An unexpected science-fiction masterpiece

Dan Brown's *Origin* considered in the light of Teilhard de Chardin's work

by Wim van Binsbergen

Brown, Dan, 2017, *Origin*,
London etc: Bantam, 463 pp.

ABSTRACT. In this critical review of Dan Brown's recent novel Origin*, the book is first situated within the ensemble of Brown's oeuvre. In general not really a fan, the critic concedes that* Origin *is a masterpiece of science fiction, which captures much of humankind's eternal and contemporary existential preoccupations with unexpected effectiveness. After summarising the book's plot, the review focuses on the life's quest of the main character, Kirsch, a computer scientist* cum *futurologist, who has been able to simulate, with his unique supercomputer, both the origin of life on Earth, and the direction in which the human species is evolving towards the future. The surprising parallels with the work of the French palaeontologist and Roman Catholic mystic Pierre Teilhard de Chardin are then discussed at length. This allows us to proceed beyond Creationism's insistence on the necessity of specific divine intervention in the emergence of life on earth. The piece ends with the critic's personal reflections on the dilemmas of theorising on God and the universe – and one possible solution.*

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Introduction: *Origin* amidst Dan Brown's novels

Frankly, when *Origin*, the new Dan Brown appeared in the local bookshops by the end of 2017, I was not particularly eager to acquire and read it.

I had read *The Da Vinci Code* (2004), on the recommendation not of my usual

literary advisors but of that of my athletic eldest son, whose informal father-in-law (a professor of psychology and, like me, a poet) had greatly enjoyed the book. The mixture of Christian historical myth (the 'bloodline' of the founder of Christianity had been the subject of several other speculative bestsellers in the previous decade), Early Modern science, Swiss bank secrets, British nobility, secret societies and terrorist murder, full of rapid plot changes and cliff-hangers, had been entertaining to the very end: the eerie, dreamy evocation of the Scottish chapple where Christ's last surviving alleged descendants were re-united as one little happy family – fully aware of their divine global mission, and amply compensated for the sacrilegious Black Mass the book's heroine as a child had seen her grandfather perform, when she was peeping in through their castle's window. Nonetheless, donning his Mickey-Mouse wristwatch, emulating vague popular stereotypes of the Harvard professor (Brown's rendering on this point remains totally unconvincing to me, who from 2004 to 2010 was a very regular participant in Harvard intellectual exchanges) and of the non-existing field of 'symbolology', the book's male protagonist Robert Langdon did not come to life – his psychology was if possible even flatter than that of his female counterpart, even more reminiscent of early science fiction full of clichéd scholarly and academic *couleur locale*, his lapses into colloquialisms too un-professorial, his Harvard too much a view from afar. I suppose it was only in order to stress this fake dimension of the book that in the movie, Langdon was played by the gregarious and blatantly non-academic Tom Hanks, while the heroine was brought to a comic, equally unsophisticated and miscast life by the French comic actress Audrey Tautou.

I soon read other 'Dan Brown's. Some showed amazing skill and accomplishments (I particularly liked the first, *Angels and Demons*, which afforded my wife and me a welcome travel guide for a fascinating afternoon in Rome when we had no more time to spare, and which rekindled my altar boy's childhood experiences mixed with fantasy, of Roman Catholic clerics as a vain, murderous, lascivious, heretical lot – but how on earth could a future pope resign himself to the idea that impregnating a nun through Artificial Insemination was no infringement of his, nor her, vow of chastity?). Most titles in this series, however, in my opinion revolved on an appalling display of flimsily appropriated Internet gleanings passed off as state-of-the-art architectural, historical and art-historical knowledge. For me *The Lost Symbol* was the last straw: a fantasy on Freemasonry symbolism in USA state architecture at Washington DC – how could a prodigal son who left home as a near-adult, after many years in which he cherished his childhood resentments re-enter the life of his rich and powerful father and not be recognised? However, also these later books had proved entertaining reads, if intellectually and literarily shallow; and being

involved in a protracted and exhausting process of moving house I expected at least entertainment from *Origin*, – miles away from the philosophical, scientific, comparative-mythological and *belles-lettres* canon with which I normally occupy myself as an intellectual producer.

