

## **THE WATER - IMPORTANT NATURAL FACTOR IN BALNEARY TOURISM DEVELOPMENT FROM ARAD AND TIMIȘ DISTRICTS**

**Angela Marușca**

**Key word:** thermal waters, mineral waters, balneary tourism

**Resumé:** L'importance des eaux minérales et thermales dans le développement du tourisme balnéaire dans les départements d'Arad et Timiș. Les eaux minérales et thermales représentent les principaux facteurs du développement du tourisme balnéaire dans les départements d'Arad et Timiș. Les sources très chaudes avec des températures comprises entre 20 et 80 degrés Celsius et les sources minérales sont les facteurs thérapeutiques de cette région. Les eaux thermales et minérales auquel on ajoute d'autres facteurs d'environnement ont contribué sur le développement du tourisme balnéaire dans ces départements. Les stations balnéaires offrent aux touristes plusieurs possibilités de traitements utiles pour se soigner ou pour protéger leur organisme.

### **1. Physical and chemical characteristics of thermo-mineral waters**

Mineral and thermal waters represent the main environmental factor in these districts. The hydro-geological researches emphasized many occurrences (springs, draw wells, logs) located in two important areas: Arad-Timisoara thermo-mineral habitat and Lipova-Buzias mineral areal in the eastern part.

**1.1.** The western part of these two districts is very rich in resources of **thermal waters** but they are being used only locally (on the spot) and insignificantly for balneary tourism (Călacea, Arad, Timișoara, Curtici, Șofronea, Dorobanți, Nădlac, Sânicolau Mare, Lovrin, Deta, Sânmihaiu German, Jimbolia), in comparison with the neighboring country Hungary, which developed important balneary centers along the frontier (Gyula, Mako, Bekescsaba, Oroshaza-Gzoparos, Gzoma, Jula). In many parts of these two districts thermo-mineral resources were left, in the best case, on a closed drilling stage (Chișineu Criș, Macea, Variaș, Periam, Lenauheim, Șandra) or cast away in the field (Socodor, Biled, Teremia Mare, Beba Veche, Cărpiniș, Cebza, Tomnatic, Banloc). The eastern part of these

two districts is poorer in thermal waters, but there are resources with temperatures less than 25 degrees C – 32 degrees C, intensively capitalized at Moneasa or on the spot at Cărand.

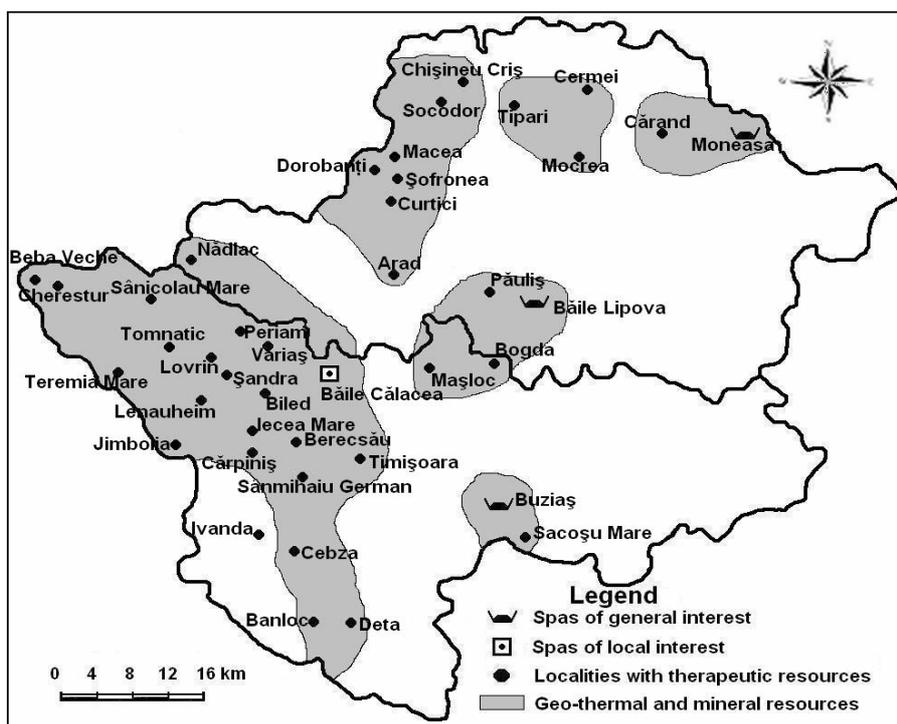


Fig. 1- The repartition of balneary and climatic spas and localities with balneary factors from Arad and Timiș district

