

BOOK REVIEWS, NOTES AND COMMENTS

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**EVOLUZIONE BIOLOGICA
E RIVOLUZIONI CULTURALI**
**Un approccio
alla complessità
degli esseri viventi**
Filippo Belardelli,
Eleonora Aricò
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*[Biological evolution and
cultural revolutions. An
approach to the complexity of
living beings]*

As its first quotation, this book contains, unsurprisingly, that of the British biologist and naturalist Charles Darwin “Man in his arrogance thinks himself a great work, worthy the interposition of a great deity. More humble, and I believe truer, to consider him created from animals”.

This citation is also prolegomenon to address the structurally biological perspective that leads and directs this text, which opens with an initial chapter: “*Prima del DNA: le teorie sull’evoluzione biologica*” (“Before DNA: theories of biological evolution”), just to seal its expository path. The chapter that follows is, in fact, more overtly historical: “*Il dibattito sull’evoluzione tra Ottocento e Novecento*” (“The Debate on evolution between the Nineteenth and Twentieth centuries”).

The text also delves into the ideological drifts that start from Lamarckism and Darwinism, dwelling on the Lysenko case in the Soviet Union, on the long and hard-fought (never dormant) history of Social Darwinism, eugenics and physical anthropology: these disciplines both serve as sad biological bases of the “ethological” views that led to a terrible extermination operation based just on the alleged difference and “inferiority,” even behavioral, of the various human “races”. Thus, increasing some of the frequently nefarious effects of seemingly innocuous biomedical research: perhaps confined to the icy environments of the inquiry, conducted among laboratories, stables and sterile rooms.

The crux of the book is what the authors call the “overcoming of the geno-centric view,” a detailed history of that crack in the central dogma of biology that will also profoundly influence the scientific generations of this volume’s authors. Text precisely built on the careful selection of some of the most relevant “steps and passages” in recent biomedicine.

The analytical novelty sparked by Epigenetics, the pivot of Chapter 4, permeates and branches out into the whole book (which, however, represents an overview that is never overly didactic and absolutely free of conventional overtones), outlining some of the main topics in contemporary biomedical disciplines. It overviews the analysis of complex systems, which obviously invests the dynamic assemblies that make up a biological organism (with emphasis on System Biology) as well as the interaction between different organisms and individuals (e.g., social interactions), the tumultuous contemporary studies on the microbiota and consequently on the new prospective analyses on how a dietary style can profoundly affect our health. This latter issue includes a roundup on the development between nutrigenetics and nutrigenomics, also complemented by some original and vivid information on the environmental conditioning affecting gametogenesis.

The chapter editorially placed at the center of the volume, entitled: “*Epigenetica ed ereditarietà*” (“Epigenetics and heredity”) represents the most lively and original contribution of the text, and not surprisingly takes its cue from the role of genes and environment in the determination of aggressive and violent behavior (in laboratory mice as in the human species).

In particular, it narrates of a study that astonished and in its own way revolutionized the style of analysis of phenomena whose regulations are even transmitted for the successive generations: this thanks to the phenotypic expression of genotypes that preserve traces of biographical events occurred during previous generations. Subtly, the discussion implies in not even a little overt form, how basically the triumph of contemporary epigenetics in some ways “compensates” for the Lamarckist viewpoint. A perspective, this latter, very often completely obliterated by the objectively more compelling Darwinist positions: those later exalted by that long phase of contemporary neo-Darwinism that followed the mighty advance of post-Mendelian genetics, and especially by the discovery in the mid-1950s of DNA and RNA as the bases of the transmission of genotypic and therefore phenotypic characters of all living organisms.

One of the features of this text is precisely the wise ability of Belardelli and Aricò to choose a few paradigmatic studies (not surprisingly, whose authors earned Nobel Prizes), almost as if they were steps on a long ladder that gradually advanced the biomedical sciences.

