

# Solution to the Mind-Body Relation Problem: Information

Florin Gaiseanu

Science and Technology of Information Bucharest (Romania) and Barcelona (Spain)

In this paper it is analyzed from the informational perspective the relation between mind and body, an ancient philosophic issue defined as a problem, which still did not receive up to date an adequate solution. By introducing/using the concept of information, it is shown that this concept includes two facets, one of them referring to the common communications and another one referring to a hidden/structuring matter-related information, effectively acting in the human body and in the living systems, which determines the dynamic inter-change of information between specific structures of the organism by electric/electronic/chemical agents and genetic/epigenetic processes. It is shown that the maintenance of body, permanently and obligatory depending on the external matter (foods, air, water) resources, needed to provide both the structuring/restructuring basic material and energy, determines the necessary existence of an info-managing system, administrating the internal mechano-chemical/physical processes. As a natural consequence, such a system should organize and assure own survival by an effective informational operability to detect the external food resources, to select the appropriate interest information and to decide as a function of circumstances. One important component in such an informational system is memory, allowing to dispose of the reference informational data for analysis/comparison and the selection between good and bad binary possible decisions. The memory receives and stores therefore signals from external reality and from the body itself, referring to the emotional reaction, digestion status, creation, and inherited predilections, within specific info-neural communication circuits between the brain and body execution/sensitive organs, the human body appearing as an integrated info-matter self-managed dynamic system. The specific body components memorize information with different degrees of info-integration: short/long-term integration, emotive/action reaction, info-abilities, culminating with the integration in the chromosomal structures by epigenetic processes. The new acquired information is transgenerationally transmissible, and is manifested as new traits, showing the adaptation capability of the human and close relation between mind and body. Analyzing the results of such a mind-body informational model in comparison with the earlier assumed/proposed/asserted archaic, Greek and Occidental philosophies, which represent only partial aspects of this relation, it is shown that this informational model, elaborated in terms of information on the basis of scientific reasons and arguments, constitutes a general, realist, and coherent model of the mind-body relation, able to integrate and/or explain most of the others.

*Keywords:* mind-body relation, philosophic concepts, information/informational systems, info-operability and memory, hidden/structuring information, genetic/epigenetic information

## Introduction

Although the mind-body relation was defined as a “problem” of two distinct entities on the philosophic historical scale by René Descartes in the 17th century (Skirry, 2016), this relation was a subject of contemplation since much older times (Gaiseanu, 2020d; Schafer, 2020), by Asian/Chinese and pre-Aristotelian philosophers (Robinson, 2020). According to this conception, the “substance” nature of mind and body is completely different, interacting only “causally” during the body motion and sensations (Shirry, 2016): While body is physically extended in space but not able to feeling or thought, mind is not extended but capable to feel and think. The problem would be therefore how these two different sorts of “substances” could interact. Such a conception is classified as a dualism view of this relation, in contrast with monism, which stipulates that both these “substances” have the same essence, allowing that everything within the surrounding reality could be described in this way (Robinson, 2020). While the archaic Buddhist conception within the so called Five-Aggregate Model succeeded to detect several body functions that determine the mind, i.e., material form, feelings, perception, volition, and sensory consciousness, entering and passing continuously through mind as a changing mind-stream (Karunamuni, 2015), Aristotle simplifies/unifies this problem, considering that a general unity between body and mind should exist, by observing that the mind is in fact a property of the body, like any other common property. In contrast to this view, Plato believed that the material reality, so also the body itself, is a “shadow” of the world of the immortal “Forms”, which contains the soul, temporarily unified with the body during the lifespan, actually immortal as well (Robinson, 2020). In more recent 18th century, Kant proposed that in the brain should exist some predetermined “a priory forms” and concepts on reality, as a superior level of the perception and understanding of reality (Brook, 2008). More recently, Popper explained that besides body and mind, the creation of the mind itself should be considered within the mind-body problem, as an additional component (Popper, 1999).

No much progresses on this problem were registered: In our nowadays, actually as always, philosophy is tributary to the contribution of other sciences like neuroscience and neurobiology, hopping that such a “hard problem” concerning the relation mind-body and its variants, like the relation between brain and phenomenological experiences of mind (Chalmers, 1995) could be solved.