After many hydro-geological and geo-physical researches done so far, it is finally known the fact that at *Moneasa* the thermal waters have a temperature lower than 25-32 degrees C and they are part of the mezo-thermal waters category. More recent researches show that thermal waters from Moneasa (natural spring as well as those exploited through drillings) are karst waters that appear in carbonated deposits from Finis, along the contact with the waterproof deposits of Mona ground water. Between 1972 and 1975 there were done five drillings for the investigation of area from a hydrological point of view and they established the structure of hydrothermal storage in the underground.

The main sources of thermal water are represented by captured thermal springs no. 1, 2, 3, 4 and 5 and the drillings in the area. These ones are used for

internal treatment (No.1), drinking water supply (no.1, 2, and drilling no.5) and balneary treatment (no. 2, 4 and 5 and drilling S1, S2, S4) (Orășanu, I., 1987)

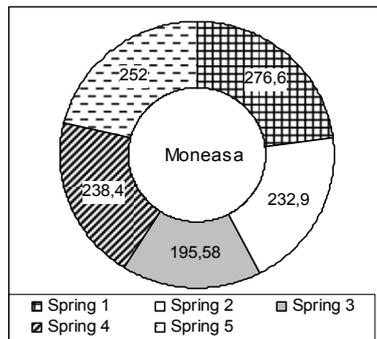


Fig.2 - The mineralization of thermal waters from Moneasa resort

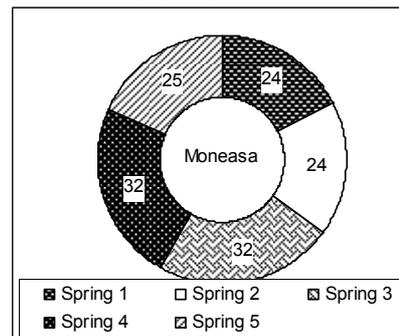


Fig.3 - The temperature of thermal waters from Moneasa resort

Regarding the chemical composition, the waters from Moneasa are bicarbonated, calcium bound, magnesium bound, sodium bound, oligomineral and hypothermal and they have an amelioration effect in the treatment of locomotive apparatus affections of rheumatic, degenerative and neurological aspect, cervical, dorsal and lumbar and cervical spondilosis, arthritis developed in the limbs area, scapulo-humeral periartitis, paresis, old skeletons of poliomyelitis some forms of hemi paresis and para paresis and asthenic nervosas (Berlescu Elena, 1986).

Some geographical areas of Banat dispose of thermal waters with very high thermal values. Therefore, in the territory of Arad and Timiș, there are hydro mineral deposits, with temperatures between 36 degrees – 39 degrees C (Călăcea), 32 degrees C (Arad), 52 degrees C (Timișoara), 66 degrees C (Sânmihaiu German), 80 degrees C (Sânicolau Mare), 81 degrees C (Jimbolia), being included in the hyper thermal waters category.

The waters from Arad-Călăcea-Timișoara area are being used in external cure for balneary treatment due to the thermal factor, the chemical composition being less important.

*Arad*, as a town, has a local interest and it disposes of oligomineral thermal waters, with temperatures over 32 degrees C, and a field climate. The waters are used in therapeutic treatment based on baths in thermal waters into indoor and outdoor pools, and they resemble in therapeutically aspect the waters from Moneasa and Vața de Jos.

