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# RESEARCH PROGRESS MEETING

March 4, 1948

by

Margaret F[illegible] Folden



Berkeley, California

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Radiation Laboratory
University of California
Berkeley, California

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184-inch Cyclotron Activities. By J. Valo. Statistics on cyclotron operation for February include 448 1/2 hours of operation. The oscillator was on 47.3 percent of that time. Delayed neutron studies occupied 20 percent of the operating time, mesotrons study 17.3 percent, chemistry, 13 percent and 41.3 percent, miscellaneous studies.

Resolution in the 184-inch cyclotron is not as sharp as in the 60-inch. However experiments showed that it is sharp enough to distinguish between the alpha and deuteron peaks. Results upon letting helium into the tank after running with deuterium are graphically illustrated in Fig. 1.

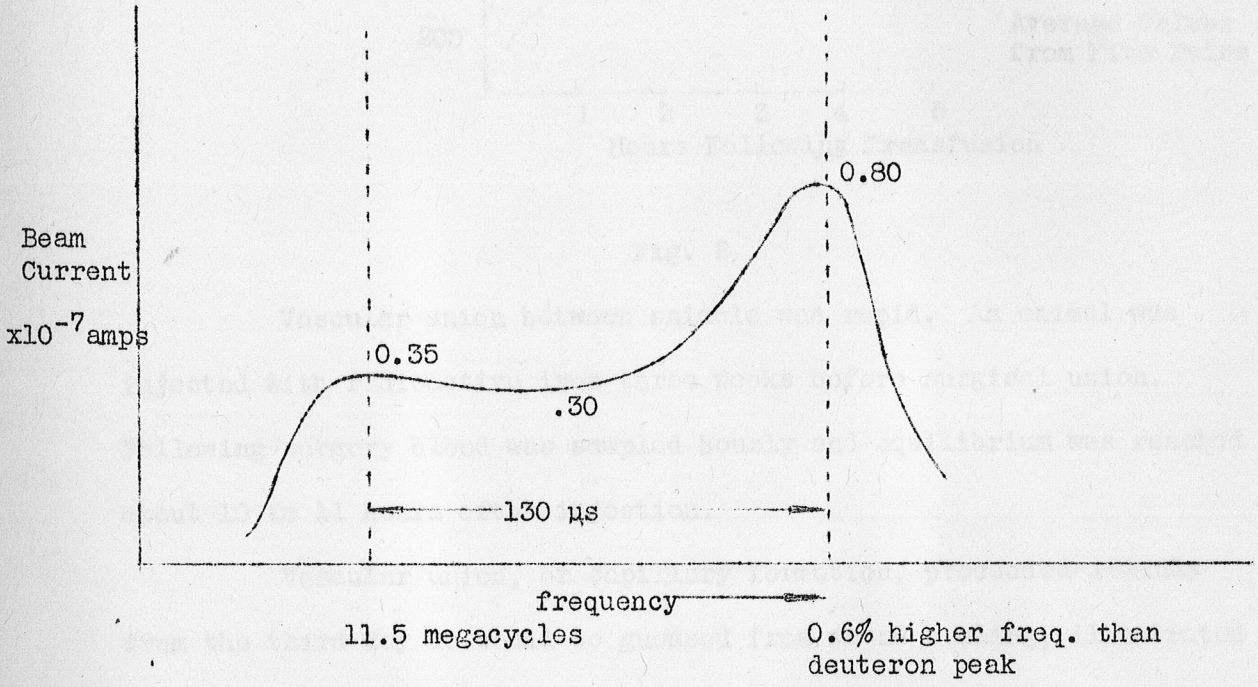


Fig. 1

Distribution of Radioactive Iron in Parabiotic Animals and Normal and Leukemic Mice. By R. Huff. Dr. Huff referred to a previous report of his work on parabiotic rats. The red cells were tagged and rate of exchange was noted by drawing blood at intervals. Equilibrium was reached in about four hours. The average rate of exchange for five pairs is shown in Fig. 2.

