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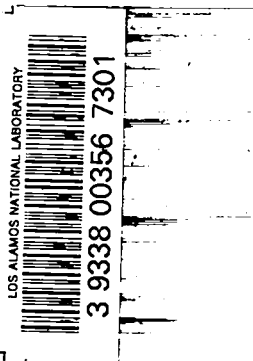
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C. 3

October 9, 1946

This document contains 15 pages

P DIVISION MONTHLY PROGRESS REPORT



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GROUP P-1 MONTHLY REPORT, October 1, 1946 - E. W. Titterton, Group Leader

The following is a brief summary of the work in progress and accomplished during September 1946.

General

In the last two months there has been a considerable turnover of personnel - both incoming and outgoing. However, I now regard the numbers as being stable until about Christmas time, or until the Commission decides the future of Los Alamos, which ever is the sooner.

Our pressing personnel need is for four or five young men with Ph.D.'s capable of taking a job from its inception and seeing it through to an engineered unit. We have several young men who have grown up with the group during the last two years who are doing very well at this type of work, but, with their limited experience, progress is necessarily slow. We have sufficient of the Research Assistant caliber and a plentiful supply of shop personnel.

The loss of four key men from our Research Section is our most serious blow - Watts, Fitch, Hunt, and Robinson - and the burden of the work they were doing will fall heavily on the remaining members during the next few months.

The gain of two men with excellent qualifications - Weiss and Hedberg - will not immediately alleviate the loss as each man will take up a special problem and will not be available for the more routine activities.

Gains and Losses

The Research Section lost five staff members and gained two men of staff member caliber and four men of Research Assistant grade. This is the section we must try and strengthen as soon as we are able.

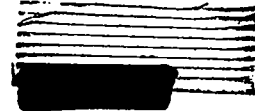
The Engineering Section lost two men and gained one. The work which this section was initially set up to do is coming to an end and, in any case, to meet our commitments it will be necessary to use the personnel for routine design, construction, and repair work as occasion arises.

The Construction Section has lost its assistant leader but we have strengthened it by the addition of eight persons. Five of these are women in the "learner" class. They are at present taking a course in construction under McCord and will be useful in a productive sense by the end of the month.

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The Communications Section has only two members (one of them new) since Huffhines and Bibbs are out of action.

Technical Problems

We are facing four major problems at the present time.

1. Cyclotron Arc Modulation. This is a high priority job and Hedberg is on it full time. Titterton is spending some time on it too as a complete re-design of McDaniel's Circuits is necessary. It will be a three-month job at least.
2. McKibben Informer Problem on the 8 Mev Generator. Weiss has already started work on this job and we have given him a Research Assistant. The problem will be a full time job for him from four to five months.
3. Voltage Control on D-D Source. Research on a degenerative stabilizer circuit for the D-D source to prevent the beam wandering off the target, as it does at present due to time voltage troubles, is underway. Gabrielson is on this job full time with part time direction from Dye. Estimated time for a solution (whether it be positive or negative) is one month.
4. Betatron Constant Frequency Variable Power Source. At present time this is tentative. We do not have anyone we can put full time on the job but if Allison does the job in Ogle's group, we will probably be able to meet the requirements for control circuits.
5. Modulated Light Source for J. C. Clark. We have an order for heavy duty power supply and control circuits for pulsing a spark gap light source in synchronism with a fast camera. I foresee serious difficulties in extinguishing the spark at frequencies as high as 1500 c.p.s. but Mr. Clark is to accept responsibility for that part of the work. Jensen will handle problems at our end. Two to three months work.

Apart from these major items, we have a full log of work of a more conventional nature.

1. Neutron monitors for C'R and King.
2. Re-design of neutron counters for the Hall's.
3. Two neutron counters for King.
4. Special Coincidence Circuit for J. Fowler.
5. Three Scales of 64
One Scale of 4096
and sundry Geiger Counter sets for Jake Hall.
6. The 100 KV RF Supply for McKibben.
7. Constant Current Magnet Supply for McKibben.

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I foresee further work for the H.E. sites, and we already have research underway for faster sweep circuits for the RP type oscillographs.