*Călăcea Spa* represents a small balneary areal of local interest, which disposes of bicarbonated, chlorinated, sodium bound, alkaline, less bromurated, methane bound, hypotonic, isotherm 36 - 39 degrees C thermo-mineral waters with a level of mineralization between 1724 – 1794 mg/l. The chlorinated and iodine-

bromurated composition of these waters confirms a chemical contamination, throughout diffusion, of the accumulated waters in the superior Pannonian by the deposit waters from underground, tied up by the present hydrocarbons in the neighboring deposits. The water's thermal quality is due to the effect of the geothermal gradient, which has, in Călacea area, a value of 13 – 21 m, and the heat transfer from stone to the water is done through conduction. In this deposit there have been done three drillings. Thermal waters are used in the cure of rheumatic and degenerative locomotive apparatus affections and renal affections (sporadic elimination of calculi, urinary infections).

*Timișoara* – a town with balneary factors, it is situated in Banat Plain, on the Bega river. It disposes of deposits thermal waters discovered in Parcul Rozelor. The drillings that were accomplished in the area of Timișoara proved the existence of three water – bearing complexes, with different hydro-chemical characteristics and located in the Pannonian sands: the 1st water-bearing complex has the outlet capacity around 216 m<sup>3</sup>/day, providing bicarbonated cold water, sodium bound, with a total mineralization of 1846,3 mg/l; the 2nd water-bearing complex has the outlet capacity around 527 m<sup>3</sup>/day, being water with a temperature of 35 degrees, bicarbonated, sodium bound, iodine-bromurated, with a total mineralization of 4109,5 mg/l; the 3rd water-bearing complex with a variable discharge, between 61,55 m<sup>3</sup>/day and 700 m<sup>3</sup>/day, the specific discharge is between 5,237 m<sup>3</sup>/day and 46,656 m<sup>3</sup>/day.

The waters of this complex are hyper-thermal, the temperature reaching 52 degrees C at the surface. Hydro-thermically speaking, the waters of the 3rd water-bearing complex are chlorine-sodium bound, iodine-bromurated, sulphuretted, with a big concentration, the mineralization having values between 6777,5 and 13411,2 mg/l. Mineral water resources from Timișoara are partial used for internal treatment, drinking water (the well from Piața Unirii), for external treatment and cure (the drilling from Parcul Copiilor, the well from Parcul Alpinet) and for recreation (the well from the park that is situated between the Stadium and the Central hospital and the well from the Recreation Base) (Foradex Timiș).

Together with the well-known balneary spas, in the territory of the two districts there are many places where thermal waters are brought to the surface through drillings and they are being developed into thermal swimming-pools (Curtici, Șofronea, Macea, Dorobanți, Nădlac, Sânicolau Mare, Biled, Lovrin, Variaș, Teremia Mare, Jimbolia, Sânmihaiu German, Deta) or they are brought to the surface through drillings but they are not transformed (Periam, Tomnatic, Beba Veche, Cherestur, Cebza, Șandra, Cărpiniș, Banloc, Lenauheim, Iecsa Mare, Berecsău, Grabăț).

Oligomineral waters are used in the swimming pools of Arad district: Curtici, Șofronea, Macea, Dorobanți și Nădlac.

Since 1976 on the surface of the town *Sânicolaul Mare* were conducted 7 hydro-geological drillings that brought up sulphuretted, bicarbonated, chlorinated, bromurated, sodium bound, hyper-thermal with a temperature of 80 degrees C. The waters are indicated in external cure for the treatment of rheumatic affections and they are being used in a modern swimming pool.

*Lovrin* – a place with balneary factors, it is situated in Timiș district, it has springs that are sulphuretted, bicarbonated, chlorinated, sodium bound, hypotonic, hyper-thermal, and brought to light by 6 drillings. These waters are indicated in external cure and they are being used in a swimming pool during the summer period.

*Sânmihaiu German* – a place with sulphuretted, chlorinated, iodinated, bromide bound, sodium bound, hypotone, hyper-thermal, with a temperature of 66 degrees C, brought to the surface through the drilling effectuated in 1977, 2147 m deep. The water is recommended in external cure for the treatment of rheumatic illness and it is being used in a modern swimming-pool with two outdoor pools for the aestival period and an indoor pool for the winter period.

