THE RISING OF THE GEOPARKS' CONCEPT, ACTIVITIES AND PROJECTS IN BRAZIL

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The acceptance of Geopark Araripe (Herzog et al., 2008) as an effective member of UNESCO Global Geoparks Network, the first in the Americas and Southern Hemisphere, has gained notoriety in Brazil and raised the interest about this new kind of protection of natural and cultural heritage under UNESCO auspices, mainly dedicated to geological heritage conservation, Earth Sciences education, and local sustainable development.

In 2007, the Ministry of Culture honoured the set of activities of Geopark Araripe with the Brazilian most prestigious cultural prize, the Rodrigo Mello Franco de Andrade Prize, in the natural and archaeological heritage preservation category.

All of these activities raise the attention and interest of individuals who are working in different institutions and states of Brazil, in the subject of protection and diffusion of Brazilian geological heritage. In addition, this Earth heritage (including all the branches, like geomorphology and paleontology) had not yet been explicitly identified as cultural heritage. Also the "geopark" brand begins to be viewed as a good pathway to overcome an unbalanced situation, where the geological heritage is less recognized than the biological counterpart, probably one of the reasons that Brazil is worldwide known mainly as the country of mega-biodiversity.

This growing interest conducted to a series of qualified events, with the frequent participation of members of the Global Geoparks Network. Started in Rio de Janeiro and São Paulo, these first short events quickly expanded to conferences, courses and workshops devoted to specific topics of Geoparks and the discussion of new projects in Brazil. We can cite the follow examples:

a) a thematic symposium at the 44th Brazilian Geological Congress (Curitiba, Paraná State, October 2008), entitled *Geological Monuments, Geoconservation, Geotourism and Geoparks*, with 61 scientific contributions and the special participation of the European Geopark Network Coordinator. Also during this event, the short-course *The process of a Geopark creation* was conducted by a representative of the Geopark Araripe;
b) an International Seminar on Geoparks and Geotourism (Fortaleza, Ceará State, November 2008);
c) workshops dedicated to the discussion of the Bodoquena-Pantanal Geopark project,

first at Bonito town (September 2007) and recently at Campo Grande City (June 2009), both in Mato Grosso do Sul State, and of the Quadrilátero Ferrífero geopark project, at Belo Horizonte City (June 2008). At the Bonito meeting was produced the document "Serra da Bodoquena Chart" (or "Cultural Landscapes and Geoparks Chart");

d) a workshop entitled *Geopark: strategy of geoconservation and educational projects*, promoted by the state universities of São Paulo State, at São Paulo City (July 2009), focused on the educative mission of the geoparks;
e) intensive courses to improve the understanding of basic topics like Earth Heritage, Geoconservation and Geotourism, conducted by top-skilled professors from the Master Course on Geological Heritage and Geoconservation of the Minho University (Portugal). These courses have been promoted in several Brazilian states (Bahia, Rio de Janeiro, Paraná, Santa Catarina) from the initiative of federal and state universities.

Inspired by the successful pioneer project Geopark Araripe, national and local initiatives over Brazil are now working to establish new geoparks in the country, where the most advanced projects are the Bodoquena-Pantanal, the Campos Gerais, the Quadrilátero Ferrífero and the Alto Vale do Ribeira. The main geological features of these areas are:

1) Bodoquena-Pantanal (Mato Grosso do Sul State)

The area of this potential geopark is partially superposed with the so-called Pantanal wetlands, recognized as a World Natural Heritage site. Here we can find the geological record of the terminal Neoproterozoic Era as well as the Quaternary evolution of the Pantanal and the karstic landforms of the Serra da Bodoquena, with seven points accepted by the Brazilian Commission of Geological and Paleobiological Sites (SIGEP) (Boggiani & Lima, 2008).
Diamictites and iron formations (these with mining activities) are attributed to the Marinoan glacial event, with some authors interpreting them in the context of the "Snowball-Earth" Theory. The first steps of the diversification of metazoan life are represented by Late Ediacaran fossils *Corumbella* and *Cloudina*, while stromatolites exemplify the predominant life-style in the Precambrian times. Crystalline streams, abundant carbonate tufas in rivers and hypersaline lakes in the Pantanal, all of them testify aspects of the rich water resources.

