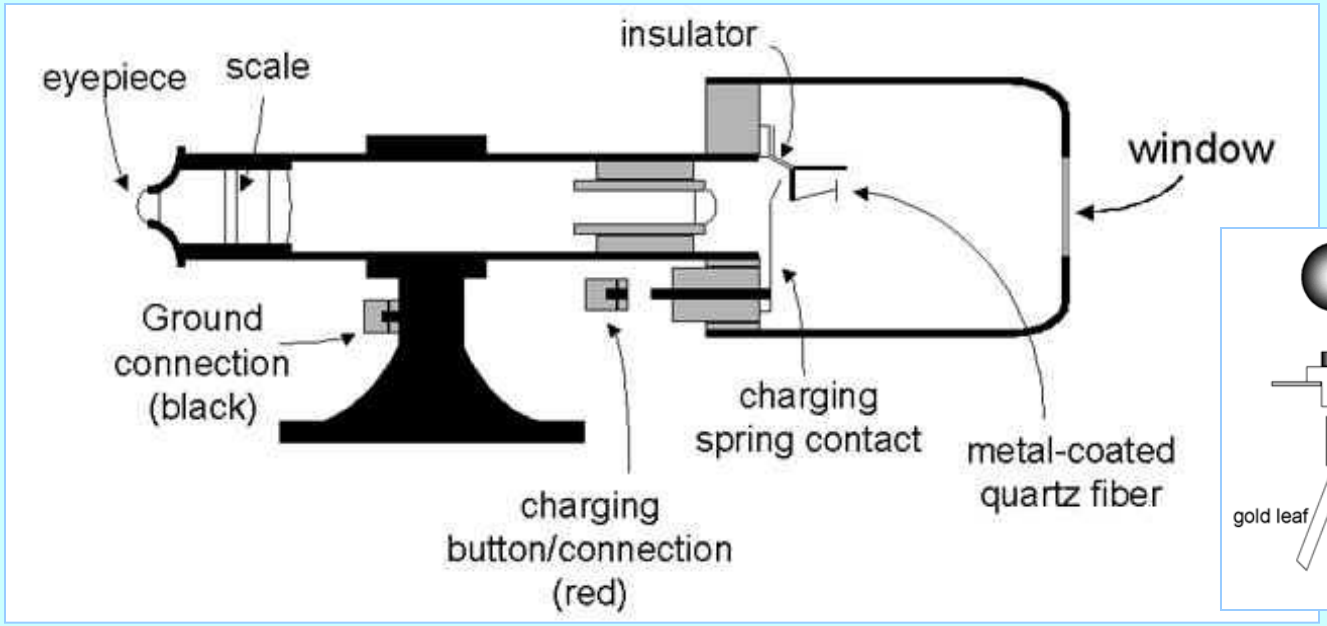
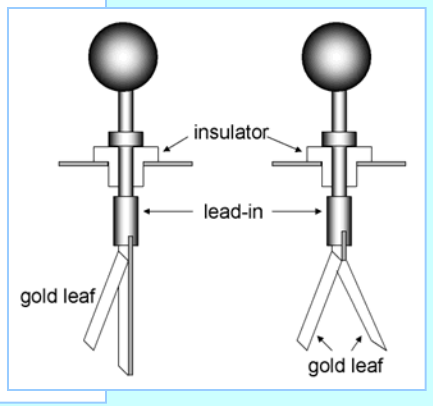
Some words about electroscopes

More generally, an electroscope is an early scientific instruments that is used to detect the presence and magnitude of electric charge on a body.
Actually, it was the very first electrical measuring instruments!
The very first electroscope was invented by William Gilbert around 1600 and it was just a pivoted needle called the "versorium"

Gilbert's versorium

The working principle is quite simple. The incident radiation produces charge pairs in the chamber volume, which creates a current flow. Consequently the charge on the electrode decreases. Due to this decrease, the quartz fiber moves and its deflection can be projected by a light source to a calibrated scale through an objective lens. Since the deflection of the quartz fiber is proportional to the current flowing through the chamber, therefore it is a measure of the dose delivered by the radiation. Upon full discharge, the electroscope charged again, applying a voltage through a charging pin.





A Henson Electroscope from our collection

This type of electroscope is of the early pioneers of dedicated instruments for the measurement of radiation. Designed by Charlie Lauritsen around ~1937 and produced by Fred Henson Company of Pasadena, it became immensely popular.

It had both the sensitivity required for use in the laboratory and the portability that allowed it to serve as a type of survey instrument, at a time no true survey instruments were commercially available.

