

IT IS REASONABLE TO UPHOLD A NON-REDUCTIVE CHRISTIAN MONISM? THEOLOGY CONFRONTED WITH THE MIND-BRAIN AND BODY-SOUL PROBLEM

LUIS O. JIMÉNEZ-RODRÍGUEZ

University of Puerto Rico at Mayagüez, Puerto Rico
Pontificia Universidad Javeriana, Bogotá, Colombia

ABSTRACT: Is Christian Anthropology essentially dualist or it is reasonable to uphold a particular form of Christian monism? Recent developments in neurosciences challenge the idea of an immaterial soul, source of spiritual operations such as cognition, volition, freedom, values, aesthetics and even religiosity. This article presents two neurological anthropologies, one represented by Jean Pierre Changeux' book *L'homme neuronal* and the other represented by Gerald Edelman's work. Through an analysis of biblical anthropology and some relevant texts written by Saint Irenaeus of Lyon and Saint Thomas Aquinas, the article seeks to demonstrate the existence of a Christian tradition characterized by a non-reductionist monism. Furthermore, a series of pertinent theological principles are retrieved from this tradition, which have inspired, and still ought to inspire, the development of a non-dualist Christian Anthropology: the principle of creation, an incarnation principle and an eschatological principle. This Christian tradition and a dialogue with natural sciences inspired two contemporary Christian theologians to develop their holistic anthropologies: Karl Rahner and Alexander Ganoczy. Finally, the article discusses what could be the contribution of theology in the ongoing interdisciplinary dialogue between neuroscientists, philosophers of mind and theologians.

PALABRAS CLAVE: Mind-Brain Problem, Body-Soul Dualism, Monism, Matter, Spirit, Reductionism, Non-Reductive Physicalism, Christian Anthropology, Neurosciences, Science-Faith Dialogue.

Es razonable mantener un monismo cristiano no reductivo? La teología confrontado con el problema Mente-Cerebro, Cuerpo-Alma

RESUMEN: ¿Es Cristiana una Antropología esencialmente dualista o es razonable mantener una forma particular de monismo cristiano? Los acontecimientos recientes en neurociencias desafían la idea de un alma inmaterial, fuente de las operaciones espirituales tales como la cognición, volición, la libertad, los valores, la estética e incluso religiosidad. Este artículo presenta dos antropologías neurológicas: una representada por el libro *L'homme neuronal* de Jean Pierre Changeux y la otra representada por la obra de Gerald Edelman. A través de un análisis de la antropología bíblica y algunos textos relevantes escritos por san Ireneo de Lyon y Santo Tomás de Aquino, el artículo busca demostrar la existencia de una tradición cristiana que se caracteriza por un monismo no reduccionista. Por otra parte, una serie de principios teológicos pertinentes permiten recuperar esta tradición, que ha inspirado, y todavía debe inspirar, el desarrollo de un no-dualismo cristiano en antropología: el principio de la creación, un principio de encarnación y un principio escatológico. Esta tradición cristiana y el diálogo con las ciencias naturales inspiraron a dos teólogos cristianos contemporáneos para desarrollar sus antropologías holísticas: Karl Rahner y Alexander Ganoczy. Por último, el artículo describe lo que podría ser la contribución de la teología en el diálogo interdisciplinar en curso entre los neurocientíficos, los filósofos de la mente y los teólogos.

PALABRAS CLAVE: Mente-Cerebro, Cuerpo-Alma, dualismo, monismo, materia, espíritu, reduccionismo, fisicalismo no reductivo, antropología cristiana, neurociencias, diálogo Ciencia-Fe.

1. INTRODUCTION: CURRENT CHALLENGES TO THEOLOGY FROM NEUROSCIENCES AND PHILOSOPHY OF MIND

Current scientific research in neurosciences and evolutionary biology triggers a change of paradigm in present anthropological representations. Today, neuroscientists

and philosophers of mind try to explain many human aspects and operations that before were considered as «spiritual», in terms of biological process happening in the brain and the nervous system. Among those operations and aspects are intelligence, will, freedom, human values, aesthetics and religiosity¹.

There are some global neuroscientific theories that aim for a comprehension of how the brain develops and functions. They seek to provide global understanding of perception, memory, learning, intelligence, internal interaction with other anatomical systems, external interactions with the environment and intentionality². In addition, these global theories seek to explain that mysterious process that we call consciousness and the organism's novelty actions and reactions vis-à-vis the environment stimulus.

This change of paradigm in anthropological representation triggers a series of theological concerns, especially in Christian anthropology. Just to mention some aspects where theology experiences a confrontation are the following:

- If there is no a soul that is essentially different from the body, as some neuroscientist and some philosophers argue, how can we understand the spiritual dimension of the human being?
- Can we talk about human immortality, salvation and eternal life without considering an immortal soul? Some argue that there is a relation between God, the human soul, and eternal life that constitutes one essential belief system³.
- According to neurosciences all experiences are mediated through our nervous system⁴. In this anthropological representation, how can we understand religious experiences?
- Traditionally the soul was considered as what makes us distinctively human. In the absence of an immaterial soul, is there something that makes us uniquely human and different from the animal?
- Can we maintain that we are free human beings or are we determined by brain functions and bio-chemical reactions? What is the basis of a free covenant between God and the human being? What is the ground of the human dignity?

Most of the issues are ground in the challenge to the idea of an immaterial and immortal soul. This article aims to address this problem. Our basic hypothesis is that the idea of an immortal substantial soul is not an essential part of the Christian belief system. There is a form of non-reductionist Christian monism that exists since the beginning of Christianity. Christian Anthropology, which is a systematic theological and philosophical reflection, could assume and integrate recent results coming from neurosciences without accepting the reductionist materialism that some presuppose.

This article starts with a summary of two models of neurological anthropology. One is reductionist and the other is not. Then we will expose biblical anthropology and Saint Irenaeus of Lyon's anthropology to show that the central nucleus of Christian Anthropology is not dualist. Next, we will present Aquinas' anthropology due to its enormous influence in latter reflections. Finally, we will present two contemporary anthropologies developed by two theologians: Karl Rahner's and Alexander Ganoczy's. The first one is a development

¹ CANOBBIO, G., *Sobre el alma. Más allá de mente y cerebro*, Ediciones Sigueme, Salamanca, 2010, p. 13.

² EDELMAN, G. M., *Wider Than the Ski: A Revolutionary View of Consciousness*, Penguin Books, New York, 2005, p. 33.

³ OVIEDO, L., «Challenges to Theology», *Pensamiento*, vol. 67 (2011), no. 254, p. 600.

⁴ MURPHY, N., «Non Reductive Physicalism: Philosophical Issues», in BROWN, W. S., MURPHY, N. and MALONY, H. N., *Whatever Happened to the Soul?*, Fortress Press, Minneapolis, 1998, p. 132.

that considers the theory of evolution and the second assumes neuroscientific results through the mediation of a structural anthropology.

2. NEUROSCIENTIFIC ANTHROPOLOGIES

In this section we present a summary of two major theories of the mind-brain relationship. These theories provide the basis for two global anthropological models. Following Javier Monserrat, we name one the «Mechanistic-reductionist-computational» model and the other the «Emergentist-Evolutionist-functional» model⁵. The first one is represented by Jean-Pierre Changeux' book *L'homme neuronal*. The second model is represented by Gerald Edelman's work.

2.1. *Mechanistic-reductionist-computational model*

This paradigm is also called eliminative materialism or reductionist materialism. According to this model everything is explained by neurological mechanisms and biochemical processes⁶. Our decisions, ideas, actions, consciousness, even what we consider as religious experiences are epiphenomena, a byproduct of biochemical functions in our brain. Let's expose Jean Pierre Changeux' initial ideas.

2.1.1. Jean Pierre Changeux: the human being as a Neuronal Man

In his book *L'homme neuronal*, this well-known French neuroscientist expresses his objective to erase the barriers that separate the mental from the neural, human sciences from neurosciences⁷. His basic hypothesis that underlines the whole book is the following: there is an identity between mental states and physical-chemical events inside the brain⁸. All human actions, sensations and behaviors are described in terms of neural networks' activities. In this book, Changeux affirms that molecular biology and neurosciences would reduce the spiritualist theses and even the emergentist position to emptiness⁹. The spirit or mind is nothing more than ions charged and the intervention of neurotransmitters at the synaptic level¹⁰.

His proposed method to study the brain is the reduction to the elementary level of neurons and synapses¹¹. Through this method, he argues that the elements that compose the brain are very similar to those that compose the brain of a mice¹² and even the matter of the non-living world¹³. Therefore, he sustains that nothing is specific to the human being¹⁴.

⁵ MONSERRAT, J., *La percepción visual: la arquitectura del psiquismo desde el enfoque de la percepción visual*, Biblioteca Nueva, Madrid, 2008, p. 18.

⁶ GANOCZY, A., *Christianisme et Neurosciences*, Odile Jacob, Paris, 2008, pp. 73 and 320.

⁷ CHANGEUX, J. P., *L'homme neuronal*, Pluriel, Paris, 2012, pp. 209 and 333.

⁸ CHANGEUX, J. P., *L'homme neuronal*, p. 334. JEAN PILLON, *Neurosciences cognitives et conscience. Comprendre les propositions des neuroscientifiques et des philosophes*, Chronique Sociale, 2008, pp. 93 and 209.

⁹ CHANGEUX, J. P., *L'homme neuronal*, pp. 209-210 and 334.

¹⁰ CHANGEUX, J. P., *L'homme neuronal*, p. 51.

¹¹ CHANGEUX, J. P., *L'homme neuronal*, p. 123.

¹² CHANGEUX, J. P., *L'homme neuronal*, p. 86.

¹³ CHANGEUX, J. P., *L'homme neuronal*, p. 123.

¹⁴ CHANGEUX, J. P., *L'homme neuronal*, p. 125.

