

**What makes us human.  
Biology, medicine, language, mind,  
ethics and religion**

**Lo que nos hace humanos.  
Biología, medicina, lenguaje, mente,  
ética y religión**

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**Tibayrenc, M., Ayala, F.** *Lo que nos hace humanos. Biología, medicina, lenguaje, mente, ética y religión.* Spain: Salt Terrae; 2021.

*Lo que nos hace humanos. Biología, medicina, lenguaje, mente, ética y religión,* is a book that essentially seeks to show a series of discoveries related to anthropology, without falling into another analysis of philosophical anthropology, since the intention of its authors has been to present the reader with a summary of scientific discoveries. First, it must be recognized that the volume is an excellent book, considerably useful if what you want is to be up to date on topics such as paleo-anthropology, population genetics, genetics and “evolution”, a topic

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that is highlighted here typographically for highlighting the fact that this is a topic to which the book continually returns.

The 288-page volume reviewed is made up of a total of seven chapters in which Tibayrenc and Ayala have addressed a series of contemporary debates that have arisen today's society around these issues, being a driving axis of the book “[...] discern between the solidly corroborated, the tentative, the doubtful and the unequivocally false” (p. 237).

This is how, with sharpness, the authors came to the determination that apparently scientific theories such as creationism and intelligent design are fallacious, since deep down they are nothing more than religious positions that try to pass off their postulates as theories and perspectives based on the science. The authors show very well how science and religion can be compatible fields, however, this compatibility is only noticed under one condition: as long as science and religion each remain in their sphere of competence, without pretending to that one enters the field of the other and tries to impose a predominant perspective. When one of them tries to replace the other, this attitude leads to the elaboration of erroneous theses about reality.

Relating now the structure with which Tibayrenc and Ayala approach the question of what makes us truly human, the volume begins by addressing in the first chapter, “The origins of humanity” (pp. 1-42) in relation to the advances that have been made in the study of the origin of man, our hominid ancestors and how they relate to today's *Homo sapiens*. In this sense, the anatomical and functional characteristics of the different hominids are studied to identify how they are related evolutionarily to current humans. Recent data are also studied, for example, on the coexistence of *Homo sapiens* with *Homo neanderthalensis* and the relationships that both species had with their hominid ancestors. Thus, it is established that the antiquity of man is a clearly corroborated fact, and it is shown how the African origin of the human being is the most plausible hypothesis that can be reached with the knowledge that we have today.

Later, in the second chapter on “Human diversity: taxonomic and medical implications. A journey through human genetic diversity in general” (pp. 43-92) the authors study the concept of *race* and its implications. It is also studied from population genetics how human diversity occurs in the world, in addition to analyzing the origin of different populations such as the Basque, Jewish and Indo-European populations.

Giving way to the third chapter on “Darwinian Medicine: Reinventing the wheel?” (pp. 93-120) the authors have carried out a complete study on the role of evolution in current diseases. There, the limits of Darwinian explanations of diseases are pointed out, showing their explanatory weaknesses, the role of balanced selection in various diseases is studied, and how evolution intervenes in the manifestation of other health conditions such as neoplasias and communicable diseases.

Already delving into the approach made in the fourth chapter, under the title “Brain genes, cognition, psychiatry and genetics” (pp.130-147), the authors studied topics such as human intelligence, monism and dualism. Within this framework of study, the debate on the scientific status of psychoanalysis is explored, the peculiarities of the human brain in relation to issues that are intended to elucidate or, at least, shed light on questions such as, for example, are there differences between the female and male brain?

An extremely important aspect addressed within the study developed in this fourth chapter, which cannot fail to be pointed out in this review, is the way in which the authors comment on the importance of not confusing the fields of ethics and politics with that of science. The foregoing, since doing science is not about adapting the products of science to what is “politically correct”, since it is not possible to deny the veracity of a well-corroborated theory just because in the eyes of society it seems immoral. The authors insist on being careful not to confuse the plausible with the true.

Upon reaching the fifth chapter “Scientific and ethical views on discriminatory thoughts in science and politics” (pp. 149-176) the

study of eugenics and racism is also covered, topics that undoubtedly belong to the field of knowledge of bioethics. In its content, this chapter addresses the study of the different types of eugenics that have occurred, its history and the diffuse limits that usually occur in practices such as genetic counseling or “soft eugenics” are shown. Consequently, both the pros and cons of eugenics are pointed out and the technical difficulties of its application are explained.

After the previous study, the reader finds himself facing the sixth and seventh chapters “Science and religion: Is dialogue possible?” (pp. 177-200). “Non-scientific explanations Creationism and Intelligent Design” (pp. 201-232). These are in my opinion, the most interesting chapters of the whole volume, because the authors propose to the reader to approach this problem from the perspective of the theory of evolution and the literalist interpretation of the Bible, and because of the way they opportunely pointed out that “when scientists speak of the ‘theory’ of evolution, they use the term theory in a different sense from that given to it in common language. In this [...] *theory* often means *assumption or hunch* [...]. In science, however, a theory is a corroborated explanation of some aspect of the natural world that incorporates observations, facts, laws, inferences, and tested hypotheses” (p. 215). In this way, the authors state that the religious meaning of the Bible should not be confused with a scientific theory, to rule out pseudo “scientific” explanations such as creationism and intelligent design. They also explain how the notion of *irreducible complexity* is frequently used to deny evolution and how this can be explained in the light of natural selection and not, the authors insist again, appealing to a direct intervention of divinity. Some may consider the theory of evolution as an unverifiable hypothesis. The detractors of the theory of evolution may insist that the combinations required for the appearance of man, for example (although it would also apply to parts of certain unicellular organisms that would imply gigantic combinations of elements to give the result) is enormous and does not reach the time of the very existence of the Earth. However, the authors try to refute the foregoing, giving as an example the resistance of bacteria to antibiotics that, taking the

probability in a single individual of achieving resistance, the number to achieve it is enormous ( $4 \times 10^{-16}$ ) but they point out: "...between 20 and 30 billion bacteria in the final culture manifest just such properties" (p. 227).

In this way, the authors remember how important it is not to fall into the fallacy of "God covers holes", that is, not to incur a god in response to that problem due to the lack of explanation of a scientific problem. In short, what the authors insist on is not to confuse doing good science with doing religion.

The conclusions reached by the volume review well what is established by science, what is tentative, what is doubtful and what is simply false. Within the first, it is worth highlighting the fact that humans are animals, they are primates that appeared on this earth since ancient times. Of the latter, it is stated that the genetic mechanisms that govern behavioral traits have barely begun. In addition, regarding the latter, reference is made to the literal interpretation of the Bible regarding the issue of human origin.

Thus, the book becomes an excellent tool to fully understand the scientific bases of anthropology. In such a way that these are not confused with philosophy, but at the same time provide current knowledge so that research in the field of bioethics have a clearer outlook on issues where ethical disputes usually arise or arise, such as those that revolve around the role of the environment in behavior, genetics in human behavior, racism, among others. In this way, the book also makes it possible to understand the role of evolution in different fields of humanity and to update the status of the most controversial anthropological issues with an accessible language, without this implying renouncing the technicalities of science. This book is, in short, a rigorous exposition of scientific issues in relation to what is specifically human.

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