More recently, coming toward philosophy from the field of solid-state electronics and science of information, Draganescu stipulated that actually matter and living entities are structured by intervention of information (Draganescu, 1979; 1990). Probably unexpected from the point of view of the classical sciences, the science of information and related physics and technology (Gaiseanu, 2013; 2017c) penetrate more and more such impenetrable up to date problems and mysteries of the human, life nature and universe. In our informational era, surrounded by an avalanche of information from our communications by internet, measurable in Bits, most of us believe that information is something common in our life, so common that it is not necessary to speak about information in other way than relating it with internet and communication; so therefore nothing else should be added on this matter. However, this is only a “visible” facet of information. Actually, information is one of the fundamental components of our world, as it was explained recently, deeply involved in the structuration of ordinary matter (Gaiseanu, 2016), consciousness (Gaiseanu, 2017a; 2017b; 2019a; 2019c), and of the living systems (Gaiseanu, 2020a; 2020c). Therefore, what is actually the relation between body and mind? In this paper it is presented a response to this problem from the informational perspective, bringing into discussion the intrinsic information, “hidden” into the structured matter of the human body and projected in mind as pure, virtual information.

### **Mind-Body as an Integrated Informational System and the Info-operability of the Mind**

In a common sense, information is manifested/detected as a change of physical parameters interacting with our body and can be perceived by our common senses (sight, sound, smell, taste, and touch) or by other specific sensors able to decode internal signals and transduce them as hungry, pain, thirst, burn, or other internal needs. All these signals are perceived/decoded and stocked in the memory areas of the brain. When we refer to decodification process, we have to take into account an internal process of interpretation of signals, as a specific way to operate information and distinguish among various sorts of signals. This process is specific to species and is formed/learned within the first period of life, when the child starts to contact with the reality and exercise the own senses and informational facilities. Therefore, the detection is associated with interpretation, memory, and informational criteria according to own experience. When a burn is detected, this will become a “bad”-type criterion and will be avoided in the future experiences. Impulses interpreted as hungry automatically trigger dissatisfaction responses, manifested to the children by cry (Gaiseanu, 2020d). Information collaborates/interacts therefore with body, being detected and operated by specific zones. The communication takes place by physical and chemical agents, specifically by means of the nervous system and by other channels, like hormones.

From the above discussion, we can draw the following conclusions: (i) we dispose of specific sensitive detectors for connection with the external reality by means of the common senses; (ii) the informational internal signals are detected/interpreted also in a specific way, as acquired by species, triggering automatic responses of the body and its specialized components; (iii) the experience gained from the contact with reality is memorized and learned; (iv) learning is an associative process, specifically with already stabilized/consolidated information, creating decision criteria; (v) body is a sensitive material entity able to react; (vi) the sensitivity of the body can be manifested/detected as information by means of external and internal informational sensors; (vii) body is a material entity able to react at information, either by mechanical, chemical, or other forms of emission of information; (viii) while the common senses are known/categorized as specialized organs to detect external information, the internal processes maintaining the existence of the body can also emit/launch specific signals of emergency or needs, asking action; (ix) an operative informational system allowing the processing of the informational signals with respect to the specific internal or external circumstances is necessary and it does exist and is operative within the body; (x) an automatic informational system allowing the body maintenance and its connection with the necessary “fuel” (foods, air, water) and fuel needs is necessary and does exist and operates; (xi) a non-automatic (conscious) informational level of the informational system does exist and operates, able to make decisions according to the specific circumstances; (xii) a quasi-permanent communication between the body and the superior non-automatic (conscious) informational level of the informational system of the human body does exist.

Although the internal informational emitters of the need signals are not detectable, the processing of the material supporting foods triggers by itself the specific signals (Gaiseanu, 2020c). As it was shown recently, the human (eukaryotic) cells work to assure own energetic needs, transforming some “sugar”-type components into specific composed biochemical agents providing energy: If the ratio between the processing and the providing material is unfavorable, then a “hungry”-type signal is emitted to the info-operational conscious center to “work”/operate for fuel supply. As the living beings depend permanently on the surrounding material (foods) conditions, such communication and decisional operability is imprescriptible. More than that, the survival

needs of such (dynamic) systems determine by means of epigenetic adaptability processes and mechanisms the change of the behavior or plasticity of the body itself, starting from the information received from the environment, as it will be shown in more detail within the next section. We can refer therefore to the human body as to an integrated informational entity, operating both with information and mechanic/energetic works.