Changeux proposes an anthropological model that he calls the Neuronal Man¹⁵ that represents the human brain as a computer¹⁶. Following that model, neurosciences are capable to explain in neural terms what before was considered to be a domain of philosophy and theology: the mental objects such as percepts, images and concepts. The mental objects are identified with chemical and electrical activities of a large population of neurons¹⁷. The cerebral machine, which is a neuronal structure, performs computations over the mental objects¹⁸, links and combines them to produce more complex mental objects¹⁹.

Human consciousness is nothing more than a global regulation and surveillance system that carries the computations over the mental objects²⁰. With respect to human emotions, they are related to the interconnections between the cerebral cortex and the limbic system that act over individual's motivations²¹. It is well known that brain injuries at the frontal lobe cause emotional troubles, perturbations of the body's orientation²², incapacity to judge our own actions and even cognitive troubles²³.

In *L'homme neuronal* Changeux explains mysticism or religious experiences as hallucinations²⁴. Mystical experiences are nothing more than auditive or visual hallucinations that modify the relationship between the subject and the exterior world without an external stimulus and without the regulation of a conscious will²⁵. Therefore, for Changeux, the human being has nothing to do with the *Spirit*. It is simply a Neuronal Man²⁶. The thinking process, emotional experiences and religious events are reduced to biological activities. However, the French neuroscientist does not explain how the thinking process can be derived from the brain functions²⁷.

In spite of that, we must mention that Changeux moderates later his position seeking the connection between the Neuronal Man with ethics, aesthetics and human creativity²⁸. He affirms latter the following: «if neurosciences are still at the beginning, philosophers, writers and theologians have produced a rich literature about the phenomenon of consciousness. Let's be just with them.»²⁹

¹⁵ CHANGEUX, J. P., *L'homme neuronal*, p. 159.

¹⁶ CHANGEUX, J. P., *L'homme neuronal*, pp. 125-126 and 161. Patricia Churchland argues a similar position: «A good model for understanding mind-brain functions is the computer [...]. The computer metaphor suggests that the mind-brain, at the information processing level, can be understood as a kind of digital computer; the problem for cognitive psychology is to determine the program that our brains run.» See CHURCHLAND, P. S. and SEJNOWSKI, T. J., *Neural representation and neural computation, Philosophical Perspectives* 4:343-382 (1990), p. 352.

¹⁷ CHANGEUX, J. P., *L'homme neuronal*, pp. 164 and 174.

¹⁸ CHANGEUX, J. P., *L'homme neuronal*, p. 170.

¹⁹ CHANGEUX, J. P., *L'homme neuronal*, p. 175, 200.

²⁰ CHANGEUX, J. P., *L'homme neuronal*, p. 183.

²¹ CHANGEUX, J. P., *L'homme neuronal*, p. 198.

²² CHANGEUX, J. P., *L'homme neuronal*, p. 198.

²³ CHANGEUX, J. P., *L'homme neuronal*, pp. 200-201.

²⁴ CHANGEUX, J. P., *L'homme neuronal*, Pluriel, Paris, 2012, p. 197.

²⁵ CHANGEUX, J. P., *L'homme neuronal*, pp. 183-185 and 190.

²⁶ CHANGEUX, J. P., *L'homme neuronal*, p. 211.

²⁷ FELTZ, B., *Neuroscience et anthropologie*, p. 10. <https://www.uclouvain.be/cps/ucl/doc/isp/documents/feltzneurosc.pdf>. Published in DELSOL, M., FELTZ, B., GROESSENS, M. C., *Intelligence animal, intelligence humaine*, Vrin, Paris, 2008, pp. 7-40.

²⁸ CHANGEUX, J. P. and RICOEUR, P., *Lo que nos hace pensar. La naturaleza y la regla*, Ediciones Península, Barcelona, 1999, pp. 15 and 162.

²⁹ Quoted by GANOCZY, A., *Christianisme et Neurosciences*, p. 75.

2.2. *The Emergentist-evolutionist-functional model.*

This second model is also called non-reductive materialism, emergent monism or biological naturalism. This model opposes both, anthropological dualism and the reduction of the human mind to mere neuronal biochemical processes. Moreover, it considers that the representation of the brain as a computer does not describe the enormous complexity of the human mind and brain's operations. Let's discuss one of its leading figures.

2.2.1. Gerald Edelman: the Theory of Neuronal Group Selection and the emergence of higher consciousness

Gerald Edelman has contributed significantly to elaborate the emergentist-evolutionary-functional model³⁰. His objective was to put «mind back into nature»³¹ and the development of a scientific theory that explains the emergence of the human mind and consciousness³². Through all his works, Edelman argues without hesitation against a computational reductionist model³³. According to Edelman, the human brain is not the product of a design process that specifies *a priori* its internal connections and its possible machine states that include fixed algorithms³⁴. There are many aspects of human mind that this computational model neglects: the brain's evolution and development; the organism's intentionality³⁵; the rich variability of neurons and their connections; and local differences of the brain³⁶.

Against Changeux' *L'homme neuronal*, Edelman explains that it is not the brain's individual components that are special but how the whole is organized and structured³⁷. The brain is the most complicated material entity in the known universe³⁸. In additions to individual neurons and their functions, we need to understand the whole morphological structure of the animal. The whole animal is the single basis for behavior and mind development³⁹.

To explain the complexity of the brain and the emergence of mind, Edelman proposes a global theory named «Neural Darwinism» or «Theory of Neuronal Group Selection» (TNGS)⁴⁰. His theory is not based on instructions as the mechanistic-reductionist-computational model, but on Darwin's notion of population and selection⁴¹. The main idea is the «selection of particular elements or states from a large repertoire» in a population.

TNGS contains three mechanisms that explain the rich structural diversity of the nervous system: (a) Developmental Variation and Selection, (b) Experiential Selection and (c) Reentrant Signaling.

³⁰ MONSERRAT, J., «Gerald M. Edelman y su antropología Neurológica», *Pensamiento*, vol. 62 (2006), núm. 234, p. 463.

³¹ EDELMAN, G M., *Bright Air, Brilliant Fire: On the Matter of the Mind*, Basic Books, New York, 1992, p. 15.

³² EDELMAN, G M., *Wider Than the Ski*, pp. 38-39. MONSERRAT, J., «Gerald M. Edelman y su antropología Neurológica», p. 443.

³³ MONSERRAT, J., «Gerald M. Edelman y su antropología Neurológica», p. 449.

³⁴ EDELMAN, G M., *Wider Than the Ski*, pp. 32-33, 35 and 38. GERALD EDELMAN, «Neural Darwinism: Selection and Reentrant Signaling in Higher Brain Function», *Neuron*, Vol. 10, February 1993, p. 115. EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 13.

³⁵ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 68.

³⁶ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 7. EDELMAN, G M., *Wider Than the Ski*, p. 34.

³⁷ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 16.

³⁸ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 17.

³⁹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 49.

⁴⁰ EDELMAN, G M., *Wider Than the Ski*, pp. 32-33. EDELMAN, G M., «Neural Darwinism», p. 116.

⁴¹ EDELMAN, G M., *Wider Than the Ski*, pp. 32-33. FELTZ, B., *Neuroscience et anthropologie*, p. 2.

(a) Developmental Variation and Selection. This mechanism is about the formation of the neuroanatomy during the fetal stages of development that characterizes every species⁴². This mechanism develops the connections among neurons, which are not predetermined by some predefined genetic process as the connections between components inside computers are by design and construction⁴³. During this developmental stage there is the creation of groups of cells characterized by morphological variations in particular localizations where genes only impose constraints⁴⁴ to complex operations that include random events and processes⁴⁵. These morphological variations arise at the level of synapses producing primary repertoires, which consist of millions of variant neuronal groups or circuits⁴⁶. Moreover, the developmental process selects populations of neurons⁴⁷. The random nature of the production of these circuits entails that, although the whole process is similar for a species, the final structure is unique for each individual⁴⁸.

(b) Experiential Selection. This phase overlaps with the previous selective mechanism. It does not produce changes in the anatomical structure of the brain or nervous system⁴⁹. It produces variations and modifications of existing synaptic connections. Through the stimulus of the organism's behavior and its interaction with the environment some synaptic connections are strengthened (selected) and others are weakened⁵⁰. These modifications in the synaptic connections, due to the organism behavior, produce secondary repertoires⁵¹.

(c) Reentrant Signaling. Through the organism's behavior and interaction with the environment some resulting neural maps emerge. A Neural map is a structurally arranged group of neurons that connects with other maps⁵². Neural maps send signals to other maps through local or long distance reciprocal connections⁵³. Reentry is the ongoing interchange of parallel signals among neural maps in different brain areas⁵⁴. This process enables widely distributed and separated neural maps to interact in a coordinate and synchronized manner⁵⁵ by means of bidirectional and recursive signals. This coordination and synchronization yields new functions⁵⁶ and provides coherence to activities localized in different maps, e.g., the integration of the color, orientation and movement of a perceived object⁵⁷.

This dynamic interaction across multiple neural maps produced by environmental stimulus, organism's behavior and conditioned by previous reentries strengthens (selects) some connections between these maps⁵⁸. Consequently, correlations between neural groups change continuously through time under different stimulus conditions⁵⁹. In addition,

⁴² EDELMAN, G M., *Wider Than the Ski*, p. 39. GERALD M. EDELMAN, *Bright Air, Brilliant Fire*, p. 83.

⁴³ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 23.

⁴⁴ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 69 and 83.

⁴⁵ EDELMAN, G M., *Wider Than the Ski*, p. 39.

⁴⁶ EDELMAN, G M., *Wider Than the Ski*, p. 39.

⁴⁷ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 83.

⁴⁸ EDELMAN, G M., «Neural Darwinism», p. 117.

⁴⁹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 83.

⁵⁰ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 83-85.

⁵¹ EDELMAN, G M., «Neural Darwinism», p. 117.

⁵² EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 19.

⁵³ EDELMAN, G M., *Wider Than the Ski*, p. 39.

⁵⁴ EDELMAN, G M., *Wider Than the Ski*, pp. 39-41.

⁵⁵ EDELMAN, G M., «Neural Darwinism», p. 117. GERALD M. EDELMAN, *Bright Air, Brilliant Fire*, p. 85.

⁵⁶ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 85.

⁵⁷ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 41.

