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SUMMARY

1. General and Technical Review. With the close of hostilities and the absence of national legislation on atomic energy, the Los Alamos Laboratory and Manhattan Engineer District were suddenly faced with the problem of determining a policy for a laboratory previously concerned with the production of an atomic weapon as soon as possible to end World War II. Personnel problems existed which were not only difficult to surmount, but in many cases were insolvable because of the mental attitude of the nuclear scientists relative to a weapon production organization. At that time, the laboratory staff could be divided into five groups:

a. Academic personnel on leave from universities and colleges.

b. Young Ph.D.'s recently from graduate school.

c. Graduate students with varying experience.

d. Technicians, administrative, and clerical.

e. Officers and enlisted personnel of the Army and Navy.

The attitudes of these individuals were as varied as their backgrounds. Some wished to remain at Los Alamos, but were committed to other positions. Others were indifferent to the laboratory's future after victory was won. And as the technical and administrative future of the project was unclear, others preferred not to gamble on the outcome.

Opinions, as to the future policy for Los Alamos, varied as much as the types of persons. One school of thought suggested the laboratory should become a monument; another group felt that it should conduct only peaceful research and abandon the atomic weapon; still a third group held that the design and production of atomic weapons must be continued.

During this transition period, Dr. J. R. Oppenheimer relinquished direction of the laboratory and in October 1945 Dr. N. E. Bradbury assumed this position.

Dr. Bradbury's philosophy for this interim period was one based on the assumption that Los Alamos would continue as an operating laboratory at its original site, and that both research and development on the weapon or matters related thereto would be considered on both a short and long range. This policy was approved by General L. R. Groves.

Plans were then established to build a strong permanent staff, and in so doing, the previous policy of paying the way home of laboratory personnel upon termination was discontinued, thereby creating the expected result of forcing the personnel to a decision of staying or leaving. Those who stayed were by that act committed to working for the success of the project.

In lieu of an immediate policy, various programs were introduced as a stimulus.

The Los Alamos University was begun in September 1945, to give a program of lectures for junior laboratory personnel. Approximately 700 took advantage of this schedule and about 130 earned college credit for their work.

Although members of the senior personnel left Los Alamos the year after V-J Day, the laboratory called upon a number of these to serve in a consultant status aiding the permanent staff in their problems.

Various conferences were held during 1946, some highly classified. The University affiliation conference held in July 1946, brought university representatives to Los Alamos to consider the possibilities offered at the laboratory for training graduate students. The climax of this conference program was reached in August 1946, when 57 consultants met with staff members of all the Manhattan Engineer District laboratories and discussed the technical program.

The Health and Safety program went forward with increasing emphasis, but in spite of this, two serious radiation accidents occurred in August 1945 and May 1946, resulting in the death of Harry K. Daghlian and Louis Slotin.

The water shortage which developed during the winter of 1945-1946 deserves special mention because it climaxed the resentment of many against the temporary nature and operation of the community and undoubtedly inspired or at least accelerated the exodus of many personnel.

The technical organization was reorganized into seven divisions, each of which was under the leadership of an individual with extensive previous experience at Los Alamos. Besides these technical divisions, there were certain technical staff groups and an administrative division. In November 1946, the Technical Board and Weapons Panel Board were formed to aid the director.

Weapon engineering continued to improve the overall design of the bomb. During the war, engineering had been conducted at Los Alamos and field testing at Wendover Field, Utah. In the fall of 1945, this latter activity was transferred to Oxnard Field, now known as Sandia Base, near Albuquerque, New Mexico.

Full scale high explosive production was transferred from Los Alamos to Inyokern.

Further developments included a technique of packaging known as the "plug" type of assembly, and a new design of a "composite" implosion weapon using both plutonium and uranium-235.

In connection with the weapon program, the laboratory undertook the technical direction of the Crossroads Operation. The Joint Task Force was to conduct three types of tests using the same type of weapon employed at Nagasaki. Dr. Ralph A. Sawyer was selected Technical Director with Dr. Marshall Holloway and Mr. Roger Warner as assistants. The responsibilities of the laboratory included recommendations for the overall character of the test; to prepare an account of expected phenomenon; to estimate the equivalent high explosive yield; to prepare the firing circuits for the underwater test as well as timing system; to prepare the weapons. Two ships were assigned Los Alamos personnel for their operations, and a regular C-54 run was established between Santa Fe and Washington for close liaison.

Crossroads Operation cost the laboratory approximately one million dollars, as well as the time of about one-eighth of the staff but it gave the laboratory gains, in psychological and technical values that were inestimable.

2. Administrative Organization. For some time a strengthening of the administrative organization had been indicated. To this end Dr. Oppenheimer appointed Col. L. E. Seeman as Associate Director in charge of a new Administration and Services division. This newly formed division brought together these various groups: Administration, Personnel, Shops, Procurement, Technical Area Maintenance, and Safety. But it in no way affected the technical staff groups that continued to be directly responsible to the director. These were: Editorial, History, Patent, Health, Library, and Declassification. The formation of the Documentary Division, in August 1946, combined all these technical staff groups except the Health Group.

