

LIFE AND SENSIBILITY OF BIOLOGICAL MATTER IN THE PHILOSOPHY OF XAVIER ZUBIRI

MARCOS LOUIS CATALÁN, JR.
Ateneo de Manila University

ABSTRACT: The present essay discusses Zubiri's ideas about biological matter, which matter, the essence of material substantivities, gives of itself through its potentiality of systematization. An animal is a dynamically stable and reversible biological structure, and its life and sensibility are systemic properties. They are functional combinations emerging from the respective activities of the component organic molecules of an animal. Life is not a force, but a dominant principle orienting molecular actions. As for the animal's sensibility, Zubiri analyzes it on three levels, namely, the sensing process, habitude, and constitutive structures. The indivisible sensing process consists of arousal, tonic modification, and response as constitutive moments. Habitude, the manner of dealing with things, underlies the sensing process, and the habitude specific to the animal is sensibility. The corresponding formality is the formality of mere stimulus, i.e., the animal apprehends the stimulus only as a sign of response and nothing more. The animal's sentient process and habitude, in turn, are made possible by its constitutive structures, specifically, its nervous system. Its morphological complexification can be understood as an advance in formalization: The greater is the degree of formalization, the more varied are the perceptions (arousal), affects (tonic modification), and possible responses available to the animal. But no matter how highly formalized its nervous system may be, the animal will never cease to apprehend something under the formality of mere stimulus.

KEY WORDS: substantivity, essence, matter, giving-of-itself, potentialities, biological matter, life, systemic property, functional combination, principle, sentient process, stimulus, impression, formality, alterity, formalization, habitude, sensibility, apprehension of stimulus, constitutive structures, nervous system.

La vida y la sensibilidad de la materia biológica en la filosofía de Xavier Zubiri

RESUMEN: Este ensayo expone las ideas zubirianas acerca de la materia biológica, que la materia —la esencia de las sustantividades materiales— da de sí por su potencialidad de sistematización. El animal es una estructura biológica que es dinámicamente estable y reversible. Su vida y su sensibilidad son propiedades sistémicas. Como propiedades, son combinaciones funcionales que emergen de las actividades respectivas de las moléculas orgánicas componentes del animal. La vida no es una fuerza, sino un principio dominante que orienta las acciones moleculares. En cuanto a la sensibilidad animal, Zubiri la analiza en tres niveles: el proceso sentiente, la habitud y las estructuras constitutivas. La suscitación, la modificación tónica y la respuesta son los tres momentos constitutivos del indivisible proceso sentiente. Habitud, o la manera de enfrentarse con las cosas, subyace el proceso sentiente y es el fundamento de toda suscitación y de toda respuesta. La habitud propia del animal es sensibilidad, y la formalidad correspondiente es la formalidad del mero estímulo. Bajo esta formalidad, el animal aprehende los estímulos sólo como un signo de respuesta y nada más. El proceso sentiente y la habitud, a su vez, se hacen posible por las estructuras constitutivas del animal, particularmente, por su sistema nervioso. La evolución morfológica de este sistema se puede entender desde la formalización: Cuanto más formalizado es el sistema nervioso, tanto más variados son las percepciones (suscitación), los afectos (modificación tónica) y las posibles respuestas del animal. Pero cualquiera que sea el grado de formalización de su sistema nervioso, el animal nunca puede dejar de aprehender algo bajo la formalidad del mero estímulo.

PALABRAS CLAVE: sustantividad, esencia, material, dar-de-sí, potencialidades, materia biológica, vida, propiedad sistémica, combinación funcional, principio, proceso sentiente, estímulo, impresión, formalidad, alteridad, formalización, habitud, sensibilidad, aprehensión del estímulo, estructuras constitutivas, sistema nervioso.

INTRODUCTION

Divided into six main sections, the present essay is an exposition of Xavier Zubiri's ideas concerning biological matter and its systemic properties, namely, its life and sensibility. Any exposition of a particular aspect of Zubiri's philosophy, however, must be situated within his understanding of matter. For Zubiri is convinced that matter is an intrinsic and constitutive dimension of all intramundane realities: «Every reality, both purely material and not purely material, is born in the bosom of matter, according to the determining function of matter, and has an intrinsically and formally material constitutive moment»¹. For this reason, the essay begins with a brief section on his formal concept of matter, followed by a section presenting the nature and origin of biological matter, and another section discussing Zubiri's positions pertinent to life as a physico-chemical property and as principle. The last three sections deal with his analysis of the non-human animal within the context of its process of sensing, its habitude of sensibility, and finally, its nervous system as a constitutive structure. The essay ends with a brief contrast between an animal and the human being, the latter representing the highest stage in the evolution of biological matter.

1. FORMAL CONCEPT OF MATTER

Material thing as a substantivity. Zubiri introduces his formal concept of matter by establishing first what a material thing is: «A material thing is a construct system of sensible qualities or of what is formally necessary for them»². Material things are substantivities, i.e., they are cyclically closed systems of internally respective constitutional notes³. The constitutional notes are its sensible qualities, including those notes required for their formal structure. For example: Photons or electromagnetic waves are associated with the formal structure of the sensible note «color». Without them, color perception would not be possible.

Matter as essence. Matter is the constitutive essence of a material thing⁴. It is the physical subsystem of constitutive notes whose primary coherent unity

¹ ZUBIRI, XAVIER, *Espacio, tiempo y materia*, Fundación Xavier Zubiri, Madrid, 1996, p. 410: «toda realidad, tanto la puramente material como la no puramente material, nace en el seno de la materia, en función determinante de la materia y tiene un momento constitutivo intrínseca y formalmente material». ETM will be used from hereon for subsequent references to this book.

² Ibid., p. 344: «Cosa material es sistema constructo de cualidades sensibles o de lo formalmente necesario para ellas».

³ For the concepts of substantivity and respectivity, Cf. ZUBIRI, XAVIER, *Sobre la esencia*, Fundación Xavier Zubiri, Madrid, 1998, pp. 135-140 and pp. 287-288, respectively. SE will be used from hereon for subsequent references to this book.

⁴ ETM, p. 345.

accounts for the constitutional unity and sufficiency of a thing⁵. As constitutive subsystem, matter determines the sensible qualities of a thing. Matter, then, or *essence-matter*, as Zubiri also refers to it, is the structural principle that constitutes every material thing to be a substantive structure.

Dynamism of matter. Matter is formally dynamic. *Dynamism* refers to every material reality's intrinsic moment by virtue of which «reality inasmuch as it is real is active by itself. It does not need to be activated; it only needs something on which its own active being could be translated into activity»⁶. That reality is formally active means that all its notes are active *in* and *by themselves*⁷. This active moment is the *dar de sí* of reality, its giving of itself: «Things, precisely because they are *de suyo*, have an active moment that consists in *giving of themselves*. And this *giving of themselves* is the expression itself of their activity»⁸.

Matter as a subsystem of potentialities. As essence of a material substantivity, matter is a subsystem of potentialities. The *materiality* of matter is «the system of potentialities according to which matter has intrinsically, formally, and structurally capacities to 'give of itself'»⁹. *Potentialities* refer to the power or capacity to do or to make something¹⁰. In the case of matter, it is potent to constitute a material substantivity¹¹. And constituting material substantivities is precisely what the *dar de sí* of matter consists in¹².

Unfolding of matter's potentialities. Matter gives of itself, but particularly in change. This dynamism in change is called *unfolding (despliegue)*: «Unfolding is the giving of itself in change. Now, the dynamism proper to matter is precisely and formally unfolding»¹³. Change is involved because there is a movement from being folded to becoming unfolded. The unfolding concerns matter's power (potentialities), as «it is precisely what is folded, and the unfolding consists in manifesting this folded power in which matter *de suyo* consists»¹⁴. This unfolding of the potentialities of matter gives rise to three types of matter, namely, elementary particles, atoms and molecules, and biological matter.

⁵ For the concept of essence, Cf. SE pp. 188-277.

⁶ ZUBIRI, XAVIER, *Estructura dinámica de la realidad*, Fundación Xavier Zubiri, Madrid, 1989, p. 158: «la realidad en cuanto real es activa por sí misma. No necesita ser activada; necesita únicamente aquello sobre lo cual podría traducirse este ser activo propio en actividad». EDR will be used from hereon for subsequent references to this book.

⁷ *Ibid.*, p. 60.

⁸ *Ibid.*, p. 61: «Las cosas, precisamente porque son *de suyo*, tienen un momento activo que consiste en *dar de sí*. Y este *dar de sí* es la expresión misma de su actividad».

⁹ ZUBIRI, XAVIER, *Sobre el hombre*, Fundación Xavier Zubiri, Madrid, 1998, p. 450: «el sistema de potencialidades según las cuales esta materia tiene intrínseca, formal, y estructuralmente capacidades de 'dar de sí'». SH will be used from hereon for subsequent references to this book.

¹⁰ ETM, p. 449.

¹¹ *Ibid.*, pp. 397-398.

¹² *Ibid.*, p. 440.

¹³ *Ibid.*, p. 447: «El despliegue es dar de sí en el cambio... Pues bien, el dinamismo propio de la materia es precisa y formalmente despliegue».

¹⁴ *Ibid.*, p. 448: «es justo lo que está plegado, y el despliegue consiste en explicar ese poder plegado en que la materia *de suyo* consiste».

2. BIOLOGICAL MATTER: FROM ELEMENTARY PARTICLES TO ORGANIC MOLECULES

Degrees of stability. *Type* refers to a material substantivity's primary coherent unity, i.e., its stability¹⁵. The three types of matter, then, refer to different degrees of stability. The first type is elemental matter, the essence of elementary particles like photons and electrons. It generally decays rapidly; it has a «decayable stability» (*estabilidad decaíble*). The second type is corporeal matter, found in atoms and molecules that constitute what is generally known as «bodies» in their various physical states. Bodies have different subtypes, as manifested in the structures of heavenly bodies like white dwarfs, neutron stars, and quasars. Corporeal matter resists dissipation, withstanding the action of other bodies and elementary particles; it has a «resistant stability» (*estabilidad resistente*). The final type is the biological matter of living beings. In addition to resisting dissipation, biological matter exhibits the activity of conservation; its stability is thus a «conserving stability» (*estabilidad conservante*)¹⁶.

Stabilization of matter. Although biological matter enjoys a greater degree of stability compared to corporeal matter, there is only a gradual difference between them because biological matter emerges from corporeal matter, the latter being its immediate substrate. The prelude to biological matter's emergence is the «stabilization of matter», which is a process that leads to the constitution of corporeal matter. Through matter's potentialities of systematization¹⁷, two types of molecules emerge. First, inorganic molecules result from the systematization of atoms. Second, inorganic molecules, in turn, undergo systematization, giving rise to organic molecules, whose formation represents the highest stage in the stabilization of matter¹⁸.

Re-configuration of corporeal matter. Organic molecules also undergo systematization, resulting in biological matter that is constitutive of living beings. A living being is a «structural substantivity [that] is not *molecular* but *trans-molecular*, where 'trans' means a 'system' of molecules»¹⁹. From here, one can see only a gradual difference between the second and third types of matter: «[Biological matter] is in turn a mere structuring of corporeal matter that introduces a new type of primary coherent unity [i.e., stability]»²⁰.

¹⁵ Ibid., p. 354.

¹⁶ Ibid., pp. 354-355.

¹⁷ The potentiality of systematization is a mode of interaction whereby elementary particles coalesce (*complicarse*) to form a system or a structure. Atoms result from the systematization of elementary particles, while molecules ensue from the systematization of atoms. Cf. SH, p. 451.

¹⁸ ETM, pp. 640-643.

¹⁹ EDR, p. 164: «sustantividad estructural no es *molecular* sino *trans-molecular*. Donde 'trans' significa 'sistema' de moléculas».

²⁰ SH, p. 56: «Es a su vez una mera estructuración de la materia corporal que introduce un nuevo tipo de unidad coherencial primaria».

2.1. *Two Kinds of Biological Matter*

Living matter. Zubiri opines that biological matter should not be exclusively identified with a living organism, since the latter is only a second kind of biological matter²¹. A primordium of the organism is *living matter*: «It is matter that does not have the structure of an organism, but has the structure of replication, independence, and control with respect to the environment, that is, it has that systemic property that we call life»²². Examples of living matter are DNA, RNA, viruses, and amino acids. Zubiri believes that just as physics distinguishes between elementary particles and corpuscles (bodies), so should biology differentiate between living matter and organism.

Living matter as hypothesis. In referring to the above examples as living matter, Zubiri wants to introduce a hypothesis concerning the transition from non-living matter, i.e., corporeal matter, to the cell²³. The systematization of organic molecules results in living matter, whose constitution is the «vitalization of matter»²⁴. Experiments involving the synthetic production of amino acids tend to confirm this hypothesis, so that Zubiri is convinced that «living matter proceeds from, and is nothing more than the terminus of the evolution of, matter that is not alive»²⁵. As experiments in molecular biology seem to indicate, «Between living and non-living structures, there is nothing more than a gradual difference of a merely systematic character»²⁶.

Organism and cell. A second kind of biological matter is the organism, like plants and animals. In general, organism refers to the body, whose parts are called «organs». A body is a structure of organs having the unity of a functional combination, where «the parts (organs) determine the function of the whole (organism), and the whole (organism) determines the function of the parts (organs)»²⁷. The basic unit of an organism is the cell. It is founded on living matter as its principle, as it is a product of the systematization of the latter²⁸. Characteristic of almost every cell is having a nucleus containing the genetic code that governs the fundamental manifestations of life. Zubiri considers the nucleus as the point where life becomes concentrated. The constitution of the cell represents the «interiorization of life», a stage in the evolution of matter starting from the production of elementary particles to its stabilization and vitalization²⁹.

²¹ Ibid., pp. 53-54.

²² Ibid., p. 54: «Es una materia que no tiene la estructura de un organismo, pero que tiene la estructura de replicación, independencia y control respecto del medio, es decir, tiene esa propiedad sistemática que llamamos vida».

²³ Ibid., pp. 451-452.

²⁴ EDR, p. 178.

²⁵ Ibid., p. 177: «la materia viva procede, y no es más que un término de una evolución de la materia que no es viva».

²⁶ SH, p. 54: «entre las estructuras vivas y las no vivas no hay más que una diferencia gradual de carácter meramente sistemático».

²⁷ Ibid., p. 453: «las partes (órganos) determinan la función del todo (organismo), y el todo (organismo) determina la función de las partes (órganos)».