Observing therefore the functions of the human organism starting from the above informational analysis, it can be deduced the following: (1) human maintains, like all the living structures, the material body existence by the connection with the material (matter-food) products; (2) human maintains own survival by connection with information, either detected from the external surroundings or internal sources; (3) human disposes (like other living structures) of the capability to operate with information, either automatically (by means of specific programmed systems), or non-automatically (by means of conscious informational system), allowing to make decisions according to the external/internal circumstances. It appears therefore that the human body is an integrated material structure with two main functions: (a) automatic structuring/restructuring of the body material itself and supplier of energy; (b) informational operability consisting in the management of such activity and communication, analysis/decision for adaptability and survival.

The categories entering into to the functions (a) refer to metabolism, i.e., all the mechanical/chemical/physical processes allowing the material composing/recomposing of the cells, body organs, components and energy generation, including the procreation and body development processes (Gaiseanu, 2020b), constituting the material axis of the organism. The categories entering into the functions (b) belong to the informational operability, constituting the informational axis of the organism. Human is therefore, like other living structures, an operational material system working with information, either to receive and elaborate decisions (conscious mind), or managing automatically and autonomously information structured/“embodied” into the genetic species system, to allow the maintenance of the living structure, its development and reproduction. The term “structured/embodied” will be clarified into the next section. In other words, human is a bipolar information-matter structure.

Therefore, on the basis of these conclusions, we can define the informational system of the human body as following (Figure 1): the Center of the Acquiring and Storing of Information (CASI), which receives the external and internal information and memorizes it into the matter substrate. Into this system enter the external and internal sensors and associated neuro-connections, forming the corresponding informational circuits. The main brain zones operating this functions are: the prefrontal cortex, allowing to memorize short-term (1 min.) information, hippocampus, memorizing the long-term information, actually the right memory, the headquarter of the remembrances, either informal or emotional, cerebellum, accumulating the automatic acquired abilities, like driving the car or playing a musical instrument (Gaiseanu, 2019h).

The memory is actually the basic center of the informational system, accumulating informational experiences of the entire life. As it can be seen from Figure 1, indicated by colored arrows entering into CASI, and according to the informational analysis presented above, information comes from all external but also from internal sources as a consequence of the body operations and communicating signals. The mind has access to memory and therefore CASI is part of the conscious operability of the mind. The thought is the informational operator of the mind. This operates and is supported by the brain connecting neurons and their energetic resources, either electronic, by electric transport along the axons—the longer part of the neuronal cells, and chemical neurotransmitter agents within the junction gap between the neighboring neuron cells. Thought is therefore supported by an energetic stream oriented to detect an information in the informational field of the

mind, so this is an info-operator acting as a vector in this field. We can define the informational field of the mind the totality of the associated/stocked information in the CASI brain areas. This field is personal and forms the own informational “world”, as a reflected reality and life experience into the personal informational system, according to the perception capability, interpretation and the accuracy of own info-operability.

