GEOSCIENCES AT THE SERVICE OF SOCIETY IN THE EXPERIENCE OF ONE OF THE FATHERS OF GEOETHICS, ANTONIO STOPPANI

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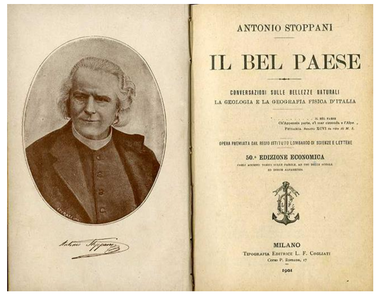
Antonio Stoppani (1824-1891) was a great naturalist and passionate scholar of **EARTH SCIENCES** who was able to use his knowledge and professionalism as an **instrument of:**

- **TRAINING**
- **EDUCATION**
- **SOCIAL PROMOTION**

He highlighted the importance of Earth Sciences for **CULTURAL AWARENESS AND DEVELOPMENT OF SOCIETY** during his historical time (after the Unification of Italy in 1861).



In «***Il Bel Paese***» (1875), in the form of short stories, but with scientific rigor, Stoppani tells the natural beauty, geology and physical geography of Italy to common people. He was convinced that knowing their own land was an instrument to create unity among the new people formed after the Unification of Italy (1861).

THE BASIC PRINCIPLES OF GEOETHICS developed in his works

1 MAN AS A "GEOLOGICAL AGENT"

He stressed the importance of **human being** as being capable, with the use of reason, to modify nature and to participate actively in shaping the Earth's surface.
He introduced in his *Course of Geology* (1871-1873) the term ***"Anthropozoic Era"*** to define the latest time period in which human action began to be significant and decisive.
This intuition somehow anticipates the modern concept of the **Anthropocene** elaborated at the end of the XX century.

Handmade wall of the XIX century now is part of the stratigraphical succession (Santa Severa, Viterbo, Italy)

Urban fossil in a street of Rome (Italy)

The Bertà Glacier (Piedmont, Italy) in 1900 and 2010. Is evident the shrinkage that is affecting the NW Italian glaciers from the Little Ice Age *(Lucchesi et al., 2014)*

Children learning how to take care to the Earth (San Giuseppe primary school, Fiano R. – RM)

2 HUMAN RESPONSABILITY AND ETHICAL COMMITTEMENT towards the Earth, society and future generations

Unlike the other morphological agents human being has the capacity and at the same time the responsibility to contribute, through knowledge and scientific progress, to a **responsible and ethical management of the environment and of the georesources.**
On these aspects is based the "**GEOETHICAL PROMISE**" recently proposed by Matteucci et al. (2014).

Drawing representing Stoppani teaching sciences to his grandchildren and friends. He used to say: *"Oh, the study of nature! You could fall in love!"*

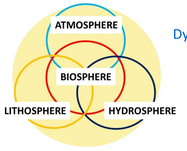
3 OLISTIC VIEW OF SCIENCE AND MAN

He also strengthened the importance of **DIALOGUE** and **INTERDISCIPLINARITY** among the different sciences, between **physical and human sciences**, including ethics and metaphysics.
Against the fragmentation of knowledge this approach is nowadays fundamental for the growth of the **common good** and for the **development of peoples.**

4 THE EARTH HERITAGE TO BE PRESERVED IN ITS UNIQUENESS AND GEODIVERSITY

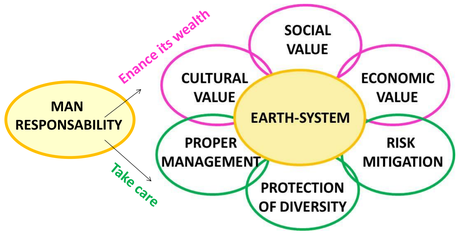
Significant are the dimensions of **beauty**, **harmony** and "**sacredness**" that Stoppani found in nature and that he considered cause for attention, appreciation and respect of the geosphere.
With these principles he somehow laid the foundations for **GEOCONSERVATION** and promotion of **GEODIVERSITY**.
He is one of the first estimators of **GEOSITES.**

The Toce fall (Italy) (A) and the Torghatten mountain (Norway) (B) in drawings of 1875 from *"Il Bel Paese"* (left) and in a recent photos (right).



Dynamic relations inside the Earth-system.

Dynamic relations between Earth-system and man.



5 THE EARTH AS A SYSTEM

Stoppani had a modern approach to the study of the Earth-system, embracing a perspective of **dynamic relationships** between the various components of the **ECOSYSTEM**.
This vision is nowadays essential for a **proper management of georesources**, for the assessment and mitigation of risk, as well as for a more **integrated growth** of the human being in **harmony and synergy with the ecosystem.**
Man has the double responsibility towards the Earth-system: **to enhance its wealth and to take care of it**.

The contribution of Stoppani is therefore of great significance in establishing the criteria that should guide researchers, scholars, educators, professionals and decision makers in their studies and activities in the field of Earth Sciences and he actually can be considered one of the **FATHERS OF GEOETHICS.**