²⁸ Ibid., p. 452.

Disposition. It refers to the molecules' structural organization, i.e., to their mode of connection or systematic association. A unicellular organism possesses a basic disposition: Molecules are distributed locally in three regions — a nucleus containing the genetic code and its molecular components, a cytoplasm, and a membrane maintaining the cell's physical cohesion; they comprise a cell's morphological structures. In a pluricellular organism, cells are organized in sub-systems, like the nervous system, engaged in a particular function³⁰. But however elaborate their disposition may be, «Living beings are merely much more complex physico-chemical structures, systematic structures with a much more marked novelty and richness; and thus, their life is a mere functional combination determined by those structures»³¹.

3. LIFE AS A FUNCTIONAL COMBINATION

Life and molecular functioning. Although biological matter is only a restructuring of organic molecules, «What biological matter has as such is not... in its molecules, but in their functioning»³². A biological substantivity is a living compound system, and its life is a mode of functioning of its organic molecules known as «functional combination». Zubiri explains his understanding of life as a functional combination within the context of simple and compound systems, and their respective properties.

Systems and their properties. Substantive systems are either simple or compound. Simple, or elemental or primary, systems are components of compound systems; once part of a compound system, they lose their substantive character. Elementary particles are simple systems, while atoms and molecules are compound systems whose component substrates are the constantly interacting elementary particles. The properties of elementary particles are *elemental*, while those of compound systems are either additive or systemic. *Additive* properties (weight, kinetic energy, etc.) are the sum of elemental properties, and thus are distributable among the latter.

Systemic properties. These properties, «although determined by the notes and only by the notes of the elemental systems that compose the new system, nevertheless, pertain entirely only to the system and cannot be distributed among the component elements»³³. Potential energy, for example, is a systemic property

²⁹ EDR, p. 178.

³⁰ ETM, pp. 653-655.

³¹ *Ibid.*, p. 357: «los seres vivos no son sino estructuras físico-químicas cada vez más complicadas, estructuras sistemáticas de novedad y riqueza cada vez más acusadas; y por esto su vida es mera combinación funcional determinada por aquellas estructuras».

³² *Ibid.*, p. 643: «Lo que la materia viva tiene de tal no está... en sus moléculas, sino en su funcionamiento».

³³ *Ibid.*, p. 351: «aunque determinadas por las notas y sólo por las notas de los sistemas elementales que componen el nuevo sistema, sin embargo, pertenecen sólo al sistema por entero y no pueden distribuirse entre los elementos componentes».

belonging *pro indiviso* to the system itself. It is a *new* property not found in elementary particles; thus, the system itself is new. Furthermore, the new property results only from a mode of interaction whose structure is different from that of the interaction that produces elementary particles³⁴. This is why «the interaction constitutive of compound systems is a source of innovation»³⁵.

Mixture and combination. To explain the origin of additive and systemic properties, Zubiri employs the classical difference between a mixture and a combination. Additive properties, like kinetic energy, come from a mixture, while systemic properties proceed from a combination. A novelty is always produced only in a combination, this novelty being a new body with its own systemic properties³⁶. An example is hydrochloric acid that ensues from the combination of hydrogen and chlorine. As a new body, hydrochloric acid has, for example, its own specific heat that is different from that of hydrogen or of chlorine.

Functional combination. Not every combination, however, produces a new body. Hydrochloric acid is the result of a specifically chemical combination. Unlike hydrochloric acid, the living being is not a new body. Nevertheless, its living character results from a combination, and thus, is new, but only on the operative level because

«the structuring in the form of systematic notes and their articulation with the rest of the notes of the living body determines a special function, an original function: it is precisely life, the vital act. Certainly, as I said, the systematic unity of the living being is not a chemical combination. But it is a strict systematic unity. And this merely systematic unity determines such a special function that I have dared call it a *functional combination*, because in the order of functioning, it is an innovation homologous to what, in the order of structures, a combination is»³⁷.

Life as a systemic property. Life, then, is a systemic property, i.e., it is not a new elemental note, nor is it a property of some notes. Rather, life pertains *pro indiviso* to the living substantivity as a trans-molecular system. Life results not from the individual molecules' separate functioning, but from their interaction as component elements of a system. Life is none other than the activity, or mode of functioning, of a biological substantivity insofar as it operates as a system.

Irreducibility of life to matter. Life, then, has a physico-chemical character, since it is the activity of a purely material construct, i.e., of a substantivity that

³⁴ The potentiality of transformation is the mode of interaction that produces the elementary particles. Cf. *Ibid.*, p. 612.

³⁵ *Ibid.*, p. 615: «la interacción constitutiva de sistemas compuestos es fuente de novedad».

³⁶ *SE*, pp. 149-150.

³⁷ *ETM*, pp. 355-356: «la estructuración en forma de notas sistemáticas y su articulación con las demás notas del cuerpo vivo determina un funcionamiento peculiar, una función original: es justo la vida, el acto vital. Ciertamente, como digo, la unidad sistemática del viviente no es una combinación química. Pero es una estricta unidad sistemática. Y esta unidad meramente sistemática determina una función tan peculiar que yo me he atrevido a llamarla *combinación funcional*, porque es en el orden del funcionamiento una innovación homologable a lo que en el orden de las estructuras es una combinación».

is a system of respective molecules. Given that life results from the interaction of molecules, can life be reduced to matter? Zubiri responds as follows:

«If by being reduced to matter, one wants to understand that life is a property of the physico-material elements of which biological matter is constituted, the question is simply absurd. I have already indicated that there are properties that cannot be applied to the elemental particles, but only to their collective grouping»³⁸.

The response is based on the nature of life as a systemic property. As such, life emerges only from the molecules' operating together as a system, since no single molecule can produce life. As a functional combination, life is not independent of molecules; yet, it cannot be reduced to the individual molecules because life is the activity or operation of the «collective grouping» of molecules, i.e., of the system itself.

3.1. *Dynamism of Stability*

Life and stability. What for is this systemic property called life or vital activity? For Zubiri, every living being «exercises an enormous activity precisely in order to persist in its own substantivity, in its own identity as a substantivity»³⁹. Reflected in his response is the intimate connection of life with stability. As mentioned previously, biological matter exhibits a conserving stability. This type of stability is manifested in the persistence of structural identity. The purpose of vital activity, then, is to enable the biological substantivity to conserve its stability, since the activity is directed specifically towards the preservation and maintenance of the substantivity's structural identity.

Dynamic stability. The living being's stability, however, is not mere persistence. This persistence, in varying degrees, is found in the first two types of matter. Their identity remains as long as they resist dissipation or decay; theirs is a passive stability. On the contrary, a living being has a specifically dynamic stability, because «it is not like the electron that *endures* the vicissitudes that surround it; the living being executes some activities precisely *in order* to be able to continue being equal to what it was before»⁴⁰. Living beings, then, *actively* conserve their structural identity; in fact, they are forced to execute their vital activities to remain structurally the same (*la misma*)⁴¹. Thus, the dynamism of stability is proper only to biological matter.

³⁸ Ibid., p. 658: «Si por reducirse a materia se quiere dar a entender que la vida es una propiedad de los elementos materiales físico-químicos de que se halla constituida la materia viva, la pregunta es sencillamente absurda. Ya he indicado que hay propiedades que no pueden aplicarse a las partículas elementales, sino sólo a su agrupación colectiva».

³⁹ EDR, p. 165: «ejerce una enorme actividad precisamente para persistir en su propia sustentividad, en su propia identidad de sustentividad».

⁴⁰ Ibid., p. 171: «No es como un electrón que *aguanta* las vicisitudes que le rodean; el ser vivo ejecuta unas actividades precisamente *para* poder seguir siendo igual que lo era antes».

⁴¹ Ibid., p. 185.

Independence and control. Because it is necessitated to exercise its vital activity, a living being seeks to distance itself from the rest. This distancing implies that it is independent of, and has control over, its environment⁴². As an independent substantivity, a living being conforms its own structures, employing the resources from its environment and transforming them to serve its structures. Control refers to modes of adaptation and systems of defense against life-threatening entities or events. Independence and control, together with the ability to replicate, are expressions of life as a functional combination. Without them, the living being would perish for being unable to exercise its vital activity for the purpose of remaining structurally the same⁴³.

Reversible and dynamic structure. However it seeks to separate from its environment, a living being can do so only within certain limits. Because of its formally respective character, the living being constantly interacts with the environment, and thus is in constant activity. Now, every living being always finds itself in a particular state of equilibrium, which is a state that is «not static but dynamic, a type of stationary state, as physicists would say; [it is] not a quietude but a quiescence»⁴⁴. Zubiri also refers to the internal state of equilibrium as the state of ordered activity⁴⁵. The interaction with the environment produces alterations in the state of equilibrium, but the living being is capacitated to recover the lost equilibrium. The living being, then, is a structure that is not only dynamic, but is also reversible⁴⁶. With its relative independence and control, this dynamic and reversible living structure executes its vital activity within its environment to preserve its structural identity.

3.2. *Life: A Vital or a Physico-chemical Force?*

The preceding discussions have sought to emphasize two points about biological matter. First, it is a dynamically stable and reversible physico-chemical system that emerges from corporeal matter by means of the latter's potentiality of systematization. Second, life is a material property pertaining to the system itself, resulting from the functioning of the system's respective organic molecules.

Not a vitalist. It can be concluded from the second point that Zubiri is not a vitalist. Vitalism maintains that life is a force that is different from, and thus irreducible to, a living being's physico-chemical processes; and that this non-physico-chemical force regulates said processes. Concerning vitalism's positions, Zubiri says, «Vitalism does not cease to be the general exhibition of our ignorance

⁴² Ibid., pp. 165-166.

⁴³ ZUBIRI, XAVIER, «El hombre, realidad personal», in *Xavier Zubiri: Escritos Menores (1953-1983)*, Fundación Xavier Zubiri, Madrid, 2006, p. 41. HRP will be used from hereon for subsequent references to this essay.

⁴⁴ Ibid.: «no estático sino dinámico, en una especie de estado estacionario, que dirían los físicos; no una quietud sino una quiescencia».

⁴⁵ ETM, p. 630.

⁴⁶ EDR, p. 166.

concerning biochemistry. That the living being does not put into play forces other than what is physico-chemical is something that experimental investigation continues to prove each day with more success and new rigor»⁴⁷. Is Zubiri, then, necessarily a physicalist?

Physicalism. Physicalism holds that there are only physico-chemical forces, and that life is nothing but a physico-chemical force. Undoubtedly, his understanding of life as determined by molecules *may* give the impression that Zubiri is a physicalist. This impression seems to be reinforced by his own words: «From the viewpoint of biochemical actions, life is unquestionably their result. Thus, the problem of biology consists in determining how and with what mechanism this result is arrived at»⁴⁸. Is Zubiri, then, a physicalist?

Not a physicalist. Zubiri would definitely disagree were one to understand life as a physico-chemical force that is the sum of molecular forces. As explained before, life is not an additive property that is distributable among molecules. As a new property not of individual molecules but of a system operating as such, life is not the result of an addition of forces, despite its physico-chemical character being determined by molecular interactions. Zubiri, then, is far from being a physicalist: «Life is a systemic property. As such, it is, on the one hand, a property with a merely physico-chemical character, but, on the other hand, for being a systemic property, it is a novelty with respect to the additive properties»⁴⁹.

Not a force. Zubiri is neither a vitalist nor a physicalist because he does not consider life as a force. Vitalism and physicalism share the fundamental presupposition that life is a force that is either physico-chemical or of some other kind⁵⁰. For Zubiri, life is not a force because it is not an *element* that is complete in itself and that acts by itself. The «either-or» of physicalism and vitalism presupposes life as an element. Zubiri offers another understanding of life that goes beyond vitalism and physicalism: Life is not a force because it is a *principle*.

3.3. *Life as Principle: Internal Orientation of Actions*

Principle, activity, and action. A *principle* is something that constitutes the character of a reality: «What is proper to a principle, then, is not to act, but something prior: To constitute. With this understanding of principle, the concept

⁴⁷ ETM, p. 659: «el vitalismo no pasa de ser la rotulación genérica de nuestras ignorancias bioquímicas. Que el viviente no pone en juego más fuerzas que las físico-químicas, es algo que la investigación experimental va probando cada día con más éxito y nuevo rigor».

⁴⁸ Ibid., p. 663: «Desde el punto de vista de las acciones bioquímicas, la vida es indiscutiblemente un resultado de éstas. Por esto el problema de la biología consiste en averiguar cómo y con qué mecanismo se llega a este resultado».

⁴⁹ SH, pp. 51-52: «La vida es una propiedad sistemática. Como tal es, por un lado, una propiedad de carácter meramente físico-químico, pero por otro, por ser propiedad sistemática, es una novedad respecto de las propiedades aditivas».

⁵⁰ ETM, p. 659.

of force does not make sense»⁵¹. A cell, for example, is not just a structure composed of molecules; rather, it is specifically a living structure because its activity constitutes it as such. Activity, however, is not the same as action. *Action* refers to the functioning of molecules, and is determined by their physico-chemical nature. *Activity*, on the other hand, «is internally structured by actions»⁵². How does vital activity constitute something as a living reality?

Convergence of molecular actions. Recall that the living being alone possesses a conserving stability, a relative independence and control of its environment, and an ability to replicate. A living being is a structure whose life is manifested as an activity that is independent, conserving, and reproducing. Vital activity possesses these characteristics that are unique to, and constitutive of, a living being because of the convergence of molecular actions that structure activity internally. Independence, conservation, and replication are the dimensions in which molecular actions converge⁵³. What makes actions converge in these three dimensions?

Convergence due to orientation. Convergence should not be understood as external, i.e., as imposed on molecular actions. Nothing directs a molecule's action towards convergence because each molecule acts according to its physico-chemical nature and mechanism. What determines actions to converge is their internal orientation⁵⁴. Consequently, actions do not disperse, but converge in independence, replication, and conservation. To what are actions internally oriented? They are oriented towards unity that dominates the actions themselves.

Primary unity. Although Zubiri does not explicitly say so, his concept of substantivity as a primary unity and the dominance of this unity are presupposed in understanding the orientation towards unity. Primary unity is physically present in every note. This presence is manifested in a note's formal respective character, i.e., in being a note that requires its unity with other notes. Primary unity, then, is present in a note as an exigent moment, and it is precisely as an exigent moment that unity dominates a note. The physical presence of unity in a note is thus a dominating presence, constituting a note's intrinsic respective character as a «note-of» the rest.

