DOSSIER ‘’PERSONHOOD: INTIMITY AND OTHERNESS’’

Philosophical considerations

Language, self-referencing and bioethics:
Can law mediate between evolution and religion?

Langage, autoréférence et bioéthique : la loi peut-elle être servir de médiateur entre l’évolution et la religion ?

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Summary  In the field of bioethics, religious and scientific perspectives generally are in agreement on moral questions such as the value of life. But a profound gulf emerges when it comes to issues related to procreation and death. This paper attempts to analyze the basic assumptions and presuppositions that underlie the bioethical debates surrounding abortion, embryo experimentation and assisted dying. Theistic perspectives are likely to accept the evolution of the physical body, but assert that the uniqueness of human language and the differences between the Homo sapien mind and that of all other animals are not the product of Darwinian selection, but rather the consequence of an ontological lacuna marked by divine intervention. This squarely places the debate about personhood between evolutionary continuity and the creation of an immortal soul connected to the presence of a Deity. The blunt confrontation between these two universes has produced an intractable duality of solitudes in the world of bioethics. It is now widely accepted that animals are conscious, in that they do experience the qualia of sensations such as colour, sound, smell, and pain. They express emotions of fear, anger, affection and grief. It is acknowledged that animal intelligence is manifested in responses to environmental needs, and that their mental processes indicate a sense of selfhood. What then distinguishes the human

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mind is its unique capacity for self-reflection and meta-consciousness, or consciousness of consciousness, which together form the basis of "personhood". The capacity for self-reflection is a necessary condition for human language. Unlike animal communication, speech presupposes the subjectivity of dialogue as in "I" and "you". No human language omits a sign of the self. Historically, the law has formed the focal point in the bioethics divide in contest between prohibition and regulation, versus liberty and free choice. Since individual agency is the foundation of the rule of law, restrictions on choice must be justified in terms of the limitations of rights. Officially, therefore, religious doctrines such as the belief in an immortal soul are kept aside in our secular courts of law, thereby underlining our commitment to the separation of church and state. We often find, nevertheless, that there are discrete attributions through Charters of Rights and Constitutions, to the Deity as the governing force behind the legal system. Almost in all cases, the insertions of religious belief into our Western legal systems are reformulated within the discourse of legal rights. The acute challenges between religious and non religious positions in bioethics normally appear when the "religionists" superimpose their will on the "secularists" about matters that invite prohibition and sanctions. These claims according to religious belief bring passionate debate into the public forum. The conundrums that emerge when we try to use bioethics as a basis for decision making, either in the legislature, in the courts, or indeed within clinical settings, are connected to the fact that in our society, there is a no man's land where agnostic belief systems continue to confuse rather than clarify the suppositions behind the decisions we make. Because of this, the rule of law remains in a frustrated position. To support the rule of law, we suggest that there is no better principle than that of human dignity and respect for individual right of action to contain a tendency of religion or ideology to compromise the individual "right to choose".

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**MOTS CLÉS**
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**Résumé**
Dans le champ de la bioéthique, les perspectives religieuses et scientifiques s’accordent généralement sur beaucoup de questions morales telles que la valeur de la vie. Mais le fossé se creuse lorsqu’on aborde les questions liées à la procréation et à la mort. Cet article tente d’analyser les hypothèses de base et les présupposés qui sous-tendent les débats bioéthiques autour de l’avortement, de l’expérimentation sur l’embryon et de la mort assistée. Les perspectives théistes, même si elles acceptent l’évolution du corps physique, affirment que l’unicité du langage humain et les différences entre l’esprit de l’*Homo sapiens* et celui des autres animaux n’est pas le produit de la sélection darwinienne, mais bien la conséquence d’une lacune ontologique marquée par une intervention divine. Le débat sur ce qu’est l’individualité oppose ainsi catégoriquement le point de vue évolutionniste (l’individualité apparaît au cours du processus continu de l’évolution du vivant) aux tenants de la création d’une âme immortelle par une déité. La confrontation brutale entre ces deux conceptions a divisé le monde de la bioéthique en deux groupes inconciliables. Il est largement admis aujourd’hui que les animaux sont conscients, en ce qu’ils font l’expérience des qualia de sensations comme la couleur, le son, l’odeur et la douleur. Ils expriment des émotions de peur, de colère, d’affectation et de peine. On reconnaît que l’intelligence animale se manifeste dans les réponses aux pressions du milieu et que les processus mentaux des animaux indiquent un sens de l’individualité. Ce qui distingue l’esprit humain c’est sa capacité unique de réflexivité, de méta-conscience ou conscience de sa conscience, tout ce qui forme la base de l’individualité. La capacité de réflexivité est une condition nécessaire du langage humain. À la différence de la communication animale, la parole présuppose la subjectivité du dialogue en « je » et « tu ». Il n’y a pas de langage humain qui ne désigne le moi. Historiquement, la loi a situé le point critique où la bioéthique met en concurrence prohibition et régulation avec liberté et libre choix. Et comme la capacité individuelle d’âger est le fondement de la règle de droit, des restrictions de choix doivent être justifiées en termes de limitations des droits. Officiellement, cependant, des doctrines religieuses, comme la croyance en une âme immortelle, sont écartées de nos tribunaux séculiers, soulignant ainsi notre attachement à la séparation de l’église et de l’état. Néanmoins, dans des chartes des droits et des constitutions, il est souvent fait référence à la déité comme force qui, en arrière-plan, régit le système légal. Presque dans tous les cas, les croyances religieuses incluses dans nos systèmes légaux, en Occident, sont reformulées dans le discours des droits légaux. Les conflits aigus entre positions religieuses et non religieuses en bioéthique apparaissent normalement.
The nature of personhood: the first evolutionary divide

According to Sullivan [1], “The concept of personhood remains the central and enduring focus of any intelligent discussion of bioethical norms” [1, p. 177]. If so, then the question of abortion is certainly the “ground zero” of the cultural wars raging around this issue. If, as Hoffmeyer [2] writes, “A decent biology must search for the evolutionary root forms of what it is to be an ‘I’, a first person singular” [2, p. 386], then a decent bioethics must equally do so. The first major dispute in evolutionary biology centered on the nature of “personhood”, and it remains so even to this day. From this perspective, the underlying critical question is whether personhood is the product of an evolutionary continuity or a theistic intervention.

