TABLE II.
Comparison of Two Strains of Myelosis.

	Strain Ar 117	Strain Rfb 117
Percentage of successful inoculations		
Stock A, not irradiated	33	7
Stock A, irradiated	88	10
Stock Rg, not irradiated	33	36
Stock Rf, " "	0*	95
Malignant cells		
Average size	16 μ	14.7 μ
Granules	Coarse	Medium
	Dark purple-blue	Purple-red
	Oxydase negative	Oxydase positive
Anatomical changes		
Enlargement of liver and spleen	Moderate	Great
Enlargement of lymph nodes	"	Slight
Color of the myeloid growth	Gray-white	Gray, often greenish
Occurrence of multiple tumors	Common (attached to bones and in viscera)	Rare (only in viscera)

*This group is small (8 mice) but the material produced myelosis in 7 of the 8 irradiated mice injected.

In tissue cultures the malignant myeloid cells of strain Rfb 117 exhibited active amoeboid motion, multiplied by mitotic division, and did not mature into polymorphonuclear leukocytes as would be expected from the studies of previous workers.[4]

Summary. A new transmissible strain of myelosis that originated in a mouse irradiated by X-rays is described. This strain possesses characteristics which differ from those of the strain previously observed. The immature myeloid cells peculiar to this strain reproduce themselves by mitotic division *in vitro* and *in vivo* and like malignant cells, fail to mature.

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Measurement of X-Ray Absorption Coefficients in Tooth Sections.*

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The following is a preliminary report of a new method of determining linear X-ray absorption coefficients in plano-parallel ground sections of teeth. This coefficient is a precise measure of radio-

[4] Timofejewsky, A. D., and Benewolenskaja, S. W., *Arch. f. Exp. Zellf.*, 1929, **8**, 1.

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pacity, which, in radiographs of such sections, is usually interpreted as measuring degree of calcification. Variations in calcification of teeth may arise in several ways: (1) With increasing age there may occur a progressive diffuse deposition of calcium salts within the already calcified matrix. (2) Secondary deposition of calcium salts may occur locally in response to some abnormal condition. (3) Certain pathological conditions may cause local rarifactions. (4) Structures in the organic matrix may cause relative variations in calcification merely by spatial displacement of inorganic material.

Such variations in distribution of inorganic material correspond to differences in compactness or density of calcification; *i. e.,* in weight of calcium salt per unit volume. However, the qualitative nature of radiopacity as ordinarily observed in a photographic film limits its value as a criterion of density of calcification for experimental purposes. To offset this limitation, Warren *et al.*[1] have measured the radiopacity by means of a Capstaff-Purdy densitometer for determining density of silver grains in photographic films. The precision of their method is stated to be of the order of 5% for sections 1 mm. thick and areas 0.5 mm. in diameter. Actually, it is even poorer than this since they used a mean thickness value throughout the section but did not include its precision measure in that of the entire determination.

Our experience with grenz-ray radiography of ground sections of teeth suggested that differences of considerably less than 5% may be significant in studies of normal calcification. In order to measure such differences, a method has been developed for the measurement of radiopacity which is good to 0.5% or better. This method employs soft X-rays and is based on the principle of the double ionization chamber described by Becker[2] for measuring minute changes in X-ray intensity. The apparatus was changed completely, however, in order to adapt it to the special requirements of a routine dental investigation. It consists of 2 symmetrical ionization chambers with a common collecting plate and individual charged plates at equal but opposite potential. Since the charge on the collecting plate represents the difference between the electrical effects in the 2 chambers, a string electrometer is used as a null instrument. The chambers are so placed over the grenz-ray tube that the radiation strikes their apertures symmetrically. A specially constructed me-

[1] Warren, S. L., Bishop, F. W., Hodge, H. C., and Van Huysen, G., *Am. J. Roentgenol. and Radium Therapy*, 1934, **31**, 663.

[2] Becker, J. A., *Physical Rev.*, 1922, **20**, 134.

chanical stage, provided with coordinate scales in the usual way, supports the specimen directly under one aperture; under the other, which has the same diameter, there are placed standards of measurement made of aluminum foil. Thus the size of specimen on which measurements are made is determined by the aperture. A micrometric arrangement for varying the length of air column permits of interpolation. Before starting measurements, the mechanical stage is placed on a microscope and areas, designated by their coordinate scale readings, are chosen for study. These circular areas are recorded on a photomicrograph of the specimen. To determine thickness at each position, provision is made for cutting out each disc and measuring it with a micrometer caliper.

The resulting apparatus is essentially a comparator whereby a minute area of ground section can be compared with a series of calibrated standards until 2 are found which most nearly match the unknown. Interpolation between these 2 values is effected by means of the air column scales. Measurements of the absorption coefficients are relative, being expressed as number of micra of aluminum which possess the same absorptive capacity. The precision of the method is indicated by the following: In a series of duplicate determinations on 60 different areas, the S.D. was $\pm 0.2\%$ or less in all but 4 instances. Also, for a micrometer caliper reading of 300μ, the S.D. was almost never greater than $\pm 0.3\%$. Consequently, the precision measure of the entire determination is around $\pm 0.5\%$ for *circa* 0.25 mm.^{3} (0.7 mg.) of tooth substance. Measurements on non-carious human teeth have already shown small but characteristic differences within individual sections, as well as striking similarities among different teeth. For an experimental study involving animals with smaller teeth, it is necessary only that the aperture size be reduced to 0.5 mm.