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Editorial

Ecology is a science that attempts thinking in a plane perpendicular to Darwin. Ecology is an infant just learning to walk, and, like other infants, is engrossed with its own coinage of big words. Its working days lie in the future. Ecology is destined to become the lore of Round River, a belated attempt convert our collective knowledge of biotic materials into a collective wisdom of biotic navigation. This, in the last analysis, is conservation.

Leopold A., 1953. Round River, from the Journals of Aldo Leopold. Edited by L. B. Leopold, illustrated by C. W. Schwartz. Oxford University Press, New York. Prof. Born Taylor's extract at: http://www.brontaylor.com/courses/pdf/Leopold–RoundRiver.pdf

1. If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity.
2. It is possible to alter these growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on earth are satisfied and each person has an equal opportunity to realize his individual human potential.
3. If the world's people decide to strive for this second outcome rather than the first, the sooner they begin working to attain it, the greater will be their chances of success. These conclusions are so far-reaching and raise so many questions for further study that we are quite frankly overwhelmed by the enormity of the job that must be done. We hope that this book will serve to interest other people, in many fields of study and in many countries of the world, to raise the space and time horizons of their concerns and to join us in understanding and preparing for a period of great transition, the transition from growth to global equilibrium.

Meadows D. H., Meadows D. L, Randers, J. and Behrens III, W. W., 1972. The Club of Rome, The Limits to Growth. A report of The Club of Rome's project on the Predicament of Mankind. A Potomatic Associated Book: http://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf

Humusica

At the beginning, it was only a dark unknown matrix in provisional equilibrium. An infinitely small window appeared in it. All matter we know erupted from this point and generated stars grouped in billions of galaxies wandering in a boundless universe. On Earth, we can observe a similar process occurring in the soil, where organic matter decomposes and regenerates itself, rooted in a dark matrix, nursing any larger and strongly dependent biodiversity.

Humusica concept

The final goal of the ambitious Humusica project was to set up well illustrated and easy to use soil classification keys, so as to provide helpful *field-manual-guides* to farmers, soil scientists, but also to not (yet) experts interested in soil, for basic soil knowledge and sustainable agriculture, aiming at producing healthy, tasteful food, and to support forestry and green spaces management for maintaining/improving our planet biotopes. This is the reason why the majority of the Humusica-articles resemble to field manuals, very rich in pictures, illustrating, explaining and critically discussing how soil develops thanks to its living components. Humusica is based on and aims at further deepening basic soil knowledge and to generally sensitize our perception towards soil conservation also within the context of future climate scenarios. Covering all related aspects, philosophic as well as not strictly scientific reflections cannot be ignored.

Fundamental ideas:

1) Anthropogenic soils correspond to natural soils modified by human beings. For understanding the functioning of anthropogenic agricultural soils, it is necessary to know the functioning of natural soils. Thus, the first two volumes of the Humusica-Special Issue (H1: articles 1-8; H2: articles 9-19) were subdivided in the following three sections: a) Natural humus systems (articles 1 to 13); b) Anthropogenic humus systems (articles 14, 15 and 16); c) Basics about and practical instructions for sustainable agriculture (articles 17, 18 and 19). The third volume (H3) is a collection of specific information (e.g. case studies; short reviews; novel tools) based on concepts reported in H1 and H2.
2) Instead of presenting all this information in a book, the Journal of Applied Soil Ecology offered us the opportunity to publish a series of articles collected in three volumes of the Special Issue Humusica. In this shape, it is easier for the readers to search for the specific articles of interest, and,

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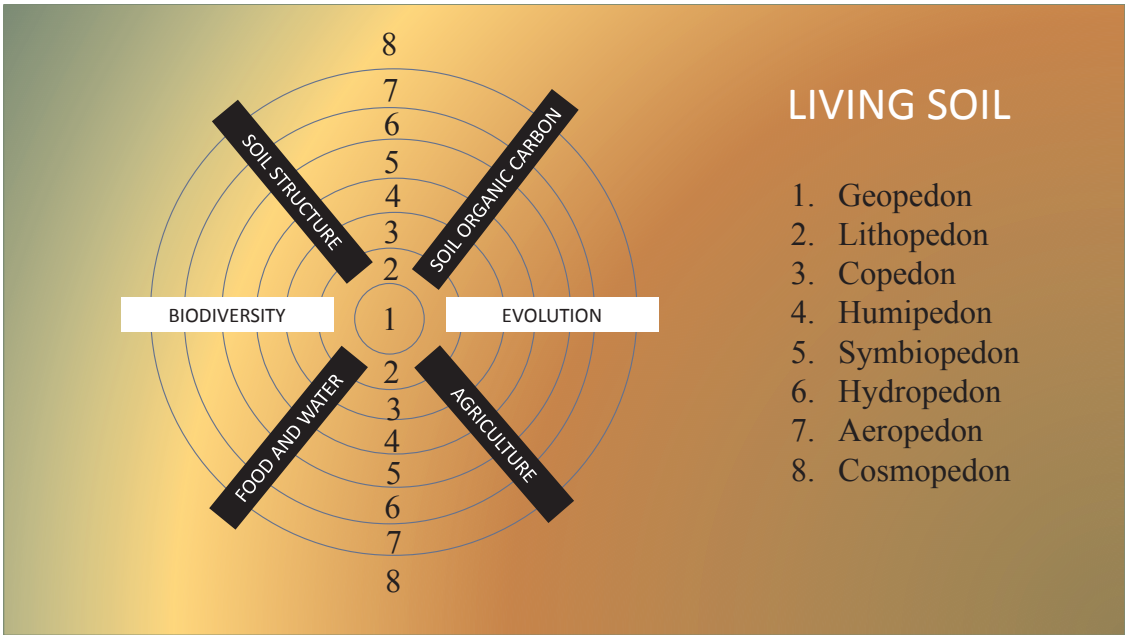