Orientation, respectivity, and dominance. Now, a living being is a substantivity that is not an additive, but the primary, unity of molecules. Since unity is physically present in each molecule, as manifested by its respective character, the molecule's action is also respective, i.e., it is an «action-of» the rest. The action's respective character is perhaps what Zubiri refers to by orientation towards unity. And since respectivity is intrinsic to each molecule, then, the orientation is also internal to its action; consequently, an action is already oriented towards unity because of the molecule's intrinsic respectivity. As explained before, primary unity is present

⁵¹ Ibid., p. 660: «Lo propio del principio no es entonces actuar, sino algo anterior: constituir. Y en esta línea no tiene sentido el concepto de fuerza».

⁵² Ibid., p. 651: «está internamente estructurada por las acciones».

⁵³ Ibid., pp. 662-663.

⁵⁴ Ibid., p. 648.

in a note as a dominating presence that constitutes a note's respective character. In the case of a molecule's action, one can reasonably surmise that its internal orientation is the mode by which primary unity dominates, making a molecule's action an action-of the rest of the molecules.

Life as a dominant principle. Because each action is action-of the rest, all the actions constitute a unity called «activity». For Zubiri, life as principle «consists in a state of activity — in an activity in which the actions are oriented towards unity»⁵⁵. As principle, life, then, is an activity, understood specifically as the primary unity of internally oriented actions: «Internal orientation of actions: here is the character of life as principle»⁵⁶. Now, life is a dominant principle that orients molecular actions. But life dominates not as a force because «for being a principle and not an element, life is not a force that is orienting in each moment the actions of the living being; rather, they are already oriented in themselves»⁵⁷. Life, then, is not another action. As principle, life is an activity, i.e., a primary unity, and it is as primary unity that life orients molecular actions towards unity itself⁵⁸. This dominance is manifested in an action's internal orientation that, as explained above, refers to its intrinsic respective character. Because of the dominance of life as primary unity, actions converge in the three mentioned dimensions that constitute a reality specifically as a living being.

Living being is its structures. Life as principle, then, is primarily the orientation of actions towards unity; but since they are biochemical actions of molecular structures, the orientation is secondarily the orientation of structures⁵⁹. The structures' orientation is significant in understanding the sense in which structures are a living being's own, i.e., as belonging to it. Zubiri says that one should not think that structures belong to the living being merely as its instruments, or that they form part of it just as the ocean is part of the earth. On the contrary: «The biochemical structures do not only belong to the living being, but the living being *is* its structures. This *is* means that its life consists in the orientation of the actions of these organized structures»⁶⁰. Consequently, because of this identity between the living being and its structures, the actions of its structures are not something that are given in a living being, nor emerge from it; rather, the structures' actions are the actions of the living being itself⁶¹.

⁵⁵ Ibid., p. 665: «consiste en un estado de actividad. En una actividad en que las acciones se hallan orientadas hacia la unidad».

⁵⁶ Ibid., p. 663: «Orientación interna de acciones: he aquí el carácter de la vida como principio».

⁵⁷ Ibid., pp. 663-664: «Por ser principio y no elemento, la vida no es una fuerza que esté orientando en cada instante las acciones del viviente, sino que éstas están ya orientadas en sí mismas».

⁵⁸ Ibid., p. 665.

⁵⁹ Ibid., p. 663.

⁶⁰ Ibid., p. 667: «Las estructuras bioquímicas no sólo pertenecen al viviente, sino que el viviente *es* sus estructuras. Este *es* significa que su vida consiste en la orientación de las acciones de estas estructuras».

⁶¹ Ibid., p. 667.

Totality. The key to understanding life as principle, then, is the concept of substantivity as a primary unity of intrinsically respective notes. As a substantivity, the living being is the primary unity of its respective, or internally oriented, structures. To refer to the living being as a primary unity, Zubiri also uses the word «totality». The living being is, and functions as, a totality. Biology should especially take into account the character of the living being as a totality because, as pointed out earlier, this totality is not an additive result of molecular actions, but is «the expression, in the order of actions, of the originary and principal unity of the living being as such. The organism functions as a totality, because it is already *a radice* an organic *unity*»⁶².

In functioning as a totality, a living being is an *element* that is complete in itself, i.e., constitutionally sufficient, and that acts by itself. As explained before, a living being acts to maintain its structural sameness. Focusing specifically on the animal, Zubiri elaborates on its orientation to conservation by analyzing the animal on three levels, namely, its act of apprehension and its underlying habitude and essential structures.

4. FIRST LEVEL: SENTIENT PROCESS

Locus. Zubiri contextualizes the first level of analysis within the difference between two Aristotelian categories⁶³. As mentioned previously, there is a constant interaction between the animal and its environment. The animal is found among the things that compose its environment. Being «among» things means that the animal has a particular position relative to them; it is placed among them. *Locus* is the category that refers to the specific place or location within which the animal is installed, with the rest of the things making up its surroundings.

Situs. Zubiri emphasizes that *locus* is not a category that is unique only to living beings: An electron, for example, also has a *locus* because of the electromagnetic field that surrounds it. Unlike the electron, however, only the animal has a *situs*, the other category that Zubiri differentiates from *locus*. That the animal is «among» things does not only mean that it has a specific place, but also that «the living being thus located is disposed or *situated* in a particular manner before them»⁶⁴. The animal is situated in one form or another in relation to the things of its surroundings. The particular situation in which the animal finds itself is due to the action of things, since their physico-chemical action creates a situation for the living being⁶⁵. Thus, *locus* applies both to living beings and things, but only living beings have a *situs*.

⁶² Ibid., p. 671: «la expresión, en el orden de las acciones, de la unidad originaria y principal del viviente en cuanto tal. El organismo funciona como un todo, porque es ya *a radice* una *unidad* orgánica».

⁶³ EDR, pp. 167-168.

⁶⁴ HRP, p. 42: «el viviente así colocado está dispuesto o *situado* en determinada forma frente a ellas».

⁶⁵ ETM, p. 539.

Relation between locus and situs. *Locus* and *situs* are the Aristotelian categories that Zubiri utilizes to introduce the first level of analysis pertaining to the animal's act of apprehension. They are not two independent concepts, since *situs* presupposes, and is founded on, *locus*. However, they are not the same, as the same location can give rise to various situations⁶⁶. And insofar as living beings are concerned, *situs* is the essential Aristotelian category: «In contrast [to the category of *locus*], it is fundamental for life; and it is necessary to claim for life the portentous originality and metaphysical importance of the category *situs*. Situation and not simply location is the primary and specific articulation of the living being with things»⁶⁷.

4.1. *Moments of the Process of Sensing*

Sensible apprehension. It was stated above that the animal's situation results from the action of things with which the animal interacts. For the interaction to take place, the animal obviously must be able to *apprehend* its environment. «Apprehension», says Zubiri, «is... an act of capturing what is present, a capturing in which I am aware of what is captured. It is an act in which what is present to me is apprehended precisely and formally because it is present to me»⁶⁸. Only when the animal is able to apprehend the environment, or what is present in it, will the animal be able to draw from the environment the resources needed for the maintenance of its structures, or to avoid whatever threatens it. Since the animal can apprehend what is present to it only through its sense organs, then, apprehension is a *sentient* act. The act of apprehension triggers sensing; for this reason, apprehension should strictly be called *sensible apprehension*⁶⁹.

Sensing. For Zubiri, sensible apprehension is, in and by itself, constitutive of sensing⁷⁰. But what does it mean to sense? «To sense», says Zubiri, «is not to select concrete things (material and formal) in apprehension, but is above all a mode of having these things apprehended»⁷¹. Sensing, then, is an act, specifically a mode, of apprehension; to sense is to apprehend or capture something that is present. Furthermore, although sensing is a single act, it is a strictly *unitary process*, as «it consists in the intrinsic and radical unity, in the indissoluble unity

⁶⁶ HRP, p. 42.

⁶⁷ ETM, p. 538: «En cambio para la vida es fundamental; y es menester reclamar para ésta la portentosa originalidad y alcance metafísico de la categoría de *situs*. La situación y no la mera colocación es la primera y específica articulación del viviente con las cosas».

⁶⁸ ZUBIRI, XAVIER, *Inteligencia sentiente: Inteligencia y realidad*, Fundación Xavier Zubiri, Madrid, 1998, p. 23: «La aprehensión es... un acto de captación de lo presente, una captación en la que me estoy dando cuenta de lo que está captado. Es un acto en que se ha aprehendido lo que me está presente precisa y formalmente porque me está presente». IR will be used from hereon for subsequent references to this book.

⁶⁹ *Ibid.*, p. 31.

⁷⁰ *Ibid.*, p. 27.

⁷¹ SE, p. 391: «Sentir no es un seleccionar cosas (materiales y formales) concretas, en la aprehensión, sino que es ante todo un modo de tener aprehendidas estas cosas».

of its three moments, of arousal, tonic modification and response... the three moments in their essential and indissoluble unity strictly constitute sensing»⁷².

4.1.1. First Moment: Arousal

Arousal as apprehension. The first moment of the process occurs when the animal apprehends something, «impressing» itself on the animal's sense organs. The apprehension may refer to any thing captured by the sense organs within the animal itself or its environment. For Zubiri, apprehension constitutes the moment of arousal; without this apprehension, nothing would trigger the sensing process. The moment of arousal is also known as the reception of stimulus, and the reception is formally stimulation⁷³. Perhaps it would not be contrary to Zubiri's thought to understand stimulation as the physico-chemical action on the senses, because of which the animal becomes aware of whatever is captured by its senses.

Arousal vs. excitation. Zubiri prefers to use the comprehensive concept «arousal» instead of «excitation»: «Excitation has, in effect, a very precise sense in physiology, for example, when one contrasts the electrical excitation of a nerve to its refractory period»⁷⁴. Excitation, then, has a limited meaning, referring to an almost exclusively biochemical process. Sensing, however, is not simply one among many biochemical processes happening within the animal because «sensing, as a process, is not only a physiological activity, but is the process that constitutes the entire life, in some way, of the animal»⁷⁵. To emphasize, then, the constitutive character of the sensing process in the life of the animal, Zubiri employs the concept «arousal» instead of «excitation», which is only a special mode of the former. (The moment of response will further show the difference between these two concepts.) Thus, apprehension, strictly speaking, arouses sensing, and triggers, in turn, the second moment.

4.1.2. Second Moment: Tonic Modification

Vital tone and affection. The context for understanding the second moment is the animal's state of equilibrium. This state has an internal essential quality known as «vital tone»⁷⁶. Tonic modification occurs when the apprehension of

⁷² IR, p. 30: «consiste en la unidad intrínseca y radical, en la unidad indisoluble de sus tres momentos, de suscitación, modificación tónica, y respuesta... los tres momentos en su esencial e indisoluble unidad son lo que estrictamente constituye el sentir».

⁷³ ZUBIRI, XAVIER, *El hombre y Dios*, Fundación Xavier Zubiri, Madrid, 1998, p. 44. HD will be used from hereon for subsequent references to this book.

⁷⁴ HRP, p. 42: «la excitación tiene, en efecto, un sentido sumamente preciso en fisiología, por ejemplo, cuando se contraponen la excitación eléctrica del nervio a su período refractario».

⁷⁵ IR, p. 28: «El sentir como proceso no es tan sólo una actividad fisiológica, sino que es el proceso que constituye la vida, en cierto modo entera, del animal».

⁷⁶ HRP, p. 41.

something alters the vital tone. The alteration is concretely the stimulation produced by the apprehension. Note that «stimulation» was mentioned previously in the context of arousal as the moment of reception of stimulus, and it was stated that said reception is formally stimulation. In the context of the second moment, the stimulation is referred to as *affection*. «Affection», however, has a precise meaning, since it refers «not in the general understanding of something that affects the animal's organism, but in the limited sense of affections, of sensing states such as anger, attraction, hunger, etc.»⁷⁷. Tonic modification is the moment of affection, when an alteration in the animal's vital tone, expressed by changes in its vital states, occurs due to the apprehension of stimulus.

Vital tension. The sensing process is usually understood only in terms of arousal and response: The animal apprehends something, and then, it responds. In other words, arousal first, followed by response; and thus, little attention is given to the moment of tonic modification. The significance that Zubiri gives to this moment is found in his concept of «vital tension», which is the dynamic version of the vital tone transformed by the apprehension of stimulus⁷⁸. Vital tension serves as the important link between arousal and response, since it is because of this tension consequent to arousal that the animal is moved towards a response: «Between arousal and response, there is not a mere succession. Rather, the arousal brings the living being to determine its response, and this dynamic moment of *bringing-to* constitutes vital tension. And the response is precisely the terminus in which vital tension ends»⁷⁹.

4.1.3. Third Moment: Response

Response as action. To explain what action is, Zubiri differentiates it from function: «Muscular contraction, for example, is a function. The subject, let us call it as such, of function is an anatomico-physiological structure; for example, a striated muscular fiber. But action is something whose subject is not a structure, but the entire animal. For example, to flee, to attack, etc., are actions. With the same functions, the animal executes the most diverse actions of its life»⁸⁰. One will note from the preceding quotation that the principal difference between

⁷⁷ HD, p. 44: «no en la acepción general de algo que afecta al organismo animal, sino en la acepción estrecha de afecciones, de sentir estados tales como ira, como gusto, como hambre, etc.».

⁷⁸ HRP, p. 42.

⁷⁹ EDR, p. 171: «entre la suscitación y la respuesta no hay una mera sucesión. Sino que la suscitación lleva al viviente a determinar su respuesta, y este momento dinámico del *llevar a* es lo que constituye la tensión vital. Y la respuesta es justamente el término en que desemboca la tensión vital».

⁸⁰ IR, pp. 28-29: «Es función, por ejemplo, la contracción muscular. El sujeto, digámoslo así, de la función es una estructura anatomofisiológica; por ejemplo, una fibra muscular estriada. Pero la acción es algo cuyo sujeto no es una estructura, sino el animal entero. Por ejemplo, huir, atacar, etc., son acciones. Con las mismas funciones, el animal ejecuta las más diversas acciones de su vida».

function and action presupposes the animal as the primary respective unity of its structures, i.e., as a substantivity. As explained previously, the animal is a biological substantivity that always acts as a totality. Because the animal acts as such, «The action is not a mosaic of functions, but proceeds from the primary unity of the animal; it is this primary unity that regulates the adaptation of the functions for the unity of their act. The action of the animal is always a response to the situation in which it is installed»⁸¹.