⁵⁸ EDELMAN, G M., «Neural Darwinism», p. 117.

⁵⁹ EDELMAN, G M., «Neural Darwinism», p. 119.

there exist a higher structure, capable of perceptual categorization⁶⁰, called by Edelman «global mapping». It couples multiple maps connected through reentries with the animal's sensorimotor behavior. This global mapping, which is in permanent modification⁶¹, articulates multiple local maps and interacts with non-mapped parts of the brain (the hippocampus, the basal ganglia and the cerebellum)⁶².

The organism's responses to the environment are selected through what Edelman calls «value system» or «selected value pattern»⁶³. «The driving forces of animal behavior are thus evolutionary selected value patterns that help the brain and the body to maintain the conditions necessary to continue life»⁶⁴. These value systems enable the animal to adapt its behavior to the environment through «rewards and responses necessary for survival».

Through TNGS Edelman explains mental processes with a clear physiological basis⁶⁵ that before were attributed to a substantial spiritual soul: perceptual categorization, memory, learning, development of concepts and consciousness. Perceptual categorization is based on the construction of maps influenced by external stimulus, associations and generalizations⁶⁶. Through perceptual categories an organism makes sense of the world and organizes an adaptive behavior by integrating signals coming from the body and the environment⁶⁷. The fundamental mechanism of memory is the change of synaptic strength (selection)⁶⁸, which is the result of a continuous process of re-categorization of previous perceptual categories⁶⁹. Without the immediate presence of a stimulus, the brain constructs concepts from previous perceptions and from the memory of past interactions and behavior. These concepts enable the organism to identify things and actions in order to controls its behavior⁷⁰. As a consequence, the process of concepts' formation, with its dependency on perception, memory and learning, is embodied.

Following William James, Edelman considers that consciousness is a process and not a substance⁷¹. Edelman rejects that consciousness, which shows intentionality, is an epiphenomenon of computational processes⁷². Furthermore, he makes the distinction between a primary consciousness and a higher order consciousness.

The ability to create a scene through the correlation of past categorizations stored in memory and present perceptual categories enables the emergence of primary consciousness⁷³. The primary consciousness, which is the consciousness of a non-linguistic animal⁷⁴, is a kind of «remembered present» that is limited to the representation of the immediate present and lacks a concept of personal-self⁷⁵. It enables the animal to choose its response from multiple possibilities in a novel environment increasing its possibility

⁶⁰ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 89. EDELMAN, G M., *Wider Than the Ski*, p. 160.

⁶¹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 91.

⁶² EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 89.

⁶³ EDELMAN, G M., *Wider Than the Ski*, p. 25. MONSERRAT, J., «Gerald M. Edelman y su antropología Neurológica», p. 455.

⁶⁴ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 94.

⁶⁵ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 99-101.

⁶⁶ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 109 and 125.

⁶⁷ EDELMAN, G M., *Wider Than the Ski*, p. 49.

⁶⁸ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 103.

⁶⁹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 102.

⁷⁰ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 108.

⁷¹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 37.

⁷² EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 112.

⁷³ EDELMAN, G M., *Wider Than the Ski*, p. 57.

⁷⁴ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 112.

⁷⁵ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 115, 120 and 125.

of survival⁷⁶. However, it does not integrate the past and the future as part of a correlated scene. For that reason the organism with only primary consciousness cannot develop future plans or projects⁷⁷. This primary consciousness is required for the evolution and emergence of the higher-order consciousness.

According to Edelman, there is a higher order consciousness that involves the ability to construct a scene in terms of the past and the future. It emerges from the evolution of a new form of symbolic memory⁷⁸ that enables the elaboration of a social-self based on past social interactions. It is the consciousness of an organism that is conscious of being conscious⁷⁹. This higher order consciousness is constituted by symbolic memory and language that allow social and symbolic interactions and transmissions to others. It includes a learning process where the past is integrated making possible future interactions with the world⁸⁰. Higher order consciousness implies the elaboration of a dynamic model of the world through language, concepts, social and symbolic relationships that integrate the past and the future⁸¹. All of these allow to anticipate what lies ahead and to plan a response. In other words, higher consciousness forms and, at the same time, is being formed by culture as a symbolic universe constituted through interactions in history. Here we are not far from the philosophical and even theological concepts of «person», «community» and «transmission – tradition».

Clearly, Edelman is an anti-reductionist and anti-dualist: the mind is neither identical to physical-chemical process nor to an immaterial soul. He uses statements such as «the basis of the mental»⁸², «the emergence of consciousness»⁸³, «the personhood emerges»⁸⁴ and the «mind arises from the physical»⁸⁵. According to him, the necessary possession of neurons does not appear to be sufficient for the emergence of the mental⁸⁶.

Following a scientific viewpoint, Edelman considers himself a sophisticated materialist but not a reductionist!⁸⁷ He calls sophisticated materialism the idea that the mind does not exist disembodied⁸⁸. According to Edelman, «the mind arises as a result of physical interactions across an enormously large number of different levels of organization, ranging from the molecular to the social»⁸⁹. The mind emerges from material systems through a historical process, that includes environmental stimulus, organism activities, learning process through trials and error⁹⁰, a particular history of the organism⁹¹, which includes the organism intentionality, i.e., goals and purposes⁹².

Against any determinism, Edelman argues that the big number of diverse repertoires, the novelty of environmental stimulus and the random conditions of selection allow the

⁷⁶ EDELMAN, G M., *Wider Than the Ski*, p. 58.

⁷⁷ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 122.

⁷⁸ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 125.

⁷⁹ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 112, 115 and 131.

⁸⁰ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 131.

⁸¹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 133.

⁸² EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 33-34.

⁸³ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 101 and 166,

⁸⁴ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 167.

⁸⁵ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 140 and 161.

⁸⁶ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 34.

⁸⁷ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 161.

⁸⁸ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 162.

⁸⁹ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 140.

⁹⁰ FELTZ, B., *Neuroscience et anthropologie*, p. 3.

⁹¹ FELTZ, B., *Neuroscience et anthropologie*, p. 8.

⁹² EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 161.

human person to have many degrees of freedom or freewill⁹³. For that reason, he even rejects Freud's strong determinism. The human being is capable to plan and hope for the future and he is even capable to freely produce effects in the world. Nevertheless, it is a limited embodied freedom, influenced by previous unconscious behavior, biochemical events, and early interactions with the environment⁹⁴. Finally, for Edelman, each human mind is embodied and mortal⁹⁵.

Gerald Edelman's TNGS produced a scientific view of the human being that supports the Emergentist-evolutionist-functional model. This model is a non-reductionist monism open to philosophical and theological reflections.

3. ANTHROPOLOGY IN CHRISTIAN TRADITION: SCRIPTURES, SAINT IRENAEUS AND SAINT THOMAS AQUINAS

Do these scientific representations of the human being enter in conflict with Christian Anthropology? Or could theologians integrate many insights from neurological anthropology, being critical of reductionist aspects, that enable the elaboration of a Christian anthropology that finally breaks free with dualism? The following sections will analyze some elements of the Christian tradition in order to retrieve a non-reductive theological monism that will render possible such interaction. Let's start with Scriptures.

3.1. *Biblical anthropology*

Scriptures do not have an elaborate theological anthropology. However, recent exegetical studies show that Scriptures present a psychic-physical unity of the human person and do not show an anthropological body-soul dualism⁹⁶. The Old Testament mentions some aspects of the human being through the Hebrew terms *nepes* (sometime written as *nefes*), *basar*, *ruah* and *leb*. These terms were translated in the Septuagint and in the New Testament as *psyche*, *soma*, *pneuma* and *cardia*. Later, they were translated in English as soul, body, spirit and heart. Unfortunately, these English terms could be understood in dualistic or even tripartist categories. Let's see their original meaning in Scriptures.

3.1.1. *Nepes*

Nepes in the Old Testament implies diverse meanings. First, (a) it could mean «throat», organ through which we absorb meal and water. It is also the organ of breathing⁹⁷. Sometimes it means «breath» whose absence implies death⁹⁸. For these reasons, Hebrews considered the throat as the seat of the elemental vital needs⁹⁹. (b) *Nepes* also means the desire to preserve human life vis-à-vis any danger or need¹⁰⁰. It is the human desire

⁹³ EDELMAN, G M., *Bright Air, Brilliant Fire*, pp. 169-170.

⁹⁴ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 170.

⁹⁵ EDELMAN, G M., *Bright Air, Brilliant Fire*, p. 171.

⁹⁶ Quoted in CANOBBIO, G., *Sobre el alma. Más allá de mente y cerebro*, p. 44.

⁹⁷ WOLFF, H. W., *Anthropology of the Old Testament*, Augsburg Fortress, Philadelphia, 1974, p. 13.

⁹⁸ WENIN, A., «Âme (théologie biblique) », in LACOSTE, J-Y., *Dictionnaire critique de théologie*, Quadrige / Presses Universitaires de France, 3e Édition, Paris, 2007, p. 31.

⁹⁹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 14.

¹⁰⁰ WOLFF, H. W., *Anthropology of the Old Testament*, p. 15.

for material things, human realities, actions and even God¹⁰¹. It is also the seat of the whole range of emotions and feelings¹⁰². In addition, (c) it means the individual's fragile existence¹⁰³, linked to blood as the seat of life¹⁰⁴. The human person a living *nepes*, a living being, only through the breath produced by God¹⁰⁵. Through *nepes* the human being is distinguished from a lifeless corpse¹⁰⁶. Finally, (d) if it includes the possessive «me» (my *nepes*) it means the personal pronoun «myself», i.e., the individual personal identity.

