under the direction of the Real Estate Branch of the Quartermaster Corps of the War Department, land acquisition for the Sibert Arsenal-Ordnance Plant began. The name was selected in honor of Maj. Gen. William L. Sibert, a native of Gadsden, Alabama, and first Chief of Chemical Warfare Service from June, 1918, to February, 1920. However, a Chemical Warfare Service training center was proposed for Gadsden and the Sibert name was saved for Camp Sibert which was deactivated at the end of the war.

### Cason and Stroup: The Early Years of Redstone Arsenal

The site selected for the CWS/Ordnance Plants was in the fertile valley of the Tennessee River, which had been used in the past for farming purposes such as the production of cotton, corn, peanuts, and livestock. Unpaved rural roads served the area. A few antebellum plantations remained among the smaller farm tracts. Over 300 individual tracts involving more than 35,000 acres had to be purchased or converted to public use under the right of eminent domain.

The Government immediately took steps to acquire the land by condemnation proceedings. When the Office of the Quartermaster General filed a petition on July 23, 1941, to this effect, the United States District Court for the Northern District of Alabama, Northeastern Division, entered an order granting possession to the Government as of noon, July 24, 1941.

The general procedure involved in securing the land was for an impartial expert - in this case, the Federal Land Bank of New Orleans - acting as a consultant to the Government, to appraise each tract. Negotiations between a representative of the Office of the Quartermaster General and the land owner then began. Generally the owners accepted the evaluation and only a small percentage of the cases had to be taken into individual condemnation suits. In most cases the acquisition of land was conducted in a very orderly and expeditious manner, and not one case is on record where operations or construction had to be delayed because land was not acquired in time. The Government saved considerable money by allowing owners to remain on their land until crops were harvested if this did not interfere with construction. The removal process was spread out, therefore, over a period of time. No

specific relocation program was needed, as the community absorbed the major portion of those displaced. In fact, many people who formerly lived on the land obtained work with the construction contractors at a considerable increase in their annual income.

On July 16, 1941, the War Department signed a cost-plus-fixed-fee contract with Whitman, Requardt, and Smith of Baltimore, Maryland, for architectural and engineering services. A second contract of the same type followed on July 21, 1941 - this one being with C. G. Kershaw Contracting Co., Birmingham, Alabama; Walter Butler Co., St. Paul, Minnesota; and Engineers Limited, San Francisco, California, for the construction of Huntsville Arsenal.

During July contractors began acquiring machinery and materials. Col. Rollo C. Ditto, the first Commanding Officer of Huntsville Arsenal, arrived on August 4, 1941, and the next day, ground was broken for initial construction. By September 14, 1941, temporary buildings on the Arsenal were complete, and the new occupants moved in. Previously, the Commanding Officer and his staff had operated from the Huntsville National Guard Armory and the Huntsville High School. Personnel matters were handled initially in the Chamber of Commerce office and Armory.

The initial plans for Huntsville Arsenal stipulated eleven manufacturing plants, four chemical-loading plants, plant storage, laboratories, shops, offices, a hospital, fire and police protection, a communications system, and utilities, including roads and railroads, necessary for the protection, storage and shipping of chemical munitions.

Original plans for the acquisition of land on



### GROUND BREAKING FOR REDSTONE

Major Carroll D. Hudson, first commanding officer of the Redstone Ordinance Plant, digs into a cotton field in October, 1941, to break ground for the first building of the military complex. The shovel has been preserved and is still used in ground breaking ceremonies.

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which to build the arsenal included over 7,000 acres to be used for construction of a depot area, later known as Gulf Chemical Warfare Depot, to be located in the extreme south portion bordering on the Tennessee River. Successive authorizations expanded the initial Chemical Warfare Service plans considerably. The end result was tantamount to a complete city which was for all practical purposes self-sufficient.