Alfred Russel Wallace and Charles Darwin [3] were widely traveled naturalists and students of various species of life. The idea of natural selection had come to Wallace like a revelation. He put his ideas into the form of a paper that he sent to Darwin for comment. Darwin was devastated because he had been developing the same concept for some time but for a number of reasons had been ambivalent about publishing it. In order to resolve the dilemma, Darwin’s friends Joseph Hooker and Charles Lyell arranged for Darwin and Wallace to each present a paper before the prestigious Linnean Society of London. In this historic joint presentation on July 1st 1858, the concept of evolution of the species through natural selection was introduced to the world. Wallace’s paper placed emphasis on biogeographical and environmental pressures on varieties and species as drivers of biodiversity, while Darwin’s focused more on competition between individuals within the same species.

In contrast to Darwin, Wallace argued throughout his life that the set of unique features that distinguish the human mind from the animal mind could not be accounted for in terms of natural selection alone. According to Wallace, selection could not explain natural abilities that appeared before they were required. Human consciousness and intelligence went far beyond the needs of any earlier members of a species. Natural selection responded to problems of the past and present, and was not future oriented. The human mind had a unique generative power. While animals were at the mercy of nature and were forced to adapt accordingly, the human mind was able to anticipate and guard against the adverse influences and circumstances that drove natural selection. The pattern of natural adaptation was that the solution followed the problem, not anticipated it.

During an interview with Albert Dawson, editor of the weekly newspaper Christian Commonwealth, Wallace explained his differences with Darwin. “Darwin believed that the mental, moral, and spiritual nature of man were alike developed from the lower animals, automatically, by the same processes that evolved his physical structure. I maintain, on the other hand, that there are indications of man having received something that he could not have derived from the lower animals”. Dawson responded with the question, “Have you any theory as to how he got that something?” Wallace answered, “I do not think it is possible to form any idea beyond this, that when man’s body was prepared to receive it, there occurred an inbreathing of spirit — call it what you will” [4].

Wallace believed that the soul survives the death of the body. Darwin in contrast, proclaimed “there is no fundamental difference between man and the higher mammals in their mental faculties” [5, p. 35]. “The difference in mind between man and the higher animals, great as it is, is certainly one of degree and not of kind” [5, p. 105].

One of the greatest ideas ever conceived by the human mind is that of natural selection. In the history of human thought hardly ever has such a great idea been conceived by two different persons in the same country at relatively the same time. Yet, since the time of their joint presentation, the status of Wallace has diminished to little more than a footnote in the history of Darwinian evolution. The reason lies in the oppositional position of Wallace and Darwin as manifested in the trial of Henry Slade [6]. “Dr.” Henry Slade, a prominent spiritualist medium, was amassing wealth by convincing people that handwriting mysteriously appearing on a chalkboard slate were messages from dead relatives. Edwin Lanister, a young zoologist, commenced a prosecution against Slade for criminal fraud. The trial held in 1876 at the London Bow Street Police Court gained further notoriety when it served to pit Wallace and Darwin against each other. Wallace entered the fray as the star witness for the defense. While he had no evidence to offer on Slade personally, he vigorously defended the concept of the reality of life after death and the possibility of the spirits of the dead making contact with the living. While Darwin did not take the witness stand, he publicly supported and gave
substantial financial aid to the prosecution as he viewed the trial as science versus superstition. Although Slade was convicted of fraud, no judgment was made on spiritualism itself.

Wallace’s belief in the continuation of the soul after death was not based on religion. In an 1861 letter to his brother-in-law, he wrote, "I spent, as you know, a year and a half in a clergymen’s family and heard every Tuesday the very best, most earnest and most impressive preacher, it has been my fortune to meet with, but it produced no effect whatever on my mind... I remain an utter disbeliever in almost all that you consider the most sacred truths" [7, p. 82–3]. Wallace was convinced that the differences between the human mind and those of other species of animal could not be the product of evolutionary adaptation and saw in spiritualism the possibility of obtaining scientific confirmation of his belief that the soul survives the death of the body. Darwin, on the other hand, went on to write The Descent of Man and Selection in Relation to Sex [5], and The Expression of the Emotions in Man and Animals [8].

The Heirs of Wallace

Natural and sexual selection in the context of the science of genetics is beyond question. Only those who choose to remain in ignorance doubt the evolutionary origin of the human species. Those who believe that science and religion are complementary have retreated to a position now known as Theistic Evolution wherein they accept the evolution of the body but not of the soul. In the 1996 message on evolution given to the Pontifical Academy of Science, Pope John Paul II [9] conceded that the scientific evidence was now such that evolution could no longer be dismissed as a mere hypotheses, and proclaimed the principle of "ontological discontinuity" explaining, "if the human body takes its origin from pre-existing living matter, the spiritual soul is immediately created by God" [9]. "With man, then, we find ourselves in the presence of an ontological difference, an ontological leap, one could say... The moment of transition to the spiritual cannot be the subject of this (scientific) kind of investigation... But the experience of metaphysical knowledge, of self-awareness, and self-reflection, of moral conscience, freedom, or again, of aesthetic and religious experience, falls within the competence of philosophical analysis and reflection, while theology brings out its ultimate meaning according to the Creator’s plans" [9, p. 383]. The message concludes with the proclamation, "We are called to enter eternal life" [9, p. 383]. Most mainstream religious denominations accept the principle that natural and sexual selection are sufficient to explain the diversity of life in all of its forms but they do not believe, as Wallace did not believe, that there is an evolutionary continuity between the mind of the apes and the mind of man.