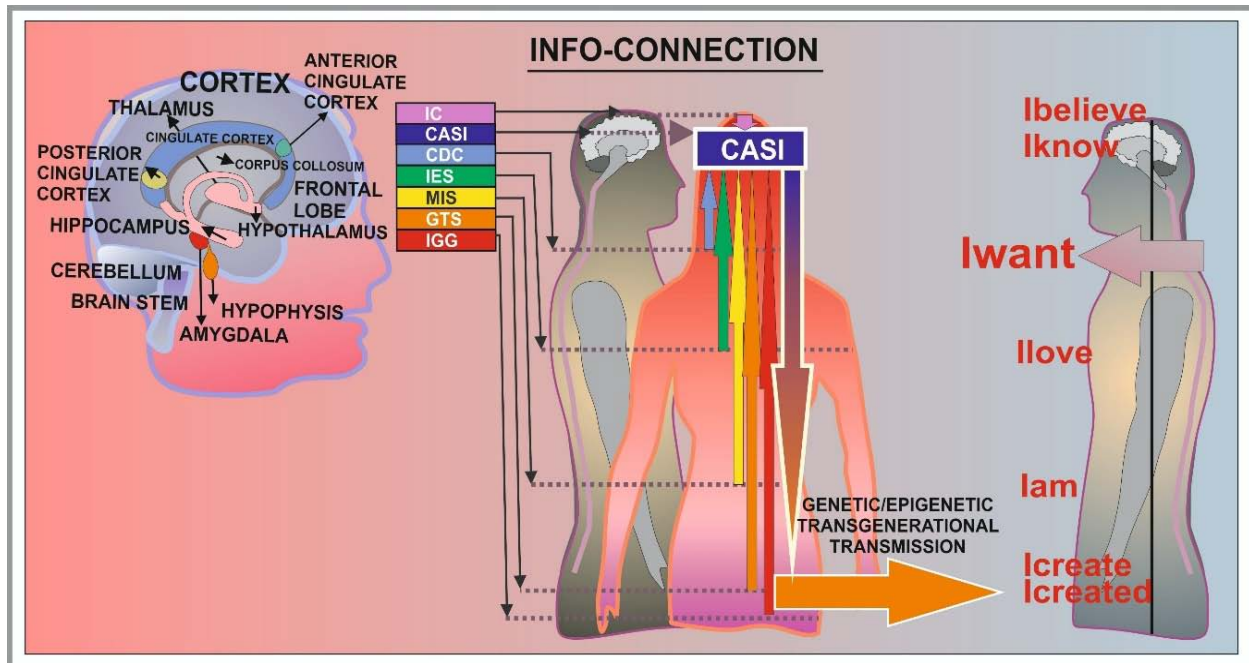


Figure 1. Mind-body informational system allowing the info-integration process (left side) and the reflected body informational activity in the mind (right side).

CASI is connected with the external and internal sensors, receiving specific information. The sight at human is one of the most developed senses, engaging about 50% from cortex (Gaiseanu, 2020e) for perception and interpretation/composing of the visual signals. The recall of a memorized image is a process which uses the same visual circuits of the brain, although with much lower resolution, displaying on the mind “visual screen” the memorized information. Therefore, the recalled process uses the revers way of the “imprinting” visual process, any type of intimate process this would be. The same happens with other sensing circuits. The visual sense operates with light, auditiv sense with sound signals, touch with pressure/mechanical sensors, smell and taste with chemical signals. In the informational electronic devices the coding/decoding/interpretation of the operational signals are common techniques, either to digitally memorize them on a material support or reproduce them in a specific device. Any could be therefore the intimate mechanism of the registration of information in CASI, based on light, sound, chemical and/or physical input, whose interpretation and reproduction use the same informational circuits and coding/decoding (“embodying”/“disembodying”) of information. Looking from this informational perspective, the Chalmer’s declared “hard” problem loses its importance, converting it into an already solved problem. The info-operational systems of the brain are able to detect, store, transduce, and interpret the information by sensitive detectors and reproducers. As it was discussed earlier (Gaiseanu, 2020f), deoxyribonucleic acid (DNA) is the main storing system of information of the entire body structure, as an informational master. Therefore, the entire body and its material components have/dispose of information. Thus, it is right to define body material as an informed matter structure (Gaiseanu, 2016).

The operability of information is assured by the Center of Decision and Command (CDC), related to the motor elements of the body, especially with the vocal system (indicated by a corresponding connection black arrow in Figure 1), as an informational decision output. This center is connected with the main part of cortex and manages the info-analysis and judgment, by means of the thought, which is the informational operator of the mind, as specified above. CDC collaborates closely with CASI, where information is stored and is maintained under stand-by conditions. The momentary necessary information is searched and activated/accessed by the thought, as an informational operator and is included into the operational/decisional process. The analysis and decision are made on the basis of decision criteria, which are also stored in memory as consolidated information, used also during the spontaneous selective info-operation by the Info-Connection (IC) center, supported by the anterior and posterior cingulate cortex, as it can be seen in Figure 1 (Gaiseanu, 2020e; 2020g). The judgment of information and decision is therefore relative to a criterion or criteria, providing a YES/NO binary (Bit) response. As CDC is a creative center, creating new information from the accumulated data during the judgment process, the informational field of CASI is actually an info-creational field of mind, as it was defined earlier (Gaiseanu, 2016; 2020a). Therefore, the Popper's philosophic concept on creativity of mind, which would create a "new" mind-body "problem" is overflowing on the mind concept itself, because the creation of the mind is information too, belonging to the same category, as a mind informational essence. The split of mind-body medically observed during the Near-Death Experiences (NDEs) could be explained by IC intervention (Gaiseanu, 2017a), which could be further extended to the soul immortality problem (Gaiseanu, 2018c) and is similar with the Plato's belief. This center is also involved in "para"-normal phenomena (Gaiseanu, 2017b) and Religious and Mystic Experiences (RMEs), as it was explained earlier (Gaiseanu, 2019c; 2019e).