However, much to my regret I have no option but to report the following. After the predictably slow and somewhat clumsy first fifty pages, *Origin* is an amazingly well-written exploration of some of the most profound and enduring preoccupations of the human mind, and specifically of our globalised, digitalised world today. The book aptly (though somewhat amazingly) avoids the most conspicuous international conflict matter of today (the North Atlantic demonisation of Islam, and the Islamic demonisation of the North Atlantic region). Instead, it addresses far more essential and enduring problematics: the origin of life on Earth, the future of humankind, the debate on the relation between religion and science, and the excesses of recent Creationism as a theology of the long-term history of the universe and of life on Earth. For a change, Brown's input of scientific knowledge, although inevitably second-hand (after all, he is a failed pop musician and a best-selling author, not a scientist), is far from stale, but, on the contrary, up-to-date, complex, and brilliantly managed. An extensive team of editors and copy editors has ensured that most of the prose is of exceptional quality, and that unmistakable slips of the pen are very rare. Used, by now, to the jaded amateurism and anti-intellectualism of pseudo-professor Langdon I was not so irritated any more by the details (like Langdon, I am myself a prominent comparative mythologist), and, I must admit, I was increasingly captivated by the author's serious and relevant voice unfolding state-of-the-art versions of perennial central questions of humankind.

Where do we come from – Who are we? – Where are we going?'

In 2010, when, at Harvard, Eric Venbrux and I presented our edited proceedings of the Second Annual Conference of the International Association of Comparative Mythology which we had organised, the doyen of that field, the Sanskritist Michael Witzel, concluded his presidential address with a PowerPoint slide showing Gauguin's well-known monumental painting entitled *'D'ou venons-nous – Que sommes-nous – Où allons-nous'*. These very words are written in a corner of the painting, and Witzel (German-born, and ever since

his transfer from Leiden a *true* Harvard professor) generously (but, as I pointed out in the subsequent debate, somewhat shallowly, from a philosophical point of view) claimed that the painter had phrased there the three central questions of all human thought and all mythology: Where do we come from – Who are we? – Where are we going?'

I could not help wondering if perhaps more of Witzel had gone into *Origin* than Brown gave him credit for – Witzel is totally absent from the long list of acknowledgements that conclude the book. Anyway, Gauguin's title runs as a red thread through *Origin*, and determines much of its structure.

Fig. 1. Gauguin's painting *'D'ou venons-nous – Que sommes-nous – Où allons-nous'.*

Origin is full of felicitous *trouvailles* which show what mastery Brown has acquired by now, in his early fifties. The book not only uses extensive data from the Internet, but also is a incessant celebration, in form and content (whole sections emulate web pages!), to Internet as it has established itself as the standard mode of expression and of interaction in the course of the last decade. The novel's characters communicate not by postal pigeons or smoke columns, not even by secret letters smuggled in by a trusted servant, and only rarely by telepathy, but like we all do these days, by Internet / e-mail / text messages / Whatsapp. This renders an immense credibility and unity of style and purpose to the book – even though the same approach, in the hands of a lesser writer (and of lesser editors, I suppose…) would have produced a boring and merely fashionable but essentially ephemeral text.