*Jimbolia* – a place with waters that are bicarbonated, bromurated, sodium bound, hypotone, hyper-thermal with a temperature of 81 degrees C (well no.1), or 79 degrees C (well no. 2) and springs that are chlorinated, sodium bound, hypotone, hyper-thermal with a temperature of 80 degrees C (well no. 3). The water is recommended in external cure and it is being used in a modern swimming-pool in the summer period.

At *Deta* – since 1977 there is a drilling 860 – 868 m deep, with chlorine-sodium water, iodinated, bromurated, less sulphuretted, hypotone, hyper-thermal, with a temperature of 53 degrees C, indicated in external cure and used in summer period.

The deposit containing sulphuretted, bicarbonated, iodinated, chlorinated, sodium bound, hypotone and hyper-thermal of 60 degrees C mineral waters from *Teremia Mare* was brought to light in 1972. In 1982 another drilling was effectuated. This one brought to the surface bicarbonated, sulphuretted, chlorurated, sodium bound and hypotone waters, with a temperature of 60 degrees C. The water is indicated in external cure and it is being used in the swimming pool and baths from the town, but nowadays these are in an advanced level of deterioration.

*Biled* and *Variaș* dispose of balneary factors like thermo-mineral waters that were being used in summer period in some swimming pools, but nowadays they are closed from reasons of profitless.

**1.2. Mineral waters** they are being exploited for a long time in this area, in well-known spas like Buziaș and Lipova. More than that, it is proved the presence

of carbonated waters in the area of Pișchia, Murani, Seceani, Firitea, Fibiș, Bencec, the presence of oligomineral waters in Cermei și Bogda, of ferruginous mineral waters in Mocrea, Țipari, Păuliș și Socodor and of chlorine-sodium waters in Ivanda. The presence of mineral waters in the area, and especially of the carbonated waters, linked to a basaltic eruption on the major tectonic line having the approximate alignment Lipova – Luncareț – Vârșeț.

*Lipova* – is a permanent balneary-climatic spa with a general interest which disposes of carbonated, ferruginous, bicarbonated, calcium bound, sodium bound, magnesium bound, hypotone mineral springs. Morphologically, the hydro-mineral deposit it is placed in the bottom land of Șistarovăț, a left tributary of Mureș river, where The Western Field meets the hills of Lipova.

The springs capture fieldwork started in 1854 didn't manage to localize the concentrated occurrence of mineral waters; therefore the exploited water lost its properties. The geological investigation of deposit started only during our century, elaborated fieldwork still being very few (Radu Pascu, Iuliu Laglen, 1930).

Documents from 1926 - 1927 attest the existence of four mineral water sources (spring no.1, 2, 3, 4), and other four draw wells were being exploited in the period of 1927 – 1930. The mineralized water-bearing complex is opened by F6 bis, F11, F12 and S4 drillings. Nowadays the F9 bis drilling debits by pumping out with 2 l/s, the F11 drilling with 1,2 l/s when pumping out, and F12 and S4 sources works like a buvet with debits of 0,16 l/s, used for the population consume.

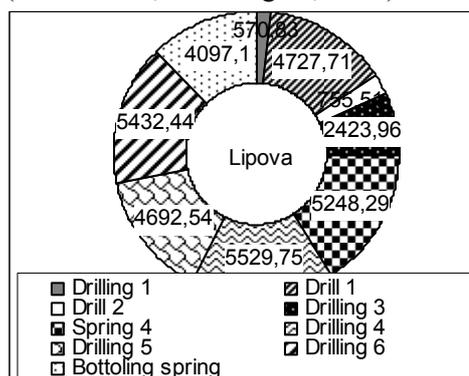


Fig.4 -The total mineralization of mineral waters from Lipova resort

The mineral water is being used like this: 184,3 mc/day (cca. 16 hours filling the bottles) for S.C.Lipomin Lipova and S.C.Apemin Lipova Thermae; 69 mc/day for balneary activity. (source: ApeMin Lipova)

Mineral waters have a positive effect for the treatment of cardiovascular affections, digestive apparatus affections, hepatics affections, breathing affections, chronic gynecological affections, locomotive affections, blood flow affections, kidney diseases and other associated illnesses.