The Info-Emotional System (IES) manages the emotional sensations, which are also perceived as information and stored in CASI. In the brain, the responsible area is represented by the limbic system, composed mainly by amygdala (alarm/emergency/danger component), hippocampus, hypothalamus, and cingulate gyrus (Gaiseanu, 2020h). The emotive/affective impulses/sensations are a reactive consequence/response to an input/associated information and in the body are connected especially with the heart (communicating also with the solar plexus), as it is indicated in the Figure 1 by a corresponding black arrow. This connection reflects actually the close mind-body action/reactivity with respect to the good/bad nature of information and selection criteria, alerting on the binary (Bit) YES/NO acceptance/rejection alternatives. Therefore, IES is an important contributor to the output decision elaborated by CDC. The emotional impulses are registered in CASI, as it can be seen in the central part of Figure 1, indicated by the green colored arrow.

The automatic informational systems are programmed and autonomic and each of them works in parallel with the others (Gaiseanu, 2020a). The Maintenance Informational System (MIS) manages the metabolic processes and is related especially to the brain stream, showing that such activities are basic for the human organism and for other sub-human living structures on the evolutionary scale (Gaiseanu, 2020i). The signals from MIS, which are connected especially with the digestion organs (corresponding black arrow in Figure 1), are received also by CASI (corresponding yellow arrow) and consist in related sensations according to the state of the digestive processing. The Genetic Transmission System (GTS) is connected mainly with hypophysis and informs the conscious level on the reproduction impulses. GTS could be also a relevant contributor to the decision especially during the youth period.

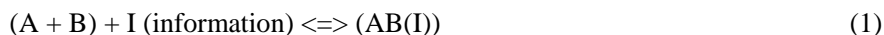
The Info-Genetic Generator (IGG) is also mainly connected with hypophysis and manages the body development according to the age. This system is the bearer of the genetic information of species inherited from parents, including their specific traits, marking the inherited predilections, predispositions, and abilities of the offspring. From the informational perspective, the activity of this system, supported at the cell level by the DNA info-related processes like transcription/translation and replication (Gaiseanu, 2020f), explains the transposing in mind of the “a priori forms” which Kant and Plato speak about and this mechanism is referred actually to the ancestral registration in the genetic informational structures of the detected surrounding reality. This is specifically information hidden into the DNA intimate structures, as it is presented in the next section.

### **Dynamics of the Integration of Information in Body and the Body Info-response**

Information can be acquired and integrated into the body structures during the lifespan: Indeed, as the existence of the living systems is permanently dependent on the foods supply, a natural consequence is that these systems have succeeded to dispose of appropriate mechanisms for adaptation to the surrounding changings by the integration of the relevant (insistent/intensive) information in own core/master structure, which is DNA. The very young science, developed starting with about two decades ago, which studies such mechanisms, is epigenetics (Gaiseanu, 2019c).

In the above sections it was commented that the concept of information shows already a largely accepted facet when the communications and the associated microelectronic devices are concerned. Therefore, first of all let see how information could have a hidden facet when the matter structuration and especially the living structuration and the associate dynamics are regarded. In a previous study (Gaiseanu, 2020f), it was shown that the entropy of a microstructures system is a measure of the order/disorder of such a system and the informational entropy (Shannon, 1948) elaborated to describe the accuracy of the received signals within a communication system could be used to calculate the quantity of information. By using the concept of informational entropy, it was possible to estimate the quantity of the relevant information contained in DNA structures of various eukaryotic (plant and animal type) cells, necessary to identify them as such (Jiang & Xu, 2010). The “negentropic” (Schrödinger, 1944) structuration and compartmentalization (specialized functions by organs) are key processes with participation/absorption of information allowing the functioning of the living systems (Gaiseanu, 2020f). Specifically, the quantity of information absorbed in a system is actually obtained by the elimination of (unnecessary/disordering) entropy.

The “collaboration”/interaction between matter and information could be revealed even from the micro-elemental level, information marking the dynamics of the change. Formulating the contribution of information at the most basic process, a reaction between two constituents A and B is an action with change of the state of the system (A, B) so with intervention of information, which can be written as:



In this relation I is information participating to the reaction as a action/changing factor, and I represents in the right side the information “embodied”/hidden into the new composed material. The Relation (1) shows also that this reaction could be reversible, i.e., the incorporated/“embodied” information could be released by the destructuring of (A, B) system into the composing elements. This relation reveals the key process of the absorption/desorption of information, both concerning the mechanisms of the info-recording/“imprinting” of information on a material substrate and the information release during the reverse destrcturation process.

