

SHORT COMMUNICATIONS

THE IMPORTANCE OF THE SPORE-POLLEN INVESTIGATIONS IN THE RECOGNITION OF THE RADIOACTIVE ELEMENT CONTENT OF THE LAKE MUD

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During the investigations of plant remains of the sediments of lake Vadkert (Soltvadkert), we recognized the opportunity of the occurrence of radioactive elements in the mud of the lakes of the Hungarian Great Plain. The basic idea came by the presence of dark brown colored vegetal tissue remains together with colourless holocene sporomorphs, fungal, algal and other plant remains. This phenomenon may have several reasons, but this may be in consequence of the rebedding of radioactive material too. The Radiometric Laboratory of the Experimental and Research Factory of the Ore Mining Company of Mecsek analyzed six mud samples and demonstrated in each a measurable quantity of radioactive materials (U: $0.9-1.3 \cdot 10^{-4}\%$, U-Ra equ.: $0.9-1.5 \cdot 10^{-4}\%$, Ra: $3.1-5.1 \cdot 10^{-13}\%$, Th: $6-13 \cdot 10^{-4}\%$, K: $0.6-0.7\%$). We express our thanks for the Laboratory for this important contribution.

The importance of the plant microfossils in the sandstone-type uranium deposits was reviewed by NORRIS and EDMOND (1973). On the basis of this work we emphasize the following: Uranium and geochemically allied elements are transported in ionic or complexed form an alkaline slightly reducing aqueous medium. P. 128: "Precipitation of these elements as complex mixtures of oxides and sulphides takes place at sites of strongly reducing conditions which may be either fixed or transient." P. 129: "The main mechanism of ore mineral precipitation is H_2S generated in pro-deltaic sediments or by petroliferous accumulations." ... "particularly noticeable in regard to U/V or U/Cu ratios. In general the main extrinsic heavy elements are uranium with one or more of V, Fe, Mn, Cu, Mo, S, As, Se, Co, Ni (HEINRICH, 1958; SHOEMAKER et al., 1959). Thorium is absent as it does not form a soluble ion analogous to the uranyl ion." P. 130: "Mineralogy and mineral paragenesis are complicated and variable (HEINRICH, 1958; LAVERTY and GRASS, 1956; WEEKS, COLEMAN and THOMPSON, 1959)..." P. 131: "In a series of experiments SZALAY (1954, 1957) demonstrated that uranium fixation in carbonaceous sediments is related to adsorption of uranium from solution by cation exchange of uranyl ions with hydrogen ions in humic acid." P. 132: ... "woody tissue is an important source of humic acids capable of fixing uranium, as the well-known relationship between macroscopic fossil wood and uranium attests."

This question has two major fields: a geochemical, and a biological one. We project to work on the problems in both fields. Methodical problems are especially emphasized. As regards the biological effect of the radioactive mud as most important

problems the following may be pointed out: 1. The effect of the phyto- and zooplankton. 2. Cytological investigations on the roots, and other vegetative organs of the angiosperm taxa. 3. The palynological study of the recent taxa may render information about polyploidy. 4. The TEM study of the pollen grains of the radioactive material containing mud may prove whether in natural environment sporopollenin adsorbs uranyl ion what may change the electron scattering power of the exine. 5. The biological testing of the radioactive material seems to be an interesting field of investigation. 6. Finally, we call attention for the study of the curative effect of the radioactive mud of the lakes of the Great Hungarian Plain.

References

- NORRIS, G. and EDMOND, B. A. (1973): Sandstone-type uranium deposits and their relationship to plant microfossils: A review. — *Methodical problems of Palynology*, 127—134.