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**INVESTIGATIONS OF THE DISEQUILIBRIUM BETWEEN
Ra-226 AND Po-210 IN SOILS, RIVER SEDIMENTS AND VEGETATION
IN THE VICINITY OF COAL MINES**

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As a result of a discharge of the radium-bearing waters from coal mines into rivers a significant increase of radium concentration in bottom sediments can be observed. Sometimes also a contamination of river banks, soils, and vegetation occurs. Mine waters contain mainly radium isotopes, i.e., Ra-226 from uranium series and Ra-228 from thorium series. Due to chemical properties of such brines, these waters contain usually no uranium, no thorium and rather seldom elevated concentrations of other isotopes as lead (Pb-210) and polonium (Po-210). The deposition or adsorption of radium on river sediments may take place on a distance of several kilometers from the discharge points. After a deposition or adsorption of radium isotopes the built-up of the activity of their progeny begins. Therefore concentrations of radium isotopes are higher than the decay products. We are able to measure the disequilibrium in Ra-226 decay chain as well as in Ra-228 decay chain, which shows the approximate age of the deposit.

On the other hand, in upper layers of soil and in vegetation very often higher activities of lead and polonium than radium are measured. The reason of the enhancement is the fall-out of radon progeny from air on the plants and soil surface. Radium is transported into plants through the root system, and this pathway is not very efficient accordingly to the fact, that radium is normally present in soil in an insoluble form (as sulphate), even on areas contaminated by radioactive deposits.

Investigations were done in selected areas in the Upper Silesian Coal Basin.