Shortly after President Franklin Roosevelt issued the Emergency Proclamation in September, 1939, the Ordnance Department began to plan for the expansion of its facilities to meet the growing needs of national security. Among its anticipated projects was a chemical shell assembly plant and its related facilities. The site for such a plant had not been chosen, however, when the Chemical Warfare Service decided to erect Huntsville Arsenal. Realizing the tremendous economy that could be achieved if a shell-loading plant could be located close to such an arsenal, the Chief of Ordnance, Maj. Gen. Charles M. Wesson, directed Maj. Myron Leedy of his office to conduct a survey of available sites in the vicinity. Acting upon Major Leedy's recommendation, the Ordnance Department decided to build a shell-loading plant on property adjacent to Huntsville Arsenal, and on September 25, 1941, Maj. Carroll D. Hudson, Ordnance Department, was named Commanding Officer.

On October 6, 1941, Major Hudson arrived in Huntsville and immediately established a local office. On October 7, he called a meeting of the Area Engineer, representatives of the architects, Whitman, Requardt and Smith, and the contractors, Kershaw, Butler, Engineers, Ltd. After discussing contracts which had been entered into by the

Quartermaster Corps, plans for the construction of what was to be known as the Redstone Ordnance Plant, named because of the preponderance of red soil, were commenced.

The requirements for the plant, as established by the Office of the Chief of Ordnance, called for the loading and assembly of 75mm chemical shell; 81mm chemical mortar shell; 30-pound chemical bomb; 105mm chemical shell, together with the loading and assembly of burster charges for this ammunition.

Accordingly, the layout of original plans called for the construction of: two burster-loading and assembly lines; two shell-loading and assembly lines; twenty-four inert storage warehouses; thirty igloos; thirty-five finished ammunition magazines; administrative and utility buildings; and all utilities.

The plant's tract of land consisted of approximately 4,000 acres, designated on the surveyor's map of Madison County as a portion of the Sibert Arsenal Project, located ten miles south of the city of Huntsville.

Ground breaking ceremonies for construction of the Redstone Ordnance Plant, redesignated Redstone Arsenal on February 26, 1943, occurred on October 25, 1941. The first building, a two-story, barracks type structure was occupied on November 11, and served as temporary headquarters for Maj. Hudson, his staff, and representatives of the area engineer, architects and contractors.

The construction of facilities progressed at a brisk rate until the Pearl Harbor attack on December 7, 1941. Afterwards the pace was more urgent and in many cases operations were on a twenty-four day, seven-day week basis.

Total construction costs of Huntsville Arsenal and the Gulf Chemical Warfare Dept. including land



approached \$70,000,000. Construction costs of Redstone Arsenal are listed in historical records at \$11,500,000.

Planning of facilities included accommodations for a large work force of women employees as it was becoming increasingly evident that there would be a scarcity of male workers. Arrangements were made with the Civil Service Commission to announce examinations for jobs known as "female trainees." Jobs on the Redstone production and assembly lines were later called "mechanic learners," whether performed by women or men. Finally, these jobs were classified "explosives operators." By August, 1945, sixty-two percent of the personnel working on the Redstone ammunition production lines were women.

Workers were generally available during the agricultural off-season periods but were more difficult to obtain at other periods. The Civil Service regional offices, the U.S. Employment Service, and the War Manpower Commission co-operated in recruiting civilian personnel for the arsenals.

At times when the manpower situation was stringent, those agencies assisted the Arsenal in conducting recruiting campaigns. Advertisements were run in local papers, and employees were urged to hand out printed leaflets to their relatives and friends on the need for workers. A spectacular touch was added when airplanes dropped handbills about this need over the adjoining countryside. Recruitment of workers, in other respects, was not lacking in the elements of human interest. There was, for example; the incident when, in the spring 1943, the president of a Negro college for girls in Georgia stepped into the office of the commanding officer and offered the services of approximately



FIRST REDSTONE HEADQUARTERS

This building was occupied in November, 1941. It was used as a temporary headquarters until the Administration Building was constructed and then used as BOQ.

one hundred young women in the graduating class. The offer was gratefully accepted. The young women from Atlanta University came to the arsenal fully aware of the rather distasteful nature of some of the work, but they did a job, which in the opinion of one qualified to judge, could hardly have been surpassed.