*Buziaş* – is a permanent balneary-climatic spa of general interest that is distinguished as an appreciated cardio-vascular treatment spa. The existence of hydromineral debit at Buziaş is due to the CO<sub>2</sub> emission and to some favourable local geological and hydro-geological conditions, such as: the reduce thickness of predominant sandy Pannonian deposits, where the water-bearing complex is being localized; the remittent, lentiform character of argillaceous, waterproof horizons, fact that permits the migration of CO<sub>2</sub> to the surface, on the fracture from the crystalline fundament. The waters from Buziaş meet CO<sub>2</sub> that climbs from the underground along with the breaks from crystalline schists, giving them the carbonated character. Besides CO<sub>2</sub> (91,5 – 96,4 %) these waters contain other gases, for examples methane. These waters have a low radioactivity, the average being 300 pCi.

The researches demonstrated that this hydrothermal deposit is formed by three horizons: a freatic one, situated at 6 – 10 m deep, another one with ascending character at 17 – 60 m deep (132 m in the western part of the spa) and a water-bearing horizon with artesian character, located where sedimentary stratum meets the crystalline fundament.

Under chemical aspect, the waters from Buziaş area – Sacoşu Mare from the artesian horizon, located in the central and western part of the spa have a total mineralization without dissolved CO<sub>2</sub>, between 3 200 – 5 200 mg/l and with a CO<sub>2</sub> content of 2 000 – 3 100 mg/l, they are bicarbonated, chlorinated, bromurated, less iodinated, sodium bound, magnesium bound, ferruginous, carbonated, and those located in the east of the spa have a total mineralization between 2 150 – 2 300 mg/l, without dissolved CO<sub>2</sub> and with a content of CO<sub>2</sub> de 2 000 - 2 500 mg/l and they are bicarbonated.

The ascending horizon's waters, quartered in the central part of the spa are bicarbonated, sodium bound, calcium bound, magnesium bound, ferruginous, carbonated waters with a total mineralization of 1 000 – 1 200 mg/l, without dissolved CO<sub>2</sub> and with a content of CO<sub>2</sub> of 500 – 1 500 mg/l and bicarbonated, chlorinated, less bromurated, sodium bound, calcium bound, magnesium bound, ferruginous, carbonated waters, with a total mineralization between 1 800 – 2 400 mg/l, without dissolved CO<sub>2</sub> and a content of CO<sub>2</sub> of 1 400 – 1 950 mg/l. The waters of groundwater horizon, located in the east part of the spa are bicarbonated, sodium bound, calcium bound, and ferruginous, carbonated, with a total mineralization of 600 – 1 700 mg/l, without CO<sub>2</sub>.

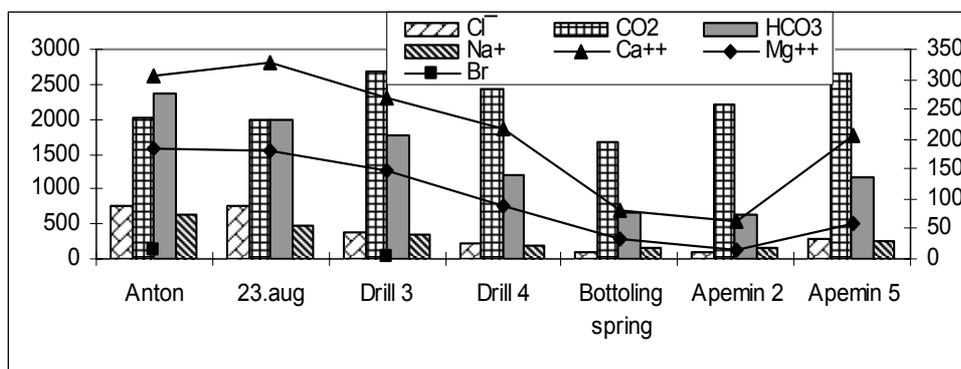


Fig. 5 - The chemical composition of the mineral waters from Buziaș Spa

Nowadays, the waters are being exploited by well no.1 (water for balneary therapy, and CO<sub>2</sub> is used by Secția Apemin Buziaș), well no.2 (water for balneary therapy - 87,4 %, supplying the swimming-pool - 3 %, and free CO<sub>2</sub> by Secția Apemin Buziaș), well no. 3 (water for balneary therapy – 97 %, supplying the swimming-pool - 2 %, in internal cure 1 %, and free CO<sub>2</sub> by Secția Apemin Buziaș) well no.4 (waters for balneary therapy, and free CO<sub>2</sub> for supplying the spa's moffet), Apemin II well and Apemin V well (offers water for filling bottles, like drinking waters ) (source : Foradex Timiș).

