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The Unity of the Human Person: A Central Concept in the Interface Between Medicine and Theology

by

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I. Introduction

The concept of personhood is a fundamental category related to critical medical decisions. Experts are unanimously in agreement concerning its axiological value in regard to bioethical issues. Therefore, there is a requirement for a precise understanding of its foundation in a biomedical context.¹⁻⁵ For example, dementia, "vegetative" states, severe encephalopathies, etc, are complex medical conditions that lead to a deep reflection about the very essence of human life. It goes beyond neurology to the fields of philosophy, theology, bioethics and other disciplines.

The approach to this issue requires a dialogue that proceeds methodologically by following two steps¹: first, it needs to start out from the phenomenon presented to the field of biomedicine, describing it as precisely and clearly as possible; secondly, it needs to elaborate and ponder all the questions that trespass the limits of this field and require an interdisciplinary approach. It is particularly important to avoid imprecision in the first stage of this process. Neurology occupies a

privileged position in the dialogue with other sciences. This is particularly so concerning the problem of personhood, which is one of the more central issues in the interface between medicine and theology.

This article will briefly review a philosophical and theological tradition in western civilization, which elaborated, with great lucidity, a unitary concept of the human person. Afterwards, the essential biomedical facts, which provide a well-defined support to this anthropological view, will be considered. The confluence of these aspects will delineate an integrating rationale based on what, in the author's view, constitutes the neurological core of personhood.¹⁻⁵ Remarkably, these different sources of knowledge can be finely articulated to shed new light on this central issue. This provides a new theoretical frame to elaborate a number of fundamental philosophical and ethical problems.

II. Historical Perspective

The word "soul" has had many different meanings throughout the history of our civilization. Spirit, breath, vital force, life, creature, reason, intellect, thought, will, the moral or emotional nature, the totality of the personal being, are among the attributes related to this word.⁶ The study of its significance leads to terms which are in the origins of our western culture: *basar*, *nefesh*, *ruah* and *leb* (these terms have been translated into the Greek as follows: *sarx*, *psuche*, *pneuma*, *kardia*, and into Latin as follows: *caro*, *anima*, *spiritus*, *cor* or *mens*).⁷⁻⁹ We will come back to these terms later on.

A long pre-Aristotelian tradition located the soul between the thorax and the abdomen, in the diaphragm muscle. The liver, the heart, and finally the brain were considered at different times and cultures as the bodily habitat of the soul.⁶ In Homer and in the pre-Aristotelian materialist tradition, the soul was considered as a breath or wrapping of the body, a kind of force, vapor, specter or ghost, a more subtle material essence. The air, the fire, or the atoms of the soul were variously considered as the essential elements by thinkers in this line of thought. According to Popper¹⁰ even these materialists sustained a dualism in which the soul or the mind were considered as the essence of the body. In fact, there were two different notions about this essence, one related to the body and the other an incorporeal one. This later was developed by Pythagoras and the Pythagoreans. They considered the essence of things as an abstract reality, a number or a harmony.

The Brain as the rector of the body

The idea of the brain as the "locus" of the soul runs through the centuries, and the most various locations inside this organ were considered as the seat of the soul not only by philosophers but also by anatomists. Notably, the Hippocratic medical treatise "About the Sacred Infirmity" emphatically affirms that the brain "tells the limbs how to act" and also that the brain "is the messenger of consciousness telling it what occurs."¹¹ It is also described as the interpreter of consciousness.

Plato

Plato conceived the soul in the realm of forms or ideas.¹² His concept of the mind includes three aspects: reason, appetites and energy. The body as the prison of the soul, the counter-position between body and matter, characterizes both his anthropology and his cosmology. The relation between body and soul is understood in antagonistic, almost hostile terms. Plato's simile of the soul as the pilot of the body does not have a biological connotation, as it does in the Aristotelian concept of the soul, which will be analyzed later on. Death leads to liberation of what is immaterial and transcendent in human beings; thus the spirit overcomes the slavery of the material body. With this transit a transformation does not occur, but a survival of the ideal or incorporeal aspect does. Death affects only the body. This is a dualist-interactionist conception of the mind-body relationship. It is also a dualist anthropology. In contrast to Plato, Aristotle develops a unitary concept of great transcendence.

