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SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF RADIATION ONCOLOGY

SAN FRANCISCO, CALIFORNIA 94143

712948

October 18, 1979

Dr. J. Bradbury
Los Alamos Scientific Laboratory
Mail Stop 844
P.O. Box 1663
Los Alamos, New Mexico 87545

Experiment # 380

Dear Dr. Bradbury:

In response to your letter of 2 October, I am enclosing the results of experiments run at LASL by myself and Mrs. Glenda Ross in August 1978. As you can see, we accumulated a large volume of data and consider our visit to the facility to have been very successful. We would like to take this opportunity to thank the members of the LASL staff, especially Dr. Howard Amols who provided the beam tune and dosimetry, and Mr. James Cunningham who provided excellent care for our animals.

As can be seen from the enclosed graphs and table, our experiments establish that there is a great deal of recovery by jejunal crypt cells from damage induced in the plateau region of the beam, but much less recovery from damage induced in the spread (3.5 cm) Bragg peak. If one assumes that a tumor is to be localized in the Bragg peak and that the jejunal crypt cell response is characteristic of normal tissues in general, then these data show that fractionating the dose can greatly enhance the effective biological depth-dose distribution and thereby augment the already favorable physical depth-dose distribution of the pion beam. These data are consistent with those from several Bevalac beams.

Again, my thanks to you and your staff for helping us to secure these data.

Yours truly,

Lawrence S. Goldstein
Assistant Professor

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FILE BARCODE



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Pion Dose (rad) to reduce the number of surviving jejunal crypt cells to 10 per circumference and the Relative Biological Effectiveness at that survival.

	One fraction		4 fractions		10 fractions	
	Dose	RBE	Dose	RBE	Dose	RBE
Peak	1360	1.07	1600	1.44	1740	1.44
Plateau	1640	0.89	2280	1.01	-	-

Peak to Plateau RBE ratio:

One fraction = 1.20

Four Fraction = 1:44

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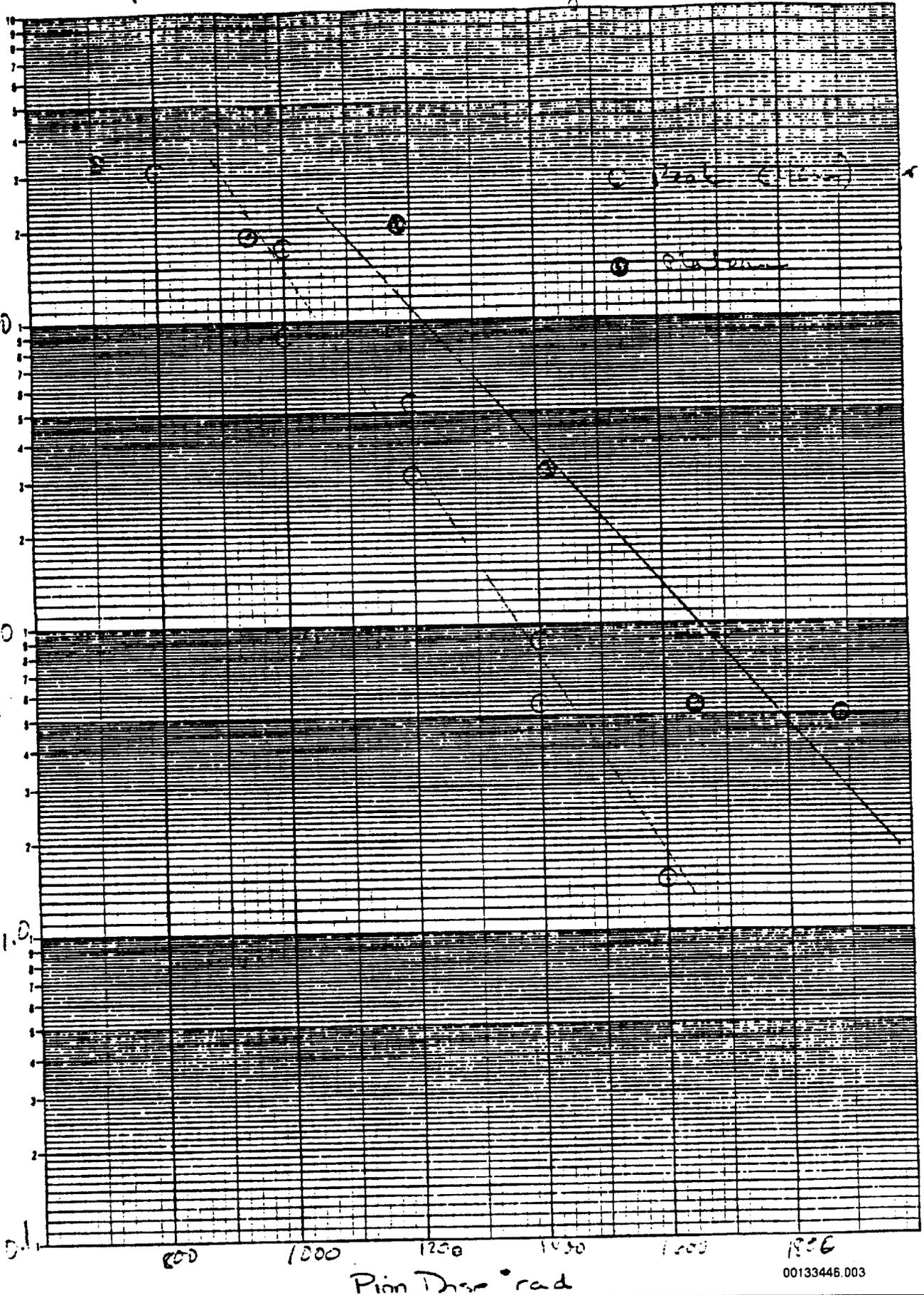
MON - ONE TX - Aug 1976