This relation is suggestive both to understand the principle of the perception/recall process of information in CASI and the “embodiment”/“disembodiment” of information from DNA genetic structure. Material substrate and information interact in this way incorporating/releasing a hidden/observable information by intimate processes.

The DNA molecule is very large, composed by sequences of only four distinct nucleotides (bases) which bind the two strands of carbon chains structured into a tridimensional double helix. The molecule of mRNA (messenger ribonucleic acid) copies during the transcription process of DNA the structuring information of a DNA sequence and transport the information from nucleus to cytoplasm, where within the translation process and with the participation of tRNA (transfer RNA) molecule and amino acids molecules absorbed from foods or fabricated by the cells themselves create the proteins, which are the building bricks of the organism. The proteins manifest the necessary properties both as regard the constructive structures and their differentiating properties (Gaiseanu, 2020c). The DNA structures are bears of information for own body and mainly manifested during the body development managed by IGG within the replication process and for the genetic transmission to the next generation by GTS. However, it should be noted that the (re)building of the body induced by DNA restructuring (embodied) information is a permanent process at a cellular level. The reading/transmission of information, measurable in Bits (Gaiseanu, 2020f), is based on the “language” of the four “letters” alphabet of DNA sequences carried by RNA components to structure the proteins, working both as building blokes and informational agents.

The epigenetic mechanisms do not modify the DNA genetic structure, and refer to the intimate processes of the interaction of information with body, specifically on the environmentally induced phenotypes (observable induced traits for adaptation) (Gaiseanu, 2019g). The epigenetic mechanisms are actually processes of transmission and absorption/“embodiment” of information. In a first phase, the initial signal called “epigenetor” initiates the interaction with the cells, which integrates this signal, converting it into a molecular chain of interactions with the body cells, becoming an “initiator” signal (Berger, Kouzarides, Shiekhattar, & Shilatifard, 2009). This signal should be insistent/intensive and repetitive to have a real effect. The final interaction takes place actually by means of “maintainer” agent, which acts on the chromosomes, which are some packaged structures in the nucleus of cell containing all information on the body and its behavior. The chromosomes consist in a mixture of DNA (30-40%), RNA (1-10%), and histones (50-60%), specific proteins which anchor the large double helix DNA structure to avoid its damage, the proportions depending on the species cell and even in the same organism on the cell differentiation and development/stage cycle. In human the largest chromosome can contain about 220 millions of base pairs (bp) with 85 mm long if straightened (Gregory et al., 2006). This shows the DNA high capacity of info-accumulation in such structure. As it was shown earlier, the quantity of the information in the human cell is of the order of  $8.38 \times 10^8$  Bits, which can be compared with  $5.07 \times 10^6$  Bits of cell of the *Staphylococcus aureus* bacterium (Jiang & Xu, 2010), showing the complexity of the info-development of the human organism on the evolutionary scale.

The epigenetic “maintainer” is actually the final step of the epigenetic process, which conserves the acquired information due to a persistent environmental cue/stress under a consolidated/stable form into chromosomes and can be transmitted to the next generation. The typical epigenetic mechanisms consist in subtle small interventions, manifested by DNA methylation (substitution of a hydrogen atom by the methyl (-CH<sub>3</sub>) group in the Position 5 of the carbon in a DNA segment of the helix, not modifying the sequence), histone modifications, variants of nucleosome positioning and some others (Berger et al., 2009).



As it can be observed therefore, the living matter is “informed”, containing a high quantity of “hidden” information inside of its structure, which can be manifested particularly as information itself by the intimate processes of DNA transcription/translation and replication and in the final macroscopic level by body shape and its functions. Thus, the structural (hidden) information in DNA contains all the elementary components to reproduce a new being structure with all characteristics, from the shape of the body and the color of eyes, to the typical behavior in everyday activities. On the other hand, it is to be also remarked that the epigenetic processes can conserve the new acquired traits and express actually at the deeper mater level the highest info-integration level, as it was be suggestively represented by the arrow from CASI toward GTS in the central part of the Figure 1. The virtual perceived information is in this way integrated and conserved in the chromosomes structure, allowing the species adaptation on a large-term period and evolution. The integration process of the virtual information received from the external sources passes therefore through intermediary stages, depending on the repetition/frequency of the accessed/received information according to the following gradual steps: acquirement in the short-term memory (cortex frontal lobe in CASI), long-term memory (hippocampus in CDC/CASI), emotional IES (limbic) system (in CASI), automatic abilities (automatic function similar with MIS, memorized in cerebellum CASI), and transposed finally by epigenetic processes in GTS, received by IGG of the next generation as an info-structured information.