This permanent emphasis on recent media also constitutes a constant hommage to the

character who, more even than Langdon and his reluctant heroine (the female museum director Ambra Vidal, 'the future Queen of Spain') is the true protagonist of this book, notably the computer scientist, futurologist, modern oracle and multi-billionaire Edmond Kirsch. The Spanish crown prince's fiancée remains bleak, featureless, stilted, devoid of personality, like all of Dan Brown's heroines and in fact like Langdon himself also in this book. By contrast, Kirsch is truly '*A Hero of Our Time*' (Lermontov). His rags-to-riches story (like in *Angels and Demons* again the nun who gives birth – in this case, for once, using the usual procreative anatomy, and fortunately before making her vows) does manifest some of the thin, early-science-fiction psychology Brown is addicted to (it effectively spoiled *The Lost Symbol*, and almost spoiled *Angels and Demons*). Yet as a top-ranking specialist in Artificial Intelligence, and as a more than passionate and abundantly equipped thinker struggling to find the ultimate answers to Gauguin's questions, Kirsch is in an excellent – and what is more, credible – position to invent, build and finance the supercomputer with which these questions may now be answered with state-of-the-art techniques of mathematical modelling and simulation. This requires unprecedented calculating power which before the quantum computer was simply unimaginable, but which now enables Kirsch to replicate the famous 1952-1959 Miller-Urey experiments in which the conditions of the Earth's presumed primordial atmosphere were modelled in a few test tubes for a few weeks.

Simulating the origin of life on Earth

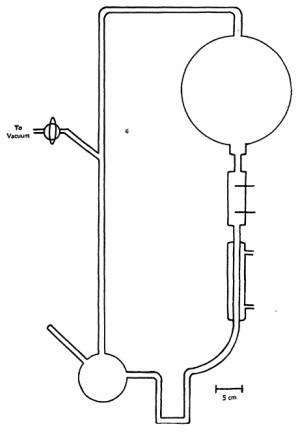

Fig. 2. Schematic view of Miller's 1952 experiment (Miller 1953: 528).[1]

[1] Although meanwhile raised to iconic status, the Miller-Urey findings have not gone without profound criticism; *cf*. the opening chapter in Wells 2002, where he speaks of *misleading* and *mythology*. In other chapters he criticises the idea of the *Tree of Life* (popular with Darwin and many of his sympathisers, including Teilhard de Chardin, *cf*. Teilhard 1955: 86; for a general overview of trees of life, *cf*. Pietsch 2012). Meanwhile the simple, one-origin tree model has been increasingly criticised as

What made those experiments audacious and thrilling is that less than a century earlier test tubes had been used (Huxley 1873: 218 *f.*) to demonstrate the very opposite: that life could not possibly emerge from dead matter, in other words, that the *generatio spontanea* in which many generations of early scientists had believed, was an impossibility. Two-thirds of a century ago, Miller's and Urey's experiments certainly did not yield *life*, but at least some of its indispensable building bricks – amino acids. (Brown, who obviously and understandably is only familiar with these experiments as mediated by today's secondary reports, believes that these results were considered negative at the time, as if the experiments were failures; but I learned about them – and about Oparin's 1938 / 1953 counterpart experiments in the Soviet Union, mentioned in Miller's first, 1953 publication[2] – as a boy, in the wake of the centenary of Darwin's (1859) *Origin of Species*, and then scientific opinion was far more positive, not to say elated; *cf* Quispel 1960). Kirsch's supercomputer allows him to engage in digital simulation on an even grander scale than is already habitual in this field of advanced and boundary-crossing research. He thus manages to convert the simulation model into an incredibly precise and comprehensive time machine, re-calculate the probable fate of every atom and molecule, yea every electron, electromagnetic discharge, and gamma ray in these test tubes, not just for a few weeks but for millions of years forward and backward, and thus to recapture the most probable details of the origin of life on Earth.

This yields Kirsch the answer to one of his momentous questions – but it happens to be the very same answer (and this is one of the few regrettable oversights of Brown's book) which also the controversial science-and-religion writer of a much earlier vintage, the French geologist / palaeontologist Pierre Teilhard de Chardin, gave in *Le Phenomène Humain* (1955, originally written 1940):[3] *life can emerge from matter on the basis of no other conditions than*

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merely a simplistic, linearised model of thought hailing from the Romantic period (*cf*. Bernal 1990: 2 *f*., 53 *f*.; Blazek 2007; Kammerzell 1994, Salminen 2002; Dewar 1995).