REPLACEMENT 8 CYCLES IN 10 DIVISIONS 20 0000 00

REPLACEMENT 8 CYCLES IN 10 DIVISIONS 20 0000 00

Surviving Crypt Cells per circumference

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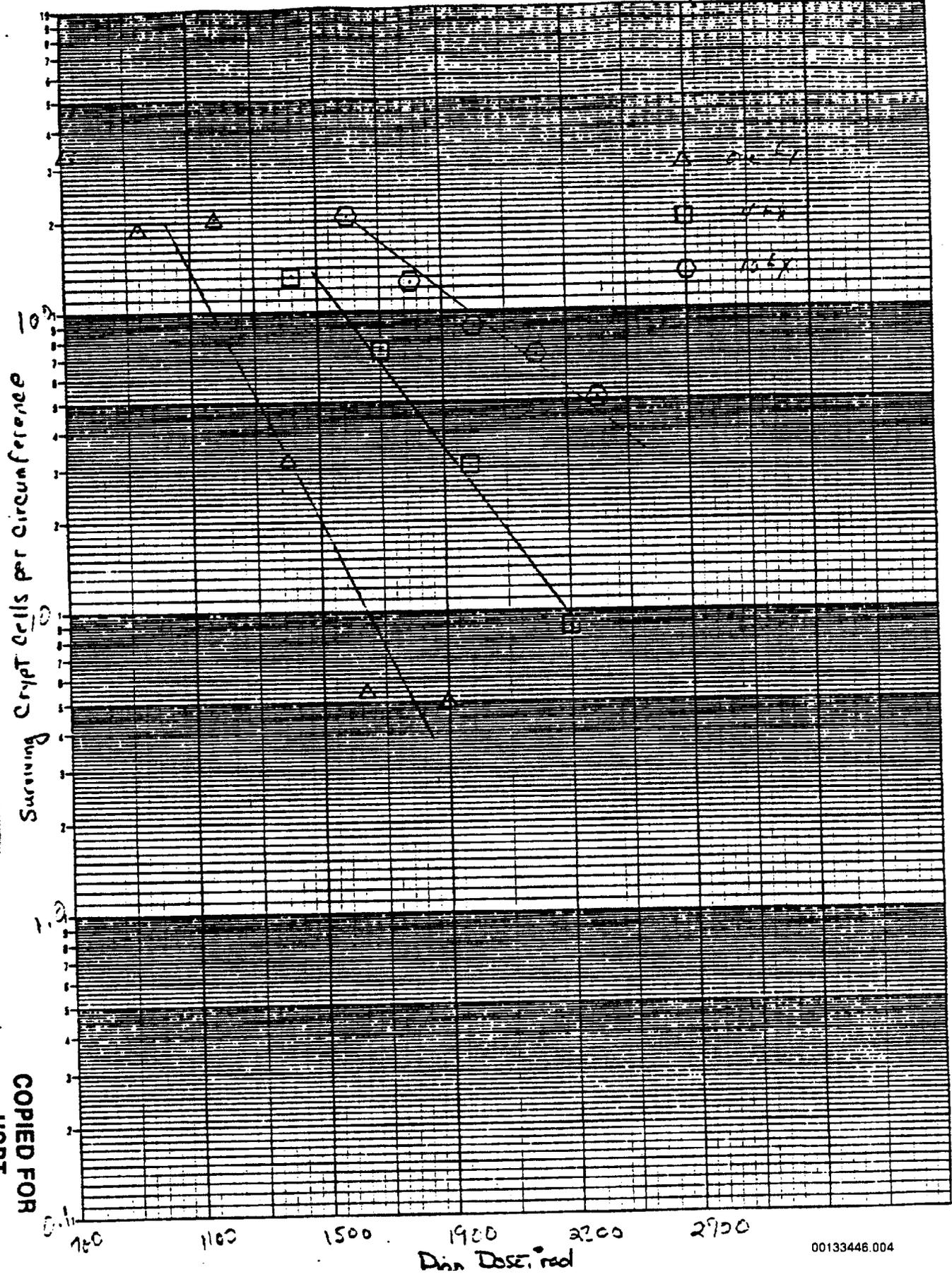