Memory appears therefore to be a fundamental basic support of the human being, which allows the adaptation and it is manifested not only from short to long-term memory in CASI/CDC, but also as a structured-matter related information in GTS. This structural hidden information is transmitted to IGG from both parents to offspring; this is the way in which the life does work, as it is represented by the horizontal arrow from GTS circuits of the parents to the IGG circuits of the new human being in Figure 1. The memory assures moreover at psychological level the identity of a person and the decision criteria not only useful, but also absolutely necessary for the local/momentary and medium/long-term orientation in surrounding reality. As probably distinguishing from all other beings, human is able not only observe/analyze and judge the information to make adequate decisions, but also to create/plan his actions in the frame of info-creativity and creative imagination. Human info-creativity has accelerated his evolution by the higher development of the brain, differentiating him in this way from the sub-human beings.

Some recent researches show that memory itself, at least the long-term memory, is supported by epigenetic mechanisms (Zovkic, Guzman-Karlsson, & Sweatt, 2013). This correlation was observed also within some studies on cognition disorders, manifested by mental retardation, inability during the social behavior or everyday cognitive tasks, in which dysfunctions in epigenetic apparatus were specifically detected (Levenson & Sweatt, 2005). Although the processes responsible for the short-term memory are difficult to be revealed because the dynamics of such a process cannot be “in vivo” detected, it is to be supposed that partial epigenetic-type processes would be involved also in any type of memory. This could be regarded as a natural consequence of the continuity in using the same process for memorization. In other words, it is to be assumed that nature patented a unique process responsible for memorization by associative/dissociative epigenetic mechanisms synthetically expressed by the Relation (1), when the memory perception/recall is concerned. Within the operability of conscious mind, the volitional recall of remembrances is still possible as expressed by Relation (1), using not only the same type of associative/dissociative process, but also the same informational circuits, as it is particularly evidential in the case of the visual information, which can be recalled and projected on the mental “screen” by the “mind eyes”. When the information is already integrated in a deeper

info-structured level in DNA, the information recall is not possible, or it is perceived as a “vague” spontaneous information, expressed for instance as specific abilities and/or “forms”. The intimate DNA mechanisms of transcription/translation and replication assisted by mRNA are categories of the information supply of the deeply memorized information in DNA, expressible also by Relation (1), in a more complex way. It is to be remarked thus the coherence of the informational system/model describing the interaction between the mind and body by using the concepts of information.

Referring further on how the activity of the informational systems is reflected in mind, we have to observe that the nature of this projection is information itself. CASI is memory, which is the personal data library where the life experience is accumulated and stored. This library can be suggestively called Iknow. Following the same pattern of definitions, CDC could be called Iwant (decision/informational output), IES is Ilove (emotions/affections), represented by the associative (love) natural tendency, MIS is detected as Iam (self detection/appreciation/evaluation), GTS is represented by Icreate (genetic transmission), IGG by Icreated (genetic inheritance), and IC by Ibelieve (info-selection by criteria/beliefs). All these projections form human consciousness, as it is represented in Figure 1. Mind would be the conscious operative system, allowing the adequate adaptation for survival, fully informational/operational.

Analyzing the nature of mind from this informational perspective, we have to observe that the archaic five-aggregate model invoked recently (Karunamuni, 2015) is the more complex with respect to others and reflects in a more refined proportion the mind-body relation. The Aristoteles’ view on the unity between body and mind as property of the body is justified by the intimate interactions described above, whereas the Plato’s conception on the soul-body split could get consideration when the NDEs phenomena are concerned, explained recently also by specific informational mechanisms (Gaiseanu, 2017a; 2017b). Some other comparative conclusions concerning the contribution of modern philosophers were pointed out above. We have to observe therefore that the informational model presented here on the mind-body relation, a subject debated since centuries and preoccupation of the philosopher since pre-Aristotelian eras, is able to explain/include on a scientific basis the main contributions/view on this topic, from the first archaic consignments till our modern days. Information, in all presented facets, is the suitable solution of this ancient philosophic problem, so much debated up to date. The intervention of information in the living structures demonstrated in this paper supports the Draganescu’s philosophic predictions.

