



# Seminarios de la Sociedad Española de Mineralogía

Volumen 10

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## International Seminar on Conservation of Mineralogical and Petrological Heritage and its Tourism and Cultural Usages

Seminario celebrado en  
Caravaca de la Cruz (Murcia, España)  
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Homenaje al Catedrático de Cristalografía y Mineralogía  
Dr. Rafael Arana Castillo



**Cover photo**

A desperate call of distress from the volcanic neck known as *Cabezo Negro de Zeneta* (Murcia), a Spanish geosite, i.e., geological heritage with international relevance, affected by a quarry seen in the background. Its Miocene ultrapotassic volcanic rocks are now forming part of the slopes of the *Santomera-San Javier* freeway and its service lanes. However, the only use that this geosite should have is for science, education and geotourism.

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"Everyone has the right to enjoy an environment suitable for the personal development, as well as the duty to preserve it."  
(Article 45 of the Spanish Constitution)

"The Natural Heritage is made by the set of natural goods and resources that provide the biological and **geological diversity**, with significant environmental, scenic, scientific or cultural values."

"The Geological Heritage is the set of natural geological resources with scientific, cultural and/or educational values, whether **geological formations** and **structures**, landforms, **minerals, rocks, meteorites**, fossils, soils and other geological evidence that allow to us insight, study and interpret: a) the origin and evolution of the Earth, b) the processes that have shaped the Earth, c) the past and present climate and landscape, d) the origin and evolution of life. "

(Article 3, Law 42/2007, December 13<sup>th</sup>, on Natural Heritage and Biodiversity)

"The Government, in collaboration with the Regional Governments ... will carry out the Strategic National Plan for the Natural Heritage, Biodiversity and **Geodiversity** ... It will include initiatives to promote knowledge, protection and the sustainable use of the **geological**, biological and **mining heritage** as scientific, cultural and tourism resources" (Article 19.1).

"In order to promote the creation and maintenance of employment in rural areas, the Program of Sustainable Rural Development will include the design of activities to inform and educate rural people about the potential use of the Natural and Cultural Heritage. Proposed initiatives will facilitate **geological**, environmental and **mining tourism**, as well as other cultural exploitation "(Article 22 f).

(Law 45/2007, of December 13<sup>th</sup>, on the sustainable development of rural areas)



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# Foreword

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The Spanish Mineralogical Society (SEM) has already published nine thematic volumes concerning different topics of interest for mineralogists in particular and for society in general. This tenth volume of the series includes the text of the invited lectures given by keynote speakers at the X Annual International Seminar which took place at Caravaca de la Cruz (Murcia) on June 25<sup>th</sup>, 2013, and which was included within the X Summer Course on Geoheritage of the Universidad Internacional del Mar, in parallel with the activities of the XXXIII Scientific Meeting of the SEM, and dedicated to the memory of Dr. Rafael Arana Castillo, co-founder of the summer course and professor of mineralogy and crystallography. The main general topic of the seminar was the “Conservation of Mineralogical and Petrological Heritage and its Touristic and Cultural Use”.

The invited lectures focused on different aspects related with geoheritage sites: description, inventories and value assessment, protection and management, as well as public use for geotourism, education and science in general. Some of the sites are renowned worldwide for their petrologic and mineralogical interest. Such is the case of giant mercury deposits of Almadén (Ciudad Real, Spain), the Teide volcano (Canary Islands, Spain) or the giant crystals of Naica (Chihuahua, México). The aim of the seminar was to show recent advancements in this field of studies, and particularly to show how mineralogy and petrology may and must contribute to understand the value of geosites and moveable geoheritage related with minerals and rocks. The interest for these geoconservation studies is steadily growing, as we can see from the books, journals and proceedings of scientific meeting being published, the guided and self-guided fieldtrips and other geotourism activities being organized, and the protected areas and special management areas (geoparks, biosphere reserves, geological reserves, geological parks, UNESCO world natural heritage, etc.) with emphasis on geoheritage and contributing towards local socioeconomic development.

This 2013 seminar was addressed by prestigious scientists and specialists covering a wide range of topics that clearly show the geodiversity that minerals and rocks offer towards the understanding of the history and evolution of Earth. At the same time, they allow us to understand the need to properly assess their value in order to select those best, unique and most representative elements that we must consider as geoheritage to be protected and managed for future generations. This is the only way to enjoy them, to use them for science and education, and to preserve them from destruction. Geoconservation consists on the studies, analyses and actions to achieve all this. Geoconservation is also about the interaction with society to properly manage geoheritage: what to protect or not protect, where to build or not build, where to allow the development of mineral resources or not, what sites must or must not be used for geotourism, where to take or not take the students for field practices, etc.

These concepts are slowly beginning to be considered and assumed by society in general. That is precisely why scientific societies and their professional members have a major role in the identification, characterization and value assessment of geoheritage and geodiversity, so that managers and politicians know what they have in hands and how this part of natural heritage and natural diversity should be cared for.

Finally, I wish to thank the authors who accepted the invitation to participate and submitted their contribution on due time, with the hope that all parts involved, members of SEM and public in general, become aware of the importance to understand, preserve and properly manage this special type of geoheritage represented by the most valuable minerals and rocks.

**Enrique Díaz-Martínez**

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Vice-President of the European Assoc. for the Conservation of Geological Heritage (ProGEO)*

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