Aristotle

According to Aristotle¹³ his predecessors characterized the soul by three attributes: movement, sensation and incorporeality.¹⁴ According to these concepts movement is one of the differential properties between living and inanimate things. This includes not only movement in its external manifestations but also other immanent transformations such as growth, changes in shape, etc. A physiological sense is implicit in Aristotelian philosophy based on the form-matter relationship. The platonic simile of the soul as the pilot of the body received in Aristotle a meaning both biological and metaphysical: the soul is the unifying principle of the organism and also the origin of consciousness. The concept of "substantial form" refers to the vital principle expressed in the organization of matter as an organism or functional unit. This organization implies a relational disposition among the different parts that constitute a unity and a totality, in a way that cannot be reduced to the mere sum of the components.

Life has a triple nature: plants obtain nutrients, they grow and reproduce themselves; animals feel and move; human beings reason, remember, know about their existence and have knowledge of their death. Human beings represent a synthesis of three aspects: the vegetative soul, the sensitive soul and the intellectual soul. Aristotle introduced the terms psychic, psychology, psychophysics and psychosomatic.¹⁵

He wrote, "I think the soul and the body react one on the other by sympathy. A change in the psychic state produces a change in the form of the body and, inversely, a change in the form of the body produces a change in the state of the soul."¹⁶

Popper¹⁰ has commented that Aristotle's essences or irrational souls are anticipations of the modern theory of the genes: as the DNA they plan the actions of the organism and guide it towards its "telos", towards its perfection. In a nutshell, his system considers the human being as a unity, and the soul is not only the conscious aspect but also the vital integrating principle.

Descartes

Gilbert Ryle¹⁷ coined the expression "the ghost in the machine". It summarizes Descartes' mechanist dualism.¹⁸ The human body is considered as an automat capable, however, of voluntary movements. The French thinker considered extension as the essence of corporeality or materiality. In this, his concept was somehow similar to Aristotelian theory of prime matter or Plato's concepts about space. Following an ancient tradition he also sustained the theory that the mind is incorporeal. In assuming that extension is the essence of materiality, he was obliged to postulate that the incorporeal substance, the soul, was inextensive, "a substance which total essence or nature is not but to think, and which in order to be, does not need any place and does not depend on any material thing."¹⁹ Following this line of thought, if interrelations and all causation in the physical world occur through pressures or impulsions, the mind-body interaction is only possible in a similar way. He was an interactionist-dualist who developed, on this premise, a mechanist theory of the mind-body interrelation.¹⁰

In Descartes the interrelation of the inextensive soul with the body occurs, however, through an extensive structure: the pineal gland. To modern neo-Cartesians this interaction can occur through different portions of the brain. Penfield²⁰ considered the "centroencephalon" as the key structure for this interaction. According to Eccles²¹ it is the zone of language in the "dominant" hemisphere. According to Penfield's concept, disanimation of the body would require the destruction of most of the brain.

Eccles' theory would require destruction of a very restrictive area of the brain hemispheres.

The concept of the soul as a vaporous entity, shade or specter and its entification or reification lead to undervaluing or disregarding the biological substratum. It also implies that the soul is a separable entity in a relation of juxtaposition with the body. Just to mention an example, a practical consequence of this dualist and mechanistic view is the requirement that every part of the organism must die before death can be certain, or an arbitrary selection of which portion determines the link between the two separable aspects.²²

Descartes' mechanistic world and his problematic interactions dualism according to which the body-mind relation occurs as an extrinsic juxtaposition, create the possibility for a dissociation between the moment when the "spirit" abandons the "machine" and the destruction or cessation of functioning of the machine itself. In other words, disanimation of the body becomes a speculative problem beyond the field of medicine.²² This situation leads to a separation between the biological basis of death and its philosophical and theological significance. Therefore, according to this position, the presence or absence of the soul in the body is irrelevant from the physiological point of view. Hence, the philosophical origin of certain positions,^{23,24} according to which it is possible to separate the concepts of personhood and death from the mere biological functioning of the organism, can be understood.

III. The Theological Perspective

Two central problems must be coherently and comprehensively articulated by theology: the anthropological issue of the deep identity of man; and the problem of the meaning and truth of human existence.