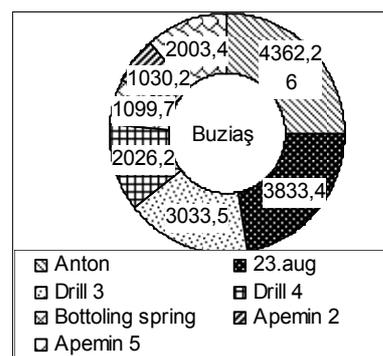


Fig. 6 - Total mineralization of waters from Buziaș Spa

The mineral water from Buziaș is indicated in the treatment of cardiovascular diseases: high blood pressure, infarct sequels, ischemic cardiopathy, mitral heart block, operated valvulopaties, Raynaund disease, acrocinosis, sequel after the superficial veins phlebitis, ulcer. Functional recovery with minerals waters cures: atherosclerosis, some forms of hemiparesis, associated diseases, digestive diseases and degenerated rheumatism.

Together with the well-known Lipova Spa and Buziaș Spa, there must be mentioned other places where mineral waters were used in external and internal cures or as a drinking water.

*Ivanda* - it has springs with sulphuretted, chlorinated, sodium bound, magnesium bound, isotones and hypertonic mineral waters under the shape of two occurrences of springs not too deep that were used as drinking water, under the name of „Magus mineral water” and „Mars mineral water”. Nowadays, the bottling equipments are left in degradation.

*Bogda* – it has as a source a spring with oligomineral waters, total mineralization 717,7 g<sup>0</sup>/<sub>100</sub>. Today it has a very small flow, but in the past, it used to supply the thermae from nearby.

*Mocrea* – disposes of springs with ferruginous, chlorinated, bicarbonated, mixt mineral waters and sulphuretted, carbonated waters lacking in improvement.

Other places which disposes of mineral waters are *Cermei* (oligomineral waters), *Păuliș* (ferruginous, bicarbonated, carbonated mineral waters) and *Țipari* (ferruginous, bicarbonated, carbonated minerals waters).

## 2. Turistic infrastructure developed on hydromineral resources

Although the value of balneary potential of Arad and Timiș districts is important, the present level of development is still insufficient. Yet in these districts, based on rich deposits of thermal and mineral waters, known for a long time (some of them even since Roman times), some resorts as treatment centres (spas) developed differently or they emphasized this natural richness punctual.

*Moneasa* resort is known even since the Roman times, but it was reorganised in the XIXth century. Nendtvich Karoly led the first chemical analyses of the thermal springs from Moneasa in 1865 and, a year later, Kery Bittner described them for the first time and made a number of recommendations regarding their usage. On 13th of May 1886, Moneasa obtained from The Imperial Minister of Internal Affairs from Vienn, the name of spa. Since then it developed sinuously. Being a property of Earl Wenenheim, the resort developed by having built up some modern edifices for that period. After being destroyed during the First World War, it was reconstructed by building some mansions. **Before** 1989, the resort increased its capacity of accommodation and usage of thermal water for treatment, by building hotels and treatment centres. Nowadays, Moneasa resort gets through a process of modernization of the existing hotels and construction of other boarding houses.

It is considered that the first springs from *Lipova* resort had been discovered in 1818 by shepherds. Based on some particular initiatives, helped by the administrative and medical authorities of that period, a balneary centre was brought into existence. There were three bathing compartments. In 1819, they started to set up a park, then a paved access road was built, a bowling court came after, a shooting gallery, a restaurant, apartments, a council estate.

