BEST PRACTICES IN COOPERATION BETWEEN AUTHORITIES AND GEOSCIENTISTS TO SERVE SOCIETY AND ENSURE ADEQUATE PROTECTION OF OUR PALAEONTOLOGICAL HERITAGE

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The geosciences have experimented recently the urgent necessity to count on practitioners who possess an ethical conscience and the desire to act responsibly and serve the society. This is especially necessary in the case of our paleontological heritage.

Fossils are any evidence of once-living organisms from past ages that are preserved in the lithosphere. They represent a relevant component of geodiversity with the unusual capacity to connect people with our natural environments, origins and past.

Fossils inform about the environment where past organisms lived and give people a fuller understanding of the history and evolution of the life.
INTRODUCTION

FOSSILS CONNECT US WITH OUR NATURAL ENVIRONMENT (they are formed in Nature)

PALEONTOLOGICAL HERITAGE

CULTURAL VALUE

OUR ORIGINS...
... AND PAST

SITES & FOSSILS

Natural VALUE

natural heritage

Natural VALUE

cultural heritage

Cultural VALUE

Illustrations by M. Antón

Photo by B. Azanza
Transmitting palaeontological knowledge to geoscientists (including educators), authorities and people, especially on the basis of the findings from the fossil record, must be pivotal in order to ensure adequate protection and conservation of the paleontological heritage, promote responsible research practices and attract attention by society.
An ethical and correct management of the palaeontological heritage often raise **key ethical concerns**.

There are a range of useful examples concerning ...

- **i)** the increasing use of technological advances and an ambitious development of infrastructures (e.g., mining activities and exploitation of georesources, railroad, highway and residential projects, etc.) often initiated, funded, and influenced by government agencies or public and/or private organizations;

- **ii)** individual actions to collect the most spectacular, relevant fossils related to both commercial or collecting, or simple vandalism;

- ... and **iii)** the increasing use of fossils in palaeontological research, didactic and touristic activities and exhibitions—and its profound impact on sites and fossils

... that relate to our palaeontological heritage and **foster personal growth, enrich citizens` knowledge and promote (and improve) interaction between society and this field of geosciences**.
Here we show a real case study that constitutes a successful and instructive example about best practices between authorities and geoscientists to serve society and ensure adequate protection of the palaeontological heritage.

In particular, it shows how to solve a conflict between infrastructure construction and the geoconservation of a palaeontological site and the fossil finds, with benefits either for the administration and to the scientific community and to effectively serve to the society.

The case study comprises the Late Cretaceous site of Lo Hueco site (Cuenca, Central-East Spain) (Ortega et al., 2008; Barroso-Barcenilla et al., 2009) that in 2007 yield an enormous and unexpected concentration of dinosaurs as a result of works under the construction of high-speed railway by ADIF (Administrador de Infraestructuras Ferroviarias) (http://www.adif.es/es_ES/index.shtml).
Field-research revealed a rich and varied fossil assemblage in the outcrop, works on the railway stopped, and an urgent and systematic palaeontological excavation started. The railway works were paralysed to facilitate the location, documentation and protection of the fossils.

The excavation forced to introduce a modification in the construction works of the Madrid-Levante high-speed line, now in current in service, at the location of the site, where a tunnel was planned, and in order to preserve it, the section in trench was built.

All this gradually involved more than 60 palaeontologists and 100 workers from diverse public institutions and private companies. ADIF financed the rental of a warehouse where the deposit and laboratory of the collection were installed.

Thanks to this discovery, the current Museum was expanded, a new centre was created and many workers and researchers were hired.

Thanks to works carried out in Lo Hueco, in where there were no signs of previous fossil sites, **new heritage came to light.** Without any other information, this can pose a very important geoethical conflict between the need of a new infrastructure construction and the preservation of a newly found fossil heritage of unique characteristics.

This evidences that **infrastructure works** (of high value for the economical and social progress of a country) and similar activities companies **can help to the discovery of new palaeontological heritage**, and that they can invest money to help to recover and promote such a heritage.

i.e.; the late Miocene Cerro de los Batallones site (Madrid, Spain) discovered accidentally in July 1991 by mining works:
The message that emerges from this case is that

1) the value of fossils is based on sound scientific knowledge produced by the geoscientific community;

2) the cultural value of the palaeontological heritage and the impact on society, culture and economy is evident;

3) there is an urgent need for action in order to achieve a proper balance between development of infrastructures and development of works, with preservation of heritage;

and 4) palaeontology as a discipline and its heritage have proven to be a very effective tool to raise citizens’ awareness of Geoethics.