Response vs. reaction. The difference between action and function based on understanding the animal as a substantivity that acts integrally explains why response is not the same as reaction. The animal's various structures react, or function, according to their properties; but it is the entire animal itself that responds. Thus, when an animal attacks an apprehended prey, the motor impulses are «always and only a functional moment; but the response is an actional moment. With the same impulses, the response can be very diverse»⁸². Distinguishing reaction (function) from response (action) explains further the previously discussed difference between the limited concept «excitation» and the comprehensive term «arousal»: Whereas the excitation of structures generates reactions in the form of electrical impulses, thereby making excitation a moment of function, arousal, i.e., the apprehension of stimulus, is a moment of action, since «arousal is everything that triggers an animal's action»⁸³.

Response as vital action. Acting as a unity, the animal responds to the apprehension of stimulus. The response is specifically a *vital* action, since «in general terms, what is proper to things for the purpose of life is to arouse a vital act»⁸⁴. What makes the response a vital act lies in the fact that it is the solution to a problem that concerns the very life of the animal. This vital problem refers to the already discussed modification in the animal's state of equilibrium. The modification creates a new situation, forcing the animal to live in a manner that is different from how it used to prior to the alteration of its vital tone. To continue living but in a different manner because of, and within, a new situation is a matter of survival. This is why a vital problem always involves two aspects: «On the one hand, to continue living; on the other hand, to do so in a new situation. It is the conflict between survival and novelty»⁸⁵. To resolve this conflict, the animal must execute a vital act, i.e., it must be able to provide an adequate response to its new situation.

⁸¹ ETM, pp. 629-630: «la acción no es un mosaico de funciones, sino que procede de la unidad primaria del animal; es ella la que regula la adaptación de las funciones para la unidad de su acto. La acción del animal es siempre una respuesta a la situación en que se halla instalado».

⁸² IR, p. 29: «siempre y sólo un momento funcional; pero la respuesta es un momento accional. Con los mismos efectores, la respuesta puede ser de lo más diversa».

⁸³ Ibid., p. 28: «Suscitación es todo lo que desencadena una acción animal».

⁸⁴ ETM, p. 536: «En términos generales, lo propio de las cosas para los efectos de la vida es suscitar un acto vital».

⁸⁵ Ibid., p. 539: «por un lado, seguir viviendo; por otro lado, hacerlo en una situación nueva. Es el conflicto entre aquella pervivencia y esta novedad».

Adequate response. The response is considered adequate if it is able to restore the altered state of equilibrium, and if it is able to enrich the animal's life by amplifying the scope of its vital activity⁸⁶. The response can sometimes be given mechanically by the animal's structures. Otherwise, the animal has to «ascertain» (*acertar*) the response. In these cases, spontaneity in the form of attempt (*intento*) through trial and error becomes significant for survival. Sometimes, the animal commits a vital error, but after further attempts, it is finally able to arrive at a «correct choice» (*acierto*) concerning which among its responses is adequate or not. The absolute failure to do so leads to sickness, and eventually, death⁸⁷. One can see that the moment of response presupposes relative independence from and control of the environment, expressed precisely «in the operative order by the capacity to give an adequate response to external stimuli or to those proceeding from the intrinsic activity that every living has in itself»⁸⁸.

The preceding discussions have focused on what sensing (sensible apprehension) is — its moments of arousal, tonic modification, and response; and the intimate link among them that makes sensing a strictly unitary process. Zubiri emphasizes that the process of sensing «constitutes what is specific to animality»⁸⁹. Setting the sensing process in motion is only the first aspect of sensible apprehension. The next section will discuss its second aspect, namely, its formal structure.

4.2. *Impression and its Constitutive Moments*

Impression as a mode of sensing. The formal structure of sensible apprehension is impression: «Sensible apprehension consists formally in being impressive apprehension. Here is what is formally constitutive of sensing: *impresión*»⁹⁰. Against modern philosophy's understanding of impression as merely subjective, Zubiri clarifies that «impression is not the designation of a sensed object, but is the designation of the mode of how something is sensed... impression is the manner of being open to something that is not subjective, to the sensed itself»⁹¹. Impression, then, is a mode of sensing, so that «to sense is to have *impresiones*»⁹².

⁸⁶ HRP, p. 43.

⁸⁷ ETM, pp. 540-542.

⁸⁸ ZUBIRI, XAVIER, «El problema del hombre», in *Xavier Zubiri: Escritos Menores (1953-1983)*, Fundación Xavier Zubiri, Madrid, 2006, p. 32: «en el orden operativo por la capacidad de dar una respuesta adecuada a los estímulos externos o a los procedentes de la intrínseca actividad que todo ser vivo lleva en sí mismo».

⁸⁹ IR, p. 30: «Constituye lo específico de la animalidad».

⁹⁰ Ibid., p. 31: «la aprehensión sensible consiste formalmente en ser aprehensión imprevista. He aquí lo formalmente constitutivo del sentir: *impresión*».

⁹¹ SE, pp. 414-415: «Impresión no es la designación de un objeto sentido, sino que es la designación del modo como algo es sentido... impresión es la manera de estar abiertos a algo que no es subjetivo, a lo sentido mismo».

⁹² HD, p. 31: «sentir es tener *impresiones*».

To apprehend sensibly is to apprehend impressively, i.e., to capture what is present by means of impression⁹³.

Impression and moment of arousal. Impression has its own formal structure, consisting of three constitutive moments, namely, affection, alterity, and force of imposition. Zubiri clarifies that impression should not be confused with the sensing process' first moment of arousal. As will be recalled, arousal refers to the moment when the apprehended thing «impresses» itself on the animal's sense organs. Arousal is not identical with impression, but «is grounded on the formal structure of the latter»⁹⁴. Arousal, then, depends on the structure of impression, specifically, on the third moment of its structure. Without impression, the entire process of sensing will not be triggered.

4.2.1. First Moment: Affection

Affection vs. affections. Affection refers to the stimulation of the animal's senses by whatever is apprehended: «Impression is, to begin with, 'affection.' The object affects physically the senses»⁹⁵. Affection is the moment when the animal «suffers» the impression, i.e., is affected by the object that impresses itself on the senses. Note that affection as explained here is different from the affections (vital states) discussed previously in the context of the sensing process' second moment of tonic modification. To refer to these states, Zubiri uses the word «affect» and distinguishes it from affection⁹⁶. Without doing violence to Zubiri's thought, one can say that affect is the effect of the object's affection of the senses.

4.2.2. Second Moment: Alterity

The «other» in affection. Affection is possible, however, only if there is something that acts on, or stimulates, the senses. The moment of affection, then, refers back to this something that affects the senses, since «affection has essentially and constitutively the character of making present to us that which impresses»⁹⁷. This moment of remission is the moment of alterity, when «something independent of the animal, that is, something 'objective,' makes itself present to the animal: a dog recognizes the voice of its master, etc.»⁹⁸. Consequently, impression cannot be

⁹³ IR, p. 79.

⁹⁴ Ibid., p. 281: «se funda en la estructura formal de esta última».

⁹⁵ ZUBIRI, XAVIER, «Notas sobre la inteligencia humana», in *Xavier Zubiri: Siete Ensayos de Antropología Filosófica*, ed. Germán Marquín Argote, Universidad Santo Tomás, Bogotá, 1982, p. 105: «Impresión es, por lo pronto, 'afección'. El objeto afecta físicamente a los sentidos». NIH will be used from hereon for subsequent references to this essay.

⁹⁶ IR, p. 32.

⁹⁷ Ibid.: «afección tiene esencial y constitutivamente el carácter de hacernos presente aquello que impresiona».

⁹⁸ SH, p. 20: «se hace presente al animal algo independiente de él, esto es, algo 'objetivo': el perro reconoce la voz de su amo, etc.».

limited only to the moment when the animal's senses are affected, since «impression is the presentation of something other in affection»⁹⁹.

Note. This «other» that makes itself present by means of impression, i.e., by affecting the animal's senses, is what Zubiri calls *note*: «Note here does not designate a kind of indicative sign as the substantive *note* meant etymologically in Latin, but is a participle, what is 'noted' (*gnoto*) as opposed to what is not noted, as long as one eliminates every allusion to cognition (this would rather be the *cognitum*), as well as to knowing (that gave rise to notion and notice). One has to consider only what is merely noted. Thus, for a mole there is no chromatic note; but for animals with the sense of sight color is something noted»¹⁰⁰.

Note vs. quality. Zubiri's concept of note is not necessarily the same as Aristotle's idea of quality. Quality is an inherent property of a thing understood as «substance». Zubiri considers the concept «substance» inadequate, because of which he employs the term «substantivity». Things are not substances, but substantivities, or systems of coherent notes; notes, then, are not inherent properties of a substance¹⁰¹. As Zubiri explains, «One has to avoid thinking that a note is necessarily a note 'of' something, for example, that a color is the color of a thing. If I see a simple color, this color is not 'of' a thing but 'is' the thing itself: color is noted in itself... In the strict sense a note is not a quality, but is something merely noted; it is purely and simply what is present in my impression»¹⁰².

Structure of alterity: Content and formality. The note that makes itself present in apprehension possesses a structure consisting of two moments. The first moment is *content*: Every note has its own content, like color, sound, temperature, and the like. The second moment is *formality*, the mode by which the content, i.e., the note itself, is present in apprehension. Zubiri explains what this mode is: «It is precisely the mode of being other: it is the aspect of independence that the content has with respect to the sentient being. The content of a note 'remains,' and insofar as it 'remains' it is independent of the sentient being in whose impression it 'remains'»¹⁰³. Two ideas from the preceding quotation need to be

⁹⁹ IR, p. 32: «Impresión es la presentación de algo otro en afección».

¹⁰⁰ Ibid., p. 33: «Aquí nota no designa una especie de signo indicador como significó etimológicamente en latín el sustantivo *nota*, sino que es un participio, lo que está 'noto' (*gnoto*) por oposición a lo que está ignoto, con tal de que se elimine toda alusión al conocer (esto sería más bien lo *cognitum*), como al saber (que dio origen a noción y noticia). Hay que atender tan sólo a ser meramente noto. Así, para un topo no hay una nota cromática; pero para los animales con sentido visual el color es algo noto».

¹⁰¹ SE, 446-447.

¹⁰² IR, p. 33: «ha de huírse de pensar que nota es necesariamente nota 'de' algo, por ejemplo, que el color sea color de una cosa. Si veo un simple color, este color no es 'de' una cosa sino que 'es' en sí la cosa misma: el color es noto en sí mismo... En sentido estricto nota no es cualidad, sino algo meramente noto; es pura y simplemente lo presente en mi impresión».

¹⁰³ Ibid., p. 35: «Es justo el modo de ser otro: es el aspecto de independencia que tiene el contenido respecto del sentiente. El contenido de una nota 'queda', y en cuanto 'queda' es independiente del sentiente en cuya impresión 'queda'».

highlighted: That the note *remains* (*quedar*) in the apprehension, and that it does so as something *independent* of the sentient being.

Remaining. How should this idea of remaining be understood? Says Zubiri, «This mere remaining is what constitutes *actualization*, that is, one's making present from oneself, the mere being present from oneself»¹⁰⁴. To understand what remaining means, one has to relate it to the concept of actuality and its three types¹⁰⁵. Actuality refers to physical presence. That a note remains in apprehension means that it is physically present, i.e., it is actual in apprehension. But the actuality relevant here is the type that is intrinsic to every thing, namely, a thing is present not because it so *for* another, as in the case of viruses, but because it is the thing itself that makes itself present from within itself (*desde sí mismo*). Therefore, that a note remains in apprehension means that it is actual in apprehension because it makes itself physically present from within itself.

Independence. The note remains in apprehension as independent of the sentient being. The independence of a note does not mean that it has a separate existence outside of the apprehension, as held by Greek and medieval philosophy. Rather, what is independent is not some other content outside of the apprehension «but is the content itself present in the apprehension insofar as something 'autonomous' with respect to the sentient being. Color [and] sound have their own autonomy in visual and auditory affections»¹⁰⁶. In other words, the note's independence should be understood *within* the apprehension itself, and not apart from it. And this mode of remaining independent *in* apprehension is precisely the moment of formality: «Independence is the formality in which the content 'remains' before the apprehender»¹⁰⁷.

In sum: Content and formality are the moments that make up the structure of alterity. Content is not identical to formality. Formality is the note's manner of remaining autonomous, i.e., of being present or actual as independent of the animal, as being «other», but *within* the latter's apprehension. It is a mode and not an object, but neither is it merely an abstract concept, since it is an essential physical moment of alterity¹⁰⁸.

4.2.3. Third Moment: Force of Imposition

The last constitutive moment of impression is the force of imposition. It refers to the force by which a note or a set of notes imposes itself on the animal. This force should not be identified, however, with the intensity with which the notes

¹⁰⁴ SH, p. 19: «Este mero quedar es lo que constituye la *actualización*, esto es, el hacerse presente desde sí mismas, el mero estar presentes desde sí mismas».

¹⁰⁵ ETM, pp. 360-364.

¹⁰⁶ IR, p. 35: «sino que es el contenido presente mismo en la aprehensión en cuanto algo 'autónomo' respecto del sentiente. El color, el sonido, tienen una autonomía propia en la afec-ción visual y auditiva».

¹⁰⁷ Ibid., p. 44: «La independencia es la formalidad en que el contenido 'queda' ante el aprehensor».

¹⁰⁸ Ibid., p. 35.

affect the animal's senses, since it is possible that a very intense affection can have a weak force of imposition, and vice versa. As mentioned previously, the sensing process' first moment of arousal depends on the structure of impression. It is precisely this last moment of impression that sets in motion the remaining moments of the sentient process, namely, tonic modification and response¹⁰⁹.

To conclude: Affection, alterity, and force of imposition are the three moments of impression. Contrary to the position of traditional and modern philosophy, impression is not simply affection; rather, it is the intrinsic unity of its three moments¹¹⁰. Impression is the formal structure of sensible apprehension. As will be recalled, sensible apprehension is the same as arousal, the first moment of the process of sensing. Since it is the structure of this apprehension that triggers the other two moments of the sensing process, Zubiri calls this apprehension «sensing as such»¹¹¹. But the sensing process is only the first level in understanding the animal as a biological substantivity. Zubiri proposes another level, the animal's habitude.