The Business Office was, of course, unaffected and continued its administrative functions for the University of California.

The British Mission gradually dwindled after Trinity, leaving only one man at the end of 1946. Three of its members participated in Operation Crossroads.

Three major problems faced the Personnel Group: Maintenance of an adequate staff; replacement of approximately 1600 enlisted men as they were discharged; staffing B-Division for the Crossroads Operation.

A new set of classifications and salaries was drafted, and approved in February 1946, providing a greater inducement for those who had received higher salaries elsewhere. This new schedule of salaries aided in the vigorous recruiting drives to fill the vacancies left by the men in the Special Engineer Detachment and to build up the complement of B-Division. The Bikini test program was not popular with scientists generally and it was necessary to offer a premium wage in anticipation of overseas duty.

The Personnel Office had certain personnel services including housing, maid service, laundry facilities which ultimately were given to the Zia Company, and

a section of the group supervised the newspaper, automobile allocation, the radio station and the stationery stockroom. These functions, too, were transferred to the Army and the Zia Company.

The program facing the Shop Group changed from stress on production to emphasis on experimental work. Additional space was available about this time. A redistribution of activities and personnel occurred, so that every individual might be employed to better advantage in meeting schedules.

Problems facing the group varied. A reduction of hours curtailed the take home pay of individuals. Housing remained a critical situation. The $100.00 monthly incentive pay was discontinued about the same time the termination of return travel reimbursement was announced. Many enlisted men were discharged, further reducing personnel, and production fell behind schedule. A system was arranged whereby plastic and metal machine orders were produced in West Coast shops. This relieved the Los Alamos machine shops of an overwhelming schedule, and allowed them to work on more difficult technical problems and special fabrications. One such job was constructed on the fast reactor.

Although operations in the Procurement Office were simplified greatly at the end of 1945, requests for materials were as diversified as ever. One contributing factor, in this case, was the purchasing for the Bikini tests. Approximately 300 tons of equipment was secured for this operation.

The Property Section was combined with Procurement in April 1946. A tight property system was inaugurated the latter part of 1946.

The Technical Area Maintenance Group provided maintenance and construction services necessary for the physical operation of the laboratory in collaboration with the Army Maintenance Groups until February 1946. At that point the Army craft shops were discontinued and the Tech Area craft shops became responsible for the entire technical area.

The safety program was originally divided into Post and Technical Area groups. However, they were centralized in January 1946 under the Post Safety

Engineer, and the position of Laboratory Safety Engineer ceased to exist. The slight tendency on certain technical division safety organizations to lose interest and gradually disintegrate finally led to the appointment of a Laboratory Safety Engineer in December 1946. It was intended that he should set up a specific safety program for the technical area and work in conjunction with the Post Safety organization.

The Photographic Group set up an expansive program during this period to increase their service facilities for the technical divisions. New equipment was added which not only increased the versatility but improved the technique of photography and duplicating systems employed.

The Health Group, which was independent of the Administrative Division, was primarily involved in termination procedures and establishing a peacetime health program at this time. Particularly was this group concerned with the two radiation accidents in September 1945 and May 1946. The symptomatic reactions of each individual involved were followed closely and case histories prepared. Activities with radiolanthanum were watched, as were the activities with plutonium and polonium. Two other responsibilities outside the routine categories included the Health Group's participation in Crossroads Operation. Training courses on basic physics and radiation problems were given by members of the Health Group to Army, Navy and Public Health doctors on Colonel Stafford Warren's staff.

The other extraneous phase of health research concerned additional information for decay curves on radiation from the Trinity test.

The Business Office was the direct representative of the Contractor and, as such, was interested in all phases of the laboratory operations. Its functions included: the laboratory payroll, attendence reports, travel disbursements, payments for purchases, consultant fees. In addition it held the purse strings for the nursery school, the newspaper, the radio station, the hospital and school employees, and the technical library. It also handled all compensable accidents

which occurred during this period, including the fatal accidents of Harry K. Daghlian, Louis Slotin and Joshua I. Schwartz. Further services rendered by this office included a check cashing facility and the establishment of life insurance and group hospitalization insurance to provide benefits for persons employed at the Project.

3. Theoretical Physics Division. This division continued its wartime program on a modified and reduced scale with the added interest of intensified research on thermonuclear systems. It devoted much time to the hydrodynamical problems in the interpretation of the blast measurements at Trinity, Hiroshima and Nagasaki; and effort was spent on the radiation hydrodynamics of the implosion fission bomb.

Further research on these programs resulted in theoretical developments on a "composite" core for the weapon, on the "alarm clock" - thermonuclear system, and on the fast reactor, which was constructed by the Physics Division and in operation by November 1946.

4. Physics Division. The former Research Division and F-Division were amalgamated into a Physics Division in November 1945 with a combination of the work performed by the old divisions, plus the inclusion of the study of fast chain reactions. Of necessity there was much reorganization and rearrangement of groups and their responsibilities.