The human being is the summit of the creation, he gathers in himself the unity of the material and the spiritual aspects.²⁵ According to Thomas Aquinas, the human person is "the horizon of creation, where the heavens and the earth are united; as a link between time and eternity; as a synthesis of the creation."²⁶

It has also been expressed this way: "in the unity of body and soul, the man, because of his bodily condition, is a synthesis of the material universe."²⁷ The situation of the human beings in the universe is not a mere accident but it is part of their essential reality.²⁸ "The Lord God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being" (Gn. 2:7). This passage from the book of Genesis expresses the constitution of man by two co-principles (matter and spirit), as well as his essential unity with the rest of creation.

Considered from a merely biological point of view, he lacks a specifically super-specialized functional constitution. However, he creates a specific human cultural environment and his technological enterprise becomes a powerful tool. He not only transcends the physical world but he can also open himself to a transcendent and infinite personal reality.

According to his relational essence – in the image of God – man can transcend biological and sociological conditioning in a search that has its natural horizon in God himself.^{8,29} He has been called to be the steward of the creation, a collaborator with God. The man, a finite being, is loved by God in himself and as whole, and he is endowed with a capacity for freedom and spontaneity.^{8,29} In his search he always makes new synthesis.²⁸ The unity of the human person is theologically axiomatic. On the basis of this unity the possibility exists for him to find a realization in the created world, in relationship with the Creator and with his fellow human beings. But what is the real foundation of this unity? The theological foundation cannot be found but in Christology: "only Christ reveals man to man himself..."²⁷ Man recognizes in Christ his anthropological status, his freedom, his dignity and his supernatural destiny.

The Semitic anthropology

Looking into the Judeo-Christian tradition it is possible to find an understanding of the human being coherent with the knowledge provided by science today. To modern eyes, the picture of man presented in Scripture appears impressively realistic. It catches both the complexity and plurality of his dimensions while affirming at the same time the unity of the human person.⁷⁻⁹ It opens the door to a deeper understanding of the reality of man: both from an empirical point of view and from the perspective of his metaphysical structure.⁷⁻⁹ Man's intimate unity is essential to his quality of being "*capax Dei*" which makes him destined to enter, as a whole, into an interpersonal communion with God.

Let us briefly review the anthropological terms in the Bible. They refer to the totality of the human being as a unity, described from different points of view. Four terms are used in Scripture: *basar*, *nefesh*, *ruah* and *leb* (these terms have been translated into the Greek as follows: *sarx*, *psuche*, *pneuma*, *kardia*, and into the Latin as follows: *caro*, *anima*, *spiritus*, *cor* or *mens*).⁷⁻⁹

Basar: The flesh-man (Greek: *sarx*) emphasizes the relation of man with the material world, his mortality. Man is reduced to his earthly empirical existence. Man does not have a body, he *is* a body. The biological man exposed to suffering and disease, temptation and sin. The term also refers

to man inasmuch as he lives only in a self-centered dimension without opening to the other and to God. This term also marks the bodily condition of man, the body-man (Greek: *soma*),⁷⁻⁹ the man as a whole, in his relations with the others; it can frequently be translated as "I". It is close to the meaning of our concept of personality.

Nefesh: The soul-man (Greek: *psuche*)⁷⁻⁹ makes reference to the conscious identity: "I", the entire man as a human being. Man does not have life, he *is* life. It also captures man's involvement in history, his psycho-social dimension and his responsibility in this sphere.

Ruah: The spirit-man (Greek: *pneuma*)⁷⁻⁹ denotes his difference with the material world, his affinity toward God, his capacity to enter a deep communion with the deepest aspects of reality, and with the Creator. It is the "soul-body-man" living in a new dimension.

Leb: this term refers to the synthesis of emotion and reason as well as to the physical and spiritual aspects and the interpenetration of these constituent dimensions.⁷⁻⁹

Frequently the word soul is interchangeable for life in the English translations (for example, Mark 8:36, Luke 12:20, etc.). The Hebrew anthropologist understands the human being as a uni-totally. He is, "as a whole" body, soul, spirit; however, this does not mean unicity or uniformity. Two existential options are presented to him: as "flesh-man" he is closed to the neighbor and to God; conversely, as a "spirit-man" he is open to God who concedes him fullness and immortality.⁸

The central events in the Christian faith

Christ's death and resurrection, doubtless the central events in the Christian faith, are articulated in terms of the Semitic anthropology. The redemption and the expression of the person "as a whole" through the resurrection constituted the anthropological novelty and the center of the Christian message, not the immortality of the soul according to the platonic philosophy,^{8,29} which ignores the dignity of the body. Conversely, the preaching of the apostles recognizes the body as "the temple of the Spirit" (I Co. 3:16). For example, the classic definition of death as no more than the separation of the soul from the body, following the platonic influence, recognizes a spiritual and transcendent dimension in the human being, but it does not capture the richness revealed in the resurrection; it is anthropologically incomplete. It implies that death affects only the body

while the soul remains intact. With this, man would abandon one essential aspect of his anthropological status: his corporeality.