5. SECOND LEVEL: HABITUDE

Mode of dealing with things. Describing the sentient process is not enough to understand the animal as a biological substantivity that interacts constantly with its environment for the sake of survival. The first level pertaining to the act of apprehension is the most external, and thus, it is the most accessible and observable. However, there is a deeper level from which one can understand the animal, its habitude. Habitude is an Aristotelian category that refers to the living being's mode of facing (*enfrentarse*) or dealing with (*habérselas con*) things. Zubiri explains this concept by contrasting a mole with a blind dog:

«If we made an exhaustive biography of a mole and of a blind dog, in neither case would we find sensations of light. Nevertheless, there is an essential difference. The mole does not have visual sensations, but there is no reason for it to have them. The blind dog, in contrast, does not have visual sensations, but as a dog it should have them. In other words, underneath arousal-response, there is a more profound level, constituted by the manner of facing things, by the mode of dealing with them. The mole does not have, nor can it have, the mode of dealing visually with things; the dog, yes. Every living being has a primary mode of dealing with things and with its own self prior to its possible situations and responses. I call this mode of dealing with things and with one's self as *habitude*»¹¹².

¹⁰⁹ Ibid., pp. 33-34.

¹¹⁰ Ibid., p. 34.

¹¹¹ Ibid., p. 31.

¹¹² HRP, pp. 43-44: «Si hiciéramos la biografía exhaustiva de un topo y de un perro ciego, en ninguno de los casos nos encontraríamos con sensaciones luminosas. Sin embargo, hay una diferencia esencial. El topo no tiene sensaciones visuales, pero no tiene por qué tenerlas. El perro ciego, en cambio, no tiene sensaciones visuales, pero como perro tendría que tenerlas. Es decir, por bajo de la suscitación-respuesta hay un estrato más hondo, constituido por

Zubiri refers to the capacity to deal visually with light, common to most animals, as *visuality* or *visual habitude*. In the above example, the essential difference between a mole and a blind dog is found in their respective habitudes. A dog is *intrinsically* capable of being aroused by, and responding to, optical sensations; however, it is deprived of exercising this capacity, and thus, is blind. In contrast, a mole does not naturally possess a visual habitude; it deals with light in another manner, but not visually, like a dog.

Habitude and the sentient process. Habitude, then, is a much more profound level from which one can understand the animal as a biological substantivity. Habitude underlies the animal's act of apprehension. More concretely, every arousal on the part of things and every response on the part of the living being presuppose habitude. As Zubiri explains, «Habitude is the fundament of the possibility of every arousal and of every response. While the response to an arousal in a situation is always a vital problem, habitude is not, and cannot be, a problem: either one has it or does not have it»¹¹³. As the fundament of the system of arousal and response, habitude is «*consubstantial*» with the living being, as evident in the example of a blind dog: «The dog is a living being that, because of its very nature, if it encounters light, it has to face it visually. If this does not occur, we do not simply say that the dog is not seeing light, but that it is blind. A sleeping dog does not see light, but it is not blind»¹¹⁴.

Not habit, custom, or action. Habitude should not be confused with habit or custom. For being modes of dealing with things, they are special cases of habitude, although not every mode of dealing with things is a habit or a custom¹¹⁵. Neither is it the same as action, since nothing is done to things; rather, habitude underlies every action. Habitude is not properly an action, but is a «*primary attitude*»: «If I call [attitude] habitude, it is only to denote that it is not about the various attitudes that a living being can or cannot adopt in its life; rather, it is about the primary attitude in which its type of life consists by definition»¹¹⁶. Habitude, then, defines formally the living being's type of life, i.e., the living being is either a plant, or an animal, or a human being depending on its mode of dealing with things.

la manera de enfrentarse con las cosas, por el modo de habérselas con ellas. El topo no tiene ni puede tener el modo de habérselas visualmente con las cosas; el perro, sí. Todo viviente tiene un modo primario de habérselas con las cosas y consigo mismo, anterior a sus posibles situaciones y respuestas. A este modo de habérselas con las cosas y consigo mismo es a lo que llamo *habitud*».

¹¹³ Ibid., p. 44: «La habitud es el fundamento de la posibilidad de toda suscitación y de toda respuesta. Mientras la respuesta a una suscitación en una situación es siempre un problema vital, la habitud no es ni puede ser problema: se tiene o no se tiene».

¹¹⁴ ETM, p. 547: «el perro es un viviente que por su misma índole, si encuentra luz, tiene que enfrentarse con ella visualmente. Si esto no ocurre, no diremos simplemente que el perro no está viendo la luz, sino que es ciego. El perro dormido no ve la luz, pero no está ciego».

¹¹⁵ IR, p. 36.

¹¹⁶ ETM, p. 547: «Si la llamo habitud, es solamente para denotar que no se trata de las actitudes varias que un viviente puede o no adoptar en su vida, sino de la actitud primaria en que consiste por definición su tipo de vida».

Habitude and environment. As explained previously, the animal is found «among» things with which it regularly interacts. Its mode of dealing with things determines them to constitute a totality known as environment (*medio*)¹¹⁷. Environment, however, is not the same as location (*locus*); it is only a dimension of environment. As will be recalled, location can refer simply to the animal's surroundings, which non-living beings like an electron also have by virtue of belonging to one or various fields. Non-living physical realities only have a location, but not an environment, since «habitude has no reality except in the living being»¹¹⁸. Only living beings, then, necessarily possess an environment, and their *locus* is strictly referred to as environment precisely because of their habitude. And since every type of living being has its own particular habitude, the same location can constitute different environments according to the habitudes of the living beings found therein¹¹⁹.

Habitude, environment, and situation. It was said before that the Aristotelian category *situs* applies only to living beings. Although only living beings have an environment, Zubiri says that situation and environment are not identical: Environment defines *situs*; consequently, there are situations that certainly will never be given in the life of a living being because of its environment. For example: «To man will never be presented the situation of supporting his feet on the ground and reaching for a star with his hands, just as to any dog will never be posed the most specifically human situations»¹²⁰. *Situs*, then, presupposes environment. And because environment is determined by habitude, «As a category, situation is founded on habitude»¹²¹.

The preceding discussions have elaborated on habitude, the level underlying the animal's arousal and response mechanisms. Habitude is not a habit or a custom. It is the mode of dealing with things that not only defines the living being's type of life, but also constitutes things, among which the living being is found, into an environment. Within the environment is inscribed the situations that can possibly be given in the animal's life. Furthermore, habitude is not action. Yet, habitude not only affects the animal, but also the things with which the animal interacts. The next section explains the sense in which habitude affects them.

5.1. *Habitude, Respect, and Radical Mode*

Respect. What exactly does habitude do to things? Says Zubiri, «Nevertheless although it does nothing with things, it terminates in them and, thus, it places

¹¹⁷ HRP, p. 45.

¹¹⁸ ETM, p. 547: «La habitud no tiene realidad más que en el viviente».

¹¹⁹ Ibid., p. 545.

¹²⁰ Ibid., p. 545: «Nunca se le presentará al hombre la situación de apoyar sus pies en la tierra y alcanzar con las manos un astro, como nunca se le planteará a un perro cualquiera de las más específicas situaciones humanas».

¹²¹ Ibid., p. 546: «Como categoría, la situación se funda en la habitud».

something in them: the manner of being referred to the living being. This is respect»¹²². «Respect» is synonymous to the second moment of alterity, namely, formality: «Because of their habitude, because of the mode of dealing with things, these things ‘remain’ for the living being in a certain formal respect: it is *formality*»¹²³. Respect, then, is the mode of being present as independent of the animal. Respect results from, and is determined by, habitude. For an animal with visual habitude, the respect of light is visibility.

Significance of respect. As will be recalled, things create a situation for the living being. Since it is the environment that defines a situation, this means that the things constituting an environment are only those that the living being can deal with, or equivalently, that can create a situation for the latter. Not all living beings are susceptible to the same things that can elicit their response. A living being can deal with things only if they remain in a certain respect determined by its habitude. Thus, contact with light does not create any situation for a living being with no visual habitude: For a mole, light is not visible, and thus the mole cannot deal with it visually, like a dog. Thus, it is respect that ultimately makes the living being’s surroundings specifically an environment¹²⁴.

Radical mode. Closely related to respect is *radical mode*, which refers to a primary character that is internal to things and that affects them profoundly¹²⁵. Zubiri qualifies this mode as «radical» because he does not want it to be understood within the context of the classical Aristotelian difference between the substantial and accidental modes of being. In the case of light, its radical mode is clarity *as such*, i.e., «such as it is given immediately to the senses, and not in its physical structure»¹²⁶. This being «as such» of things is the internal primary character that constitutes their radical mode¹²⁷. Though they are closely related, radical mode is different from respect¹²⁸.

Respect vs. radical mode. Insofar as respect is concerned, light’s visibility is not independent of the living being: Light is visible only to the living being in its act of seeing. Consequently, visibility is always with reference to a living being. This reference, however, is absent in the case of radical mode. Light’s clarity does not depend on the act of seeing, as it is due to the physical properties of light itself. Clarity, then, properly belongs to light, and is not determined by the living being’s act. Zubiri succinctly summarizes the difference as follows: «Respect is an extrinsic relation to things, the relation of things with the living being is a

¹²² Ibid., pp. 547-548: «Sin embargo, si bien no hace nada con las cosas, termina en ellas y, por tanto, pone algo en ellas: la manera de quedar referidas al viviente. Este es el respecto».

¹²³ IR, p. 93: «por su habitud, por su modo de habérselas con las cosas, éstas ‘quedan’ para el viviente en cierto respecto formal: es la *formalidad*».

¹²⁴ HRP, p. 45.

¹²⁵ ETM, p. 544.

¹²⁶ Ibid., p. 548: «tal como se da inmediatamente a los sentidos, y no en su estructura física».

¹²⁷ Ibid., p. 550.

¹²⁸ Ibid., pp. 548-549.

pure remaining of the former before the latter. In contrast, radical mode is something intrinsic to things themselves»¹²⁹.

Habitude's «action». Since clarity is intrinsic to light, it is independent of the living being. However, recall that clarity *as such* refers to the immediate mode in which it is given to the senses. This means that light is not absolutely independent of the living being. As said previously, although the living being's habitude is not properly an action, it nevertheless affects things by placing in them their formal respect. Zubiri explains what this effect of habitude consists in:

«In the habitude of the vital act, the mode becomes formally actual. Independently of the habitude, the mode was in things effectively but only virtually. Clarity as such is had only in an act of vision. Outside of it, clarity exists, but not formally as such. The mode is in its being *as such* and thus its exhibition is an actualization. Consequently, the primary effect of the habitude of the living being on things is not to do anything with them and to them, but simply to modify them. Modification does not mean here alteration, but exactly the opposite, exhibition, actualization of what things more properly are in themselves»¹³⁰.

Habitude places in a thing its formal respect by exhibiting what is inhibited in it, which is its radical mode. Without altering the thing, the exhibition makes the radical mode, present only virtually in the thing, become formally actual; because of the exhibition, the thing now remains before the living being in a particular respect. Perhaps it is permissible to conclude that respect is the radical mode itself made actual by the «modifying action» of habitude. In the case of light, since its clarity as such (radical mode) is tied to vision, the visual habitude exhibits or actualizes clarity concretely as visibility (formal respect) in the act of seeing.

Radical habitudes. Like *situs*, the Aristotelian category of habitude applies only to living beings. Each type of living being possesses a «radical» habitude that actualizes things in a particular respect or formality: A plant deals with things as food for nourishment; an animal senses them as stimuli, whether visually or in some other manner; and a human being intellectually senses them as realities. These three habitudes — nourishment, sensibility, and sentient intellection — are different from each other, but they are not mutually exclusive¹³¹.

¹²⁹ Ibid., p. 549: «el respecto es una relación extrínseca a las cosas, la relación de éstas con el viviente es un puro quedar de aquéllas frente a éste. En cambio, el modo radical es algo intrínseco a las cosas mismas».

¹³⁰ Ibid., pp. 549-550: «En la habitud del acto vital, el modo se hace formalmente actual. Independientemente de la habitud, el modo estaba en las cosas efectiva pero tan sólo virtualmente. La claridad sólo lo es en cuanto tal en un acto de visión. Fuera de éste, la claridad existe, pero no formalmente en cuanto tal. El modo está en el *en cuanto tal* y por esto su exhibición es una actualización. En su virtud, el efecto primario de la habitud del viviente sobre las cosas no es hacer nada con ellas y sobre ellas, sino simplemente modificarlas. Modificación no significa alteración, sino justamente al revés, exhibición, actualización de lo que las cosas más propiamente son en sí mismas».

¹³¹ HRP, p. 44.

5.2. *Habitude and Formalization*

Formalization. A very significant concept in Zubiri's analysis of the animal's habitude of sensibility and its correlative formality of stimulus is the concept of formalization. Like formality, formalization is also determined by habitude:

«Therefore, to the extent that formality is determined by habitude I shall say that the form of independence, that the form of autonomy insofar as determined by the sentient being's mode of dealing with things, should be termed *formalization*. Formalization is the modulation of formality, that is, the modulation of independence, the modulation of autonomy. Otherness does not only make present to us something we call a note, but a note that in one way or another "remains"»¹³².

As will be recalled, the note remains in apprehension as «other», i.e., as independent of the living being; being independent is the note's formality. However, the note remains as independent «in one way or another». This means that there are gradations in its mode of independence, so that the note possesses a certain degree or form of autonomy vis-à-vis the living being. The note, then, is present in apprehension as «formalized», i.e., with an autonomy that is modulated by the living being's habitude.

Formalization vs. Kant and Gestalt. Formalization is not the same as Kant's sensible form, which in-forms content with the structures of space and time. Space and time are *a priori* forms that the sensibility imposes on the initially form-less content. For Zubiri, formalization is not concerned with the activity of informing content, but is simply the content's mode of remaining independent, regardless of whether or not the content possesses a space-time structure; in this sense, formalization is prior to in-formation. Neither is formalization identical with 19th century psychology's understanding of form (*gestalt*) as the totality or configuration of elemental notes. For Zubiri, formalization is not the configuration of notes, but only its mode of remaining independent. Furthermore, independence applies not only to the configuration, but also to the elemental notes, since, aside from content, every note also has a formality¹³³.