Huntsville Arsenal reached its peak of 6,707 employees in May, 1944. Over ninety percent of the force was civilian.<sup>1</sup>

Military strength reached its peak of 580 in October, 1942. In December, 1943, a number of WAC's arrived for administrative duty. Enlisted men were used primarily as security forces. None worked on production or maintenance projects.

By May 1, 1945, approximately 700 employees were on military furlough or had resigned to enter the armed forces. This amounted to about twelve percent of the work force.

Huntsville, like the other CWS arsenals, manufactured toxic agents, smoke, and incendiary material, and with these filled shells, grenades, pots, and bombs supplied, usually, by the Ordnance Department.

During the forty months of operation, more than 27,000,000 items in the form of shells, grenades, canisters, smoke pots, bombs, and bomb clusters were manufactured. No production figures were released on the production of mustard gas, phosgene, and lewisite, but more than 6,000,000 smoke grenades, 2,300,000 smoke pots, 2,500,000 WP shells, 5,000,000 M-69 thermite incendiary bombs, 268,000 M-47 bombs, 900,000 M-54 bombs, 9,000,000 canisters for artillery shells, 448,000 M-75 incendiary clusters, and 55,000 M-76 bombs were produced at Huntsville Arsenal.

In addition to performing production tasks, the

personnel of Huntsville Arsenal achieved several awards. In August, 1942, the Arsenal was awarded the Army-Navy "E" for outstanding production. Formal presentation was made October 31, 1942. Three stars were awarded subsequently. The Treasury "T" award for participation in war bond campaigns was first presented on November 17, 1943.

Redstone Arsenal reached its peak employment in February, 1945, with 4,252 civilian employees, eighteen military officers, and four enlisted men on detached duty with the Signal Corps.

Between March, 1942, and September, 1945, more than 45,000,000 items of ammunition were produced or assembled at Redstone Arsenal. These items included 11,605,800 rounds of chemical artillery ammunition, 3,615,000 rounds of chemical mortar ammunition, 3,288,000 rifle grenades, 706,300 miscellaneous items such as aerial bombs and tank weapons, and 14,233,000 burster charges. The technique of mass production of tetrytol was perfected at Redstone Arsenal. Tetrytol, a high explosive binary mix, was used in the loading of certain bursters, boosters, and demolition blocks.

In less than three years, personnel of Redstone had won five Army-Navy "E" Awards for production excellence. The first award was presented on November 28, 1942. Stars appeared on the "E" flag each time the Arsenal again earned the award, on July 17, 1943, January 15, 1944, November 4, 1944, and June 23, 1945. Redstone was the first installation in the Southeast to fly a "T" banner for having more than ninety percent of its employees investing ten percent or more of their salary in War Bonds.

The Fred Project, the installation's first contact with the rocket business, was established at

Huntsville Arsenal in January, 1945, at the request of the Army Air Corps. Its purpose was to investigate various chemical combinations as possible propellants for use in the launching of JR-2 bombs, an early design similar to the German V-1 Buzz Bomb. The units were developed at the Arsenal and tested at Elgin Field. This was the first government in-house liquid propulsion group. The project was terminated in September, 1945.

Many other things had also been terminated by September, 1945. By the end of the war Huntsville and Redstone arsenals had met or surpassed every goal set, often pioneering production techniques later adopted elsewhere throughout the military establishment. Huntsville had produced chemical munitions valued at \$134,589,951. Redstone was shipping twenty freight car loads of munitions each day. Then the war ended and production stopped. There was an immediate drop in personnel strength.

The inevitable phasedown followed quickly, but the years after the war were not quiet ones for those who remained. The smooth running machine that had sent munitions off production lines to supply depots and ammunition dumps behind battle lines throughout the world ground to a halt, then reversed. Much of the munitions came back to the point of origin for demilitarization or renovation and storage. Large quantities of obsolete items had to be destroyed to free storage space.

Thousands of obsolete incendiary bombs were burned by the Gulf Chemical Warfare Depot. As part of the process, the bombs had to be removed from the wooden boxes in which they had been packed for shipment. A shortage of lumber for civilian construction created a lively demand for the boxes which sold for twenty-five cents each. Many homes

built in this area soon after the war had floors and side walls made of bomb containers.