During the period under discussion, the fast reactor became a reality. The cyclotron, the Cockcroft-Walton accelerator, and the "short tank" Van de Graaff, borrowed during the war were purchased for Los Alamos, and experimentation continued with each of these particle accelerators. Inasmuch as the laboratory was unable to purchase the "long tank" Van de Graaff, from the University of Wisconsin, a program to construct such a machine was approved early in 1946. The new Van de Graaff will incorporate certain new desirable features never before attempted, making it larger and more flexible than any in existence at the time of its conception.

Other phases of research conducted by this group included experiments with the betatron and the chronotron, and studies in cosmic radiation.

5. M-Division. This division, formed in the fall of 1945, under Darol Froman, was assigned a program of work, including both peacetime applications of nuclear energy and a continuation of weapon development. This schedule embraced:

a. Maintenance of the Weapon, insofar as the pit was concerned

b. Critical Assemblies

c. Bomb improvements

d. Proposed mechanical methods of initiating thermonuclear reactions

e. Optical and Engineering-Physics

Main developments during 1945-1946, were concerned with stockpiling, and simplifying procedures of delivering and storing hot plugs. In connection with the field assembly program, the division established a training course for the Army Officers chosen for this operation.

Two tragic accidents occurred to members of this division. In August 1945 and September 1946 respectively, Harry Daghlian and Louis Slotin received fatal radiation while performing experiments with critical assemblies. These occurrences halted all such activities and brought about an elaborate system of remote control. A new safety program was put into effect wherever active material assemblies which might reach critical were involved.

6. Chemistry and Metallurgy Research Division. Late in October 1945, the Chemistry Metallurgy Division became CMR Division under Eric R. Jette, who assumed the position of Division Leader when the co-division leaders, Joseph Kennedy and C. Smith left the Project.

As with the case with the entire laboratory, a reorganization of the personnel staff of the Division was required by the general departure of key individuals during this interim period.

The Division program comprised metallurgical and physical studies of plutonium and other transuranic elements; research and development work in polonium and plutonium chemistry; tritium research; research on the chemistry of the transuranics; radiochemistry studies, especially with radiolanthanum; and the effects of intense radiation. CMR Division continued its extensive manufacturing function of essential nuclear elements for weapon production, as well as a large service organization for production of nuclear materials for use by the other Laboratory division. For example, it supplied the active material in appropriate shape and condition for preparation of the Los Alamos fast reactor. A very important watchdog function included a group for monitoring and decontamination activities in the technical areas, responsibility for counters and meters for detecting radioactivity and laundering of contaminated protective clothing.

7. Explosives Division. The Explosives Division moved toward a simplicity of structure with the close of the war in order to concentrate on various explosive research problems of great importance to the laboratory program. This was possible because certain wartime programs were discontinued or transferred to other installations. G. B. Kistiakowsky departed in October 1945, leaving Max Roy as the Division Leader. The program of X Division was generally divided into six groups. These were: Explosives research; explosives production; study of slow explosives; detonators; study of detonation and shock phenomena; and radiographic research.

8. Ordnance Engineering (Z) Division. This division was established in the Laboratory just prior to the termination of hostilities. It remained in a state of flux until late 1945, when a more formalized organization was established. However, the division was split between Sandia Base at Albuquerque and the Los Alamos Laboratory, with testing sites as far apart as Wendover Field, Utah, and Salton Sea, California. This separation of effort, along with severe

housing problems, greatly hampered the operation of the Division. The program of Z Division embraced five parts: testing of the components of the weapons under actual conditions to which they would be submitted; design of new components and redesign of existing components of the ordnance phases of the weapon; development of improved replacement items involved in the implosion weapon for use in the stock pile; stock piling of all component parts of the weapon other than the nuclear components; and assembly of the weapons.

9. Documentary Division. In order to relieve the Director of the supervision of a large staff of special technical groups, a new documentary division was established in the Fall of 1946 which combined the groups having the responsibility for Library and Document Room, the Technical Series and History, report editing, declassification, classified information dissemination, legal and patent matters, and technical illustration and art work. Ralph Carlisle Smith was appointed Chief to this Division with Herbert I. Miller as his alternate. The new organization greatly improved the services of these individual groups at the same time effecting a substantial reduction of personnel.

10. Conclusion. The Los Alamos Laboratory operated throughout 1946 on the interim philosophy expressed by Dr. Bradbury in October 1945. Progress had been made in all the technical fields bearing on weapon development. However, the laboratory was still without a clear-cut policy for its future. The Manhattan Engineer District had completed its mission. The Atomic Energy Commission would direct the course of the laboratory after 1 January 1947. Dr. Bradbury in anticipation of various questions which might arise in deciding the long range policy for Los Alamos, prepared a letter outlining the past history, problems of the laboratory and suggestions for a possible future laboratory program. This letter was presented to the Commission on its first visit to Los Alamos in November 1946.