Christ's resurrection indicates that death affects the totality of man and not only his "body."^{8,29} The concept of the body must be reconsidered as a constituent and essential part of the soul. Thus, the center of the Christian preaching is not in just one aspect of the human person; it encompasses the totality. The final and full expression of the human redemption does not imply the abandonment of the body but its complete assumption and liberation in God and for God.⁸ The apostle Paul talks about a "spiritual body", which is only apparently contradictory. The contradiction exists between spirit and "flesh" but not between spirit and body. The natural body can be transformed into a glorified or pneumatic body (I Cor. 15).

The person reaches his goal when he becomes full of the divine reality and overcomes all his alienations. It is the definite entrance of man in his fullness into the kingdom of God. This is what is implicit – after a closer scrutiny – in the word soul when it is used to note the dynamic principle in the human being that makes them move towards an insatiable search for the infinite. Finally, with death, all that is essential and transcendent may crystallize.⁸ According to this spiritual dimension, human beings can transcend the domain of what is merely physical to reach a new mansion, a transfigured body. Moreover, the Christian message introduces a more encompassing dimension. The resurrection does not concern only man in his more nuclear aspect, but with the consummation of the world the whole creation will be redeemed, and his country, the "cosmos", will be transformed "so that God may be all in all" (I Co. 15:28). The unity of man with the universe will be consummated (Ro 8: 21).

The essential aspects of the Judeo-Christian tradition have been considered, as well as the central events of the Christian faith. They provide the key to interpret Pope Pius XII words in his "Replies to Some Important Questions Concerning Reanimation"³⁰ in 1957, establishing that "it was the province of physicians, and particularly of the anesthetist, to give a clear and accurate definition of 'death' and of the 'moment of death' when a patient passed away while unconscious." He conceived a disintegration as equivalent to the death of the person "even if certain organs continue to function." These statements presuppose the essential unity of the human person. They indicate that loss of personhood and death are coincident and inseparable.

It is important now to analyze how the above-considered tradition is articulated with the theological and anthropological principle of the unity of the human person in Thomas Aquinas' conception. Finally, it will

become evident how these aspects are coherently interrelated with a new rationale based on current biomedical knowledge.

IV. The Thomist Tradition

Thomas Aquinas re-approached and transformed the categories of the Aristotelian philosophy, the relationship between matter and form known as Hylemorphism (Greek "hyle" and "morphe" form). He developed a concept that defines the plural unity of the human person. He resolved the arduous problem of a relation that could save on one side the distinction of the components and on the other the unity of man's personal being.³¹ This conception became part of patrimony of the Christian faith as it is in consonance with the Biblical model.

Thomas Aquinas' anthropology has two fundamental aspects: First, "The doctrine of the human nature as a unity of 'soul and body' which explains the intelligibility of the human being and his history". The second aspect is "the doctrine of the person which in a special mode orients us from the ethical point of view and in relation to the way of the person in the plane of the creation and of the Christian salvation."³¹ These two aspects have axiologic value.

Aquinas retook and elaborated Boecio's formula. The person is "individua substantia rationalis natura". Let us summarize it.³² Substantiality indicates the ontological substratum of the person. The person as a whole is greater than the mere sum of any of the constitutive aspects. The identity of the person subsists as superior to the expressions of any particular act. The individuality points out the distinction of every man as a unique and irrepeatable living being, the biological and corporal status. Rationality is an essential attribute of man. It is not dependent on the actual capacity of expression in a certain moment or circumstance. The status of personhood is related to the specific constitution of the human individual. It is not determined by the acts of the person.

Contribution of Thomism to a unitary doctrine of the human person

The Thomist conception articulates both the biological and spiritual dimension of the human being. The main concepts can be summarized as follows:

- (a) The human person is a unity of differentiated dimensions. The soul is the "substantial form of the body". It is the source of self-consciousness as well as the vital principle, which unifies the body.
- (b) The head is the critical portion that determines the life and unity of the human body.³³
- (c) Substantial changes occur as instant transitions.