Nepes was translated in the LXX as *psyche*, which covers almost the same meaning: breathing, life, desire, emotions and the living person¹⁰⁷. In Hellenistic Judaism the book of Wisdom makes reference to the immortality of the human being¹⁰⁸. Does this imply a belief in a substantial immortal soul? It is true that the belief of the bodily resurrection is not explicitly affirmed in the Book of Wisdom¹⁰⁹ but neither it refers to an immortal soul¹¹⁰. The allusion to immortality refers to a life with God and not to a property of an immortal soul detached from the body. Immortality of the whole human being is totally dependent on a relationship to God who decides to give it to the righteousness¹¹¹. The text in Wisdom 9,15 «*perishable body weighs down the soul, and this earthy tent burdens the thoughtful mind*» is not about platonic dualism. The author is not qualifying negatively matter or the body. It is affirming that our deliberations are weak (referring to verse 14) and its linkage to the earth (verse 15)¹¹². The Book of Wisdom uses concepts as body and soul. However, the mentality is clearly Jewish¹¹³. In the New Testament *psyche* preserves the same meaning as in the LXX. In conclusion, *nepes* is the living individual being who cannot preserve life through his own effort¹¹⁴. *Nepes* never means a nondestructive immortal life capable of living by an inner attribute after death¹¹⁵. Neither it is a substance endowed with spiritual faculties¹¹⁶.

3.1.2. Basar

Basar refers to some aspects of the human being and the animal. It has multiple meanings. First, (a) *basar* refers to visible parts of the body or to the whole human body¹¹⁷. It never refers to a lifeless corpse. It is a living being «in whom there is breath»¹¹⁸. (b) It also means a personal pronoun: my «*basar*» is equivalent to «myself»¹¹⁹. (c) It could mean the human being *per se* but in his bodily aspects. (d) It also refers to relationships, e.g.,

¹⁰¹ WENIN, A., «*Âme*», p. 31.

¹⁰² WOLFF, H. W., *Anthropology of the Old Testament*, pp. 17-18.

¹⁰³ WENIN, A., «*Âme*», p. 31.

¹⁰⁴ WOLFF, H. W., *Anthropology of the Old Testament*, p. 19.

¹⁰⁵ ANDRE WENIN, «*Âme*», p. 31.

¹⁰⁶ HANS WALTER WOLFF, *Anthropology of the Old Testament*, p. 22.

¹⁰⁷ ANDRE WENIN, «*Âme*», p. 32.

¹⁰⁸ See Wisdom 2,22f; 3, 1-4; 9, 15.

¹⁰⁹ DORÉ, D., *El libro de la Sabiduría de Salomón*, Verbo divino, Pamplona, 2002, p. 22. VILCHEZ, J., *Sabiduría*, p. 105.

¹¹⁰ VILCHEZ, J., *Sabiduría*, Verbo Divino, Pamplona, Navarra, 1990, p. 103.

¹¹¹ WRITE, A. G., S.S., «*Sabiduría*», p. 778.

¹¹² WRITE, A. G., S.S., «*Sabiduría*», in R. Brown (ed.), *et al.*, *Nuevo Comentario Bíblico San Jerónimo. Antiguo Testamento*, p. 786.

¹¹³ VILCHEZ, J., *Sabiduría*, p. 104. WRITE, A. G., S.S., «*Sabiduría*», p. 778.

¹¹⁴ WOLFF, H. W., *Anthropology of the Old Testament*, p. 24.

¹¹⁵ WOLFF, H. W., *Anthropology of the Old Testament*, p. 20.

¹¹⁶ WOLFF, H. W., *Anthropology of the Old Testament*, p. 25.

¹¹⁷ WOLFF, H. W., *Anthropology of the Old Testament*, p. 28.

¹¹⁸ WOLFF, H. W., *Anthropology of the Old Testament*, p. 29.

¹¹⁹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 28.

man and wife being one *basar* (one flesh) means a community for life¹²⁰. Finally, (e) it means human life as being weak and fragile in contrast to God's power¹²¹. It refers to our dependency on God's power to live and our mortality¹²².

3.1.3. Ruah

According to Wolff, *ruah* is a theo-anthropological concept¹²³ with multiple meanings. First, (a) it means wind. Especially, it could imply a stormy wind as a mighty phenomenon standing at God's disposal¹²⁴. (b) It means breath as a human vital power given by God¹²⁵. When *ruah* departs the human being returns to dust, a lifeless matter. In this sense it is similar to *nepes*. However, *ruah* is the human breath that proceeds from God as a gift and returns to Him¹²⁶. (c) It also means God's creative power and human participation of it, e.g., the charisma of prophesy, the commission to proclaim God's word, wisdom, divine presence in the human person, even artistic inspiration and gifts¹²⁷. Very close to this meaning is *ruah* as the person's spiritual disposition¹²⁸. Here, a lack of *ruah* implies falling in a state of unconsciousness¹²⁹. Finally, (d) *ruah* means will, the driving force that impels the human person¹³⁰. These meanings seen as a whole suggest that *ruah* is God's communication to the human being and the dynamic relationship between God and us¹³¹.

3.1.4. Leb or lebab

Wolff considers *leb* as the most important word in the Old Testament anthropology¹³². It is almost exclusively applied to the human person and not to animals. Let's sketch its multiple meanings. First, (a) *leb* is the heart as physical vital organ¹³³. It also means (b) feelings, emotions, desires, longing, and emotional impulses¹³⁴. It is the seat of joy, grief, courage and fear¹³⁵. (c) In most cases, *leb* implies many rational activities: understanding, knowledge, capacity, wisdom, moral discernment, judgment, insight, consciousness, memory, and a sense of direction¹³⁶. It is close to what today we ascribe to the brain or mind¹³⁷. Accordingly, Wolff proposes that *leb* is better translated as «spirit» (*Geist* in German, *esprit* in French) or «mind». The absence of *leb* entails a confusion of mind. (d) *Leb* is the place of decision and an activity of the will¹³⁸, including ethical judgments formed by the moral conscience. For this reason, being pure of heart implies having a pure

¹²⁰ WOLFF, H. W., *Anthropology of the Old Testament*, p. 29.

¹²¹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 30.

¹²² WOLFF, H. W., *Anthropology of the Old Testament*, p. 31.

¹²³ WOLFF, H. W., *Anthropology of the Old Testament*, p. 32.

¹²⁴ WOLFF, H. W., *Anthropology of the Old Testament*, p. 33.

¹²⁵ WOLFF, H. W., *Anthropology of the Old Testament*, p. 33.

¹²⁶ WOLFF, H. W., *Anthropology of the Old Testament*, pp. 33-34.

¹²⁷ WOLFF, H. W., *Anthropology of the Old Testament*, pp. 35 and 37.

¹²⁸ WOLFF, H. W., *Anthropology of the Old Testament*, p. 37.

¹²⁹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 36.

¹³⁰ WOLFF, H. W., *Anthropology of the Old Testament*, p. 39.

¹³¹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 39.

¹³² WOLFF, H. W., *Anthropology of the Old Testament*, p. 40.

¹³³ WOLFF, H. W., *Anthropology of the Old Testament*, pp. 42 and 44.

¹³⁴ WOLFF, H. W., *Anthropology of the Old Testament*, pp. 45-46.

¹³⁵ WOLFF, H. W., *Anthropology of the Old Testament*, pp. 44-45.

¹³⁶ WOLFF, H. W., *Anthropology of the Old Testament*, pp. 47-51.

¹³⁷ WOLFF, H. W., *Anthropology of the Old Testament*, p. 46.

¹³⁸ WOLFF, H. W., *Anthropology of the Old Testament*, p. 51.

conscience. The expression «talking to the heart (*leb*)» is an attempt to change the will and the human intention¹³⁹. Having a «new heart» means to be ready for a new action¹⁴⁰. Love God with all your heart (*leb*) is having a conscious devotion and a surrender of the will¹⁴¹. Finally, (e) *leb* is used a personal pronoun, as a person as such¹⁴².

In conclusion, biblical anthropology is not dualist. There is no separation matter-spirit or body-soul. Even terms that we translate as soul (*nepes*) or mind (*leb*) are related to physical organs (throat and heart). Biblical anthropology describes aspects or dimensions of the whole human person (relationship and dependency to God, understanding, action and life) and does not refer to autonomous substantial parts.

3.2. *Saint Irenaeus' Christian Anthropology: the body as image and likeness of God*

The Second Century Fathers of the Church produced a diversity of anthropologies developed with apologetic concerns, especially to refute gnostic doctrines influenced by platonic thinking¹⁴³. Gnostics considered that the flesh or the sensible body was not an essential and constitutive aspect of the human being, who was identified with the soul¹⁴⁴. The Valentinians distinguished three classes of human beings: the materials (*hyletic*), the psychics and the spirituals (*pneumatics*)¹⁴⁵. For them the material human being is irrational and made by the Demiurge from the dust. This type of human being does not deserve to be called human. The psychic, who is human, is rational and comes from the same essence of the Demiurge. The spiritual is gnostic and comes from the substance of Sophia (the Holy Spirit). According to the Valentinians, it is the last one that would abandon the material aspects during death to become purely spiritual.

To respond to gnostic ideas the Fathers developed their anthropologies inspired in a series of theological principles. (a) A creational principle: the whole human being is created by God. (b) A Christological principle: the *Logos* became incarnated, i.e., He assumes the human flesh (*sarx*). (c) An eschatological principle revealed by the resurrection of Christ: the resurrection of the body¹⁴⁶. Let's now focus our attention to Saint Irenaeus of Lyon, who understood the human being as composed of body and soul¹⁴⁷.

Without any ambiguity Irenaeus declares that God has created the human flesh in his image and likeness¹⁴⁸. The Verb and the Holy Spirit modeled the body from the dust and formed the body in the image and likeness of God¹⁴⁹. Neither reason nor intelligence constitutes the image of God, as Saint Augustine later affirmed¹⁵⁰. The material used

¹³⁹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 52.

¹⁴⁰ WOLFF, H. W., *Anthropology of the Old Testament*, p. 54.

¹⁴¹ WOLFF, H. W., *Anthropology of the Old Testament*, p. 53.

¹⁴² WOLFF, H. W., *Anthropology of the Old Testament*, pp. 54-55.

¹⁴³ ORBE, A., S.J., «La definición del hombre en la teología del Siglo II», *Gregorianum*, 48/3, 1967, pp. 522-523.

¹⁴⁴ ORBE, A., S.J., *Antropología de San Ireneo*, B.A.C., Madrid, 1997, p. 67.

