

RADIOCARBON DATING OF THERMAL WATERS IN VIŠEGRAD SPA

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Abstract

The determination of the age of thermal waters in Višegrad spa by the analyses of radiocarbon - ^{14}C and tritium - ^3H had the purpose to confirm or contribute to explain some suppositions, which are obtained by other investigation methods in this project. The age of waters by these methods has been determined for the first time in Bosnia and Hercegovina.

Complex investigations included geological, geophysical, hydrogeological, hydrological research, structural boring, physical, chemical and balneological analyses.

The most important results of investigation are:

- aquifer of thermal water is formed in T_2^2 limestones, which are covered with the rocks of volcanic - sedimentary formation and ultramafites in the largest part of terrain. This supposition is for the first time proved in geology of Bosnia and Hercegovina with boring.
- accumulation of thermal water is of artesian type, the catchment area of water exists in hills of Janjac and Gostilja (distance between Janjac and Gostilja and spa is 5 km), where triassic limestones are on the surface of terrain; the thermal water is of atmospheric origin with complicated hydraulic regime of circulation.
- three wells have constant hydrogeological parametres: capacity of 80 l/sec, piezometric level of 25 meters over the surface of terrain, temperature of 30,6-32,5 $^{\circ}\text{C}$, the water is radioactive, chemical composition of HCO_3 -Ca-Mg ions, mineralization about 370 mg/l, N_2 - O_2 gaseous type.

Radioactive dating including other investigations proved the following conclusions as far as Višegrad spa is concerned:

- The age of thermal water is around or below 40,000 years.
- Hydrogeological parameters are constant and independent of contemporary hydrometeorological conditions i.e. thermal waters are not mixed with contemporary surface-waters.

Thermal waters are of atmospheric origin and they are characterized by small speed of circulation in aquifer.

The possibility of pollution of thermal water in aquifer does not exist.

The series of volcanic-sedimentary formation and ultramafites are impermeable rocks and poor thermal conductors.