5.3. *Analysis of the Apprehension of Stimulus*

Modes of sensible apprehension. As Zubiri emphasizes, content and formality are different moments of alterity. Content depends on the animal's system of receptors, while formality is determined by its habitude. More importantly, the

¹³² IR, p. 36: «Por eso, en la medida en que la formalidad está determinada por la habitud, diré que la forma de independencia, que la forma de autonomía en cuanto determinada por el modo de habérselas del sentiente, debe llamarse *formalización*. Formalización es la modulación de la formalidad, es decir, la modulación de la independencia, la modulación de la autonomía. La alteridad no solamente nos hace presente una nota, sino una nota que en una forma o en otra 'queda'».

¹³³ Ibid., pp. 43-45.

same content can be apprehended as formalized differently, i.e., as having different degrees of independence. This is why, says Zubiri, «This formalization is that which specifies the distinct modes of sensible apprehension»¹³⁴. These two modes are the animal's apprehension of stimulus and the human apprehension of reality. The next sections analyzes the apprehension of stimulus within the context of the previously discussed constitutive moments of the structure of impression.

5.3.1. First Moment: Affection

Stimulus. As will be recalled, affection refers to that moment when something impresses itself on the animal's senses, so that the animal is described as «suffering» the impression. Zubiri calls *stimulus* whatever it is that acts on the animal senses. The stimulus has two essential moments. First, the stimulus is *intrinsically* ordered towards a response¹³⁵. For example: The apprehension of heat can make the animal either flee from, or go near, it. Second, the stimulus is directly apprehended, i.e., it must actually be stimulating its apprehender. Zubiri insists on this second moment, as it is possible to apprehend a stimulus «from a distance», like observing someone with a toothache. The toothache cannot be strictly a stimulus for the observer, since it does not directly affect the observer, like the one actually suffering it¹³⁶.

Mere stimulus. Zubiri adds an important qualification to what he understands by stimulus. A stimulus is not only intrinsically oriented towards a response. More importantly, a stimulus also consists in nothing else except to stimulate; consequently, what the stimulus is as such is exhausted in its being purely a stimulant. Zubiri refers to such stimulus as *mere stimulus*. He explains this concept of mere stimulus in the context of the statement «Heat warms»: «When heat is apprehended *only* as something warming, we will say that heat has been apprehended as mere stimulus, that is, as something that is only a thermal determinant of a response»¹³⁷. To consist solely in stimulating, or to be a pure stimulus, is the positive physical profile of the mere stimulus that is apprehended in the moment of affection.

5.3.2. Second Moment: Alterity

Formality of stimulus as sign. Zubiri refers to the mere stimulus' mode of remaining as the *formality of stimulus* (or formality of mere stimulation): The pure stimulus remains in the animal's apprehension exclusively as stimulation

¹³⁴ Ibid., p. 41: «Esta formalización es la que especifica los distintos modos de aprehensión sensible».

¹³⁵ SH, p. 21.

¹³⁶ IR, p. 48.

¹³⁷ Ibid., p. 49: «Cuando se aprehende el calor *tan sólo* como algo calentante, diremos que se ha aprehendido el calor como mero estímulo, esto es como algo que es tan sólo determinante térmico de una respuesta».

in view of triggering a response¹³⁸. The formality of stimulus consists in the formality of sign¹³⁹. A sign consists of two aspects: «Something is formally a sign and not a simply a signal when that to which the sign leads is an animal's response. Sign consists in being the content's mode of formality: the formality of determining a response... But also, in the second place, it does not deal with 'knowledge,' but with 'sensing,' with apprehending impressively: it is to sense something as signing»¹⁴⁰.

Aspects of a sign. First, a sign determines a response. A sign is not a signal¹⁴¹. A signal primarily points to (signals) and/or signifies something else by extrinsic attribution. A green traffic light, for example, conveys to a pedestrian that the vehicles have stopped moving. A signal, then, brings the apprehender to a knowledge of that to which the signal refers. But a sign does not refer to another thing, but only to itself. This is why «the sign is the apprehended note itself. Signitivity intrinsically and formally pertains to [the note] and not by extrinsic attribution»¹⁴². A sign, then, is not concerned with providing knowledge, but with determining a response. This explains the second aspect of a sign, i.e., its close link to the sentient process: When the animal apprehends heat, it signs to the animal to respond in one way or another. Thus, says Zubiri, «To sign is to determine sentiently in an intrinsic and formal manner a response»¹⁴³.

5.3.3. Third Moment: Force of Imposition

Objectivity of sign. How does the mere stimulus impose itself on the animal? Since the formality of the mere stimulus is to be a sign of response, the mere stimulus imposes itself precisely by determining the animal to provide a response. Certainly, the mere stimulus remains in the animal's apprehension as an «other», but its otherness lies specifically in being a sign that determines the animal to respond. This is why Zubiri refers to the mere stimulus as an *objective sign*: «Objective here means mere signitive alterity with respect to the apprehender insofar as it imposes itself on the latter... It is from its objectivity that the sign receives its force of imposition»¹⁴⁴.

¹³⁸ HD, p. 32.

¹³⁹ IR, p. 49.

¹⁴⁰ Ibid., p. 51: «Algo es formalmente signo y no simple señal cuando aquello a lo que el signo lleva es una respuesta animal. Signo consiste en ser un modo de formalidad del contenido: la formalidad de determinar una respuesta... Pero además, en segundo lugar, no se trata de 'conocimiento,' sino de 'sentir,' de apprehender impresivamente: es sentir algo como signante».

¹⁴¹ Ibid., pp. 49-51.

¹⁴² Ibid., p. 50: «signo es la nota apprehendida misma. La signitividad pertenece a ella intrínseca y formalmente y no por atribución extrínseca».

¹⁴³ Ibid., p. 52: «signar es determinar sentientemente de un modo intrínseco y formal una respuesta».

¹⁴⁴ Ibid., p. 52: «Objetivo significa aquí la mera alteridad signitiva respecto al apprehensor en cuanto se impone a éste... De su objetividad es de lo que el signo recibe su fuerza de imposición».

Significance of objective sign. As explained previously, the mere stimulus' formality is the formality of sign. As an objective sign, the mere stimulus determines the animal to respond. But what is the significance of the mere stimulus' character as an objective sign? According to Zubiri, «The formal effect that the stimuli's character as objective sign has for the animal's life is the creation of a situation. The response of the animal is an adequate response to a stimulus, sensed in a situation, and definitely ordered to the conservation of its self»¹⁴⁵. As will be recalled, habitude places in things their formality, because of which they are able to create a situation that the animal can deal with according to its habitude of sensibility. The situation sets the animal's sentient process in motion, culminating in a response that, for the sake of the animal's survival, should be adequate to the situation that triggered the process in the first place.

5.4. *Pure Sensing*

Stimulus' alterity in pure sensing. The first mode of sensible apprehension, the apprehension of mere stimulus, is also known as *pure sensing* or *impression of stimulus*: «Pure sensing consists in apprehending something as merely arousing objectively the sentient process. In pure sensing, sensible impression, then, is *impression of stimulus*»¹⁴⁶. In pure sensing, the stimulus' alterity pertains constitutively to the sentient process. As will be recalled, what the stimulus is as such is exhausted in being purely a stimulant. It is independent of the animal, but only as an objective sign of response. Once a response is given, the stimulation ceases, and so does the stimulus' independence. Thus, its independence is intrinsically bound to sensing. As Zubiri says, «Had there been no stimulation, there would be no objective independence... To apprehend something as mere stimulus is to apprehend it as an objective aspect of sensing, that is, as something independent only in sensing»¹⁴⁷.

Pure sensing vs. sensing. Zubiri insists that pure sensing should be distinguished carefully from sensing as such, or «only» sensing: «Sensing apprehends something impressively. Pure sensing apprehends this impressing something under the formality of mere stimulation... Pure sensing is only a mode of sensing as such»¹⁴⁸.

¹⁴⁵ ETM, p. 679: «El efecto formal que tiene para la vida animal el carácter de signo objetivo de sus estímulos es la creación de una situación. La respuesta del animal es una reacción adecuada a un estímulo, sentido en una situación, y ordenada en definitiva a la conservación de sí mismo».

¹⁴⁶ IR, pp. 52-53: «Puro sentir consiste en aprehender algo como mero suscitante objetivo del proceso sentiente. En el puro sentir, la impresión sensible es, pues, *impresión de estimulidad*».

¹⁴⁷ SH, p. 459: «si no hubiera estimulación no habría independencia objetiva... Aprehender algo como mero estímulo es aprehenderlo como vertiente objetiva de un sentir, esto es, como algo independiente, solo, en el sentir».

¹⁴⁸ IR, p. 79: «El sentir aprehende algo impresionantemente. El puro sentir aprehende este algo impresionante en formalidad de estimulidad... El puro sentir es tan sólo un modo del sentir en cuanto tal».

Sensing as such is an act of apprehension by means of impression. Now, what determines the act of sensing specifically as pure sensing is the formality of mere stimulation, which is proper to animals because of their habitude of sensibility. For this reason, pure sensing is not identical to, but is only a mode of, sensing as such or «only» sensing.

The foregoing discussions have focused on habitude, the fundament of the sentient process. Regarding the animal, its habitude is sensibility and the correlative formality is mere stimulus, consisting in being an objective sign. The habitude of sensibility determines the stimulus' degree of independence (formalization), making possible the mode of apprehension specific to animals, the impression of stimulus or pure sensing. The habitude of sensibility, however, is not the ultimate level from which to understand the animal. This final level deals with the animal's structures.

6. THIRD LEVEL: STRUCTURES

Structures as a constitutive moment. It was explained before that between the sentient process and habitude, the latter is a more profound level since it underlies the system of arousal and response. However, habitude is not the ultimate level because «underneath the living being's mode of facing things, and precisely to make it possible, to determine it, the living being has its own structures. And these *structures* are those that determine the habitude within which is inscribed the arousals and responses»¹⁴⁹. A dog, for example, possesses a visual habitude and is capable of sight because its habitude and act of seeing are determined by its optical structures. For Zubiri, the sentient process and habitude present the animal in its operative moment, while structures present it in its constitutive moment¹⁵⁰. This constitutive moment is the ultimate and most profound level from which to understand the animal as a biological substantivity.

Sensing as a material systemic property. Obviously, Zubiri speaks of *material* structures, as they pertain to the animal that represents the third type of matter, biological matter. As explained previously, the living being is a *trans-molecular* substantivity, i.e., a system of organic molecules. Is sensibility, then, nothing but the activity of the animal's component molecules? Zubiri provides a qualified response:

«It is not that sensing, for example, is merely an elemental molecular activity; rather, it is a rigorously new function. But sensing, as a new function, is constituted by molecular structures and only by them; it is a systemic molecular

¹⁴⁹ EDR, p. 174: «por bajo de este modo de enfrentarse del viviente con las cosas, y precisamente para hacerlo posible, para determinarlo, el ser viviente tiene él sus propias estructuras. Y estas *estructuras* son las que determinan la habitud dentro de la cual se inscriben las suscitaciones y las respuestas».

¹⁵⁰ HRP, p. 46.

activity. This therefore implies that, on one hand, sensing is a purely material property, but materially new; only the reduction of what is material to the physico-chemical element can lead to this nonsense that a dog is like a chemical compound, that is, that it rigorously does not sense. No, the dog senses, but its sensing is a material property [that is] purely systemic; thus, a material property, but of a matter that is of a type other than corporeal matter. Nevertheless, it is pure matter like the latter and is a configuration of the latter»¹⁵¹.

One has to realize that, as a constitutive moment, structures are the *essence-matter* of the animal. Essence-matter is potent to give of itself (*dar de sí*) not merely by repeating what it has already given, but more importantly, by making possible something new. In the case of sensing, essence-matter, i.e., the molecular structures, gives of itself through its potentiality of systematization¹⁵². Thus, sensing is a material property. However, it is not the sum of molecular activities, since the individual molecules do not sense. Rather than being an additive property, sensing is strictly a *systemic* property, emerging from the interaction of respective molecules. Sensing, then, is a new property, specifically, a new function, with corporeal matter (molecules) as its substratum.

Structures and actions. Structures determine the animal's actions, and they do so following a certain norm of reaction. According to its degree of evolution, every animal has a *system of actions* proper to it, consisting of the type of responses that it is able to give when stimulated. This ability to respond depends on its morphological structures. In turn, these structures have a biochemical make-up that regulates their *norm of reaction*, which remains relatively constant in the course of the animal's life. For this reason, says Zubiri, «The response of the [cell] is thus always *en-classed* (system of actions) and *regulated* (norm of reaction) by its structures»¹⁵³.

Irritability and habitude. Whereas the structures' norm of reaction relates to actions, the structures' *susceptibility* relates to habitude. Also known as irritability, susceptibility is a natural property of the cell, the basic structural unit of the organism: «Every cell, whether a plant or an animal, can be stimulated and is stimulated. In this aspect, every living being, including the plant, has what I call *susceptibility*»¹⁵⁴. The natural property of susceptibility is related to habitude,

¹⁵¹ ETM, pp. 357-358: «No es que el sentir, por ejemplo, sea mera actividad molecular elemental, sino que es una función rigurosamente nueva. Pero el sentir, como función nueva, está constituido por las estructuras moleculares y sólo por ellas; es una actividad molecular sistemática. Lo cual implica, por un lado, que el sentir es una propiedad puramente material, pero materialmente nueva; sólo la reducción de lo material a lo físico-químico elemental puede llevar a esa enormidad de decir que un perro es como un compuesto químico, es decir, que en rigor no siente. No, el perro siente, pero su sentir es una propiedad material puramente sistemática; por tanto, una propiedad material, pero de una materia que es de otro tipo que la materia corporal. Sin embargo, es pura materia como ésta y una estructuración de ella».

¹⁵² SH, pp. 454-455.

¹⁵³ ETM, p. 635: «La repuesta de ésta está, pues, siempre *enclasada* (sistema de acción) y *normada* (norma de reacción) por sus estructuras».

¹⁵⁴ IR, p. 95: «Toda célula, sea vegetal o animal, es estimable y está estimulada. En este aspecto, todo viviente, incluso el vegetal, tiene lo que llamo *susceptibilidad*».

since «irritability determines, from the viewpoint of responses, the radical habitude of living things: the type of irritability of a plant is not the same as that of an animal, nor, among animals, the mechanism of irritability of an amoeba the same as that of a neuron»¹⁵⁵. Irritability is not the same as habitude; rather, it is prior to habitude, serving as the base from which a particular habitude develops. The next section will discuss Zubiri's exposition concerning the development of the animal's habitude of sensibility.

