Form 361—M

UNITED STATES DEPARTMENT OF COMMERCE
WASHINGTON

National Bureau of Standards

Certificate

FOR

ONE SPECIMEN OF RADIUM SALT
NBS No. 27163

SUBMITTED BY

Canadian Radium and Uranium Corporation
for
M. D. Anderson Hospital,
Houston, Texas.

DESCRIPTION.—The material is contained in a metal tube 22.9 mm long and 2.91 mm in external diameter. The specimen and container weigh 2.97 gm. The Bureau is informed that the material is a compound of *radium*. After the measurements had been completed the specimen with a card bearing the number of this certificate was enclosed in a package suitably inscribed and secured by a seal of this Bureau.

THIS CERTIFIES that the specimen described in the preceding paragraph has been compared with the Radium Standard of this Bureau and has been found to have a gamma radiation equivalent to that from

13.23 *milligrams of radium*

in radioactive equilibrium and contained in a tube of Thüringian glass 0.27 mm thick. The uncertainty in this value does not exceed 0.7 percent. Observations extending over 25 days indicate that the radium contained in the specimen is in radioactive equilibrium.

For the Director,
by

L. F. Curtiss

L. F. Curtiss, Chief,
Radioactivity Section,
Division of Atomic and Molecular Physics.

Test No. 12896-25

December 8, 1925.

NOTE.—The Bureau is informed that the tube is of 10% iridium platinum of a density of 21.5 and has walls 1.0 mm thick. On this basis if the radioactive material were contained in a glass tube of the kind specified above, the gamma radiation from the specimen when in equilibrium would be approximately 0.2 percent greater than the value named in the body of this certificate.

The observations upon which this certificate is based do not serve to distinguish between radium preparations and those containing mesothorium or radiothorium.

Actual Value = 14.45

14.45

49/399 Physics Department

July 13, 1949

Dr. Lauriston S. Taylor
Director
Section of Physics
Bureau of Standards,
Washington, D.C.

Dear Dr. Taylor,

We are having difficulty here with the calibration of our x-ray therapy equipment. The only standards we possess are two Victoreen dosemeters which, although checked at frequent intervals by the makers, invariable differ in their indications when they arrive back in Houston, sometimes by as much as 15%. It is proposed therefore to try to set up a more consistent standard by using some "air-wall" condenser chambers and a Farmer electronic dosemeter, of English origin. By this means we would hope to control the x-ray dosage within 5%.

I am writing to ask, therefore, if it would be possible for your department to calibrate two sets of condenser chambers (capacity approximately 150 and 500 r) respectively). This would entail bringing up the dosemeter to Washington. I am willing to assist by doing this and operating the dosemeter if required.

If the Bureau could undertake this task, would you please notify us when it would be convenient for you to receive me? I would suggest the first week of August, if this would suit.

Answer filed under 3.2/US (Natl. Bureau of Standards)

Yours sincerely

LGG:tk
3-2/US

L.G. Grimmett, Ph. D.
Physicist

49/416 Physics Department

August 1, 1949

Dr. Frank H. Ray
National Bureau of Standards
Washington 25, D.C.

Dear Dr. Ray,

Thank you for your letter of July 27.

I shall be very happy to fall in with your suggestion to calibrate our condenser chambers on Monday, August 15, and will be at the High Voltage Laboratory at 8:30 a.m.

Thanks also for offering the use of the 2-volt cell.

Yours sincerely

LGG:tk
3.2/US
6.11

L.G. Grimmett, Ph. D.
Physicist

Comment by Taylor on Newell's Memo

Just because there may be a large biologic uncertainty, there is no excuse for tolerating sloppy physical measurements where little effort will yield satisfactory measurements. This will lead eventually to complete degradation in the whole therapy technique."

Paper No. 10

The degree of precision required in the radiation dose delivered in cancer radiotherapy

By D. F. HERRING, Ph.D., and D. M. J. COMPTON, D.Phil.
Enviro-Med, Inc., La Jolla, California, U.S.A.

Herring's and Compton's Conclusions:

- An increase in dose of less than 10% above the optimal dose produces observable increases in necrosis
- A reduction in 10% in the dose decreases the probability of local control by a factor up to 7.
- Dose delivered to the patient should be within +/- 5% or better
- In each step of delivering the dose the uncertainty should be +/-2% or better.

L.J. Shukovsky 1970 “Dose, time, volume relationships in squamous cell carcinoma of the soupraglottic larynx.” Am J. Roent, Rad Therapy and Nuclear Med. 108, 27-29