The Heirs of Darwin

The heirs of Darwin are those who accept that the mental properties more or less unique to humans such as subjectivity, self-consciousness, the capacity for dialogue, and the capability of generative thought, were not the product of a divine intervention. For the heirs of Darwin, there can be no such thing as disembodied mind. The evolutionists submit: How can the mind continue to exist after the death of the brain? When we think of spirits and ghosts we usually impart to them sight, sound, and form. Yet how can you have sight without eyes? How can you have sound without the auditory system of the outer and inner ear? How can you have thought without a brain? How then can you have a soul without a body?

Following the July 2012 Cambridge conference entitled Consciousness in Humans and Animals, the participants all signed The Cambridge Declaration on Consciousness which concluded with the assertion: "We declare the following: The absence of a neocortex does not appear to preclude an organism from experiencing affective states. Convergent evidence indicates that non-human animals have the neuroanatomical, neurochemical, and neurophysiological substrates of conscious states along with the capacity to exhibit intentional behaviors. Consequently, the weight of evidence indicates that humans are not unique in possessing the neuroanatomical substrates that generate consciousness" [10]. The question that divides the heirs of Wallace from the heirs of Darwin is: Are those metacognitive mental properties that appear to constitute the very essence of the human soul, such as is manifested in advanced self-consciousness and language, the product of divine intervention or did they evolve according to standard evolutionary processes that can be fruitfully analyzed and understood?

In search of the soul

Language more than anything else marks the distinction between human beings as persons and every other form of animal life as organic "objects". If there is an evolutionary continuity in the development of those properties that we normally refer to as constituting the human soul, the answer lies in the evolution (or not) of language. According to theistic evolution language is a product of the soul whereas in nontheistic evolution the soul is the product of language. Helen Keller [11], blind, deaf, and therefore mute from early infancy, provides a penetrating retrospective analysis of the difference between animal-like consciousness and the meta-consciousness of human beings. When she interpreted the hand signs of Anne Sullivan spelling the word "water" as representing the perceptual phenomenon she felt as her hand was held under the flowing pump, she then went on to demand signs for a variety of other things she wanted. Nevertheless, she states that she still had no power of thought nor was she conscious of any change or process going on in her brain, but that, "I merely felt keen delight in obtaining more easily what I wanted by means of the finger motions that she taught me" [11, p. 116].

Helen Keller declares that after she learned a sign for herself a momentous transformation in her mental state began to take place that she describes as the dawning of her soul [11, p. 113], and can best be understood as the emergence of metaconsciousness. She explains, "When I learned the meaning of ‘I’ and ‘me’ and found that I was something, I began to think" [11, p. 117]. According to her own account, learning a sign of her self was necessary for her to make the transition from learning and using signs, as bonobos and
chimpanzees do, to understanding and using language as a human.

The French linguist Émile Benveniste [12] best recognized and clarified the unique nature of the pronoun I. As a word, I does not have a fixed reference in terms of the physical self. When we make judgments and statements such as "I hurt myself", the I is contemplating the physical body, and therefore is not the body but the owner of it. The I thus contemplates its body. The I is not the same thing as the mental self. The I can make judgments about the mental self. We can say "I feel sad, happy, or depressed. The I is not a thing nor an object. It is the contemplator of things and objects. The I can think about the self, contemplate the self, and make judgments about the self, but it always somehow stands outside the self when it functions in this fashion.

According to Benveniste [12], "The very terms... I and you, are not to be taken as figures but as linguistic forms indicating "person." It is a remarkable fact - but who would notice it, since it is so familiar? - that the "personal pronouns" are never missing from among the signs of a language, no matter what its type, epoch, or region may be. A language without the expression of person cannot be imagined" [12, p. 225]. Thus, language presupposes persons; persons presuppose dialogue; dialogue presupposes the person who is speaking; and the person who is speaking presupposes the subject. Thus language presupposes subjectivity. In the words of Benveniste [12], "It is by identifying himself as a unique person pronouncing I that each speaker sets himself up in turn as the "subject" [12, p. 220]. "It is in and through language that man constitutes himself as a subject, because language alone establishes the concept of "ego" in reality, in its reality which is that of the being" [12, p. 224]. It is in this way that the capacity for language constitutes the foundation of personhood.

The transparency of language

Many authors have commented on how language and perception converge into a single thought. As stated by Shore [13], "In our experience, our words do not represent concepts: they present them in a wholly transparent way. This is what I meant when I noted that native speakers do not normally speak in their language, but through it" [13, p. 357]. Phillips [14] refers to the ordinary common sense view that: "We are in immediate contact with things and do not require the mediation of signs". Thus, signs are transparent in that we see through the signs to the everyday world without taking note of the signs. "The perfection of language, he writes, 'lies in its capacity to pass unnoticed. But therein lies the virtue of language: it is language that propels us toward the things it signifies. In the way it works, language hides itself from us'" [14, p. 17]. Given the presence of the phenomenon we call snow, and given the word "snow" that is used to represent it, the experiential perception snow (a), and the word "snow" (b) converge into the thought of snow (c). In turn, the single thought of snow (c) can be decomposed into its two constitutive elements, (a) the phenomenological perception snow, and (b) the word "snow". Human language thus is structured like Borromean rings where ring (a) links with ring (b); ring (b) links with ring (c) and ring (c) links with ring (a) as (a) \(\rightarrow\) (b) \(\rightarrow\) (c) \(\leftarrow\) (a). If any one ring is cut, the other two become disengaged. Sign and its object converge into a single thought (Fig. 1).