6.1. *Development of Sensibility*

Differentiation. Differentiation is central to the beginning of sensibility. Although differentiation is a biological concept used in embryology to describe the progressive development of cells resulting in their acquisition of a special function (like digestion, for example), Zubiri provides this concept with a philosophical understanding within the context of the living being considered as a totality. As will be recalled from the discussion on life as a principle, the biological substantivity is and always functions as a totality because it is a primary unity, and not the additive result, of molecular actions. Concerning differentiation, what it does is «to disengage with relative autonomy each of the possible functions already given in the prospective potencies of the germinal plasma; but it does not create them»¹⁵⁶. For Zubiri, then, differentiation does not create anything, as it only disengages and makes autonomous the different aspects of the internal richness and complexity of the living being as a primary unity.

Liberation of stimulus. Zubiri applies this understanding of differentiation in the inception of sensibility. Sensibility, strictly speaking, is the «biological liberation of stimulus»¹⁵⁷. The liberation consists in disengaging the natural susceptibility common to all cells, thereby making it biologically autonomous; for Zubiri, «It is this making of stimulation as autonomous that, to my mind, constitutes *sensing*»¹⁵⁸. Thus, although all cells can naturally be stimulated, there exists a particular group of cells that makes stimulation its exclusive function. This liberation of stimulation occurs *in* the formation of nerve cells that are specialized in being stimulated and in transmitting stimulation rapidly. Sensibility, then, begins initially as a result of the cellular process of differentiation. However, in accordance with differentiation understood merely as disengagement, «The nerve

¹⁵⁵ ETM, p. 636: «la irritabilidad es lo que determina, desde el punto de vista de las respuestas, la habitud radical de los vivientes: no es lo mismo el tipo de irritabilidad de un vegetal que el de un animal, ni, dentro de los animales, es el mismo el mecanismo de irritabilidad de una ameba que el de una neurona».

¹⁵⁶ Ibid., pp. 674-675: «desgajar con relativa autonomía cada una de las posibles funciones dadas ya en la potencias prospectivas del plasma germinal; pero no las crea».

¹⁵⁷ SH, p. 498.

¹⁵⁸ IR, p. 95: «Es esta autonomización de la estimulación lo que a mi modo de ver constituye el *sentir*».

cell does not create the function of sensing; it only disengages [the function], as a specialization, from the susceptibility proper to every cell»¹⁵⁹.

Grades of sensibility. As shown above, sensibility initially begins from the moment when nerve cells are formed; from this initial moment, sensibility will develop progressively. Zubiri speaks of three differential grades of sensing that appeared in the course of the animal's evolution¹⁶⁰. The first grade is susceptibility. With the appearance of nerve cells, cellular susceptibility becomes autonomous, thereby being transformed into *sentience*. This second grade is a diffused type of sensibility. Sensibility, strictly understood as the liberation of stimulus, can be found only in highly evolved animals, as only they possess a nervous system that is more or less centralized, and whose process of centralization continues as evolution marches on.

Animalization of life. The moment of the appearance of sensibility as such constitutes the *animalization of life*¹⁶¹. With the appearance of sensibility in the evolutionary scene, animal psychism begins. For Zubiri, the entire evolutionary history of animals, «from the first animal that has sentience up to the most complex of the orangutans and the first of the hominids certainly is nothing but the evolutionary complexification of the elemental psychism of every animal, namely: the complexification and development of its function of sensing as biological liberation of stimulus»¹⁶². As will be shown in the next section, this complexification of sensibility is associated with the nervous system's morphological development in the course of the animal's evolution.

6.2. *Morphogenesis of the Nervous System*

Centralization and homeostasis. As stated above, the animal with sensibility as such possesses a nervous system whose centralization continues as the animal evolves. Centralization refers to the process whereby nerve cells gradually become systematized, i.e., forming a system principally tasked with receiving, coordinating, and transmitting impulses. Centralization culminates in the formation of the brain, the main component of the central nervous system. Zubiri relates the centralization of the nervous system with the introduction of homeostasis, which is none other than the previously explained internal state of equilibrium in which every animal finds itself. Part of the centralization involves certain mechanisms that maintain the internal environment of the animal. These mechanisms are an absolutely essential moment of the life of

¹⁵⁹ HRP, p. 48: «La célula nerviosa no crea la función del sentir; tan sólo la desgaja como una especialización de la susceptibilidad propia de toda célula».

¹⁶⁰ SH, pp. 13-14.

¹⁶¹ EDR, p. 180.

¹⁶² *Ibid.*, p. 180: «desde el primer animal que tenga sentiscencia hasta el más complicado de los orangutanes y el primero de los homínidos, ciertamente no es sino una complicación evolutiva de esto que es el psiquismo elemental de todo animal, a saber: las complicaciones y el desarrollo de su función de sentir como liberación biológica del estímulo».

the animal, since, as will be explained below, they «dynamically subtend» every activity of the animal¹⁶³.

Centralization and sensing. The central nervous system is the constitutive structure involved with sensing, since «the essential function of the nervous system, from the most rudimentary neuron up to the most complex central mechanism, is in being the organ of liberation»¹⁶⁴. Though Zubiri does not explicitly say so, it is reasonable to relate the central nervous system with what he refers to as the *centralization of sensing*: «Because of [centralization], we can think, in general, that an animal can be slaughtered, something that cannot be done to any plant... An animal is centralized. And the more centralized it is, the more perfect its life is, but the more vulnerable it is»¹⁶⁵.

Corticalization. Zubiri notes that as the centralization of the nervous system advances, there is also a progressive increase in corticalization¹⁶⁶. Corticalization can refer two things. First, it refers to the expansion in terms of size and number of folds of the cerebral cortex, the evolutionary modern part of the brain. Second, in the context of phylogenesis, corticalization refers to the transfer of certain functions from sub-cortical centers to the cortex. With reference to the phylogenetic context, Zubiri speaks of the corticalization of the vegetative (organic) life.

Corticalization of vegetative life. The vegetative life consists of the functions of nutrition and growth; these functions are therefore related to the mechanisms that preserve the homeostatic equilibrium of the internal environment of the animal. Both the animal's sensitive and vegetative lives are centralized in the brain and regulated cortically. Worth emphasizing in this regard is Zubiri's position that the vegetative life is articulated with the sensitive life, because of which «every superior animal has a vague presence of its organic life before itself, which can be, and has been, called its physiological I»¹⁶⁷. The articulation of the vegetative function with the sensitive function accounts for the animal's *cenesthesia*, or visceral sense. Because of cenesthesia, the animal is able to sense at every moment its organism and its states, like hunger, thirst, heat, pleasure, pain, and the like¹⁶⁸. How should this articulation between the vegetative and sensitive functions be understood?

Unity of vegetative and sensitive functions. These functions are popularly understood as existing separately. This understanding cannot be maintained from the perspective of the animal as a primary unity. The two functions do not exist side by side, operating independently of each other. Rather, there is only

¹⁶³ Ibid., pp. 181-182.

¹⁶⁴ ETM, pp. 679-680: «La función esencial del sistema nervioso, desde la más rudimentaria neurona hasta el más complejo mecanismo central, está en ser órgano de liberación».

¹⁶⁵ EDR, pp. 180-181: «Pensemos que por esto a un animal, en general, se le puede dar la puntilla, cosa que no se puede hacer con ningún vegetal... Un animal está centralizado. Y cuanto más centralizado es, más perfecta su vida, pero más vulnerable».

¹⁶⁶ Ibid., p. 182.

¹⁶⁷ ETM, p. 698: «todo animal superior tiene la vaga presencia de su vida orgánica ante sí mismo, lo que puede llamarse y se ha llamado su yo fisiológico».

¹⁶⁸ Ibid., p. 409.

one function consisting of a vegetative moment and a sensitive moment. The vegetative and sensitive functions are structurally articulated in a single function. Thus, Zubiri says, «The transmission of impulse is biologically a formality [moment] of an integral animal function that involves the vegetative [function]. Animal function is intrinsically and unitarily a vegetative-sensitive function or a sensitive-vegetative function. It is a *structural unity*»¹⁶⁹.

Dynamic subtending. Zubiri explains the structural unity of the vegetative and sensitive functions by employing the concept of dynamic subtending. An inferior function A cannot continue normally unless it depends necessarily on a superior function B. For this reason, function A exigently demands function B. Although function A depends on function B, «The first function is strictly *maintained* at the core of the second; therefore, the first sustains the second intrinsically and *formally*»¹⁷⁰. In the case of the vegetative function, it requires the sensitive function, since the chemical functioning of an animal, for example, can continue normally only if the animal perceives optically some stimuli. However, without a normal chemical functioning as a constitutive component of the visual apparatus, optical perception would not be possible. Thus, the vegetative function is a formal moment of the sensitive function *subtending* the latter.

Sensing and the neuronal process. As mentioned above, the development of sensibility is associated with the morphological development of the nervous system. The association does not mean that the development of sensibility is parallel to the morphogenesis of the nervous system. Zubiri seems to imply this non-parallelism when he speaks against the neurosciences' tendency to present sensing as occurring only at the end of the neuronal process: «Sensing is not produced when the neuronal process ends, and thus, nor wherever the process ends. Sensing is the course of the entire process itself»¹⁷¹. Consequently, «The neuronal process is psycho-neurological in all its parts and moments»¹⁷². Thus, one can reasonably conclude that the animal's psyche develops and is shaped *in*, and not outside of, the development of the nervous system. This development takes place in two dimensions: Specification and formalization.

6.3. *Specification*

Formation of receptors. Specification is a type of differentiation whereby some nerve cells become specialized concretely in the reception of stimulation. During

¹⁶⁹ SH, pp. 499-500: «La transmisión del impulso es biológicamente una formalidad de una función animal integral que envuelve lo vegetativo. La función animal es intrínseca y unitariamente función vegetativo-sensitiva o función sensitivo-vegetativa. Es una *unidad estructural*».

¹⁷⁰ Ibid., p. 508: «la función primera *se mantiene* estrictamente en el seno de la segunda; con lo cual la primera sostiene intrínseca y *formalmente* la segunda».

¹⁷¹ ETM, p. 688: «El sentir no se produce cuando termina el proceso nervioso, ni por tanto allí donde éste termina. El sentir es el proceso mismo entero en su transcurso».

¹⁷² Ibid., p. 689: «El proceso nervioso es psico-neurológico en todas partes y momentos».

the moment of specification, receptors are formed, giving rise to the eleven «nuances of sensibility», namely, sight, hearing, smell, taste, laberynthic and vestibular sensibility, localized touch (contact and pressure), heat, coldness, pain, kinesthesia, and cenesthesia (visceral sensibility)¹⁷³. Zubiri emphasizes that the animal's sensitive life is not a mosaic composition of different sensations because the animal is first and foremost a primary unity. The diversity of receptors is a differentiation of the single function of sensing that developed from the natural susceptibility of the animal. Consequently, receptors do not create the function of sensing, but merely specify or nuance it¹⁷⁴. Thus, it is only appropriate that they are commonly known as «sense organs», as they are simply the organs assisting the animal in the exercise of its single sensing function.

Biological specification of stimulus. Zubiri elaborates further on specification, focusing on the structure of each receptor in relation to a stimulus. For example: Except for the difference in wave longitude, infrared radiation and light do not differ essentially in their respective physical structures. Yet, their physical action on the skin and eyes provokes different sensations: One is sensed as heat, while the other, as visible light. The transmission of nerve impulses cannot explain the different sensations, since the neuro-physiological process does not evince a radical heterogeneity, except with regard to the areas where the impulses terminate. The difference is found essentially in the receptors: Each receptor possesses a specific structure that classifies and filters stimuli, so that only a particular stimulus with a given structure corresponds to, and is received by, each receptor. Thus, because of the receptors' specific structure, «The stimuli, although they are not physically, nevertheless, remain biologically specified»¹⁷⁵. Furthermore, it is not really the stimulus that provokes a sensation «but the modification produced in the receptor: the alteration of its previous state»¹⁷⁶.

Specification is only one of the two dimensions in which the nervous system is morphologically enriched in the course of the animal's evolution. The other dimension is formalization. Formalization is not independent of specification, since the former presupposes an already specified sensibility. These two dimensions are articulated in the degree of telencephalization¹⁷⁷, the evolutionary process by which the control of motor functions and the representation of sensory modalities are progressively transferred to higher areas of the brain. The articulation between specification and formalization characterizes a highly evolved centralized nervous system. Concerning formalization, Zubiri says that it affects the entire sentient process¹⁷⁸. Thus, to understand what formalization is, it is necessary to return to the constitutive moments of the process of sensing.

¹⁷³ IR, p. 100.

¹⁷⁴ ETM, p. 694.

¹⁷⁵ Ibid., p. 694: «Los estímulos, aunque no lo estén físicamente, quedan, sin embargo, biológicamente especificados».

¹⁷⁶ Ibid., pp. 694-695: «sino la modificación producida en el receptor: la alteración de su estado anterior».

¹⁷⁷ Ibid., p. 697.

¹⁷⁸ IR, p. 40.

6.4. *Formalization and the Sentient Process*

Moment of arousal. As will be recalled, the moment of arousal refers to the apprehension of something that impresses itself on the animal's receptors. In relation to apprehension, «Formalization is that function because of which the impressions and stimuli that reach the animal from its external and internal environments, are organized forming in a certain manner outlines of autonomous unities»¹⁷⁹. By «autonomous unities», Zubiri refers to closed constellations of notes¹⁸⁰. Because of formalization, what the animal ultimately apprehends is precisely these constellations. Formalization enables the animal to apprehend something as a unity, or expressed simply, as «one» thing. A concrete example will help elucidate the formalization of apprehension.

Sensation vs. perception. When a dog sees its master, it apprehends the latter's elemental notes, like height, sound and quality of voice, color, smell, and the like. Zubiri refers to the apprehension of elemental notes as *sensation*. But the dog does not only apprehend notes, but specifically, its master. As will be recalled, formalization is the modulation of the notes' degree of independence. By modulating their independence, «Formalization constitutes precisely the 'unity' of the sensed content»¹⁸¹. Concerning the dog's apprehension, formalization organizes the elemental notes, modulating their independence to constitute a unity, i.e., an autonomous constellation that the dog apprehends concretely as its master. Strictly speaking, independence now applies only to the unity of notes. Thus, because of formalization, sensation is transformed into *perception*, which is the apprehension of a closed unity of notes¹⁸².