What to do with production plants and land in the immediate absence of a requirement to produce anything posed more of a problem. By early 1946, the Chemical Corps had authorized lease of more than 5,000 acres in Huntsville Arsenal for agricultural use, a practice that continues to this day. It was also decided to lease to private enterprises any facilities not immediately required with suitable recapture clauses so that the Army could regain possession if necessary.

Plants for the production of chlorine gas were among the first leased to industry, another practice that continues in effect. Other leases followed and as it became evident that the Arsenal was headed for standby status, Huntsville Arsenal absorbed the neighboring Gulf Chemical Depot - "Warfare" had earlier been dropped from the title - in January, 1947. In the same year there was a brief and abortive attempt to manufacture automobiles on the installation. The Keller Motors Corporation, formerly Dixie Motor Car Corporation, leased a building on the post in August, 1947. Probably not more than three cars were actually hand built, and the company went under. Late that year the Army decided that the Arsenal was surplus to its need and directed local officials to prepare for deactivation.

Huntsville's ordnance neighbor, Redstone Arsenal, had also fallen on lean years. A post war workload of renovation of returned ammunition supported a greatly reduced work force. Civilian employment had been about 3,000 at the end of July, 1945; by December it had dropped to 600 and the trend continued down.

The work ended in February, 1947, and Redstone

went into standby status with a permanent force of approximately 225 people.

It seems likely now that Huntsville Arsenal would have been shut down completely and sold during 1948 or 1949 if the demilitarization and decontamination work could have been completed, but with a greatly reduced work force, those tasks took time. Another saving factor was the leases that had been negotiated for some of the arsenal buildings. The leases required the arsenal to furnish utilities. Redstone Arsenal also drew its electrical power from Huntsville and was dependent upon Huntsville's railroad network.

On at least three occasions, there were announcements of impending sale. "For Sale" signs actually hung on the fences for a time, but a reprieve always came and the sale was postponed. For a short time in late 1948, the Air Force seemed interested in acquiring Huntsville Arsenal.

While the big Chemical Corps arsenal's fate hung in the balance, however, things were happening at neighboring Redstone. During 1948, the Chief of Ordnance had been convinced by then Col. H. N. Toftoy, Chief of the Ordnance Rocket Branch, and his staff that Ordnance rocket research and development activities should be centralized in a "rocket arsenal." Largely at Toftoy's urging, Redstone was chosen as the site in November 1948. Colonel Carroll D. Hudson returned to Redstone Arsenal to resume command on November 30, 1948. For about a year, or until November, 1949, both Redstone and Huntsville Arsenals came under the jurisdiction of Third Army. Early in 1949, it was decided to deactivate Huntsville Arsenal and turn the area and responsibility for the remaining activities there over to the Redstone Arsenal command. Redstone

became the Ordnance Rocket Center on June 1, 1949, and a month later assumed responsibilities for all land and buildings that had formerly comprised its bigger neighbor, Huntsville Arsenal, pending its closeout. About 350 civil servants transferred from Huntsville Arsenal to Redstone giving the new "rocket arsenal" an initial civil service strength of some 720 persons.

During 1949, two contractors, Thiokol Chemical Corporation and Rohm & Haas, completed negotiations with the Army to perform rocket propellant research and development and began moving into government-owned facilities at Redstone.

In the interest of economy and efficiency, it was decided to relocate the then Ordnance R&D Division Sub-office (Rocket) at Fort Bliss, Texas, charged with research and development of guided missiles, to Redstone by utilizing facilities of the former Huntsville Arsenal. The Secretary of the Army approved the plan on October 28, 1949. This meant the major portion of Huntsville Arsenal would be permanently transferred to Redstone as home for the new Ordnance Guided Missile Center.

<sup>1</sup>The distribution of the types of workers was fairly constant in that approximately nine percent of the personnel were unskilled; forty-eight percent semiskilled; eighteen percent skilled; and twenty-five percent administrative or graded employees. A representative sample recorded in September, 1944, showed twenty-six percent white female, eleven percent colored female, fifty-two percent white male, and eleven percent colored male. For a long time, the arsenal maintained a working ratio of white and colored employees almost equal to the population ratios.