Beside the philosophic importance (Gaiseanu, 2018a), the informational model of mind-body relation presented in this paper is useful and effective to explain/define accurately psychological concepts like attitude (Gaiseanu, 2020d), to advance in the understanding of consciousness (Gaiseanu, 2019c; 2020a) and life science (Gaiseanu, 2020c; 2020f), in neurosciences (Gaiseanu, 2019i; 2020i), neurology (Gaiseanu, 2020h), psychiatry (Gaiseanu, 2020g) to understand the mechanisms of mind and mind dysfunctions/disorders, gerontology and geriatrics (Gaiseanu, 2020b; 2019b; 2019f), and neuorehabilitation therapies (Gaiseanu, 2020h). In the engineering/microelectronic field, such a model advances effective application in biosystem/biocomputing structures (Gaiseanu, 2020a), in the simulation/preparation of artificial cell/cell characteristics by big data engineering (Filip, 2020) transposed in biosystem structures (Dolinskia & Troyanskaya, 2015) and in humanoid modular or integral structures/architectures in robotics engineering.

## Conclusions

The analysis of previous archaic, Greek and Occidental philosophic concepts and views on the mind-body

relation shows various, sometime contradictory aspects on this relation, mind and body being considered as independent or inter-correlated but distinct entities. The contribution of science of information presented in this paper allows to clarify and model on the basis of scientific results this relation, surpassing the limitative empiric possibilities of the philosophic concepts used up to date, highly enlarging the capabilities to understand and describe this relation, on the line of the Draganescu's philosophic assertion concerning information as a contributing agent into the living structures, earlier proposed.

It was shown therefore that information manifests two main facets: information referred to communications, largely used today thanks to the high revolutionary contribution of microelectronic systems in the development of the informational devices, and another referred at structuring information, hidden into the living structuration elements.

The analysis of human as a living being continuously depending on external foods highlights the necessity of the existence of an informational system according to the info-relational functions, first of all for the detection of external resources for survival. It was shown that memory is one of the main constituents of the informational system of the human body, necessary to accumulate/store the reference information, from where the info-operational system accesses/operates suitable/adequate information for decision making. Memory is necessarily connected to external and internal informational sources by means of specific sensitive body integrated sensors, human body appearing as an integrated info-material operative structure. Beside memory and decision making, the informational components/circuits are specialized moreover on functions, referred to info-selection, emotive actions/reactions, digestive management, reproduction, and inherited genetic info-generation.

The hidden information is accumulated in DNA—type structures, communicating with the body cells by chemical agents in a four-type alphabet language for body structuration/restructuration with proteins, as body basic bricks and/or informational agents. The epigenetic processes allow the body adaptation by the integration of the virtual received information from external/environment cues/stress sources, repetitively and/or intensively applied, which is gradually absorbed into the specific cell structures engaging the short/long-term/affective and abilities memorization, finally deeply integrated into the chromosomes structures, transferred to the offspring. The epigenetic mechanisms of perception/recall of information in memory can be suggestively described by a associative/dissociative basic relation of embodiment/disembodiment of information. The same relation can describe also the deeply integrated information in DNA chromosomal structures during the epigenetic info-embodiment/disembodiment (replication, transcription/translation). Such structured/consolidated information is impossible to be recalled by the conscious mind, but could be manifested spontaneously by predilect abilities and “a priori forms”. The projection of the informational distinct functions composes actually the mind, as an informational operator with seven specific components, defined as memory, decisional operability, info-connection/selectivity, affective/emotional reactivity, self-detection status, procreation, and inherited abilities.

The comparison with other philosophic models highlights the general/integrative character of the informational model of mind-body relation presented in this work, well explaining a large category of earlier observed/proposed characteristics on the basis of scientific bases.

The presented model determines revolutionary advances not only in the philosophic field, but also in neurosciences/neurology, psychology/psychiatry, medical sciences in general, gerontology/geriatrics and associated naturist therapies, as well as in the engineering technologies involved in the humanoid architecture and cell mechanisms or cell/artificial cell simulation.

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