Animal signs, on the other hand, are more like three rings linked in the sequence of the sign, what it represents, and the interpretation (Fig. 2).

According to Martin Heidegger [15], "Only where the word for the thing has been found is the thing a thing... The word alone gives being to the thing" [15, p. 62]. "Therefore this statement holds true: language is the house of Being" [15, p. 63]. "If it is true that man finds the proper abode of his existence in language... then an experience we undergo with language will touch the innermost nexus of our existence" [15, p. 57]. "In order to be who we are, we human beings remain committed to and within the being of language, and can never step out of it and look back at it from somewhere else" [15, p. 134]. In this sense, language is the house of personhood. The experiential phenomenon of self-perception and the personal pronoun "I" converge in self-identity.

The soul as a sign of itself

According to Charles Saunders Peirce [16, p. 284] thinking is a semiotic process and every thought and idea is a sign. The object of a sign, which is an idea, can be another sign [17, p. 138]. For Peirce [16, p. 284], every Interpretant of the Object that was in the form of a thought becomes a sign in and of itself. Umberto Eco [18] called the process whereby the Interpretant of a sign becomes the Representa-
Self-referencing: evolution or religion

Peirce [19] asks us to imagine the logical logic of a country where at a specified point there lies a point-by-point map of the country. There will be a point on the map that is a representation of the map, giving maps of maps, ad infinitum.

"It is therefore, he writes, "the precise analogue of pure self-consciousness" [19, p. 161–2]. Peirce calls this a sign that represents itself a "Sign of itself." "It is that the word or sign which man uses is the man himself. For, as the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign..." [20, p. 188–9]. A sign of itself contains its own explanation and those of all its significant parts, "each such part has some other part as its object" [21, p. 230].

Paul Ryan [22,23, p. 12–3] diagrams Peirce's sign of itself as a relational circuit where the first position (a) is linked to the second position (b) that is in turn linked to the third position (c) that links back to the first position (a) as in (a) → (b) → (c) → (a) (Fig. 3).

According to the mathematician Louis Kauffman [24], Peirce's system of mathematical logic furnishes the key to understanding thinking and language as a semiotic processes. "Peirce (1976) wrote a remarkable essay on the Boolean mathematics of a Sign" writes Kauffman, "that combines the properties of addition and negation" into a single sign for inference, which Peirce referred to as the Sign of ilation [24, p. 81]. Kauffman [24] calls it a portmanteau such as a suitcase that opens into two sides, or a word whose form and meaning are derived from a blending of two or more distinct forms such as smog is formed from smoke and fog. Every sign that constitutes a portmanteau possesses "pivot duality" in that the sign can be interpreted in terms of either of its two components [24, p. 84]. "In the end, it is important that the portmanteau Sign can be decomposed back into its component parts, for this allows the translation between Peirce's thought into the Boolean algebra" [24, p. 83] (Appendix A).

Kauffman [24] points out that "The pattern of pivot and portmanteau is the clue to this robust nature of the formal language in relation to human thought and to the human as a Sign for itself" [24, p. 85]. Language is transparent because it functions like a portmanteau. The concept of

The soul as semiotic self reflective convergence (SSRC)

According to Kauffman [24], "The double meaning of the portmanteau is a precursor to the interlock of syntax and semantics that led to Gödel's work on the incompleteness of formal systems" [24, p. 80]. The key to understanding Peirce on mathematics is to view the nature of the self as structured like a Gödel numbering. "In this view, there can be no essential separation of the human being and the mathematics of language of that being" [24, p 104].

Kurt Gödel's [28] story begins with the mathematician David Hilbert who sought to place mathematics on a complete and final logical foundation in which every axiom would be true and every theorem in the system would be provable. Virtually, any mathematical system can be redefined in terms of membership in sets and any theorem can be formulated as a theorem of set theory. In the early twentieth century, Bertrand Russell articulated a paradox in set theory that created a foundational crisis for mathematics. We can take as a given that most sets are not members of themselves because the set is not the same thing as its content or members; but we can also take as a given that there are some sets which are members of itself. The set of all concepts is a member of itself because a set is a concept. Conceivably, we can have the set of all sets that have the property of not being a member of itself. Hence, the self-referential paradox: if this particular set is a member of itself then it is not a member of itself, and if it is not a member of itself then it is a member of itself.

Paradoxes are illogical, that is to say they defy the principles or rules of logic in that they generate self-contradictions. This is particularly true for self-referential paradoxes such as Epimenides famous "all Cretans are Liars". If Epimenides had been an Athenian, the sentence would not be paradoxical because it was not self-referential. Since he was a Cretan, however, the statement became self-referential. If the statement was true then Epimenides was a liar, and if he was a liar then his statement was a lie and could be true. Similarly, the self-referential statement "This sentence is false" creates a logical self-referential paradox, in that if the statement is true, then it is false. Bertrand Russell's barber's paradox is a classical example. The barber's sign reads, "I shave only men who do not shave themselves". There are thus two sets of men, the set of men who shave themselves and the set of men who are shaved

Figure 3.  Relational circuit.

Circuit relationnel.
The Chomsky Revolution: the second evolutionary divide

The Darwin–Wallace divide as to the evolutionary continuity or "ontological discontinuity" of personhood has now reemerged in a new form regarding the nature and origin of language. "Why does language matter?" asks Kennealy [31] in The First Word, "Because the story of language evolution underlies every other story... about an animal that evolved, started talking, started talking about the fact that it was talking, and then paused briefly before asking itself how it started talking in the first place" [31, p. 13]. "The story of language evolution studies," she states, "is unavoidably the story of the intellectual reign of the linguist Noam Chomsky" [31, p. 8].