For a period the resort was the property of some entrepreneurs, but it was the property of Lipova as well. Documents from 1926 - 1927 register the existence of „Lipova Spa, anonymous company for the carbon acid and mineral water industrialization”, where there were four sources of mineral water (springs no. 1,2,3 and 4). In Lipova there were balneary establishments and special equipments, solarium for aero- and heliotherapy, and a sanatorium with 200 seats for children hepatitis sequel treatment.

Starting with 2002 the resort became private and it has the following functions: bottling mineral waters since 1994 by SC Lipomin SA and SC Apemin Băile Lipova SA and recreation in the resort's swimming pool. In this resort there are still visible places for accommodation and treatment that were functioning before 1989, but now they only pollute the landscape, because they are just ruins.

*Buziaș* balneary and climatic resort is first mentioned in a document in The Middle Age, but it was mentioned as a balneary locality just since 1805. It was then when it started the exploitation of the first balneary spring named Saint Michael, action that marked the beginning of the resort's activity. In 1811, there were registered the first patients that were treated here, in 1816 there were set up the first springs, and in 1819 it was officially declared a spa, according to mineral waters quality confirmation, the analyses being done by prof. P. Kiteibel.

Buziaș Spa were bought, in 1906, by Jakob Muschong, a prosper industrialist of that time who, at short time after getting it, set on the joint-stock company "Muschong Minerals Spas" Buziaș. From that moment on, the resort quickly made progress. But few of the old properties are still on function today: some of the old mansions are inhabited by renters and the old casino from the resort's park is used for public demonstration. The few existing hotels were built in the period of communism. After the revolution almost no money were invested, and what once was called „the pearl of Banat” fell into decline.

Although it has an extraordinary tourist potential, investors avoid the town-resort Buziaș. Yet, among those who were interested in opening a business here, there is a company of financial investments that renovates Park Hotel. Although it isn't a very big step, it is still something that could bring other investors, because in the property of Buziaș resort there are included as well: 12 mansions, Grădina Banățeană, Timiș Hotel, Buziaș Hotel, the old Casino, spa, the park and the unique swimming pool with mineral waters from the country, everything being now in an advanced level of deterioration.

The positive effect of thermo-mineral waters from *Călacea* was first signalized in 1880. Based on the researches about the hydro-thermo-mineral deposit there soon it developed a resort of local interest, the first facilities for the next balneary establishment dating since 1906 - 1916. Nowadays, Călacea Spa resort started an important process of improvement and revival, being now named

Tourism and Treatment Aqua trading company. Those who come here for treatment and relaxation can benefit of daily medical procedures offered by spa centre, of special moments in the club or the promenades in the resort's park. Those who enjoy swimming can find here a swimming pool having olympic dimensions and a sport base and of course playgrounds for children.

### Conclusions

Arad and Timiș counties have a large range of natural resources, and the balneary ones are very important, because a lot of towns (places) already have developed or less developed forms of exploitation and improvement of these resources. Although these districts have a huge touristic potential, there is a low closeness of accommodations in the resorts with balneary factors and even if there are some, they are at different levels of degradation. Here it would be necessary to have some serious investors who should build or renovate the buildings designated for balneary tourism, but they should have in mind some strategies for a development that would last and taking care not to deteriorate the quality of natural factors.

The combination of touristic facilities and a durable development should take some steps in order to enhance the attractiveness of the area that has balneary factors and it should really contribute to the revival of balneary tourism in these two districts.

### References

- Berlescu Elena, (1971), *Stațiunile balneare de-a lungul timpului și azi*, Editura Medicală, București
- Berlescu Elena și colab., (1986), *Cura balneoclimatică – indicații și contraindicații*, Editura Medicală, București
- Orășeanu, I., (1987), *Hydrogeological study of Moneasa area (Codru Moma Mountains)*, Theoretical and Applied Karstology 3, 175-199, București
- Stoicescu, C., (1982), *Farmacodinamia apelor minerale de cură internă din România*, Editura Academiei Române, București
- Țenu, A. (1975), *Apele subterane de adâncime din Banat*, rev. Studii de Hidrogeologie, XII, București
- \*\*\* Date din Arhiva FORADEX, Timiș
- \*\*\* Date din Arhiva APEMIN, Lipova