However, the most original feature of this book, which really makes it a relevant publishing event, is the unusual fusion of philosophical-oriented perspectives in a text that dynamically reviews the major advances in contemporary biomedicine. The references to Spinoza, the almost surreal presence of a philosopher

who has certainly influenced generations conducting research since the late 1970s is that of Emanuele Severino. Alongside their fathers, the founders of Western philosophy emerge and accompany the biomedical discoveries, almost providing a frame of reference for the purely scientific activities that unfold over the decades. The reference to “*Il canto notturno di un pastore errante dell’Asia*,” equal poem by Giacomo Leopardi, reveals the deep humanistic culture, which alongside Descartes and philosophers T. Morton or Y.N. Harari, accompany the more specifically scientific chapters in complete heuristic harmony.

This is not by chance. Indeed, senior author Filippo Belardelli has both a degree in Philosophy and in Biological Sciences: which explains this particular style of exposition, where the history of ideas produced by original human minds makes little distinction between humanistic or scientific disciplinary backgrounds: we do not forget the debate within the British intellectual community that pitted those who, in the Royal Society, preferred the designation of “*natural philosopher*” instead of “*scientist*” for members whom we would then call scientists tout court today. The latter prevailed, as we know.

The text cannot fail to include the authors’ references to their past and actual specialized knowledge, from the lengthy studies on interferon to the reflections that a public institute dealing with cell biology necessarily exerts on industrial development, precisely due to the innovative capacities of research, especially that public research that has the ethical and moral task of making up for the lonely disciplinary areas that do not naturally attract private capital for their development. Also, the interest in advances in cellular and especially molecular bases in understanding phenomena of terrible social impact such as addiction testify to the ethical sensitivity of the authors.

Chapter 9 “*Le sfide dell’Homo sapiens per un mondo sostenibile*” (“The challenges of Homo sapiens for a sustainable world”), which encompasses the paragraphs “Who are we and where are we going?” and especially “Priority challenges for biomedical research today”, actually encapsulates a concise but visionary summary of what the challenges might be today for the near future of research, essentially aimed at the psychophysical well-being of humanity. We should never forget those areas of the planet where human survival is jeopardized by hunger or disease, perhaps diseases long since eradicated or effectively controlled in the wealthy parts of the planet. Hints of the interactions between sustainability management choices and their reflections on health conditions also touch on a topic as topical as it is burning. They demonstrate the authors’ deep sensitivity to sensitive issues as well.

The Preface to the book, written by Umberto Agrimi (veterinarian and executive at the Italian National Institute of Health), re-proposes an absolutely non-anthropocentric view; not coincidentally, it concludes with a fine quote from sociobiologist Edward O. Wilson who praises the structural unity of all living beings with the species *Homo sapiens*. Agrimi therefore emphasizes, as a militant researcher, the growing importance of One Health perspectives, those that see in the complex and

multifaceted world of animal and plant beings and in their environments, the analytic key to the future of biomedical sciences and global terrestrial health as well as its protection.

Very usefully, the text is rich with a voluminous glossary, which starts from a few general headwords to list highly specialized terms as well. It should be emphasized that throughout the text, glossary included, the humanistic flavor of this volume infuses the treatment through clever and regular reflections about the etymological origins of the individual scientific terms, another element that in its own way makes the volume a rather rare example of a successful fusion of C.P. Snow’s “Two cultures” (“*Due culture*”).

Finally, thanks to quotations or explicit acknowledgments, the book contributes also to reconstruct historically the Istituto Superiore di Sanità (the Italian National Institute of Health) that hosted and hosts the authors. This text leaves an editorial trace of the scientific activities of the presidents and directors who guided the Institute: on which stands out the unforgettable figure of the virologist Giovanni Battista Rossi, mentor of Belardelli (as of many of the best researchers of his generation) who, in a still in some respects marginal Italy, knew how to make the ISS a leader in the management of the “Aids emergency,” leaving a scientific, but also managerial, example that Belardelli himself, in his activity as head of complex and diversified structures, was able to continue and make flourish.