As a result of the revolution that Chomsky brought about in the field of linguistics a wide consensus is now developing around the following four propositions:

- first: language is unique to humans. No other animal or primate has anything like it [32, p. 42–3];
- second: language is "essentially an instrument of thought", Communication, in comparison, "remains a minor part of actual language use" [32, p. 14–6];
- third: the capacity for language is independent of vocalization. Comparative studies of the neural activity of deaf signing and vocal speech prove that the unique neural features that underlie language evolved and function independently of the capacity for vocalization [33–35];
- fourth: the basic property of language consists of "an infinite power of 'associating the most diverse sound and ideas', in Darwin's words" [32, p. 3]. This property is a product of a basic simple recursive cognitive function that enables two different kinds of thoughts to combine into one. Chomsky refers to it as Merge [32, p. 16–9, 36, p. 10–1]. Merge consists "of the simplest possible mode of recursive generation: an operation that takes two objects already constructed, call them X and Y, and forms from them a new object that consists of the two unchanged, hence simply the set with X and Y as members" [36, p. 70].

Chomsky is an heir of Wallace arguing that language did not evolve from simpler forms of communication but emerged more or less complete as a process of thought once the Basic property was functioning. "If we rely on unambiguous evidence of symbolic behavior as a proxy for language, then we might take the Blombos cave South Africa artifacts — geometric ochre engravings and beads — as providing as reasonable a time and place for the appearance of language. That is by 80,000 years ago, at that very spot" [36, p. 149]. Given the absence of earlier evidence of symbolic thought, and the later blossoming of the magnificent Paleolithic cave paintings Chomsky and Berwick conclude that human language and the Basic property merge must have arisen between 200,000 years ago at the earliest and 60,000 years ago at the latest [36, p. 150].

According to Chomsky [37], "So it looks as if — given the time involved — there was a 'great leap forward'. Some small genetic modification somehow that rewired the brain slightly... Something happened in a person that that person transmitted to its offspring, and apparently in a very short time, it (that modification) dominated the group; so

by the barber. If the barber shaves himself, he does not fit in the set who are shaved by the barber because the barber shaves only men who do not shave themselves; and he does not fit into the set of men who are not shaved by the barber since he is the barber.

Gödel believed that Hilbert’s project was misconceived. In order to prove anything about the system of natural numbers, the system had to entail self-reference. Self-reference entails paradox. Hence no mathematical system, at least as complex as the system of natural numbers, can be both logical and complete as to truth and proof [29, p. 295]. Since defining truth and proof within a logical system results in self-referential paradox, the truth and proof of the system must be determined outside of the system. The problem that Gödel faced was: how to create propositions as to proof and the truth of a system that are truly self-referential and yet external to the system?

The key to Gödel’s brilliant mathematical achievement was the creation of non-paradoxical self-referential statements about whole numbers, in whole numbers by Semiotic self reflective convergence (SSRC). Gödel’s proof consists of three separate and distinct systems [30, p. 26]. The first (a), the system of natural numbers, is represented in a second system (b) in the form of a formal axiomatic system, in terms of a finite set of axioms from which theorems and proofs could be derived according to logical rules of inference. A formalization of mathematics such as Russell and Whitehead’s Principia Mathematica is achieved by the axiomatisation of Georg Cantor’s set theory in terms of Gottlob Frege’s propositional calculus wherein propositions can be designated as true or false, and proof determined through the function of logical operators such as “and”, “or”, “not”, and “if then”. System (b) in turn is represented in a third system (c) in which every single item in the axiomatic system is represented by a unique natural number.

Any number can be expressed as a product of prime numbers in only one way. The number 9000, for example can be only expressed in terms of prime numbers as $2^3 \times 3^2 \times 5^3$. Thus (a) and (b) are related; (b) and (c) are related; and (c) is related to (a) as (a) $\rightarrow$ (b) $\rightarrow$ (c) $\leftarrow$ (a). Whole statements in the logical axiomatic system are each represented by a Gödel number that is the product of multiplying the Gödel numbers of its individual items. Multiplying their two representative Gödel numbers represents a logical relationship between two propositions in the logical system. In this way, Gödel logically demonstrated that every system concerned solely with the relationship between whole numbers will contain propositions that are certain in that they can neither be proved or disproved within the system.

A Gödel number (c) is a portmanteau sign possessing pivot duality since it can be decomposed back into its component parts, (a) and (b). According to Kauffman [24], “‘This understanding is already present in Peirce through his view of the nature of the perceiving consciousness as a sign for itself’” [24, p. 109]. “We ourselves are portmanteau signs of a complex order. We are packing cases of multiple meaning large enough to make a human being a sign of itself’” [24, p. 109]. The structure of Semiotic self reflective convergence (SSRC), whether in mathematics or in the language of being, is generatively recursive wherein each (c) can become a new (a) in a further (a) $\rightarrow$ (b) $\rightarrow$ (c) $\leftarrow$ (a) convergence [28, p. 62, fn48a].
it must have had some selection advantage [37, p. 13-4]. While Chomsky has revolutionized the field of linguistics, his suggestion that the ontological discontinuity leading to language was the product of a genetic mutation has been met with the same skepticism as that of the theistic insertion of an immortal soul. While acknowledging that Chomsky is "the linguist who first unmasked the intricacy of the system and perhaps the person most responsible for the modern revolution in language and cognitive science," Steven Pinker [38, p. 21], like many others, remains an heir of Darwin arguing, "Though we know few details about how the language instinct evolved, there is no reason to doubt that the principle explanation is the same as for any other complex instinct or organ, Darwin’s theory of natural selection" [38, p. 333]. He goes on to say, "Thus the first traces of language could have appeared as early as Australopithecus afarensis... Or perhaps even earlier" [38, p. 352-3].