Perception and degree of formalization. Zubiri explains formalization in the order of perception by employing Katz's example concerning the training of a crab to catch a prey that is placed on a rock. When the prey is suspended from a string, the crab does not respond, since it does not perceive the prey. However, a dog, for example, sees the prey, whether placed on a rock or suspended from a string. The difference in perception lies in the animals' respective degrees of formalization: The more advanced is the degree of formalization, the greater is the capacity of the animal to perceive diverse notes as organized into independent unities. Thus, for the crab, there is only one constellation, «prey-rock»; for the dog, however, «rock», «prey», and «string» are three constellations that are independent of each other. Furthermore, as evident from the dog's capacity to perceive the prey wherever it is placed, for an animal with a superior degree of formalization, «A determinate specific block can wander from one situation to

¹⁷⁹ HRP, p. 49: «la formalización es aquella función en virtud de la cual las impresiones y estímulos que llegan al animal de su medio externo e interno, se articulan formando en cierto modo recortes de unidades autónomas».

¹⁸⁰ IR, p. 37.

¹⁸¹ Ibid., p. 36: «La formalización constituye precisamente la 'unidad' del contenido sentido».

¹⁸² Ibid., pp. 37-38.

another — from rock to string — and be perceived as something *the same* by the animal»¹⁸³. Such are the effects of formalization in the order of perception.

Moments of tonic modification and response. Concerning the moment of tonic modification, «Formalization of the vital tone nuances the latter into different ‘affections’»¹⁸⁴. On account of formalization, the animal is able to sense a variety of vital states, like hunger, thirst, malaise, general well-being, anger, and the like; furthermore, it is also able to differentiate, in terms of quality and degree, one organic state from another. As for the moment of response, the capacity to coordinate movements is due to formalization. This capacity for motor coordination is evident in the case of a cat: When hurled into the air, the cat lands unhurt on the ground because it is able to coordinate its legs as it falls¹⁸⁵. Thus, «Motor formalization is responsible for the diversity of movements, some adapted, others learned, etc., that the animal can realize»¹⁸⁶.

6.5. *Formalization and the Brain*

Organ of formalization. As evident from the effect of formalization on the constitutive moments of the sentient process, formalization is not a speculative concept, but «a moment of apprehension anchored on a structural moment of the animal organism itself»¹⁸⁷. This structural moment of the organism is none other than the brain. Certain cortical regions are engaged in formalization, like the frontal lobes and other areas concerned with movement; in case of lesion in some of these areas, paralysis follows. This is why Zubiri considers that «the essential function of the brain lies not in being an organ of mere ‘integration’ (Sherrington) or in being an organ of ‘signification’ (Brinkner), but in being the organ *par excellence* of ‘formalization’»¹⁸⁸. Formalization is such an important concept that Zubiri is convinced that it can contribute significantly to the understanding of some neuro-psychological phenomena, like agnosia¹⁸⁹.

Neuronal basis of formalization. To support his hypothesis about the brain as the organ of formalization, Zubiri refers to the functional organization of its neurons¹⁹⁰. Two types of activities are found in the cerebral cortex. Some neurons are engaged in a *specific* activity in relation to the stimulus, as they are specialized

¹⁸³ ETM, p. 696: «un bloque específico determinado puede vagar de una situación a otra —de la roca al hilo— y ser percibido como algo *mismo* por el animal».

¹⁸⁴ HRP, p. 50: «la formalización del tono vital matiza a éste en distintas ‘afecciones’».

¹⁸⁵ IR, p. 40.

¹⁸⁶ HRP, p. 50: «La formalización motriz es la responsable de la diversidad de movimientos, adaptados unos, aprendidos otros, etcétera, que el animal puede realizar».

¹⁸⁷ IR, p. 45: «un momento de la aprehensión anclado en un momento estructural del organismo animal mismo».

¹⁸⁸ HRP, pp. 50-51: «la función esencial del cerebro no estriba en ser un órgano de mera ‘integración’ (Sherrington), ni en ser un órgano de ‘significación’ (Brinkner), sino en ser el órgano por excelencia de ‘formalización’».

¹⁸⁹ ETM, p. 696.

¹⁹⁰ SH, pp. 523-525.

in receiving stimulation and in transmitting and associating nerve impulses to enable the animal to respond to stimulation. Other neurons are not engaged in such activity in relation to the stimulus. Their activity is *non-specific*, oriented to the production and general maintenance of the activities of the brain. This non-specific activity depends on the neurons of the reticular system proceeding from the brain stem. They keep the brain awake or in a state of vigilance, as well as regulate some of its centers, including the cerebral cortex itself. But the cortex also has its own non-specific functional organization, in which neurons with short axons play a decisive function. However, despite these two different neuronal activities, there is, strictly speaking, only a single brain activity, but with two *coordinated* moments. Zubiri believes that «in one way or another, it is in the articulation between specificity and non-specificity that formalization is inscribed»¹⁹¹.

Importance of non-specific activity. The two activities are coordinated in such a manner as to provide a response to stimulation. When the animal is stimulated, the stimulation triggers the neurons with specific activity, so that a stimulus is constituted at the end of the reception, transmission, and association of nerve impulses. However, the specific activity of constituting the stimulus sets in motion the neurons with non-specific activity; the non-specific activity, then, is produced only in and through the specific activity. For Zubiri, the non-specific activity takes precedence insofar as the response to stimulation is concerned. Aside from modulating the cortex, the neurons with non-specific activity also modulate, organize, and orient the specific activities of cortical neurons, synchronizing them in view of providing a response. Although it is the specific activity that triggers the non-specific activity, the specific activity is actually at the service of the non-specific activity, as it is the latter activity that enables the animal to respond. This why Zubiri believes that the richness of the animal's life depends on the non-specific activity: «Given a stimulating situation, the animal has multiple possible responses at its disposal due to the non-specific activity of its brain»¹⁹².

6.6. *Formalization and Evolution of Psychism*

Formalization as psycho-organic. Although the neuronal basis of formalization shows that it is a physiological function, formalization also has a psychic aspect, since, as discussed previously, it allows the animal access to a variety of perceptions, affects, and possible responses. Thus, formalization is psycho-organic¹⁹³. Its psycho-organic character is evident as the animal evolves. For Zubiri, the evolution of life consists in a progressive formalization¹⁹⁴, opening up situations that make possible the animal's initiative as it deals with various

¹⁹¹ Ibid., pp. 524-525: «En una o en otra forma, es en la articulación de especificidad y de inespecificidad donde se inscribe la formalización».

¹⁹² Ibid., p. 524: «Dada una situación estímúlica, el animal dispone de sus múltiples respuestas posibles gracias a la actividad inespecífica de su cerebro».

¹⁹³ Ibid., p. 501.

¹⁹⁴ EDR, pp. 202-203.

stimuli. Zubiri notes that the stimulus' signitive character admits of degrees¹⁹⁵. And it is precisely the advance in formalization that causes a change in the degree of signitivity. To understand this change, one has to situate it within the context of sensibility in its primary and fundamental form.

Sensing as manifestation of organic states. As will be recalled, the formality of mere stimulus consists in being an objective sign of response. The close link between sign and response is based on the radical unity of the two aspects of sensing. The first aspect is the organism and its state: «In its primary and fundamental form, to sense is to sense oneself in a determined state. Sensing involves above all a manifestation of an organic state because of the liberation of stimulus»¹⁹⁶. The other aspect is response, since the sensing of the organic state «is already an attempt to modify the [organism's] situation, in the direction of avoiding or continuing something»¹⁹⁷. Sensing, then, in its primary and fundamental form, involves the unity of the organism and its state, on one hand, and the response in view of modifying the organic state, on the other.

Stimulus and organism. As explained before in the sentient process, the stimulus impresses itself on the animal, i.e., on its organism's receptors, modifying the organism's vital tone and provoking the animal's response. Thus, the entire sentient process is triggered because of the action of the stimulus on the organism. One can see, then, that the stimulus «does not have any formal character except in being referred to the organism, making manifest its state and regulating the reaction»¹⁹⁸. This close organism-stimulus connection explains why Zubiri says the stimulus is «attached» (*pegado*) to the animal. This attachment of the stimulus is expressed concretely in the animal's instinctive response. The instinctive character is more pronounced in animals with a fundamental and primary form of sensibility. In the case of an animal with such sensibility, one can presume that the degree of signitivity is significantly high because of the reflexive response. The automaticity of the response also serves to indicate the force with which the stimulus imposes itself on the animal.

Gradual detachment of stimulus. However, as it evolves morphologically and advances in formalization, «The animal progressively senses its stimuli as 'note-sign' becoming more independent from the animal itself; that is, it senses the stimulus as something that is increasingly detached from the apprehender»¹⁹⁹. The detachment of the stimulus is due to the decrease of the stimulus' character

¹⁹⁵ IR, p. 53.

¹⁹⁶ ETM, p. 681: «En su forma primaria y fundamental, sentir es sentirse en un determinado estado. El sentir envuelve ante todo una patentización de un estado orgánico por la liberación de un estímulo».

¹⁹⁷ Ibid., p. 682: «es ya un conato a modificar la situación de éste, en la dirección de evitar o proseguir algo».

¹⁹⁸ Ibid., p. 683: «no tiene más carácter formal que el de referirse al organismo, patentizando su estado y regulando la reacción».

¹⁹⁹ IR, pp. 69-70: «el animal va sintiendo sus estímulos como 'nota-signo' cada vez más independientes del animal mismo; esto es, siente el estímulo como algo que va estando cada vez más despegado del aprehensor».

as sign. The decrease in signitive character refers to the easing of the tight link between stimulus and organism, so that «the less simple and less direct is the relation between sign and reaction, the less is the character of the [stimulus] as pure stimulus, that is, it has less direct reference to a state of the animal organism»²⁰⁰. Note, however, that Zubiri speaks only of a *gradual* detachment of the stimulus. Its detachment from the animal will never be absolutely complete, as it will always be referred to the organism and its state, no matter how advanced the animal is in terms of formalization: «The formal character of the stimulus is maintained integral; it is the specific character of the animal's sensing»²⁰¹.

Animal's initiative. Now that the stimulus is less attached to, or more independent of, the animal, the stimulus no longer provokes an automatic response from the animal. This implies that there is a distance between the stimulus (sign) and the animal (reaction). Due to the decrease in signitive character, «A kind of intermediate phase between sign and reaction is created: a phase of expectation. This phase is the constitution of a richer situation, and in it is inscribed the possible initiative of the animal»²⁰². Due to the initiative made possible by formalization, the animal is no longer restricted to providing an instinctive response because it now has at its disposal a variety of responses from which it can select. One can say that the more advanced is the formalization of the animal, the greater is its initiative, and consequently, the richer are its responses and the greater is the degree of its independence from and control over its environment. This is why Zubiri believes that it is formalization that unlocks all the richness of the animal's life, since «the structures of formalization constitute and express the framework in which the possible initiative of the animal is inserted. That is, they are the structures that most properly express the distance and relaxation between sign and reaction»²⁰³.

CONCLUSION

Matter continues to give of itself. As the animal evolves, the more complex its nervous system becomes. Despite its complexity, the nervous system is able to maintain the unity of the sensing process, thus assuring the animal that it can continue to respond adequately to stimulation²⁰⁴. However, there comes a moment

²⁰⁰ ETM, p. 692: «cuanto menos simple y menos directa es la relación entre signo y reacción, lo patentizado tiene menos carácter de puro estímulo, es decir, tiene menos referencia directa a un estado del organismo animal».

²⁰¹ Ibid., p. 683: «el carácter formal de estímulo se mantiene íntegro; es el carácter específico del sentir animal».

²⁰² Ibid., p. 692: «Se crea... una especie de fase intermedia entre el signo y la reacción: una fase de expectación. Esta fase es la constitución de una situación más rica, y en ella se inscribe la posible iniciativa del animal».

²⁰³ Ibid., p. 697: «las estructuras de formalización constituyen y expresan el cuadro en que se inserta la posible iniciativa del animal. Es decir, son las que más propiamente expresan la distancia y la distensión entre el signo y la reacción».

²⁰⁴ IR, p. 69.

in evolution when the animal reaches such an advanced degree of formalization that the unity of sensing is threatened, since its nervous system can no longer provide the animal with the resources to respond adequately to the stimulus. Zubiri refers to this moment in the morphological complexification of the nervous system as *hyperformalization*, which consists in the formation of neural structures that are found in abundance only in the human brain²⁰⁵. With hyperformalization is the «dawning of intelligence»²⁰⁶. Given the constitutive character of structures, this structural development that is unique to the human nervous system has significant repercussions in terms of habitude and the sensing process.

The habitude proper to the human being is *sentient intelligence*: «Sentient intelligence: Here is the properly human radical habitude in [man's] dealing with things. The formality in which things remain in this habitude... is reality»²⁰⁷. Zubiri's technical word for «reality» is the common Spanish phrase *de suyo*. Things are present (*actual*) in human apprehension as *de suyo*, i.e., as having characters that already (*prius*) pertain to it «in its own right» (*en propio*) prior to the apprehension itself²⁰⁸. To apprehend something under the formality of reality is to apprehend it not merely as an objective sign that determines a response, as in the case of animals because of their habitude of sensibility. Zubiri also insists that the formality of reality is essentially different from the formality of mere stimulus²⁰⁹. The act of apprehending things as *de suyo* is the formal act of intelligence²¹⁰, but this intellective act is constitutively sentient, since the only access to reality is by means of the senses. This human habitude, in turn, transforms the constitutive moments of the animal's sensing process into sentient intellection (arousal), sentiment (tonic modification), and volition (response)²¹¹. Because of the hyperformalization of the human nervous system, only the human being, then, is, properly speaking, an «animal of realities»: «Here is the essence of human reality, the essence of the human substantivity... From the viewpoint of his notes..., man is an animal of realities»²¹².

Loyola House of Studies
Ateneo de Manila Campus
P.O. Box 257
U.P. Post Office
1144 Quezon City, Philippines
marclouis.sj@gmail.com

MARCOS LOUIS CATALÁN, JR.

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²⁰⁵ Ibid., 73.

²⁰⁶ SH, 478.

²⁰⁷ Ibid., 37: «Inteligencia sentiente: he aquí la habitud radical propiamente humana en su enfrentamiento con las cosas. La formalidad en que quedan las cosas en esta habitud... es realidad».

²⁰⁸ Ibid., 24.

²⁰⁹ Ibid., 57.

²¹⁰ NIH, 111.

²¹¹ IR, 283.

²¹² HD, 46: «He aquí la esencia de la realidad humana, la esencia de la sustantividad humana... Desde el punto de vista de sus notas..., el hombre es animal de realidades».