Fig. 1. A new concept of soil. Organic-mineral interface between living and dead organisms, made of 8 interconnected/interdependent pedons. Cosmopedon: particles (organic and not) running in the space; Aeropedon, Hydropedon: dust and microorganisms transported by air and water, respectively; Symbiopedon: soil attached to the surface of organisms (e.g. skin, roots) or inside them (involved in the processes of food biodegradation and co-evolution); Humipedon, Copedon, and Lithopedon: the soil of a classical soil profile; Geopedon: fossil soil, rock and fossils under evolution.

in the case of the proposed field-manuals, to take them into the field as helpful guide for soil classification. Furthermore, several contents provide material capable for educative- and divulgatory purposes.

3) To make all of our Humusica-contributions fit into the Journal, even a new article type called *Applied Field Research Article (AFRA)* was specially introduced, in which scientists may publish practical information for soil investigation (e.g. examples of soil classification; description of new types of soils; tools for soil exploitation and management; practical experiments in agriculture; examples of teaching activities, soil lessons). In Humusica, research articles, AFRAs, review articles, and short communications were collected in three volumes (H1, H2, H3).
Humusica is conceptually considered as a whole project, although the single topics not always perfectly meet the Journal's criteria.
4) Humusica authors propose to subdivide the soil profile into three sub-systems, presented for the first time in this Special Issue: Humipedon (topsoil richer in biodegradable organic matter, i.e., source of energy and water); Copedon (site of chemical-physical transformation of mineral matter and source of neo-formed mineral aggregates and water); Lithopedon (bedrock and source of water and minerals, storage room and source of fossil material).
5) In soil, the recycling of living organisms takes place. DNA breaks down in fragments, providing basic elements for other organisms. Involved in the process, soil inhabiting microorganisms influence the evolution and functioning of all the planet's ecosystems. We suggest to study the soil related to the natural evolution. As for animals and plants, each geological plaque (or even smaller insulated areas, indeed) may host relatively isolated types of soil. Humusica suggests a new concept of soil presented in articles 1 (H1), 13 and 17 (H2). A consequent and potentially sustainable exploitation of the Humipedon is presented in articles 18 and 19 (H2).
6) To evolve are not species, nor populations or genes but ecospheres containing organisms forming functional natural systems WITH soil.
7) Soil is a partially invisible, complex, interacting matrix that envelops the entire planet. It inhabits even living organisms and extragalactic space (Fig. 1, corresponding to the cover figure of the Humusica Special Issue).

How to read/use Humusica

All the articles collected in the Humusica Special Issue are structured in three volumes:

Humusica 1 (H1): dedicated to natural terrestrial (aerated, rather climacic and forest) humus systems

In this volume, after a general introduction about soil and its morpho-functional classification (articles 1, 2 and 3), the authors present all possible diagnostic horizons that one can find in the field (article 4). Based on presence/absence and relative thickness of these horizons, a step-by-step classification of humus systems and forms is illustrated in articles 5 and 6, dry and hydromorph topsoils, respectively. A detachable dichotomous (presence/absence of defined diagnostic horizons) version of the humus forms classification key is furnished, as well as an equivalent iPhone application (Terrhum) available on Apple store. Two reviews (articles 7 and 8) dedicated to humus forms sampling processes and soil biodiversity conclude volume 1.

Humusica 2 (H2): dedicated to Histic (peats), Aqueous (sea sides), Para (Crusto, Bryo, Rhizo, Ligno, Anaero, Archaeo) and Anthropogenic (Agro and Techno) humus systems

Articles 9, 10, 11 and 12 correspond to keys of classification of soil horizons and humus systems of wetlands, peats and sea-sides. Article 13 deals with the initial phases of soil construction, through pioneer humus systems, from thin Crusto to thicker Bryo, Rhizo or Ligno humus systems in terrestrial ecosystems, or Archaeo and Anaero of submersed ecosystems. Articles 14 to 19 are dedicated to anthropogenic humus systems and agriculture; these articles support a biological/ecological concept of soil and sustainable agricultural strategies, to preserve organic matter and soil organisms.

Humusica 3 (H3): a supplementary collection of specific information (e.g. case studies; short reviews; novel tools).