From the maintenance point of view, the load we have from the Physics and M Divisions is of reasonable proportions. The load from the H.E. division is, however, distressingly large. This merely reflects the inexperience of the personnel in X Division who are now operating the sites. They often call out our men to replace a fuse or a burned-out pilot light. We are doing everything reasonable to cope with the situation and, on October 1, will have been joined by Raymond Taylor who will work full time on this job. This is one of our biggest worries and I do not see a solution to it at all.

All in all, we have as much work as we can possibly handle at the present time and if the load should increase, it will become necessary to decide which jobs will be dropped for attention at a later date when the situation eases up.

Statistics:

Total Personnel in Group	47
Personnel in Research Section	14
Engineering	8
Construction	17
Communications	4

Personnel Lost
Aug. 1 - Sept. 30

Personnel Gained
Aug. 1 - Sept. 30

Engineering

Fishbine, H.
Freyman, R. W.

Shopp, A.

Research

Watts, R.
Fitch, V.
Robinson, P.
Telfair, I.

Weiss, H.
Hedberg, C.
Burditt, F.
Glore, F.
T/5 Beckett, C.

Construction

Mather, J. W.

Clark, Edith
Ewen, Ruth
Lane, Edna
McFarlane, H. B.
Powell, Marjorie
Steinmann, W. L.
Vigil, A.
Plotkin, S.

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Breakdown of work

<u>Division</u>	<u>Hours of work</u>
A	4
CMR	441
P	437.5
Z	13
X	2
M	259
"isc. - mainly site maintenance	250
Total	1406.5

This breakdown shows only jobs completed and does not take account of longstanding research problems, such as the fast sweeps for X and " Divisions, Arc Modulator, 100 KV RF supplies, etc., for P Division. It is really an index to the more routine type of job.

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GROUP P-2 MONTHLY REPORT, October 1, 1946 - L.D.P. King, Group Leader

Job and Personnel

1. Water boiler.

Bentzen, King,
Starner

Progress

An additional 183 KWH were run during the month for a total of 4225 KWH.

A serious attempt is being made to reduce all backgrounds in the building. This requires a considerable modification in the present gas outlet system and the more complete shielding of some of the parts and parts of the thermal column.

To reduce the γ activity near the boiler, it has been necessary to remove the concrete floor over the gas outlet tube in the building. The eight inches of concrete and sixteen inches of earth will be augmented by six inches of lead.

A well-shielded concrete pit is under construction some 200 feet from the building at the water outlet. This shield will prevent freezing of the water outlet during the winter, reduce the γ activity in the Omega area, and will also house the safety liquid trap for the gas outlet previously located in a pit in the building. An underground stainless steel pipe will carry the gases away from the Omega area. The activity anywhere in the area should be perfectly safe with this shielding.

The gas outlet has been removed to a wider point on the South Mesa about 1500 feet south of Omega. It is hoped that by releasing the gas about 60 feet above the ground at this point, the previous trouble with down draft into the canyon will be eliminated. This outlet will be made permanent by replacing the seron tube strung between trees by an underground stainless steel pipe as soon as a satisfactory outlet location is found.

This work, in addition to the painting and general clean up, has caused a shut down during the past week. It is believed that normal operation can be continued in another week.

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2. Irradiations for other groups.
Starner
During the month runs were made for the following other groups and personnel: Sample 49 slug for fast reactor - P. Morrison, Group P-5; cobalt needles - J. Hoffman, Health Group; samples for phosphorus blood tests - A. Purley, Health Group; diffraction experiment with neutrons - F. Wellig, Group "4-6.
3. Short delay gamma measurements.
Bentzen, King
Further work delayed by presence of 49 slug.
4. Short delay neutrons.
Starner
Preliminary tests made on counter efficiency.
5. Magnetic lens β ray spectrograph.
R. Carter
One calibration run made. Work discontinued due to loss of personnel.
6. Scattering of cold neutrons from graphite.
King, Starner
No progress.
7. Elastic scattering of monochromatic neutrons.
J. E. Mack
Work discontinued due to termination of personnel.
8. Magnetic scattering of neutrons.
Bentzen, King, Shapiro
Due to a suggestion of Otto Halpern, experiments are planned to measure the magnetic scattering of slow neutrons as a function of angle from a MnSO_4 single crystal.
Construction of a large U^{235} detecting chamber is underway.
H. Slatin in CMR-6 is attempting to grow an anhydrous MnSO_4 crystal essential to the experiment.
It is hoped that the magnetic moment of the neutron can be obtained from this scattering data.