2) Campos Gerais (Paraná State)

The "Campos Gerais do Paraná" is located at the dip slope of a cuesta landform, around the regional cliff that defines the "Segundo Planalto Paranaense" border to the east, at the central portion of the Paraná State (Guimarães *et al.*, 2008). This region has a very special geodiversity, with a geological heritage composed by: Devonian marine fossils (invertebrates of the Malvinokaffric Realm and ichnofossils like *Cruziana*, *Rusophycus*, *Planolites* etc.); a great number of stratotypes from Paleozoic units of the Paraná Basin (one of the principal intracratonic basins of South American Platform); a very well preserved record of the Gondwana glaciogenic features of Permo-Carboniferous age (diamictites, striated pavements, dropstones).
But more spectacular is the geomorphological heritage, with tectono-magmatic controlled canyons (Cretaceous dyke swarm, faults and fractures related to the South-Atlantic opening), hundred meters high escarpments, a lot of rapids and falls, and a world-level example of quartz-sandstone regional karstic landscape, with features like ruiniform relief, underground segments of water streams, and sinkholes, among others.

3) Quadrilátero Ferrífero (Minas Gerais State)
The name of the area of this probable geopark (and also the proper state name) points to the deep connection with the geodiversity. Here is an excellent window to the beginning of the geological history of the Earth, with very good expositions of Archean and Paleoproterozoic rocks.
Undoubtedly the geological relevance of the "Quadrilátero Ferrífero" is strongly related to the iron and gold mineralization (and other ores, like manganese), with a very rich mining heritage. Another important group of Earth heritage is the mountain ranges that individualize the landscape of this segment of Minas Gerais State.

4) Alto Vale do Ribeira (São Paulo and Paraná States)
Situated at the region of the political boundaries of the São Paulo (at south) and Paraná States, the area covers a wide span of the geological time table, being of great relevance for the understanding of the Brazilian Precambrian tectonic evolution (Theodorovicz, 2008).
The predominance of metalimestone rocks led to the development of a huge concentration of caves, with a didactic, scientific, ecological, geotourist and aesthetic valuable karstic landscapes. Also gold and lead-silver-zinc mineralization, with a long history of mining activity (now almost totally inactive), complete a scenery where the geological and the history of mining heritages overlap.

But if a high valuable set of geological attributes are critical to the existence of a geopark, also it is not sufficient. There is the necessity of a linkage with the people who live at the territory, with educational and tourist activities, besides the valuing of intangible concerns, all playing a decisive role to reach the objective of harmonic development.
The present stage of elaboration of geopark projects in Brazil mirrors the concerns above mentioned where the headers of the proposals belong to universities and science agencies, and state or national geological surveys and cultural institutes.
An interesting example where we can find a connection with cultural aspects is the planning of an essentially urban geopark, the Baía da Guanabara Geopark in the Rio de Janeiro State, highly focused on the concept of Cultural Landscape. 600 million years of geological history, since a continental collision, passing by the opening of the Atlantic Ocean, up to the modern processes of landscape modeling, bring together an augen gneiss, diabase dykes and landforms like the iconic tourist sites of the "Pão de Açúcar" and "Corcovado".
This entire geological heritage must be seen closely associated with the cultural heritage, since they: a) build a local and national identities; b) are used, mainly the augen gneiss from quarries, as an important dimension stone in architectural monuments of the Rio de Janeiro City; or c) controlled, at the early beginning, the so distinctive Brazilian cultural expression: the "samba"! It was at sculptured stairs on this particular rock-type (at the "Pedra do Sal" site) that slavers gathered, including to religious ceremonies and to sing their traditional and new songs (Mansur et al., 2008).
The activities above cited have contributed to the dissemination of the geopark concept in Brazil and to the promotion of new projects. Some of the next steps include the adjustment and equalization of procedures and public talks from the people who are elaborating some geopark proposals. Exchange of well-suited experiences and the identification of common difficulties will serve to the consolidation of the present projects and will guide new works. These appointments strongly show how pertinent and necessary is the creation of a national geoparks network. One movement in this direction was the establishment of a discussion group at the world wide web (hosted at http://groups.google.com.br/group/rede-brasileira-de-geoparques), dedicated to the formation of a Brazilian Geoparks Network.

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