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INCONTRI CON GLI ASINI Percorsi educativi, formativi e terapeutici

Damiano Biscossi,
Elena Mignosi, Birgit Winther
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[Meeting with donkeys.
Educational, training
and therapeutic courses]

Animal-Assisted Therapy (AAT), often referred to as Pet therapy, is presently considered a therapeutic approach that involves domestic animals with the aim of promoting emotional, psychological, and physical health and well-being in humans. AAT interventions are often led by qualified professionals who facilitate structured interactions between patients and animals, with clearly defined therapeutic objectives [1]. It is important to distinguish AAT from Animal-Assisted Activities (AAAs), which do not have specific therapeutic goals,

as well as from the use of service animals, such as guide dogs for the visually impaired.

Although species like horses and donkeys have been increasingly employed in various contexts, dogs have long been regarded as the preferred species for pet therapy due to their long-standing evolution alongside humans, as well as their sociability and trainability. For example, therapeutic strategies that leverage the emotional connection between children with autism spectrum disorders and dogs may possibly be an effective complementary way to reduce social withdrawal. The simple, easily interpretable movements of dogs can help facilitate engagement in straightforward social actions that do not rely on verbal communication and are highly repeatable and predictable (e.g., throwing a ball for the dog to fetch, walking the dog on a leash, or giving hand commands) [2, 3]. However, it is important to recognize that while non-human animals are increasingly acknowledged for their ability to provide unique opportunities for positive social interaction, the evidence supporting the use of AAT in clinical populations is still limited by several methodological challenges, including a scarcity of randomized controlled trials and poor replication.

Italy is one of the few countries to have implemented national regulations for Animal-Assisted Interventions (AAI). In 2015, an agreement was formalized between the Italian Government and regional authorities, establishing official guidelines for AAI. These guidelines specify the training requirements for each single professional type involved in the design and delivery of AAI (i.e., veterinarians, animal handlers, health professionals), set behavioral standards for the animals involved, and outline actions to ensure the welfare of the animal involved and ongoing assessment of benefits for participants.

As part of the Italian National Institute of Health (Istituto Superiore di Sanità, ISS) activities, the team led by psychobiologist Francesca Cirulli contributed in the years to the development of the national guidelines and has spent over a decade conducting research to evaluate the actual benefits of AAIs for different populations [2-6]. The group also produced a technical-scientific report on the methodologies for assessing the suitability of the animals involved in AAIs and their welfare, edited by Nadia Francia [7]. In addition, in 2019, Francesca Cirulli and Marta Borgi edited the book *Che cos'è la pet therapy* (What is Pet Therapy) to provide the general Italian public with scientifically grounded insights into this complex topic.

According to the current Italian guidelines, only five species — dogs, horses, donkeys, cats, and rabbits — are allowed for AAT at the national level. A 2017 Italian survey found that donkeys were the third most commonly involved species in AAI [8]. However, despite some potential of these approaches, scientific evidence on the benefits of donkey-assisted interventions remains scarce [9, 10], especially when compared to the growing body of research supporting the positive effects of dog- and horse-assisted approaches on human health.

The present book provides the Italian public with an overview of interventions employing donkeys both in Denmark (Section 1) and in Italy (Section 2). The authors are all from the educational science field; therefore, inevitably this small volume exudes a humanistic aroma. The book is organized into chapters, each focusing on different facets of the human-donkey relationship. Chapter 1 offers an historical overview of donkeys in therapeutic settings, while the subsequent chapters delve into their potential to ameliorate mental health and support physical recovery in humans. The final chapter provides a compelling exploration of the bond formed between humans and donkeys, highlighting how this connection can also be applied in educational contexts. The text draws from a rich tradition of emotional bonding between humans and equines, featuring real-life, narrative-type stories and heartwarming anecdotes that illustrate the transformative power of animals in our lives. However, it lacks scientific evidence from international peer-review journals to substantiate its claim.

This essay has some limitations. The passionate approach taken by the faithful authors likely represents a minor flaw for a more rigorous scientific audience. Rather rich in content and accessible to a broad audience, the book may though provide a few valuable insights for healthcare professionals, veterinarians, and anyone interested in the emotional and behavioral traits of this somehow surprisingly complex animal species, whose ethological characteristics and behavioral changes have been shaped by a long domestication process, likely influenced by scattered selective actions from different and diversified human populations.

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