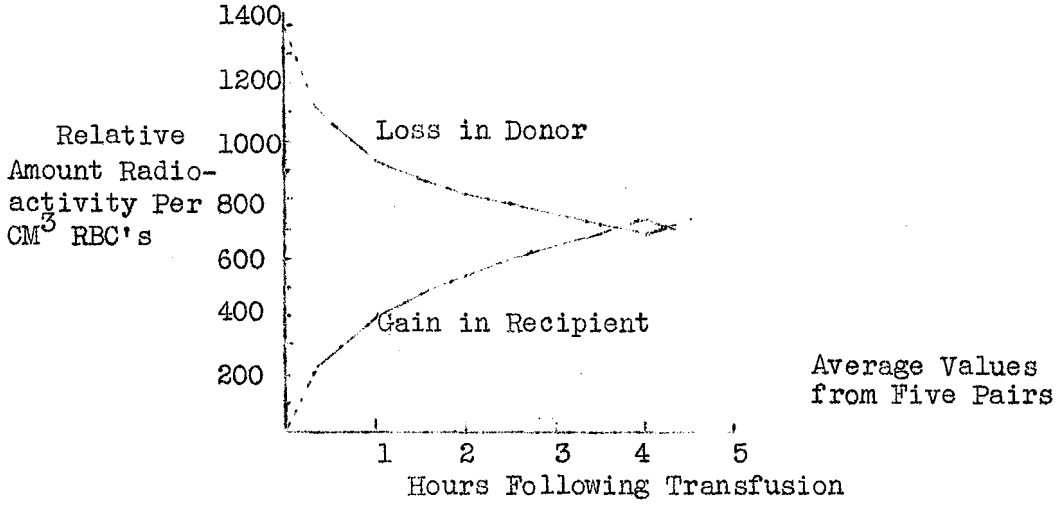


Fig. 2

Vascular union between animals was rapid. An animal was injected with radioactive iron three weeks before surgical union. Following surgery blood was sampled hourly and equilibrium was reached about 10 to 11 hours after injection.

Vascular union, or capillary formation, proceeded rapidly from the third day as would be guessed from wound healing, illustrated in Fig. 3.

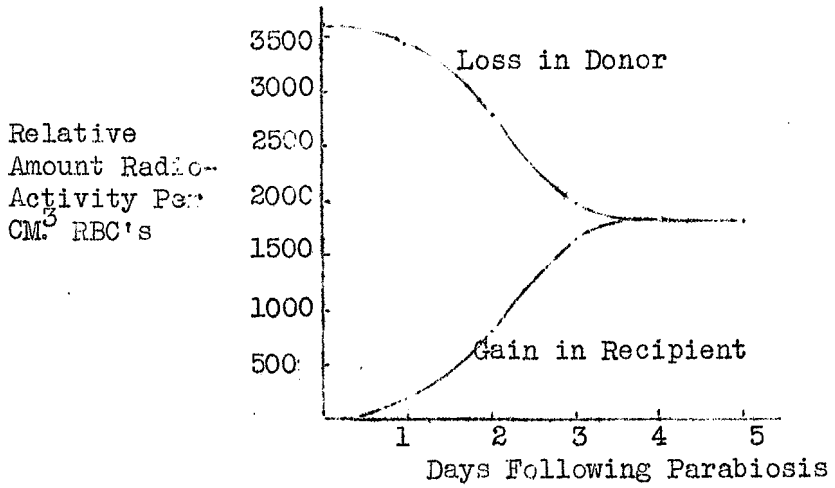


Fig. 3

Since leukemia is accompanied by anemia it was hoped that a study of the distribution of radio-iron in leukemic mice would obviate the underlying abnormality. The animals were given 50 mgs. per mouse which is almost a toxic dose. The number of counts per animal was 330,000. The distribution of radio-iron in bone marrow showed a greater uptake in the leukemic than in the normal mice. In the liver, uptake was more rapid in leukemic mice and after the peak was reached the loss was more precipitous. In the red cells, there was a gradual and progressive uptake of radio-iron, with an abortive attempt in the leukemic animals. This may also represent hemolysis. These results as shown in Fig. 4 however were inconclusive and more experiments are planned.