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9. Hardness of delayed fission γ rays.

Bentzen, King

Due to a suggestion of Mr. Fermi, an experiment to measure the hardness of the delayed fission γ rays is underway. A Geiger counter is to act as a detector and graphite will be used as an absorber. Earlier measurements under (3) above indicated 90 percent hard γ 's of 2 mcv or over. The hardness could not be determined accurately since lead absorbers were used.

10. Recoil range separation of fission products.

Wiskel, Katcoff

No report.

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GROUP P-3 MONTHLY REPORT, October 1, 1946 - R. F. Taschek, Group Leader

<u>Job and Personnel</u>	<u>Progress</u>
6. Electron source for short tank. Hemmendinger, Taschek	Inactive.
7. Electrostatic analyser resistance stack. Hemmendinger	Analyser spacing measurements have been made. Plates were slightly out of adjustment and new measurements will be made when back in operation again.
8. Calorimetry for absolute energy calibration.	Inactive.
11. Tritium. Jarvis, Hemmendinger, Manley, Taschek	Assembly and construction for the D-T experiments are in progress at the tank. The diffusion pump is now running on silicone oil. Turner valves have been put of monatomic and diatomic beams. All graphite and carbon shutters, liners, slits, and diaphragms have been replaced by tantalum. Safety trap and target assembly are in place on a new steel framework on which the glass uranium pumping system will be installed. It is hoped that the second week in October will see tests of the complete system using D on D as a source and D on H to measure background. If the C(dn) background is still bad after changing to silicone oil, a barrier will have to be built past the magnetic analyser. All safety and operating features must be tested under actual running conditions.

The n-p scattering chamber has been tested with a foil of polythene and a strong (100 c) PoBe source. Operation under these conditions (no background) is good and if this experiment does not immediately go on the T(dn) source, an attempt will be made to determine at least a portion of the PoBe neutron spectrum by the

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- range method. Specific ionization does not look promising for very fast neutron spectroscopy since the slope of the range energy curve is so small, above a few Mev.
12. Conversion to interchangeable source.
Hemmendinger,
Taschek
At low priority, a complete system of maximum speed and flexibility is being worked upon for neutron and charged particle sources of variable energy.
13. C(dn) source.
Taschek
Inactive.
14. Be(γ n) reaction for α 's from Be⁸.
Hemmendinger
Job finished, report to be written.
15. β -ray spectrometer.
Inactive.
- Z and G building activities
16. Cockroft-Walton set.
Bright, Davis,
Hoogterp
D-D yield measurements continuing. New counting arrangement set up because of erratic behavior and unavailability of thin-wall aluminum counters. Glass-wall counters now in use in improved geometry permit counting two minutes after irradiation of CaI₂ solution.
Ion source of Cockroft-Walton outfit has been giving trouble. It has been rebuilt twice and now seems to be giving an adequate output.
Data on "identical" irradiations have been varying abnormally. Investigation of causes of variations is continuing.
17. γ rays from the d-d reaction.
Elizabeth Graves
Equipment is being collected and tested for the measurement of γ rays in the presence of a relatively large neutron flux. It is planned to look for γ rays from the d-d reaction in relatively small numbers.


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In cooperation with A. C. Graves, the problem of delays in Geiger avalanches is being investigated. A double counter has been designed and built and is about ready for testing. The experiment utilizes two α counters in coincidence which may be operated either as ionization chambers or Geiger counters. The pulses from a single α passing through both counters are amplified, passed through appropriate delay lines and photographed on a scope. This is done first with both counters operating as ion chambers and second with one an I.C. and one a Geiger counter. Comparison of the data will give the desired information. This problem has importance not only for measurements of the lifetime of the mesotron, but also for delayed α measurements such as Benedetti is doing at Oak Ridge.