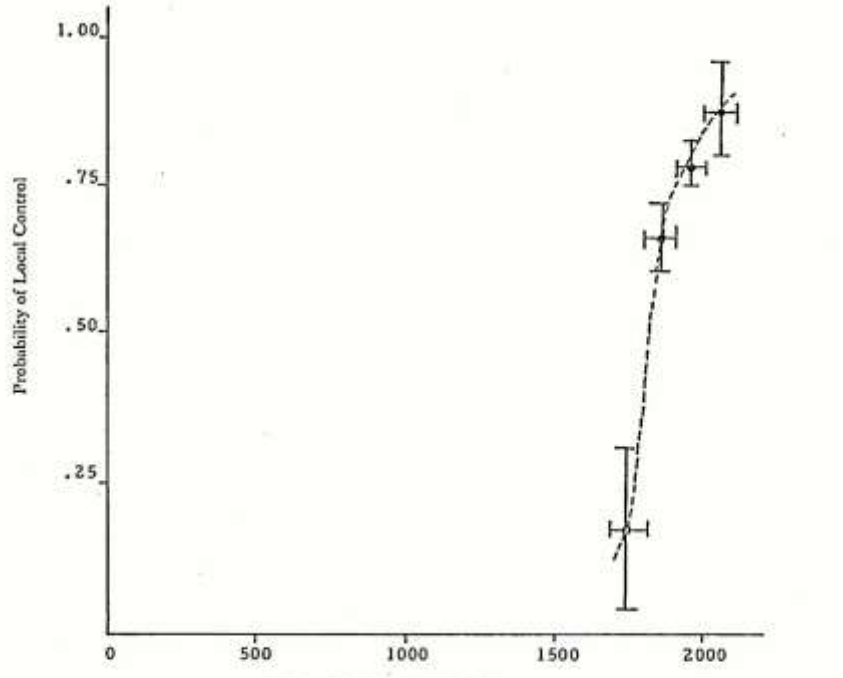
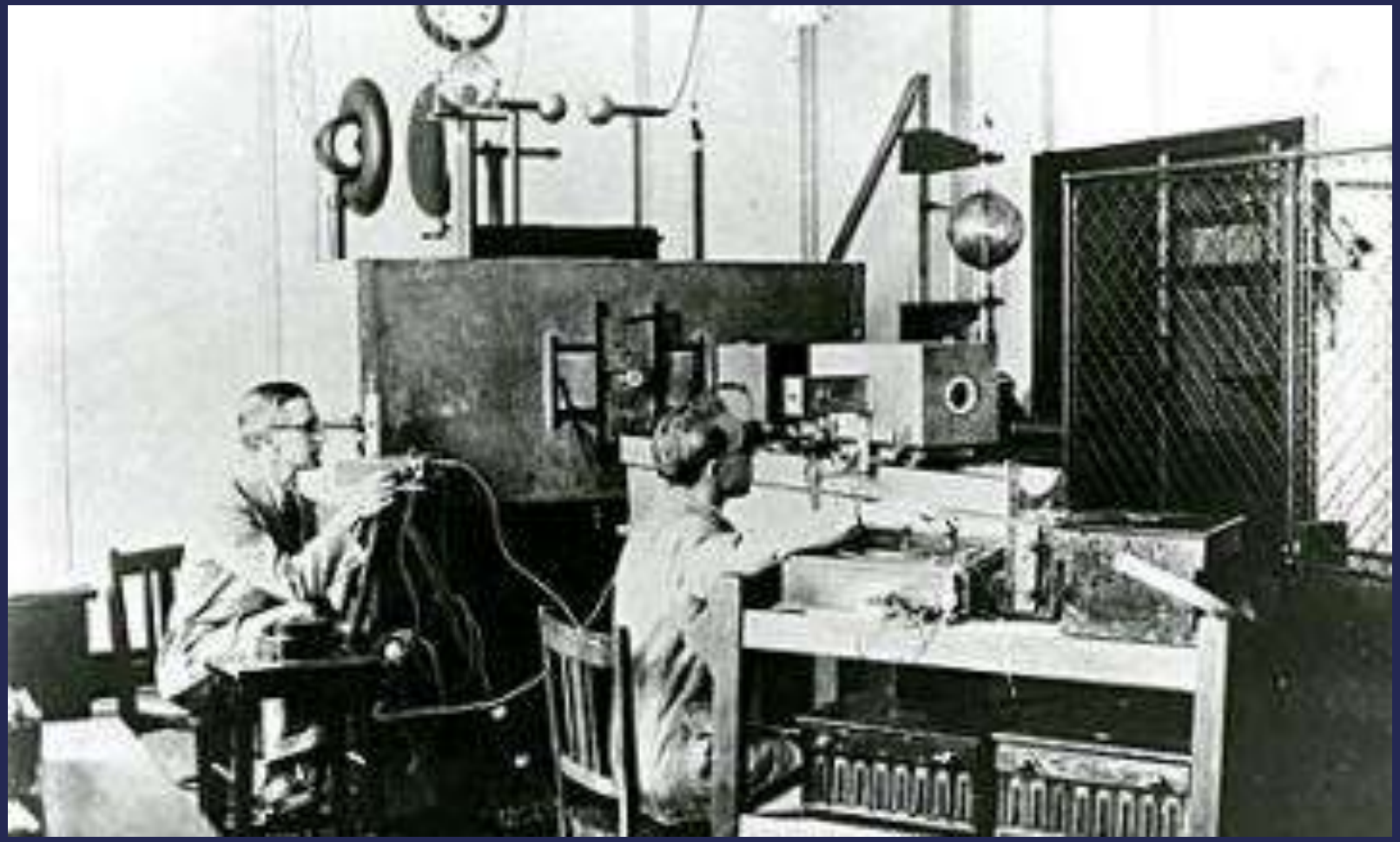


FIG. 2.

Probability of local control for combined stages T2 and T3 for supraglottic squamous cell carcinoma v. nominal standard dose in rets. Vertical error bars represent the 90 per cent confidence limits calculated by the authors of this report on the basis of the original data. Horizontal bars indicate spread in dosage for each point. Data are from Shukovsky (1970).

Additional data concerning the probability of achieving local control as a function of tumour dose for laryngeal



THE SATURDAY EVENING POST

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THE DOUBLE RIDE
By Francis Wallace

GOVERNMENT-RUN-EVERYTHING By John Raymond McCarl

Leslie Thrasher

Tipping the Scales – Thrasher's famous cover picture

Born Charles Leslie Thrasher
September 15, 1889
Piedmont, West Virginia
Died December 2, 1936 (aged 47)
Port Jefferson, New York
Nationality American
Occupation illustrator
Years active 1907–1936

Panorama View, Bureau of Standards, Washington, D. C.