The Great Leap forward: the out of Africa story

We need to broaden Berwick and Chomsky’s [36] question "Why Only Us?" to: "Why only we obligate bipeds?" Maxine Sheets-Johnstone [39] points out the stunning implications which the shift to obligate bipedalism has had for sexual selection and reproduction. Sexual difference is the first and most likely the primordial semantic item of meta-cognition initiating the "semantic continuum of primordial language" [39, p. 91]. "Hominid bipedality, " she asserts, "eventuated in a radically different primate bodily appearance" [39, p. 90]. As stated by Gee [40], "If females standing upright expose their breasts to view, men standing upright expose their penises... The connection between penis display and sexual selection should be too obvious to underline" [40, p. 120]. Rancour-Laferriere [41] points out that "Bipedalism means a dramatic new potential for sexual signaling" [41, p. 35].

Sue Savage-Rumbaugh [42] relates that all of her bonobos and chimpanzees have demonstrated in a variety of ways, that not only do they recognize themselves in mirrors and on the screen of a live television, but they also enjoy playing with their image and even altering it by making faces and monitoring the changes [42, p. 272-6]. An obligate biped hominin possessing the capacity to recognize a mirror image of its self likely would also have had the mental capacity to interpret the display of its own external reproductive organs as an iconic sign of its own sexual identity and difference.

If we let: and represent (a) the phenomenological perceptual experience of the sexed body, and let: and represent (b) the visual reproductive organs as iconic signs of sexual identity and difference, the physical signs of sexual identity and the phenomenologically sexed self converge into the self referential thought of gender identity as (a) (b) (c) (a), having the same self-referential structure as a Gödel number and Peirce’s sign of itself where as in Ryan’s relational circuit, the phenomenological experience of sexuality (first position a), is represented by external visual biological signs of sexual difference (second position b), which in turn loops back where the two kinds of thought converge into the single thought of gender identity (third position c). In this way, why we talk may be correlated with why we walk.

Given that we grant that animals have consciousness, the obvious difference between the minds of our closest relatives the bonobo and the chimpanzee is in regard to the capacity for metaconsciousness. Obligate biped infants are born in complete dependency. If females selected males in regard to their potential for providing resources, protection and care of young, the capacity of males to monitor their own emotional states, and for females to interpret their mental states would offer a selective advantage. If language emerged from metacognitive thought rather than a way to communicate, certainly sex, gender, and reproduction would be its primary focus as is suggested by over a hundred late Paleolithic figurines of female bodies such as the Venus of Willendorf, in conjunction with numerous stone, antler, or ivory carved phalluses [43, p. 90-104, 113-7, 121-36].

While fossil evidence of ancient apes have been located throughout Europe and Asia [44], there is now a general consensus that anatomically modern humans evolved and migrated out of Africa, gradually replacing older obligate biped species. While there is no evidence of an evolutionary continuity between the hoots of apes and the noise of Hamlet, there could well be as between their ability to recognize their own self in a mirror and our capacity for semiotic self reflective convergence. SSRC may have gradually evolved to a tipping point where inner thoughts (a) could be brought into convergence with arbitrary vocal signs (b) as (a) (b) (c) (a). Chomsky’s language property “Merge” could materialize from SSRC much as a butterfly emerges from its chrysalis, “providing the basis for unbounded and creative thought, the ‘great leap forward’ revealed in the archaeological record, and the remarkable differences separating modern humans from their predecessors and the rest of the animal kingdom” [32, p. 25].

The bioethics divide and the rule of law

The capacity for semiotic self reflective convergence that constitutes the human being as ’I’ as in ‘I am’ comes with a cost in terms of the knowledge that the ‘I’ will eventually cease to be. The price of metaconsciousness is the knowledge of death. The cure for the affliction of the thought of becoming nothing is the conviction that the ‘I’ will continue to exist after the body expires. A belief in the soul surviving the death of the body in some form or other, whether in ancestor worship, reincarnation, or monotheism, is the cornerstone of religion.

The split between theistic and secular bioethics is a manifestation of the evolutionary divide separating theistic from standard evolutionary biology. From the perspective of theists, since birth and death are in the hands of God from whom the soul emerges, conception and death ought to be regulated according to religious convictions. Under the rule of law purely religious doctrines and beliefs fall outside the parameters of legal discourse since they are not susceptible to evidentiary proof; hence, the two sides of the bioethics
divide must confront each other within the discourse of rights. If the language of rights is to be taken seriously, two propositions about rights must be accepted. The first is that rights are indefeasible, and the second is that rights are not absolute.

Rights are indefeasible in the way in which truth may be said to be indefeasible. If we discover that a proposition is true when we believed it to be false, we say that it was always true, and when we discover a proposition to be false which we had believed to be true, we hold that it was always false. The same drive towards objectivity through indefeasibility is present in the concept of right. There can be conflicting claims of right, just as there can be conflicting claims of truth. Enshrining rights within constitutions is one way to ensure their indefeasibility. The indefeasibility of rights, for example, is implicit in the ongoing dispute concerning the interpretation of the second amendment of the constitution of the United States concerning the right of individuals to carry arms. If some future decision of the Supreme Court were to overturn previous rulings and hold that the original intent of the drafters was only to preserve the right of the individual states to continue to maintain militias, then it would follow there never was a true right of individuals to arm themselves.

Rights are indefeasible because they are not subject to being outweighed by utilitarian considerations, nor by the interests of other persons. Conflicting claims of right therefore cannot be resolved through some form of balance or weighing. We cannot say that in certain circumstances one right overrides another right, as this would make the second right defeasible. We can only say that in certain circumstances what is purported to be a right is in fact not a right. Neither can there be such a thing as a justifiable infringement of a legal right if rights are not defeasible. If an act or inaction is justified, it cannot be a breach of a right.