The soul as the "substantial form of the body"

According to the Aristotelian tradition, man is a synthesis of three aspects: the vegetative life, the sensitive soul, and the intellectual soul.³⁴ Thomas Aquinas developed a unitary theory. He clarified the fact that though there are three conceptually differentiable levels, there is only one soul and not three. The unity and totality of the body is greater than the sum of its components. The ontological level pertinent to the human person includes the convergence of these aspects. The man is not conformed by the sum of two different essences, that is, soul and body. Spirit and matter are, more precisely, the two co-principles that constitute man as a unity and a totality. The soul is the "substantial form of the body". The body is realization and expression of the spirit.

Shewmon³³ has noted the affinity between current biological concepts and the Aristotelian-Thomist conception of the soul as "substantial form" of the body. In living organisms a constant and dynamic exchange of atoms and molecules occurs, which includes all the tissues and organs of the organism. It encompasses even the more seemingly static components as the bones and the nervous tissue. After a certain time, the original atoms and molecules are replaced by different ones. However, the organism remains the same due to a conservation of relations at the atomic, molecular and biological levels. This implies a persistence of the form of the body throughout time. This is an essential or "substantial" aspect. Shewmon has noted the similarity of the Aristotelian-Thomist concepts with certain modern analysis of the vital processes. This author quotes Varela³⁵ who has developed the concept of "autopoiesis" or "autopoietic mechanism" to describe the essence of living organisms. According to Varela, "an autopoietic machine continuously generates and specifies its own organization throughout its operation as a system of production of its own components, and it does this in an endless exchange of components under conditions of continuous perturbations and compensations of the perturbations. Therefore, an autopoietic machine is a homeostatic system (or rather a relation-static system) that has its own organization (defining networks of relations) as the fundamental invariant". From a biological point of view, this description, along with the organizational principle it implies, has a great similarity with the Aristotelian-Thomist concept of "substantial form of the body".

The head as the critical portion which determines the life and unity of the human person.

Thomas Aquinas considered the head as the critical portion in the human body.³³ According to him, it is "the seat of consciousness," but at

the same time, "no other external portion is related to the integrity of the organism in the same way as the head."³⁷ Thus, the essence of the body as animated matter, the body-soul unity, ceases with the absence of respiration, "not because this is the means of union but because of the remotion of that disposition in virtue of which the body is conditioned by this union."³⁸ Therefore, the spiritual faculties in the human beings include the intellect and the will and, though they are essentially immaterial, they require an appropriate functioning of the brain.

Substantial changes occur as instant transitions.

According to the Aristotelian-Thomist tradition, things have their existence in virtue of two principles: matter as pure potentiality and substantial form, which specifies the substance or essence of the object, phenomenon or entity. The accidents or properties characterize the object in its condition as such. Substantial changes occur as a critical series of accidental changes. They are instantaneous while accidental changes are continuous. These concepts are relevant to different problems including the definition of death.³³ It makes intelligible the theological concept of death as an instant transition and the fact that the soul encompasses the whole body, and yet, the destruction of only one essential part (the brain) can lead to the loss of the substantial form of the body as an instantaneous change. It can be considered a substantial change because it means dissolution of the essential attributes of the human person: substantiality, individuality, and rationality. It is coincident with the understanding of death as an event or transition between the process of dying and the process of disintegration.^{38,39} This is sustained on neurological, legal, social and religious grounds.^{1-5, 22, 38-40}

The Thomist conception harbors the mystery of man as a biological, psychological and spiritual being. His anthropology "always unites very closely the consideration of nature and the person, so that nature founds the objective values of the person, and the person confers a concrete meaning to the universal values of nature."³¹

V. The Unity of the Person: the Biomedical Basis

Errors and oversimplifications have not been infrequent concerning this issue. Let us summarize them:¹⁻⁵

(a) The univocal treatment of differentiated hierarchical levels in the human organism.

(b) The inadequate specification of what function or set of functions determines the criticality of the brain.