¹⁴⁵ BEHR, J., « Anthropologie », in LACOSTE, J.-Y. (Dir.), *Dictionnaire critique de théologie*, 3e Edition, Presses Universitaires de France, Paris, 1998, pp. 73-74. ORBE, A., S.J., «La definición del hombre en la teología del Siglo II», p. 523. ANTONIO ORBE, S.J., *Antropología de San Ireneo*, pp. 71-73

¹⁴⁶ CANOBBIO, G., *Sobre el alma. Más allá de mente y cerebro*, p. 54.

¹⁴⁷ SAINT IRENAEUS, *Adversus Heresies*, II,13,3.

¹⁴⁸ ORBE, A., S.J., «La definición del hombre en la teología del Siglo II», pp. 550 and 552. ANTONIO ORBE, S.J., *Antropología de San Ireneo*, p. 40.

¹⁴⁹ SAINT IRENAEUS, *Adversus Heresies*, V,6,1. ANTONIO ORBE, S.J., *Antropología de San Ireneo*, pp. 42-43.

¹⁵⁰ FALQUE, A., *Dios, la carne y el otro. De Ireneo a Duns Escoto: reflexiones fenomenológicas*, Universidad Católica de Colombia, Bogotá, 2012, p. 270.

to model the first man came from the same arid soil that we can find in our world¹⁵¹. Consequently, the body is composed of the same elements found in the earth without any extra material addition.

For Irenaeus, the advent of the soul (*psyche*) supposes the modeled body¹⁵², against the gnostic affirmation that the soul is divine and against a reductionist account that could reduce life to the state of the dust before being modeled by God. The modeled body has all the necessary members but needs the principle of life that puts the body in movement¹⁵³. Let's not forget that the corpse has also all the necessary members before its decomposition. The creation of the soul, the breath of life, is linked to the body. As a breath of life, the soul does not have in itself the force to exist. It depends on God and participates of His life. The soul is neither identified to a human being nor considered a substantial thing¹⁵⁴. It is a living and dynamic principle of the living being. The soul is a quality of the body: it is the first term of the expression «living body». Consequently, the soul is neither independent of the body («living principle» of the body) nor the body is independent of the soul (it is the second term of the expression «living body»)¹⁵⁵. The soul obtains from the body the dignity of the flesh formed by God's hands¹⁵⁶.

Irenaeus does not qualify the soul as immortal¹⁵⁷. Strictly speaking, only God, the Uncreated, is immortal. For this reason, all creatures are mortal¹⁵⁸ and the human being is capable of corruption and incorruption¹⁵⁹. Incorruption is God's gift to the flesh and not a soul's essential or substantial property¹⁶⁰. For Irenaeus, the works of the soul in themselves do not have value, even soteriological value. The value of the soul and the value of human actions come from their union with the body. Irenaeus does not point to one kind action that originates only in the soul¹⁶¹, not even intellectual or volitive operations. This implies that human actions and operations emerge from the whole human being.

In Irenaeus, as in Saint Justin, what is relevant and central is the body and not so much the soul¹⁶². The soul has a modest part in Irenaeus anthropology and soteriology¹⁶³ where the major concern is the spiritualized and saved flesh¹⁶⁴. The soul unites the spiritual principle (*pneuma*) with the flesh¹⁶⁵. Consequently, the soul is not the anthropological

¹⁵¹ SAINT IRENAEUS, *Adversus Heresies*, I,5,5; III,21,10; V,15,4 and V,16,1. ANTONIO ORBE, S.J., *Antropología de San Ireneo*, p. 45.

¹⁵² SAINT IRENAEUS, *Adversus Heresies*, V, 1, 3. ANTONIO ORBE, S.J., *Antropología de San Ireneo*, p. 67.

¹⁵³ ORBE, A., S.J., *Antropología de San Ireneo*, p. 67.

¹⁵⁴ ORBE, A., S.J., *Antropología de San Ireneo*, pp. 73 and 443.

¹⁵⁵ ORBE, A., S.J., *Antropología de San Ireneo*, p. 71.

¹⁵⁶ SAINT IRENAEUS, *Adversus Heresies*, V,6,1.

¹⁵⁷ Actually, the belief in the idea of the immortality of the soul is almost inexistent in the first Fathers of the Church. Some of the fathers even accept the death of the soul and body waiting the resurrection, as explained by Étienne Gilson in *El espíritu de la Filosofía Medieval*, Ediciones RIALP, Madrid, 4ta Edición, 2009, pp. 180-181. See Saint Justin, «Dialogue», VI, 1-2. Tatian, «Address to the Greeks», XIII.

¹⁵⁸ SAINT IRENAEUS, *Adversus Heresies*, II,4,3 and III, 8, 3. ANTONIO ORBE, S.J., *Antropología de San Ireneo*, pp. 434 and 448.

¹⁵⁹ SAINT IRENAEUS, *Adversus Heresies*, V,12,1. ANTONIO ORBE, S.J., «La definición del hombre en la teología del Siglo II», p. 550.

¹⁶⁰ SAINT IRENAEUS, *Adversus Heresies*, V,3,3. ANTONIO ORBE, S.J., «La definición del hombre en la teología del Siglo II», p. 551.

¹⁶¹ ORBE, A., S.J., *Antropología de San Ireneo*, p. 453.

¹⁶² ORBE A., S.J., *Antropología de San Ireneo*, p. 70.

¹⁶³ ORBE A., S.J., *Antropología de San Ireneo*, p. 452.

¹⁶⁴ SAINT IRENAEUS, *Adversus Heresies*, V,3,2-3 and V,9,1. ORBE A., S.J., «La definición del hombre en la teología del Siglo II», p. 554.

¹⁶⁵ ORBE A., S.J., *Antropología de San Ireneo*, p. 68-69.

center but the mediation between flesh and spirit (*pneuma*)¹⁶⁶. The soul (*psyche*) and the spirit (*pneuma*) are not «things». The first is a living principle and the second is a principle of spiritual life. What constitutes the human being is the substance of the flesh¹⁶⁷. In Orbe's own words: «*The animal and the rational, as in his day the spiritual, exists in function of the body: as virtues or potentials linked to it. All is referred to the plasma [body as formed from the earth], the only that essentially is a human being. Soma and the human being are equivalent.*»¹⁶⁸

For Irenaeus salvation arrives from the union of body and spirit (*pneuma*)¹⁶⁹. God's plan is the deification of the flesh, the full communion between God's Spirit (*Pneuma*) and the human flesh¹⁷⁰. The Verb modeled the human body with the objective to assume its own body¹⁷¹ and the human being is modeled following the paradigm of the glorified flesh of the risen Christ¹⁷².

This anthropology is more in accord with the biblical categories of *basar* (*soma*), *nepes* (*psyche*) and *ruah* (*pneuma*). The accent is in the unity of the human being without the substantiation of the living principle and the spiritual principle or the reduction of the human person to simple dust. This Christian anthropology is open to dialogue with a non-reductive neurological anthropology by the fact that it values the flesh that comes from the earth. Consequently, there is a linkage between the human being and the cosmos. There is no material element in the human being strange to the universe. At the same time, all operations come from the whole human being and none from a spiritual independent substance, i.e., an immaterial soul. Moreover, the category of «flesh» is relevant to the understanding of salvation.

3.3. *Saint Thomas Aquinas: the soul as the form of the body*

3.3.1. Historical, philosophical and theological background

Let's revise some historical context to understand Aquinas' position. Aquinas inherited some philosophical and theological tensions. First, Augustine integrated platonic anthropology into his system. Augustine states that the human being is «a rational soul that uses a mortal and terrestrial body»¹⁷³ and maintained the immortality of the soul. Meanwhile, other Fathers of the Church held the unity of the body and soul composition. Moreover, there was the Averroist controversy. Aristotle affirmed in an obscure text in *De anima* (430a,10-25) the existence of two intellects. One intellect, later called active or agent intellect, is independent of the body, impassible, essentially an act, immortal and eternal¹⁷⁴. It was not clear if the active intellect was God or a suprasensible being inferior to God¹⁷⁵. Later, Averroes affirmed that there is only one universal active intellect present

¹⁶⁶ ORBE A., S.J., *Antropología de San Ireneo*, p. 77. FALQUE, E., *Dios, la carne y el otro*, p. 275.

¹⁶⁷ SAINT IRENAEUS, *Adversus Heresies*, V, 9, 2-3. ORBE A., S.J., *Antropología de San Ireneo*, p. 74.

¹⁶⁸ ORBE A., S.J., *Antropología de San Ireneo*, p. 71. See SAINT IRENAEUS, *Adversus Heresies*, V,12,2.

¹⁶⁹ ORBE A., S.J., *Antropología de San Ireneo*, p. 58.

¹⁷⁰ ORBE A., S.J., *Antropología de San Ireneo*, p. 74.

¹⁷¹ SAINT IRENAEUS, *Adversus Heresies*, V, 33, 4. ORBE A., S.J., *Antropología de San Ireneo*, p. 99.

¹⁷² SAINT IRENAEUS, *Adversus Heresies*, V, 13, 3. ORBE A., S.J., *Antropología de San Ireneo*, p. 104.

¹⁷³ SAINT AUGUSTIN, *De moribus ecclesiae*, I, 27, 52.

¹⁷⁴ ARISTOTLE, *De anima*, 413a,5-9; 413b,24-27 and 430a,10-25. GILSON, É., *El espíritu de la Filosofía Medieval*, pp. 184-185.

¹⁷⁵ VIGNAUX, P., *Philosophie au Moyen Âge*, VRIN, Paris, 2004, p. 149.

in all human beings¹⁷⁶, which survives after death but is not personal¹⁷⁷. Consequently, the individual, including memories and identity, will cease to exist after death.

Aquinas's anthropology navigates through these controversies producing a synthesis with a monist aspect united to a dualist side. Let's discuss both.