The indefeasibility of rights can be reconciled with their conditionality by including in their general description a list of exceptions specifying all the circumstances when the right does not exist. For example, a justified killing in self-defence would not constitute either a violation or a breach of a right to life. These potential situations, however, are so varied and numerous that they would not be thought of until they happen, so one could never get a complete and workable delineation of the right. If, however, one could describe exception-generating principles, a catalogue of specific exclusions would not be necessary. Such general principles are implicit in most rule-governed practices [45].

It is a general principle, for example, that when under particular circumstances where it not possible to comply with the rule, one is generally not held responsible. This principle underlies such legal defenses as infancy and insanity. In situations where following the rule would not achieve the object of the rule compliance would not be expected because it would be a cost without a value. The following opinion of Harman L.J. of the English Court of Appeal is one which most judges would probably share: "...in a case where the reasons behind the rule do not exist I do not feel bound to apply it" [46]. Situations can also arise where, although by following the rule the ends which justify its existence are achievable, under the particular circumstances obedience would produce a negative value greater than the positive goal of the rule. It then would be irrational to demand compliance. Practically, every legal system avoids this in a rule-like manner such as the defence of necessity. Rights, while indefeasible, are not absolute but must be interpreted ceteris paribus. In particular, they must be subject to the exception that the right does not apply where the negative outcome of its application would outweigh the positive good.

The fundamental issue bisecting bioethics centers around women’s right to control their own bodies, and in particular procreation. Clearly abortion is the fulcrum point of the divide, as manifested in the pro-choice versus pro-life conflict. From a strict legalist point of view, religious conviction that a fetus contains a human soul is regarded as unprovable and failing to constitute a valid legal argument. Similarly, the argument that zygotes, embryos, and fetuses are actual persons does not fall within the “neutrality” typical of traditional legal argument. Differences in styles of argumentation can thus leave both religious and secular parties to these discussions sides feeling as though the other side is unable to communicate in the terms that they themselves deem most appropriate. The result is that from the secular legalist perspective, religion-based rights claims are viewed as a form of a quasi-argument that thinly veils the theistic content.

The theistic argument is to designate a zygote, embryo, or fetus as a separate entity from the mother. It is human because it is composed of human DNA, somewhat different from the mother. It is biologically alive. Since it is living, then it must be a life. Since it is a form of human life, it is a form of human “being”. At the moment of conception, therefore, a new entity comes into existence that is human, alive, and an individual organism—a living and fully human being and thus entitled to legal protection. By this chain of reasoning zygotes, embryos, and fetuses are endowed with personhood, creating an exception to the right of the female to control her own body.

The second most contested issue within the bioethical divide is that of the right to assisted death, which while indefeasible is nevertheless conditional. Some theists deny that the right to life includes the right of the individual to terminate it since life and death belong to God; hence, the criminalization of assisted dying with a limited number of exceptions which are gradually being recognized. From the legalist perspective, there is no rational justification for overriding a patient’s wishes by placing a particular time limit such as death within 6 months in cases of terminal illness. With respect to the law of human rights, there is no clear reason that a teenager suffering from a painful terminal disease should not have the same rights as an adult in the same circumstance. Similarly, behind the opposition to advanced directives in the case of impending dementia on the grounds that the patient is no longer the same person that made the directive, one will generally find a religious rather than legal rights-based line of reasoning. Theists often make use of “slippery slope” arguments to illustrate the supposed risks of denying the right to an assisted death to the elderly in any circumstances. These issues are complex; hence, the decriminalization of assisted dying ought to be carefully undertaken. If, however, assisted dying is a true right, then it is indefeasible and a legalist outlook dictates that its limitations ought to be in the form of exceptions where it can be shown that the costs outweighs the benefits.
Theistic determinism and individual autonomy

The existence of God remains a legitimate question given the present limits of science. In addition, those arguing from a legalist perspective should concede that the question of how the brain produces the mind remains a mystery, in animals as well as in humans. Nevertheless, since the time of Wallace the evidence for an evolutionary continuity between our species and our common ancestor with other hominids has exploded in terms of fossil evidence of a wide variety of obligate biped hominins, genetics, cognitive science, neuroscience, and animal cognition. Finally, Charles Saunders Peirce and Kurt Gödel have provided a resolution to the problem of the paradox of self-reference.

The true issue in the bioethical cultural wars surrounding issues such as abortion, birth control, stem cell research, assisted dying, and animal rights is whether there is an evolutionary continuity between the human mind and that of other species of hominids or whether there is an ontological gulf due to the possession of a soul. Nevertheless, when a pregnant female and a male enter an empty lift, biology, cognitive science, the law, and common sense tell us that there are only two persons in the elevator. Philosophy tells us whether or not there are two or three depends upon the meaning, we give to the concept personhood, while religion typically asks us to accept a pre-provided concept of personhood that purports to be indisputable.

Towards a middle ground on personhood

The great divide between theism and various types of evolutionism has existed in Western civilization almost from its inception, and persists to this day. The antecedence of the extremities can be traced in parallel tracks to a secular intellectual movement in opposition to religious authority and institutions. Since the enlightenment, the trend has gone more towards the secularising of public institutions and legal systems, although the sustaining force of religion remains in evidence. It is naive to assume that religious belief is something that has dispersed with the exponential developments in science, and it is indisputable that multitudes of citizens either subscribe to religious or agnostic beliefs. Thus, to insist that secular law is pristine is to render a simplicity to our social fabric that does a discredit to wide sectors of educated, professionally endowed, and sensitive citizens that are a part of a multicultural milieu.