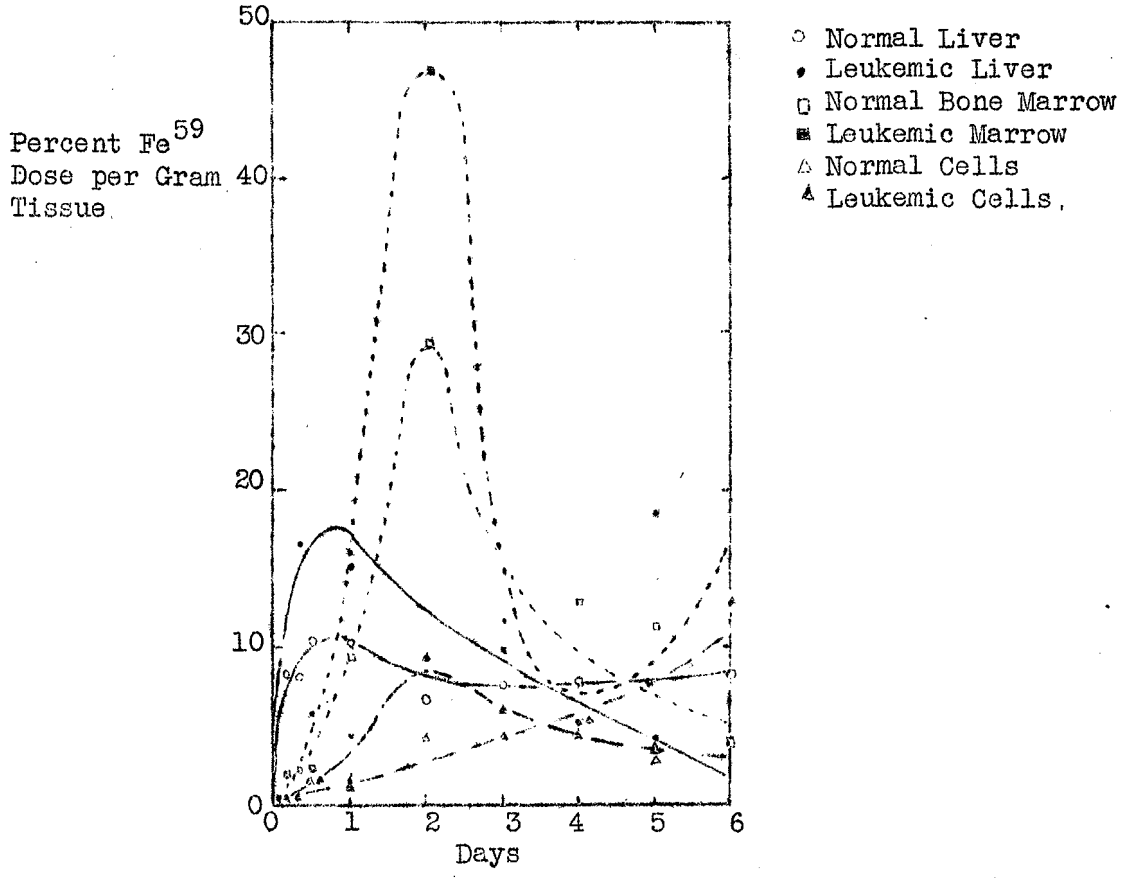


Fig. 4

The Synchrotron. By M. Martin. Assembly of the magnet and of the vacuum chamber has been completed. The inside ring which is made of glass cloth wound and baked on a mandrel is satisfactory. The outer wall however is not satisfactory. Applying a coat of varnish to the outside has made it tight. It is planned to try making the outer wall by the same technique as that used on the inner wall. As a last resort a quartz ring has been ordered.

The magnet was operated for the first time on March 4 with the chamber in place. It will be possible to produce 10,000 gauss by 16 kv in the windings. Thus far 12 kv have been attained. No vacuum trouble has developed.

Magnetic measurements are now planned and it is hoped that a beam may be achieved in about two months.

Mesons Detection. W. Panofsky. Studies are being made to electronically detect mesons in the deflected alpha beam. Counter pulses are looked for as a function of time after the cyclotron is pulsed.

The apparatus used is described in Fig. 5.

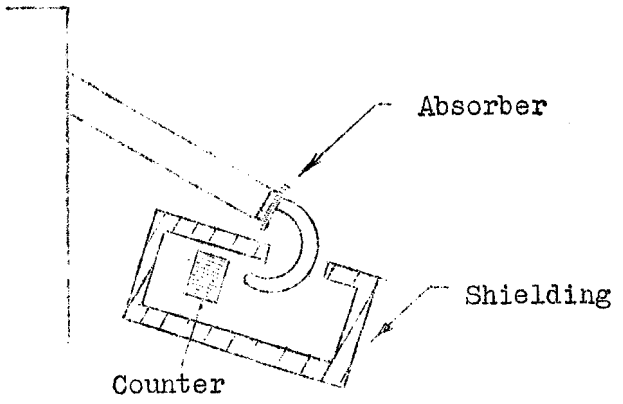


Fig. 5

It was expected that:

$$e/m = \frac{10}{3000 \times .02} \times 1/4 \times 5 = 1/5 \text{ of count/minute}$$

Nothing was found of statistical significance. Plans are being made to try a scheme to deflect the mesons out of the tank by a magnetic channel.

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