



# **Alkuaine-analyysit maaperästä**

Servo Kasi

Aalto yliopisto

[Bruno Pontecorvo \(1913–1993\) his patent in geophysics starts with 4 figures and text:](#)

“This invention relates to geophysical prospecting and more particularly to well logging by the use of radioactive radiations. " By radioactive radiations is meant those radiations which result from the reactions of nuclear physics, particularly gamma radiation, and fast and slow neutron radiation. It is appreciated that alpha and beta radiations and positron's, protons and other types of radiations exist, as a result of nuclear reaction, and insofar as these are useful in the process to be described they are included. However, 'most of these other types of radiation are not sufficiently penetrating for the present purpose and hence ,will not be usable. Incidentally, the term radiation as here used is intended to cover both the radiation of particles such as neutrons and the radiation of quanta, as for example, gamma radiation. ...”

[Pontecorvo patent 1950 \(1942\)](#)

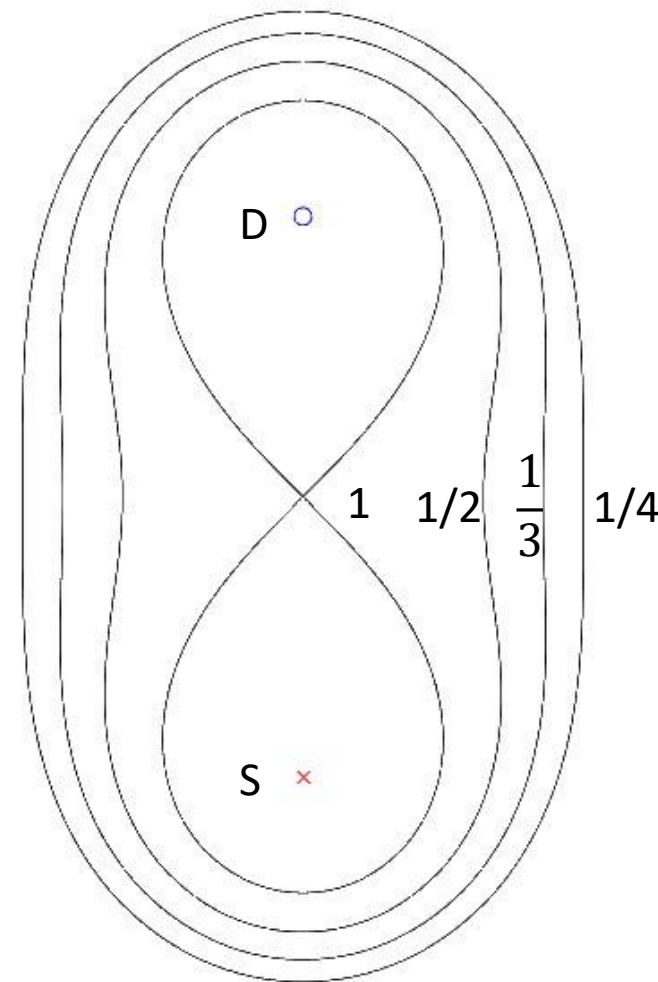
“... neutrons will penetrate in many cases dense formation more readily than porous ones.”

In pores there is water or oil.

Density is measured with gamma photons.

Weight curves of. neutron gauge. S its source and D detector. Also numbers of the relativ weights

### Cassini ovals



Around S and D the access tube as in the patent figures of Pontecorvo.