If we set apart extreme positions that deny volatilvity and credibility to each other and search for a modicum of civility and tolerance in trying to build a respectful view of persons holding divergent beliefs, we enter a framework which is reflected in the agnostic characteristic of a legal system. While being dedicated to a secularized theory of rights, the system lives with the ambivalence seen in legislation and judicial decisions that reveals an "in and out" manifestation of public sentiment and judicial opinion. Regardless of the secular model that we have posited, it is an obligation of judges and the citizenry to abide by the actual precedence of law and legislation, which is a mirror of the majorities ruling on, for example, a controversial subject in bioethics.

In the public space where there will be an inevitable mix of secular and religious approaches, we need to locate the ground for a respectful bioethics. In our view, the optimum conditions should be a legal and social order where human agency (personhood) can be given the fullest possible respect, unless there can be proof that subscribing to a particular view does harm to others, or in any way violates the human agency of other persons of unlike beliefs. This surely is the working definition of tolerance. If our commitment to a secular model of law requires of us that human rights be understood in this way, then we recommend an approach in bioethics which allows for those committed to religious beliefs to make decisions consistent with their values but not including the right to impose or restrict the choice of contrary opinions. In other words, in the model that we have proposed, sanctions and prohibitions are to be minimized to every extent possible even though sentiments can be offended. Inevitably, injustices might occur and anomalies will be a part of the balance, but as a general thrust, we see this as the only way to avoid profound discrimination and distrust in the battlefield of current bioethics.

Those who feel deeply about their religious views will undoubtedly react with apprehension and profound disagreement. In such examples as fetuses who at a certain stage of development make claim on the right of life, stem cells which violate the notion that all human material has been created in the image of God, and cases of assisted suicide where rational acts are treated as defiant of God's will expressed towards the suffering, they will argue that it is wrongful to allow travesties that will come with undue permissiveness. It is not the opinion presented here that religious voices should not be given respect by a secular law. It is rather that religious voices should not have the right to drown out the spirit of human agency. Personhood, for what we have described, has taken perhaps hundreds of thousands of years of evolution to come to the level where it can be linked to a civilised notion of liberty and choice. Regression against this accomplishment, we contend, is a denial of the enlightenment and all that has come afterwards.

It may be the case that constitutional values have their origins in what could be called religious sources, but this does not mean that a secular society is not entitled to have the rule of law displace theocracies. In the name of religion, we must be mindful that there have been strong edicts expressed on matters of birth control (notwithstanding uncontrollable population growth), attacks on homosexuals, (despite radical transformations of attitudes globally), attacks on the emancipation of women, and contemporary warfare devastating whole populations rationalized by religious beliefs. No apology should therefore be given to the serious commitment of a liberal and secular rule of law that would control, to the largest degree possible, the moral foundations of bioethics.

Finally, it may be contended that our responsibility to the vulnerable will be lost in a morally bankrupt secular vision. But why should this be a natural outcome of an individually based bioethics? The collective experience of living has led to many kinds of arrangements where acceptance and care for the vulnerable has been intrinsic to the long-term viability of the group. That is not to say that there cannot be cooperation between secular and religious constellations as they are justifiably represented in any given society. This
occurs all the time in most of the liberal democracies as we know them. There is no greater virtue in defending the vulnerable based on religion as opposed to secular principles. That is an indisputable fact in the record of human conduct.

**Human dignity**

It has been frequently argued by natural law philosophers and theologians that any legal system that asserts itself from acknowledging religious origins will suffer the consequence of being an amoral system with no retort to evil infractions. In contrast, we hold to the belief that in modern democracies it is possible, without denying or accepting religious sources, to acclaim the need for and to make a commitment to universal values based upon widespread acceptance at a global level. In the area of bioethics, Ruth Macklin [47], in her poignant book *Against Relativism*, concludes that the hope for an evolving and tolerant bioethics is to emphasize the need for a baseline of humanistic practice through a globalized rule of law instantiated in such proclamations as the United Nations declaration of human rights. Many countries, in recent decades, have followed these types of statements and alas, many have been dishonoured in their breach. But no better solution has been found for our unrelenting preoccupation with how to achieve a respectful standard for all human kind, including those so vulnerable that they are limited in being able to express what we have earmarked as human capacity. It is a measure of the civility of a society how the least capable are treated, and we insist that human dignity has an intrinsic connection to the very idea of vulnerability. Bearing responsibility to these special populations is a mandate to which every society should subscribe, particularly in the context of present and emerging challenges in bioethics.

What then can we make of the binding principle of human dignity? Although imperfect because of its vagueness often shown in the lack of clarity in its relationship with other fundamental values, it is the best point of departure for a tolerant bioethics in a civil order. It is a constant struggle to determine its precise affinity with liberty, self determination and equality, but it is the finest value that can be identified because it has surfaced in the mainstream of constitutions and other emblems of solidarity working towards a concept of inalienability and inviolability.

The ideal of human liberty is that each individual possesses inherent dignity. As we have written on another occasion, "the assumption seems to be instinctively made that human dignity at once represents the individualistic morality brought on by the enlightenment, which defers to the notions of autonomy and respect for persons, while attending to a social dimension of humanity where persons are given a special status of protection that goes to the heart of what it means to be a person, or, with these dimensions in mind, to be a human with all that it compports" [48]. In this way, human dignity is the key anchor for our modern day notions of personhood, and is therefore integral to solving problems in bioethics today.

**Disclosure of interest**

The authors declare that they have no competing interest.

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**Appendix A. Peirce’s system of notation for mathematical logic (Kaufman, 2001, p. 81–3)**

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Peirce’s sign of illation combines two contradictory logical properties, addition and negation into a single sign for inference

By leaving the space for a variable blank, Peirce is able to express negation. In Peirce’s system, not A is equivalent in meaning to A is false

A implies A means that A is true for any A

A implies B, normally written as A → B, is equivalent to not both A and not B

A implies not B, normally written as A → ¬B, is equivalent to not both A and B
Self-referencing: evolution or religion

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