3.3.2. Monist Aspect

Following Aristotelian terminology, Aquinas affirms that the soul is the form of an organized body¹⁷⁸. This implies that the soul is the first principle of living things¹⁷⁹. It is the soul that constitutes the human body and both, soul and body, are one substance in a psychic-physical unity¹⁸⁰. Therefore, the human being is neither the soul alone nor the body alone. It is the body-soul union¹⁸¹. The soul is a substantial form immediately unified to the matter in the body. It bestows on matter its corporeal nature, life and human reason¹⁸². The body-soul relation is not an accidental extrinsic union. It is a substantial union that constitutes a whole and complete substance, the human being, from incomplete components¹⁸³. The body without the soul is not really a body, i.e., a corpse is not a body. It is the soul that makes and forms the body¹⁸⁴. Due to the soul the body is a living body¹⁸⁵ and due to the body the soul reaches its perfection¹⁸⁶.

Etienne Gilson summarizes Aquinas' anthropology with the following formula: the human being is « the unity of a soul that bestows substantiality to a body and a body in which the soul subsists »¹⁸⁷.

3.3.3. Dualist Aspect

Aquinas, concerned with the Averroist controversy and influenced by Augustine, affirms that the soul does not depend on the body to exist. When the body dies the soul survives¹⁸⁸. To argue this position Aquinas states that the human soul executes immaterial activities. Here, Aquinas follows this philosophical-epistemological principle: *to grasp the essence of material or corporeal things the intellectual operation cannot be material or corporeal*¹⁸⁹. This does not imply that the intellect is in all aspects fully independent of the body. According to Aquinas, there are two cognitive operations in the human being: one sensible and the other intelligible. The first one depends on the body and the second one is independent of

¹⁷⁶ COPLESTON, F. C., S.J., *El pensamiento de Santo Tomás*, Fondo de Cultura Económica, México, 1960, p. 195. CANOBBIO, G., *Sobre el alma. Más allá de mente y cerebro*, p. 60.

¹⁷⁷ VIGNAUX, P., *Philosophie au Moyen Âge*, pp. 157-158.

¹⁷⁸ Aristotle considered the soul as the act or form of the organized body that potentially has life. ARISTOTLE, *De anima*, 412a, 20 and 414a, 14-29.

¹⁷⁹ SAINT THOMAS AQUINAS, *Summa Theologiae*, Ia, 75, 1.

¹⁸⁰ COPLESTON, F. C., S.J., *El pensamiento de Santo Tomás*, pp. 175-176.

¹⁸¹ SAINT THOMAS AQUINAS, *Summa Theologiae*, Ia, 75, 4. SAINT THOMAS AQUINAS, *Contra Gentiles*, II, 57.

¹⁸² SAINT THOMAS AQUINAS, *Summa Theologiae*, Ia, 76, 1. GILSON, É., *El Tomismo. Introducción a la filosofía de Santo Tomás de Aquino*, 4ta Edición, EUNSA, Navarra, 2002, pp. 256-257.

¹⁸³ SAINT THOMAS AQUINAS, *Summa Theologiae*, Ia, 75, 2. GILSON, É., *El Tomismo*, pp. 257-258.

¹⁸⁴ GILSON, E., *El Tomismo*, p. 248. CANOBBIO, G., *Sobre el alma. Más allá de mente y cerebro*, p. 58.

¹⁸⁵ CANOBBIO, G., *Sobre el alma. Más allá de mente y cerebro*, p. 57.

¹⁸⁶ GILSON, É., *El Tomismo*, pp. 250 and 252.

¹⁸⁷ GILSON, É., *El espíritu de la Filosofía Medieval*, pp. 188 and 194.

¹⁸⁸ SAINT THOMAS AQUINAS, *Summa Theologiae*, Ia, 76, 1.

¹⁸⁹ GILSON, É., *El espíritu de la Filosofía Medieval*, p. 190. ÉTIENNE GILSON, *El Tomismo*, p. 248.

it¹⁹⁰. Aquinas uses this argument to prove the immateriality of the soul, which implies its immortality¹⁹¹. Due to its immortality, each individual soul survives death. However, this state of separation after death is not the soul's natural state¹⁹². In the separated state the soul can only perform the spiritual operations that are independent of the sensibility¹⁹³. To be fully in its natural state the soul must wait until the resurrection of the flesh¹⁹⁴.

Following Jean Ladrière's evaluation of Aquinas' anthropology, it is relevant to remark that the Dominican favored Aristotelian categories over Platonic to sustain human being's unity¹⁹⁵. The principle of matter allows the form to have a concrete, non-abstract, reality. The soul is the principle of life (not a thing) that characterized a «living» body. The soul is an integrative principle that makes a body an organic system.

However, Aquinas modifies Aristotelian anthropology to integrate the immortality of the soul¹⁹⁶. Today, according to Ladrière, we have to think the unity of the human being without compromising the Christian belief that death is not the absolute end of the human person.

4. CONTEMPORARY CHRISTIAN ANTHROPOLOGIES

4.1. *Karl Rahner: self-transcendence of matter toward the spirit*

4.1.1. Background and rahnerian principles

Karl Rahner seeks to think anew the relationship between spirit and matter in dialogue with the scientific theory of evolution. He describes how traditional Christian Anthropology (Neo-Scholasticism) envisioned the relation soul-body and matter-spirit¹⁹⁷: matter and created spirit are considered to be essentially distinct although in close unity (substantial unity). Moreover, this traditional anthropology is tempted to debilitate and soften the unity of matter and spirit in favor of the last one¹⁹⁸. At the same time, Rahner mentions that scientific anthropologies are also tempted to misunderstand the whole human being in a «primitive materialistic manner», referring to reductive materialism as a source of conflicts between natural sciences and theology.

Behind Rahner's effort to elaborate a new anthropology there are a series of principles, not always explicitly formulated, that guide his reflections and conclusions. These principles are the following:

- (i) Methodological principle: no rationality, including theology, exhausts and knows reality in an absolute way¹⁹⁹. A necessary condition for a fruitful and respectful

¹⁹⁰ LADRIÈRE, J., «Le problème de l'âme et du corps dans la conception classique», in B. FELTZ, and D. LAMBERT, (eds.), *Entre le corps et l'esprit: Approche interdisciplinaire du mind – body problem*, Mardaga, Liège, 1994, pp. 27-29.

¹⁹¹ GILSON, É., *El Tomismo*, p. 249.

¹⁹² SAINT THOMAS AQUINAS, *Summa Theologiae*, Ia, 76, 1.

¹⁹³ LADRIÈRE, J., «Le problème de l'âme et du corps dans la conception classique», p. 29.

¹⁹⁴ SAINT THOMAS AQUINAS, *Contra Gentiles*, IV, 79.

¹⁹⁵ LADRIÈRE, J., «Le problème de l'âme et du corps dans la conception classique», p. 22.

¹⁹⁶ LADRIÈRE, J., «Le problème de l'âme et du corps dans la conception classique», p. 18.

¹⁹⁷ RAHNER, K., «Natural Science and Reasonable Faith», in *Theological Investigations*, Vol. 21: *Science and Christian Faith*, Crossroads, New York, 1988, p. 28.

¹⁹⁸ RAHNER, K., «Natural Science and Reasonable Faith», p. 43.

¹⁹⁹ RAHNER, K., *Hominisation: The evolutionary origin of man as a theological problem*, Herder and Herder, New York, 1968, pp. 23-24.

- dialogue between natural science and theology is the recognition of methodological limitations and strengths of each field. Moreover, implicit in Rahner's dialogical method is his use of philosophy, i.e., metaphysics, as mediation between scientific facts and worldview and Christian theology. This mediation respects the special methodological characteristics of each discipline.
- (ii) Scientific-philosophical principle: the theory of evolution makes the appearance of forms (entelechies) no longer necessary²⁰⁰. Although the categories of «form» and «matter» could still affirm the necessary unity and distinction of multiple anthropological aspects²⁰¹, they are no longer helpful in light of the evolutionary worldview²⁰². Modern biology renders difficult or impossible to conceive spirit and matter as being distinct and heterogeneous realities²⁰³.
 - (iii) Philosophical-theological principle: «spirit» and «matter» can be considered as «continuous essential constitutive elements», putting the accent in the «continuity» and «unity» between both. This is not against any proposition of faith²⁰⁴. It is more against a non-doctrinal habit in theology. Against any form of Gnosticism and Manichaeism, Christianity affirms that everything is created from One God²⁰⁵. There are no two separated and essentially different worlds: one spiritual and the other material²⁰⁶. Spirit and matter are not two absolutely different realities that coexist side by side without any relationship, as affirmed in platonic or neo-platonic philosophies²⁰⁷. There is only one world characterized by a primordial unity (against dualism) and continuous degrees of differentiation among beings (against metaphysical reductionism)²⁰⁸.
 - (iv) Theological-anthropological principle: there is a distinction between human beings and animals. Although natural sciences does not makes a clear distinction between them, the human being is distinct from the animal because the first is called to enter into a dialogue with God in freedom, and this is precisely a call to salvation²⁰⁹.

4.1.2. Relationship between matter and spirit

Matter and spirit cannot be conceptualized as separated, heterogeneous or contradictory entities²¹⁰. They have more in common than they have differences. Following biblical anthropology and Saint Irenaeus, Rahner affirms that there are no human actions that are purely spiritual or purely material. Every human action is connected with some

²⁰⁰ RAHNER, K., «Natural Science and Reasonable Faith», p. 30.

²⁰¹ Rahner even repeats that formula: RAHNER, K., *Hominisation*, p. 58. RAHNER, K., «Man as a Historical Spirit», Chapter 11 in *Hearers of the Word*, appears in G. McCool, S.J. (ed.), *Rahner Reader*, Crossroad, New York, 1981, p. 52.

²⁰² RAHNER, K., «Natural Science and Reasonable Faith», p. 44.

²⁰³ RAHNER, K., «Natural Science and Reasonable Faith», p. 28.

²⁰⁴ RAHNER, K., «Natural Science and Reasonable Faith», p. 29.

²⁰⁵ RAHNER, K., *Foundation of Christian Faith: An Introduction to the Idea of Christianity*, New York, Crossroad, 1992, p. 181.

²⁰⁶ RAHNER, K., «Natural Science and Reasonable Faith», p. 34.

²⁰⁷ RAHNER, K., «Natural Science and Reasonable Faith», p. 34-35.