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PLATON + LATCON - AUG 76

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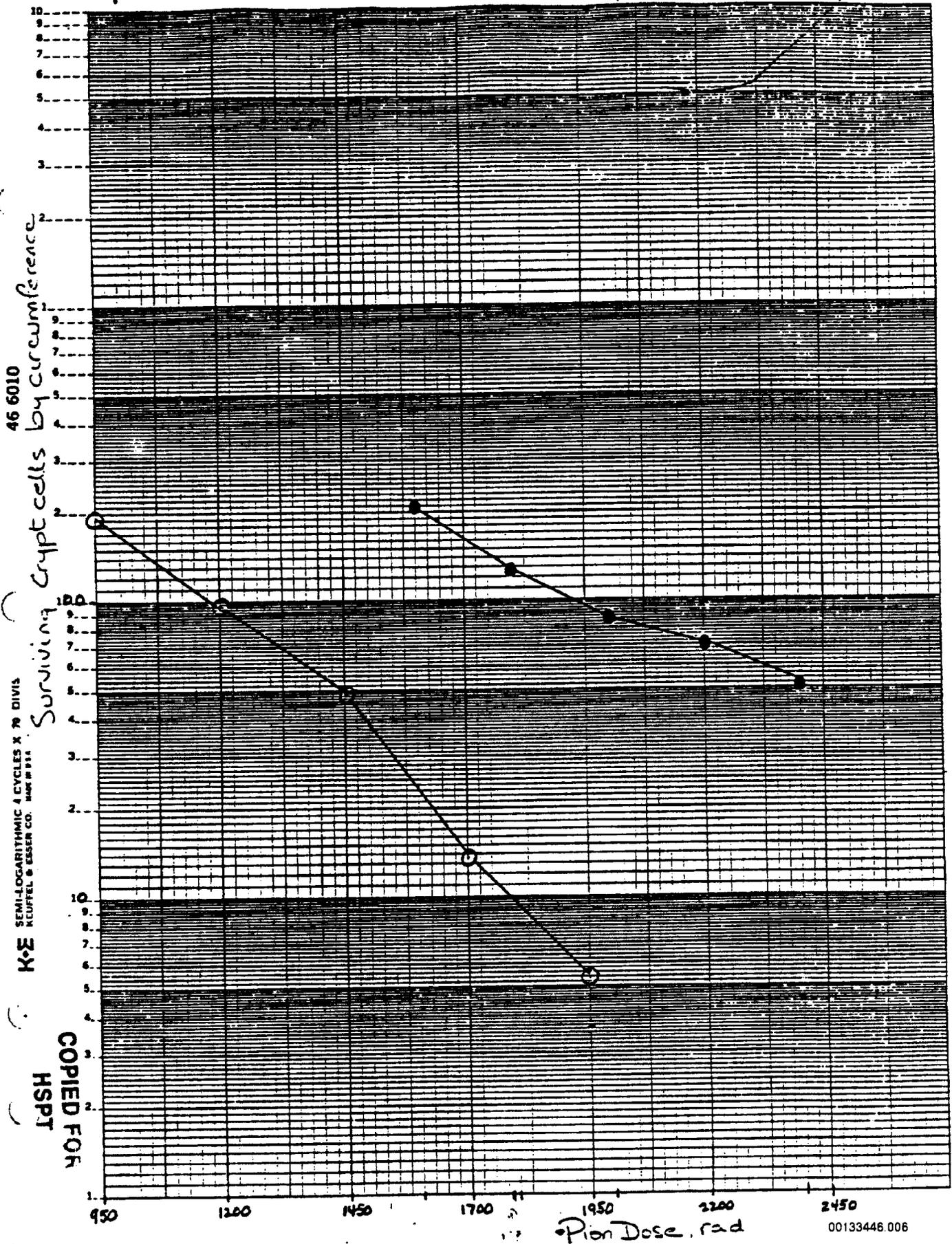
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Pion

10+x

8/17/78

Plat



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4FY - PION

RESEARCH LABORATORY OF THE U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND, FORT BRAGG, NORTH CAROLINA

Surviving Spleen Cells per Circulation

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