

maximal contraction is obtained in the innervated muscles. The strength of contraction is estimated or measured. In the absence of motor response the presence of some regenerating nerve fibers at the point of stimulation is indicated by a tapping or burning sensation projected into the skin distribution of the stimulated nerve. If no sensory effect can be elicited, one may assume complete absence of regeneration only after having varied the position of the needles several times to preclude the possibility of poor contact with the nerve.

Intraneural bipolar stimulation has been carried out on over 1,000 patients at Cushing General Hospital during 1945 and 1946. Positive responses were followed by the return of voluntary contraction of variable degree. The absence of response could be confirmed, in most instances, by stimulation of the exposed nerve at the subsequent operation performed because of this finding. The first appearance of muscle contraction on intraneural stimulation permitted calculation of a mean nerve-growth rate of 1.4 mm./day. Long-term follow-up studies have shown that when, in a given patient, the schedule for beginning contraction of various muscles, predicated upon this growth rate, was not maintained within narrow limits, appreciable recovery of function could not be expected by further waiting.

Intraneural stimulation is an objective and easy means of discovering the extent of spontaneous or postsutural regeneration in an injured nerve. Needless surgery is avoided, and necessary surgery is anticipated because of the possibility of determining with greater accuracy and at an earlier time the presence or absence of adequate nerve regeneration.

Interlaboratory Comparison of Measurements of I^{131}

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Radioactive iodine, I^{131} (8.0 days), is coming into use in increasing quantities in medical research and clinical treatments. It is desirable to have quantitative measurements of this material which are reasonably accurate for many of the purposes for which this isotope is used. Since quantitative procedures for measurements of this type are still in a developmental stage, many of the users as well as the producers have requested some form of intercomparison to determine how accurately measurements are made at present, with the aim of discovering and correcting any serious disagreements.

As a first step in this program the National Bureau of Standards procured a sample of I^{131} from the Clinton Laboratories and prepared from it a number of identical 25-ml. samples which were distributed to approximately 40 hospitals, universities, and similar institutions using this isotope or interested in its measurement. They were requested to measure this sample, which was approximately 1 rutherford (10^6 disintegrations/second) total activity, and to report the results. Replies were received from 30 of these institutions, 26 of which reported results in terms of disintegrations per second. The remaining 4 gave values in counts per second, which could not be interpreted in terms of disintegration rates.

The reported values, plotted in Fig. 1, give some idea of the spread. One value was very high (nearly 100 times the average of the others), which seems to indicate an error in reporting

rather than measurement. Neglecting these values, the average value reported was 3.0×10^4 disintegrations/second/ml. of 0.75 rutherford for the 25-ml. sample. The lowest value deviated from the average by 40 per cent and the highest by 80 per cent.

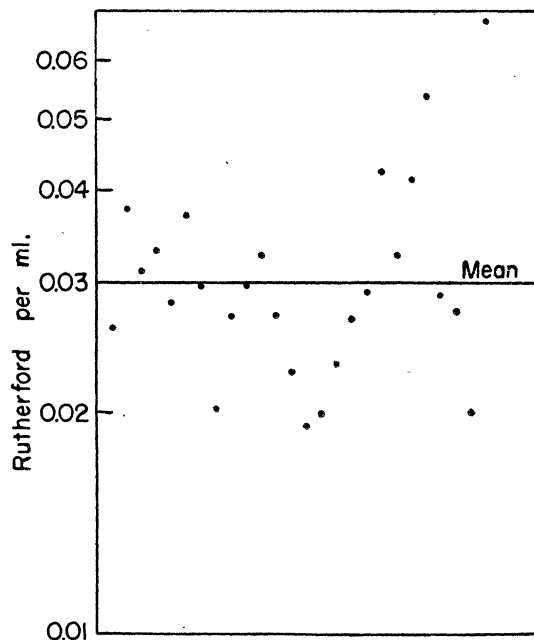


Fig. 1

This preliminary distribution serves only to focus attention on the magnitude of the discrepancies and the need for more accurate standardization. It is certain that much of the variation reported above, in those cases where beta-ray counters were used for measurement, can be reduced by the use of the $RaD + E$ beta-ray standards now available from the National Bureau of Standards. These standards are undoubtedly correct in absolute value to ± 5 per cent. By the use of the nominal value, as stated in the certificate accompanying these standards, all counter measurements can be placed on a common basis of comparison to a somewhat higher accuracy.

One sample sent out by us was reported contaminated by a growth of streptococcus on receipt by the cooperating institution. The difficulty of bacterial growth in preparation of P^{32} and I^{131} has been encountered by others. This indicates that all containers should be carefully sterilized before filling, a precaution which we will adopt in the future. Bacterial contamination interferes seriously in measurements which require preparation of aliquots of the original sample.

Since another program of intercomparison is to be started in the immediate future, we would like to hear from other institutions or investigators who may not have been included in the preliminary distribution and who wish to cooperate in the measurement. The method of distribution of calibrated samples is about the most satisfactory way of standardizing in various laboratories measurements for radioisotopes of half-value period too short for the preparation of permanent standards. The National Bureau of Standards proposes to extend this service to other short-period isotopes as the demand arises.