²⁰⁸ RAHNER, K., «Natural Science and Reasonable Faith», p. 34. RAHNER, K., *Hominisation*, pp. 46 and 92.

²⁰⁹ RAHNER, K., «Natural Science and Reasonable Faith», p. 42.

²¹⁰ RAHNER, K., «Natural Science and Reasonable Faith», p. 52.

materiality²¹¹, even cognitive and volitive actions. Consequently, any affirmation of the spirit is also an affirmation of the body and vice versa²¹². However, there is a real difference between them. Matter and spirit are, at the same time, inseparable and irreducible to each other²¹³.

How Rahner understands matter? Rahner states that matter is the concreteness of a limited being²¹⁴. It is the deficient or limited way of being²¹⁵ that externalizes the finitude of the human condition. In another formulation, Rahner stated that matter is the lower stage of created spirit²¹⁶. Since the material condition is shared with the cosmos and with others, corporeality is the condition of possibility that allows the human person to experience the world and others²¹⁷. The body is the human being as spirit in the world²¹⁸.

If matter is understood in reference to «spirit», how Rahner understands spirit? For Rahner, spirit means multiple intimately connected aspects. Spirit means the human subjectivity or personhood, who questions the meaning of life, who seeks a response, who chooses in freedom and responsibility and who is oriented towards the Absolute Spirit, God²¹⁹. In addition, Rahner identifies spirit with consciousness²²⁰, which is not something purely spiritual, independent of matter. According to Rahner, consciousness has an inner material constitutive element and not just an external or superficial basis where consciousness «rest upon»²²¹. In reality, consciousness is present in «a sufficiently elevated organization of matter»²²². In conclusion, the spirit is the fullness of being, the perfection of matter, the person's fulfillment in his consciousness, actions, intellect, freedom and relation to God²²³.

4.1.3. Self-transcendence as matter becoming spirit

Rahner relates «matter» and «spirit», without reducing one to the other, through the concept of «self-transcendence», which is a philosophical and theological interpretation of the scientific concept of «evolution». Transcendence is a process or a dynamic orientation where a particular reality overcomes its limits and goes beyond itself to become something new and different (not a repetition or duplication of a previous state) in the sense of «being more»²²⁴. Through a history of self-transcendence, complex biological system emerged from purely physical systems and human consciousness emerged from complex biological systems²²⁵. It is a history of material reality advancing through higher ontological levels.

²¹¹ RAHNER, K., *Grace in Freedom*, Herder and Herder, New York, 1969, p. 232.

²¹² CANOBBIO, G., *Sobre el alma*, p. 29.

²¹³ RAHNER, K., *Foundation of Christian Faith*, p. 184. RAHNER, K., *Grace in Freedom*, p. 232.

²¹⁴ RAHNER, K., *Hominisation*, p. 56. RAHNER, K., *Foundation of Christian Faith*, p. 183.

²¹⁵ RAHNER, K., *Hominisation*, p. 82.

²¹⁶ RAHNER, K., «Natural Science and Reasonable Faith», p. 34.

²¹⁷ RAHNER, K., *Foundation of Christian Faith*, p. 183. Also see RAHNER, K., «Man as a Material Being», Chapter 10 in *Hearers of the Word*, appears in G. McCool, S.J. (ed.), *Rahner Reader*, Crossroad, New York, 1981, p. 51.

²¹⁸ RAHNER, K., *Hominization*, p. 59.

²¹⁹ RAHNER, K., *Foundation of Christian Faith*, p. 183.

²²⁰ RAHNER, K., «Natural Science and Reasonable Faith», p. 52.

²²¹ RAHNER, K., «Natural Science and Reasonable Faith», pp. 40 and 43.

²²² RAHNER, K., «Natural Science and Reasonable Faith», pp. 40-41.

²²³ RAHNER, K., *Hominisation*, p. 59.

²²⁴ RAHNER, K., «Natural Science and Reasonable Faith», p. 38. RAHNER, K., *Foundation of Christian Faith*, p. 185. KARL RAHNER, *Hominisation*, pp. 87-88.

²²⁵ RAHNER, K., «Natural Science and Reasonable Faith», p. 40.

Active self-transcendence happens when a conscious and free agent achieves a higher perfection²²⁶.

Transcendence as «becoming» more is not to be understood as an automatic cause that resulted in something foreseeable²²⁷. It is a non-mechanical causality used to explain how matter becomes a human subject²²⁸. Through the concept of self-transcendence Rahner explains the becoming of matter (a deficient mode of spirit also called «frozen spirit») into spirit, which is essentially a new form of being more than matter²²⁹.

Matter is oriented toward spirit (personhood, consciousness) and the spirit is the self-transcendence of matter. The created spirit (human person), with its cognitive and volitive activities, connotes the perfection of the material²³⁰. At the same time, the perfection of the spirit cannot be developed without a material reality. In conclusion, matter and spirit are not two heterogeneous things grouped together. Through the concept of self-transcendence, Rahner avoids material reductionism and ensures the primordial unity of the human being²³¹.

The Absolute Being, God, is the absolute ground and the absolute condition that renders possible self-transcendence²³².

4.1.4. Description of the human being

According to Rahner, «human beings are bodily creatures who have a fundamentally unlimited transcendentality and unlimited openness to being as such in knowledge and freedom»²³³. The human being is an embodied spirit always immersed in the concrete reality of a material world with an unlimited openness to God²³⁴. Another of Rahner's anthropological formulation is: «man is the self-transcendence of living matter»²³⁵.

The human being is a level of organized matter different from the level of animal²³⁶ due to his/her active self-transcendence as knowledge, freedom, consciousness and relation to God. This active self-transcendence is something that cannot be reduced to an object of natural science²³⁷.

4.1.5. Life after death: immortality of the soul or resurrection of the whole person?

For Rahner, the dogmas of the incarnation and the resurrection forbid to see an salvation outside matter²³⁸. Following the principle of incarnation, Rahner states that the place of salvation is the matter and not an immaterial soul, idea found in Irenaeus' anthropology.

²²⁶ RAHNER, K., *Foundation of Christian Faith*, p. 185.

²²⁷ RAHNER, K., *Foundation of Christian Faith*, p. 186.

²²⁸ VASS, G., S.J., *The Mystery of Man and the Foundation of a Theological System*, Sheed & Ward, London, 1985, p. 26.

²²⁹ VASS, G., S.J., *The Mystery of Man*, p. 26.

²³⁰ RAHNER, K., *Hominisation*, p. 56.

²³¹ RAHNER, K., *Foundation of Christian Faith*, p. 184.

²³² RAHNER, K., *Hominisation*, p. 92. KARL RAHNER, «Natural Science and Reasonable Faith», p. 39.

²³³ RAHNER, K., «Natural Science and Reasonable Faith», p. 42.

²³⁴ RAHNER, K., «Natural Science and Reasonable Faith», pp. 43-44. VASS, G., S.J., *The Mystery of Man and the Foundation of a Theological System*, Sheed & Ward, London, 1985, p. 24.

²³⁵ RAHNER, K., *Foundation of Christian Faith*, p. 187.

²³⁶ RAHNER, K., «Natural Science and Reasonable Faith», p. 46.

²³⁷ RAHNER, K., «Natural Science and Reasonable Faith», p. 44.

²³⁸ RAHNER, K., «Natural Science and Reasonable Faith», p. 52. RAHNER, K., *Foundation of Christian Faith*, p. 191.

The idea of death as an absolute separation between soul and body or between spirit and matter is the persistence of a neo-platonic mentality²³⁹. It is the human being who dies and not just the body. Consequently, death affects the whole reality of the human being²⁴⁰.

If death is a complete release from the body and a total rupture with the world, then the affirmation and understanding of a resurrection as the total human perfection remains obscure²⁴¹. The fulfillment of the human history does not rest in the idea of an immortal soul but in God's self-communication²⁴². The last phase of the history of humanity is the immediate unity to God through grace where matter will be spiritualized²⁴³. For Rahner, there is always a human corporality after death²⁴⁴.

In conclusion, Rahner has the merit of defining anew the concepts of matter and spirit in light of evolutionary theory. In his anthropology we see that all human acts are material and spiritual, including our relation to God. He states that consciousness is not something spiritual as opposed to material. On the contrary, there is always a material aspect and reality in consciousness. He takes seriously the resurrection of the body and affirms a bodily aspect after death. Perhaps, his disadvantages are that in the elaboration of his anthropology he does not consider neurosciences and that he still gives the impression of two a poles system (matter-spirit)²⁴⁵.

4.2. *Alexander Ganoczy and his structural anthropology*

Alexander Ganoczy is a Hungarian catholic theologian who has taken seriously neuroscientific anthropological representations with their corresponding challenges to Christian faith. He considers that currently there is a lack of response from the part of theologians to such challenges. Ganoczy insists on the need to develop a new holistic theological anthropology, in dialogue with natural sciences, finally free of all types of dualisms²⁴⁶.

In order to elaborate his Christian anthropology, Ganoczy articulates neurosciences' representations and facts with the structural (not to be confused with structuralist) anthropology of Heinrich Rombach²⁴⁷. Ganoczy considers that Rombach's philosophy is compatible with recent neuroscience's results and with the biblical description of the human being²⁴⁸. Rombach's structural anthropology has the advantage that it does not decompose the human being into simpler components²⁴⁹. For Rombach, the human being cannot be defined as an individual substance or as a composition of a perishable material substance and an immaterial substance²⁵⁰. For Rombach, the use of the category

²³⁹ RAHNER, K., *On the Theology of Death*, Seabury Press, New York, 1973, p. 19.

²⁴⁰ RAHNER, K., *On the Theology of Death*, pp. 17-18.

²⁴¹ RAHNER, K., *On the Theology of Death*, p. 25.

²⁴² VASS, G., S.J., *The Mystery of Man*, p. 27.

²⁴³ RAHNER, K., «Natural Science and Reasonable Faith», pp. 54-55.

²⁴⁴ RAHNER, K., *On the Theology of Death*, p. 25.