- (c) Exclusively attributing all content of consciousness to the cerebral neocortex.
- (d) Disregarding the encephalization process of arousal in human beings as one of the aspects of consciousness, as well as the richness of its components and its contribution to the content of consciousness, and hence the philosophical and biomedical meaning of this fact.
- (e) Considering autonomic integration as brain stem-centered, contrary to current neuro-physiological knowledge, which shows autonomic integration as related to hierarchically higher limbic structures.
- (f) As a consequence of (c) and (e), a dichotomy: consciousness (cerebral neocortex)/autonomic integration (brain stem).
- (g) Disregarding the integration "as a whole" of these functions.
- (h) Finally, as a result of the above, the failure to recognize and make explicit a fundamental fact: the essential unity of the human person.

Considering fundamental biomedical knowledge the author has proposed the concept of a system that, from a biological point of view, could be justly considered as "the system of the mind-body unity" (SMBU).¹⁻⁵ It captures the idea that the generation of consciousness is inseparable from the rest of the integrative functions that determine the capacity of the organism to function "as a whole". The above essential and irreplaceable system can be described with a necessary and sufficient level of resolution. It is composed of the following subsystems:

- 1) Structures from the ascending reticular activation (sub)system: nonspecific populations of neurons located in the tegmentum of the rostral pons and midbrain, the intralaminar and reticularis nuclei of the thalamus and the posterior hypothalamus.
- 2) Limbic structures: the hypothalamus, the basal forebrain, the amygdala, the hippocampal complex, the cingulum, the septal area, the nucleus basalis of Meynert and reticularis nuclei in the midbrain and rostral pons. Also the pedunculo-pontine nucleus, the rostral raphe nuclei, the periaqueductal gray and the nucleus locus ceruleus.
- 3) The cerebral cortex with the thalamus, and basal ganglia.

This system provides the capacity for the following functions:

- (1) The generation of consciousness;
- (2) Integration and control of the communication systems of the organism (nervous, hormonal, immune);
- (3) Processing, integration and regulation of the afferent flow from, and the efferent responses to, the whole organism;

- (4) Integration and control of the mechanisms that maintain homeostasis in the internal environment;
- (5) Behavioral and adaptive interactions with the outer world;
- (6) The most intimate relation between physiological processes and mental states;
- (7) The integration "as a whole" of each one of the foregoing functions.

A key question that needs to be addressed is whether or not the interrelation and integration "as a whole" of functions from (1) to (6) could be better understood in itself as constituting a function higher than, and irreducible to, either any of the specific (sub)functions of the system or to the mere sum of them. Is the interrelation between the processes that generate these functions the origin of a qualitatively higher functional level that might constitute the most valid concept to consider the brain as being above any other organ or system of organs in the organism? Are these various brain functions simply integrated through their mutual interaction? Or, are they so closely integrated and mutually enriched in the living brain that, as a whole, they could be better understood as a global "metafunction" of the SMBU?

Modern neuroscience depicts the functions of the brain in a fragmentary way.⁴¹ An explanation as to how all the highly specialized and apparently fragmentary work of the brain is put together constitutes the central problem of neurocognitive science. This is known as the binding problem. Specialists concede that the solution to this problem may still be far.^{41, 42} However, this is only a first level of the problem related to consciousness. In a second level, the way the brain integrates and control "as a whole" its different general functions would have to be approached. The state of the art in this area should not preclude an approach based on more general inferences. The more precise knowledge about the brain achieved during the last few decades is revealing, in general, concerning the "what" and "where," even when the "how" may represent a much more complex challenge. An inescapable picture that becomes patent, when the brain is considered in a more global perspective, is the practically complete anatomical and physiological correspondence among its different general functions (see above).

The example that follows indicates the need of keeping sight of the global perspective. Observations that indicate the impressive capacity of the brain to integrate and control its function should not be overlooked. It has been shown that humans can consciously access a great range of brain functions. One way of achieving this is through conscious sensory feedback.^{43, 43} Conscious feedback seems to create spectacular access to skeletal muscle and to autonomic musculature. Indeed this pattern also

extends to conditioned immune responses.^{45,46} Biofeedback control of single neurons and populations of neurons is well established. It seems that, any neuron or population of neurons can come under rapid, precise, voluntary control when immediate conscious sensory feedback is provided. To gain control over a single spinal motor unit its electrical activity is monitored, amplified and played back over headphones; in such a short period as 30 minutes subjects have been able to play drum rolls using a single motor unit isolated from adjacent units. Similarly, to gain control over alpha waves in occipital cortex a tone is sounded when the rhythm is detected in the EEG, and subjects can learn to increase the amount of alpha at will after a short period of time. Conscious sensory feedback appears to be a necessary condition for the establishment of biofeedback control. This is only one expression of the anatomical and functional correspondence among the different global functions of the brain. This is a spectacular capacity of control which reflects the existence of the finest relation between the system "as a whole" and each one of its most basic components. There does not seem to exist a convincing explanation of these observations except that of a powerful functional integration with a global reach. This knowledge is consistent with what researchers as Damasio have stated, in the sense that because a theory of consciousness must show how we acquire a sense of self, it necessarily must consider not only the brain but also the entire body.⁴¹