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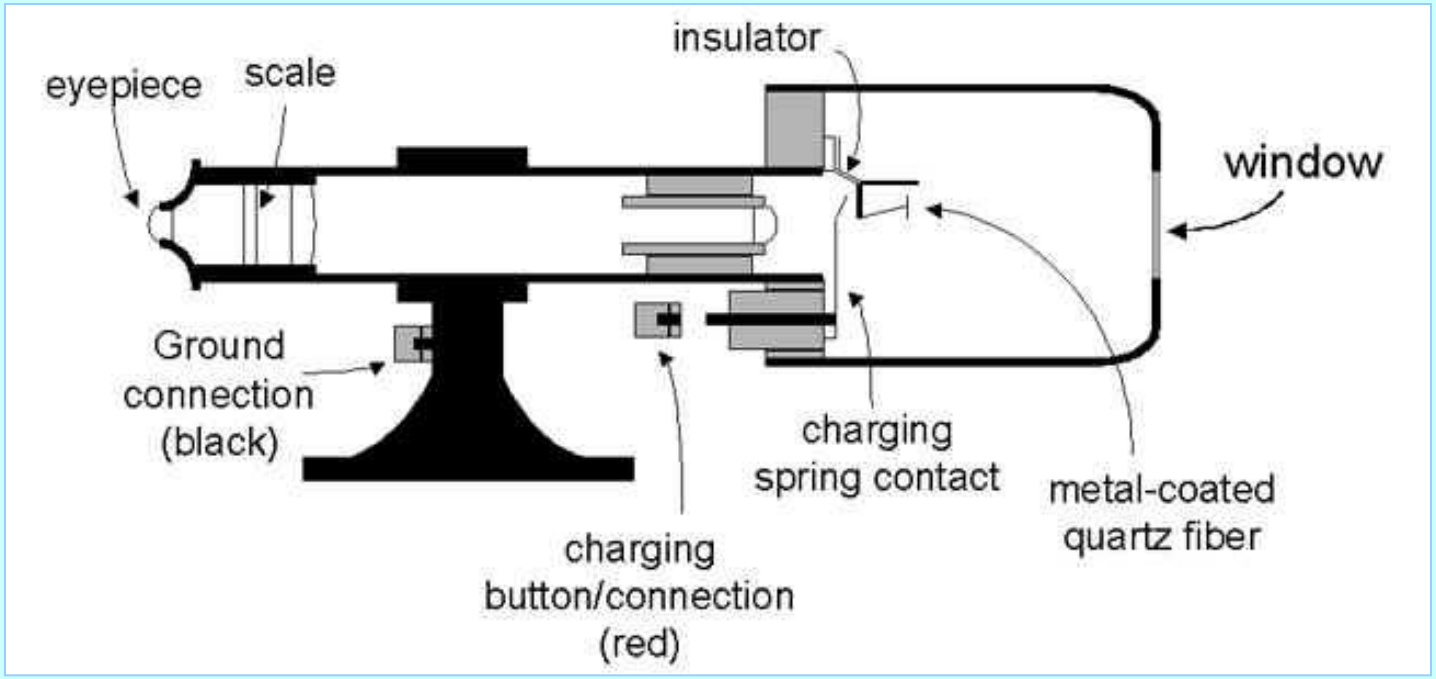

Such instruments were built at Chalk River Laboratory sometime around 1945. Originally designed for gamma-emitting samples, but this device was used to measure beta-emitting samples being inserted into a hemispherical chamber via a sliding drawer.

… to whom it may concern ☺!

In the late 1940s, Wilfred Mann, who worked at Chalk River during World War II, took them with him to the British Embassy in Washington, D.C. where he served as a liaison between the British and American intelligence communities. While working at the embassy, he had the misfortune to report to the notorious Russian spy Kim Philby. Because of this association, Mann was later accused of being the "fifth man" in Philby's spy ring. To clear his name, Mann wrote the book "Was There a Fifth Man? (Pergamon Press, 1980) in which he proclaimed his innocence.

In the early 1950s, Mann took the electroscopes to the National Bureau of Standards (NBS) where he had been hired to head up the radioactivity section. Later, during the Cuban Missile crisis, Mann became concerned that the NBS might be destroyed in an atomic attack on Washington. To preserve the NBS's capability to make radioactivity measurements, Mann calibrated these two electroscopes (and one other) against the NBS primary radioactivity standards. The electroscopes were then sent to the NBS facility in Colorado. Had Washington and the NBS been destroyed, these electroscopes would have become the nation's primary instruments for radioactivity measurements. Fortunately, they never got their promotion.