²⁴⁵ GANOCZY, A., *Christianisme et Neurosciences*, p. 11.

²⁴⁶ GANOCZY, A., *Christianisme et Neurosciences*, pp. 10-11 and 23.

²⁴⁷ ROMBACH, H., *Strukturanthropologie: Der menschliche Mensch*, Alber, München, 1987. Translated in Spanish as HEINRICH ROMBACH, *El hombre humanizado. Antropología estructural*, Herder, Barcelona, 2004. HEINRICH ROMBACH, *Die Gegenwart der Philosophie*, Alber, München, 1988. Translated in Spanish as HEINRICH ROMBACH, *El presente de la filosofía*, Herder, Barcelona, 2007. As far as we know there are no English translations of these books.

²⁴⁸ GANOCZY, A., *Christianisme et Neurosciences*, p. 17.

²⁴⁹ GANOCZY, A., *Christianisme et Neurosciences*, p. 16.

²⁵⁰ GANOCZY, A., *Christianisme et Neurosciences*, p. 16. ROMBACH, H., *El hombre humanizado. Antropología estructural*, pp. 17, 21, 36-40 and 57-72.

of «system» is problematic because it is associated with determined movements and a composition of «elements» that can be assembled, disassembled or replaced²⁵¹. The perspective of «system» leads to divide and separate the human being into assembled entities. To replace the perspective of system, Rombach develops an anthropology based on the category of «structure».

Rombach defines «structure» as «an arrangement of different moments that are efficient together as a whole»²⁵². The structure is a dynamics that modifies itself constantly²⁵³. A «moment» is «an event or process decisive for the existence of one thing or a person»²⁵⁴. Each moment is neither independent nor an individual thing or substance. All moments have their being in the other (*esse in alio*)²⁵⁵. Moments as events or processes generate, organize and stimulate the whole. «There is a structure where and when the moments cannot exist or act if they are not in a whole»²⁵⁶. If you extract from a structure even one moment the whole structure collapses²⁵⁷.

In terms of anthropology, «the moments that constitute the human structure cannot exist separately like elements that compose a system»²⁵⁸. In the human structure body and soul are some structuring «moments» that cannot exist separately from each other²⁵⁹. In reality, in the human structure seen as a whole, there is a multiplicity of inseparable moments: energetic, biological, bodily, spiritual, mental, neuronal, animal, social and cultural moments²⁶⁰. Following another definition of «structure» developed by Gerhard Vollmer, Ganoczy affirms that the human structure is «the totality of interactions and correlations of what constitutes a human being»²⁶¹.

Structure is something that constructs, organizes, and integrates itself. «It is a whole where each aspect takes its exact form through the integration with others»²⁶². A structure results from the convergence, interaction and cooperation of dynamic moments that constitute the plural unity found in the living organism²⁶³. This dynamism implies that a structure is not a thing composed of other things, but a becoming where the structure constitutes itself²⁶⁴ in a process called «structural genesis»²⁶⁵. Consequently, spirit or mind is more than the sum of its components²⁶⁶.

Ganoczy describes the human being as «a structural unity of body and spirit that appears and acts as a person»²⁶⁷. If all living beings are structures, the human being is the structure «*par excellence*». The human being exists due to the dynamic interaction of the organic-mental and bodily-spiritual moments. No moment can exist without others or be reduced to another²⁶⁸.

²⁵¹ GANOCZY, A., *Christianisme et Neurosciences*, pp. 16-17.

²⁵² GANOCZY, A., *Christianisme et Neurosciences*, p. 16.

²⁵³ ROMBACH, H., *El hombre humanizado. Antropología estructural*, p. 17.

²⁵⁴ GANOCZY, A., *Christianisme et Neurosciences*, p. 17.

²⁵⁵ ROMBACH, H., *El presente de la filosofía*, p. 90.

²⁵⁶ GANOCZY, A., *Christianisme et Neurosciences*, p. 17.

²⁵⁷ ROMBACH, H., *El presente de la filosofía*, pp. 90-91.

²⁵⁸ GANOCZY, A., *Christianisme et Neurosciences*, p. 17.

²⁵⁹ GANOCZY, A., *Christianisme et Neurosciences*, p. 87.

²⁶⁰ GANOCZY, A., *Christianisme et Neurosciences*, p. 17.

²⁶¹ GANOCZY, A., *Christianisme et Neurosciences*, pp. 82 and 86.

²⁶² GANOCZY, A., *Christianisme et Neurosciences*, p. 86.

²⁶³ GANOCZY, A., *Christianisme et Neurosciences*, p. 87.

²⁶⁴ GANOCZY, A., *Christianisme et Neurosciences*, p. 87.

²⁶⁵ ROMBACH, H., *El presente de la filosofía*, p. 142.

²⁶⁶ GANOCZY, A., *Christianisme et Neurosciences*, p. 80.

²⁶⁷ GANOCZY, A., *Christianisme et Neurosciences*, p. 87.

²⁶⁸ GANOCZY, A., *Christianisme et Neurosciences*, p. 87.

Considering this structural anthropology, Ganoczy suggests that salvation could be related to the integration of the human being²⁶⁹. Following Teilhard de Chardin, creation happens through the natural process of evolution²⁷⁰.

To sum up, Ganoczy has the merit of developing a non-dualist anthropology that articulates biblical descriptions with neuroscientific facts through the mediation of a structural anthropology. This structural anthropology integrates into the whole multiple and inseparable aspects of the human being. Perhaps, this effort requires further development and systematization.

5. CONCLUSION

After revising some anthropological aspects of Scriptures and the thought of Irenaeus, Aquinas, Rahner and Ganoczy, we conclude that, from the perspective of Christian belief, it is reasonable to uphold a monist Christian anthropology with the condition that it must be non-reductive. In biblical anthropology we do not find any separation matter-spirit or body-soul. Scriptures present a fundamental unity of the human being with a multiplicity of aspects pertinent to the whole person. In Irenaeus' anthropology the accent is found in the unity of the human being without the substantiation of the living principle (*psyche*) or the spiritual principle (*pneuma*). The body (*soma*), which is equivalent to the human being, is created from the same matter we find in the universe and in the image and likeness of God. In Aquinas we find a monist non-reductionist formulation that influenced later Christian development: the soul is the form of an organized living body. Moreover, Rahner's anthropology states a non-dualist formulation: the human being «is the self-transcendence of living matter». Finally, Ganoczy states that the human person is the «structural unity of body and spirit that appears and acts as a person». All these anthropologies are monist and their monism discards the reduction of the human person to predetermined material processes.

Both, neurosciences and biblical anthropology, render inadequate anthropological dualist formulations inherited from the Greek culture: «the human being is composed of body and soul or matter and spirit». A fruitful dialogue between natural sciences and theology inspires more adequate anthropological formulations, e.g., «incarnated subject»²⁷¹, «embodied mind» or «incarnated spirit».

In a dialogue between neurosciences and theology there are some aspects that neurosciences contribute to the elaboration of a holistic Christian Anthropology. In neurosciences we find a clear unity between the human being and the cosmos. At the same time, there is something new that emerges with the human being: symbols and language that are fundamental for a personal, symbolic, social and cultural relation to others, including God. These interpersonal, social and cultural relations render possible the human self-constitution. At the same time, neurosciences show that the human being is a historical being that self-constitutes himself/herself in the present through a revision of his past and through the elaboration and imagination of possible futures in relation with others and God. Moreover, the human being is always in peril to suffer a collapse that affect its mental and bodily integrity.

²⁶⁹ GANOCZY, A., *Christianisme et Neurosciences*, p. 83.

²⁷⁰ GANOCZY, A., *Christianisme et Neurosciences*, p. 319.

²⁷¹ FLICK, M. and ALSZEGHY, Z., *Antropología Teológica*, Sígueme, Salamanca, 1970, p. 152.

In an interdisciplinary dialogue, there are some Christian theological principles that should inspire the development of a new holistic Christian Anthropology. These principles are the following: (a) God creates all aspects of the human being; (b) the *Logos* assumes fully our humanity, including matter and weakness; (c) God calls the human being to fulfillment in Him and death does not end absolutely the human person. These principles are the minimal that must be preserved in Christian Anthropology.

Through these theological principles salvation is seen as the full integrity of the human being. In addition, salvation could be understood as a communion that enables the human being to enter in a process of self-constitution oriented toward wholeness and fulfillment of all aspects. The human being is a never ending process of becoming, an open being called by God to be co-creator of his/her own person and co-creator of a relationship with God, who is the ultimate condition that renders possible human fulfillment and wholeness.

Theology also contributes by showing that the human being has, in addition to biological, cognitive, volitional, social and cultural moments or aspects, a deeper dimension that the Bible calls *ruah* or *pneuma*. This dimension is manifested as an inner calling, a longing for communion with the Absolute that does not absorb the human person. This calling to communion impels the human being to transform his entourage caring for its preservation. It impels him/her to see the other not as an instrument for himself/herself but as a flesh of his own flesh (*basar* of his *basar*) with an inalienable dignity. Finally, this inner calling impels to embrace the final mystery of human transformation and flourishing through a full participation of God's life.

6. ACKNOWLEDGMENT

The author would like to acknowledge partial support from the project *The Convergence of Culture and Science: Expanding the Humanities Curriculum at UPRM*, from the National Endowment for the Humanities, Grant 10913742. In addition, he expresses his gratitude to the University of Comillas in Spain for the use of *El Fondo Bibliográfico «Manuel García Doncel. Ciencia, Filosofía y Teología»*. Moreover, he expresses his gratitude to the Faculty of Theology of the Catholic University of Louvain in Belgium for the use of their Library. Finally, the author acknowledges and thanks the resources and support obtained from the Faculty of Theology of the Pontificia Universidad Javeriana in Bogotá, Colombia.

Department of Electrical and Computer Engineering,
University of Puerto Rico at Mayagüez, Puerto Rico
Theology Department, Pontificia Universidad Javeriana, Bogotá, Colombia
lojimenez@gmail.com

LUIS O. JIMÉNEZ-RODRÍGUEZ

[Artículo aprobado para publicación en agosto de 2015].