Further investigation is required to substantiate and develop the above proposed concept. However, at the very least, it is closer to the anatomical and physiological reality of the living brain than the dichotomy cortex=consciousness / brain stem=autonomic integration. It may provide ground for a precise and explicit rationale concerning the unity of the human person. It is relevant to the most fundamental bioethical issues including the formulation of death. It could be the best rationale to characterize the brain as the essential and highest hierarchical level of organization in the human organism. It would provide a clearer understanding concerning the irreplaceability and criticality of the brain and the ontological level pertinent to the definition of death. This concept would provide a coherent explanation as to why the brain is the privileged organ in which the essential "functional synthesis" of the living human organism occurs. The destruction of the system with the capacity to generate its critical "metafunction" would inherently mean the loss of the essential quality of the organism as a "uni-totality".

The rationale considered above is relevant to other ethical problems that include the concept of personhood and the problem of defining health.⁴⁷ This rationale would explicitly support the inseparability of both the loss of personhood and the death of the organism. It would also

provide a suitable conceptual frame to approach and elaborate a number of fundamental issues such as the problems of identity and individuality, the principle of totality, etc. All these aspects still require further neurological and bioethical investigation.

Thus, this rationale may provide a biomedical foundation to a unitary concept of the person, which is questioned today by certain positions. This concept is founded on neurological knowledge and belongs to the field of biomedicine. At the same time, it remains open and suggestive for those of us who believe in a transcendent substantiality of the human person, a metaphysical dimension essentially articulated with the intrinsic biological unity of the human organism.

The biologicality of the cerebral components, its organicity, is not an accidental aspect, which could be totally replaced by some sort of artificial intelligence device at some point in the future.³³ The constant metabolic activity of the brain, the endless exchange of molecules, the constant remodeling of the cellular structures, the harmonic functioning of the systems of neurotransmitters, the fascinating complexity of the cerebral modules, along with the horizontal and vertical organization of the brain, and its possibility of concerted functioning and adaptive automodification, all this, constitutes an essential aspect of the capacity of the brain for its "intelligent" integration and control of the organism, as well as the expression of the intellectual faculties. This incredible capacity is genetically codified from the very beginning. There is an immanent dynamism and potentiality along the continuum of human life, from intra-uterus life to adulthood and senescence.

VI. Loss of Personhood is Coincident With and Inseparable From the Moment of Death

The rationale considered herein provides a suitable conceptual frame to approach and elaborate a number of fundamental issues such as the problems of identity and individuality, the principle of totality ("the whole" is greater than the extrinsic sum of the parts or the acts), etc. This concept allows greater precision in approaching the problem of the definition and determination of death. It separates death from a number of "limit-syndromes" like the "vegetative" states, severe states of dementia, severe encephalopathies, and primary brain stem death.¹⁻⁵ It is not possible to dissociate personhood either from consciousness or from the biological capacity of the organism to function as a unity and a totality, as both aspects have a common neurological basis. It is evident the coincidence of the death of the individual – at the same time human being and person –

with the death of the organism. Biomedical knowledge confirms what is theologically axiomatic: the unity of the human person.

VII. Conclusion

A concept of personhood based on the intrinsic biological unity of human beings is not of little importance to understanding human life and death, as well as a number of fundamental biomedical problems. A tradition of philosophic and theological thought meets the anthropological principle of personhood as a unity of differentiated dimensions. This unity does not imply either uniformity or unicity. The rationality considered herein supports the above-mentioned anthropological principle from a biomedical perspective. It provides a synthesis, which constitutes an adequate conceptual frame to re-approach a number of issues currently treated – by certain trends – in a reductionist way. The concept of a critical metafunction in the human brain is fundamental if one is to understand the unity of the human person, which has axiological value to elaborate a number of issues in the interface between biomedicine and theology. This concept can be articulated with a historical tradition of thought in western civilization.

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