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GROUP P-5 MONTHLY REPORT, October 1, 1946 - David B. Hall, Group Leader

Initial critical assemblies of the fast reactor were started on 12 September and continued for three days until mechanical failure of the bottom tamper mechanism resulted in a shut-down. The mechanism is being rebuilt in part and upon completion the reactor will be reassembled sometime in October. Before more nuclear measurements are performed, the aluminum gas seal envelope will be assembled around the tamper and the control and safety rods installed. Some re-design of associated reactor equipment is being done, with particular emphasis on the mercury cooling system.


Personnel:


Terminations during September

P. Morrison
James Hughes
Murray Peshkin
John Twombly

Present Personnel

David B. Hall - Group Leader
Jane H. Hall
A. Sayer
N. Godbold
D. Rose
E. Turovlin
Violet Kissee)
E. O. Swickard) on loan from M-5
W. NeSmith)
H. Valpe)
V. C. Wilson) temporary visitors from G. E. Research Lab.
H. Schulz)





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GROUP P-9 MONTHLY REPORT, October 1, 1946 - J. L. McKibben, Group Leader

Job and PersonnelProgress

2.(c) Accelerating
tube flashover.

Beauchamp, Frankel,
Hines, Kee, Krohn,
McKibben

Tests have been made on a section of the accelerating tube to be used in the large machine. Two rings of Mykroy 9" OD x 6" ID x 1.25" high were mounted between the wall and the high voltage electrode of the test generator. These two sections were made vacuum tight by rubber dam gaskets. Spun electrodes of the type we plan to use were in place during the test. The two sections rapidly conditioned so that they would hold 200 Kv or better. This corresponds to 750 Kv per foot. Other sections are to be tested - sand blasting the interior is expected to give some benefit.

4.(a) Design for large
generator.


Barth, Calderelli,
Dickinson, Froelich,
McKibben, Seay

Design has progressed where considerable contact with vendors is necessary. Consolidated Steel is designing a pressure vessel that will meet our specifications and those of the ASME code. Four plans for the building have been drawn up by Stranahan of Post Architects. The model in favor mounts the vessel on a tower within a shell for wind and weather protection. The tank will be picked up by a cable hoist of some kind.

4.(b) Model of large
generator.

Geddings

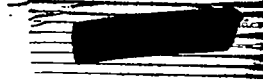
A 1/16 scale model of the large pressure vessel is being constructed. It will be used to check plans.



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GROUP P-11 MONTHLY REPORT, October 1, 1946 - Wm. Ogle, Group Leader

Job and Personnel

Progress

A. Photo-fission thresholds.

Brown, Carson,
Walsh, Ogle.

During the early part of the month, the betatron wafer broke up and had to be replaced. The deuterium threshold was run in order to recalibrate the machine, and then the thresholds of 25, 28, and Th. were measured, all giving the same threshold value. Since this is obviously suspicious, a run was made with lead in the counting geometry instead of a fissionable material. A very similar curve to the curves of 25, 28, and Th. was obtained, with lower counting rates, however. An attempt is now being made to determine whether or not the neutrons are formed in the betatron.

B. Beam removal.

Walsh

The peeler has been assembled. Work is now being held up awaiting the construction of injector parts in V-shop.

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GROUP P-12 MONTHLY REPORT, October 1, 1946 - J. L. Fowler, Group Leader

Job and PersonnelProgress

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|---|---|
| 1. Cyclotron.

Curtis, Slye | Collins Radio Company has started design of new R.F. oscillator. Cyclotron used for neutron source during most of month. |
| 2. Time of flight measurements.

Fowler | Preliminary specification for design of detector modulation equipment has been given to Electronics. |
| 4. Multifragment fission as a function of incident neutron energy. | No progress. |
| 6. Fission fragment induced fission.

Fowler | Preliminary runs indicated more work needed on electronic equipment. New coincidence circuit ordered from electronics. Equipment to be used for Item 4 also. |
| 7. Experiment to detect momentum effect due to fission fragments.

Curtis | Apparatus redesigned. |
| 8. Observation of fission by photographic technique.

Rosen | Plates being exposed. |
| 9. (D-p) reactions.

Curtis, Fowler, Slye, Squires | Characteristics of analyser magnet have been determined and indicate re-design is necessary. Proportional counter has been designed and is in process of being constructed. |

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