[2] There is an interesting link here with another long-standing interest of mine (van Binsbergen 2011): the *Black-Athena* debate, as initiated by Martin Gardiner Bernal (Bernal 1987-2006). His father, John Desmond Bernal, a leading physico-chemist widely known for his four-volume social history of science, was with J.B.S. Haldane one of the pioneers in the West of a natural-science approach to the origin of life (*cf*. Bernal *et al*. 1962 / 1957) , and both were staunch Moscow communists. Finding a materialist explanation for the origin of life was for them an interesting application of the historical materialism of Marx, Engels and Lenin. Martin, although himself not really a communist, originally studied Sinology in Cambridge UK (where for some time he lived in the house of the leading anthropologist Meyer Fortes), and wrote a PhD on Chinese communism in the early 20th c. CE.

[3] Ever since his death in 1955, when the Roman Catholic church lifted the embargo on the publication of his writings, an enormous literature has grown around Teilhard's work and person. The principal works are easily identified on and retrieved from the Internet, and I

simply those contained in the natural laws that supposedly have unalteringly governed all so-called dead matter since, supposedly, the beginning of time. For the emergence of life on Earth there is no need whatsoever to invoke the specific intercession of a personal, creative god.[4] We will come back below to the several reservations ('supposedly…') which the previous statement contains.

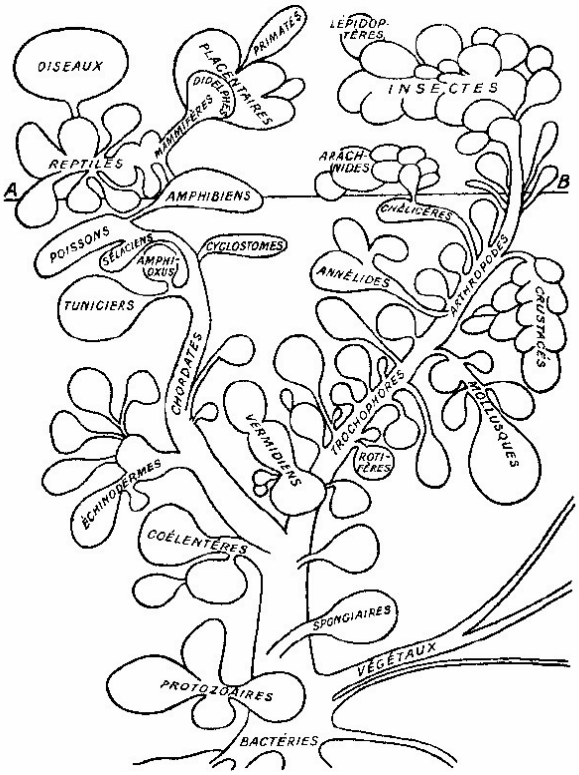

Fig. 2. L'« Arbre de la Vie », d'après Cuénot. (Masson et Cie édit). Sur cette figure symbolique, chaque lobe principal (ou grappe) équivaut à une « Nappe » au moins aussi importante (morphologiquement et quantitativement) que celle formée par les Mammifères pris tous ensemble. — Au-dessous de la ligne AB les formes sont aquatiques ; au-dessus elles vivent à l'air libre.

Fig. 3. Cuénot's 1951 'Tree of Life' as copied in Teilhard de Chardin 1955: 86

Debating the origin of life on Earth

Kirsch's research is set against the background of a major ideological war now being waged in American (*i.e.* USA) intellectual and religious life: that between

shrink from listing them here.

[4] This reiterates Immanuel Kant's introduction to his theory on the origin of the Solar system (1755): if we can explain phenomena by an appeal to natural laws, which are divine creations anyway and splendidly testify to God's glory, why take recourse to the idea of direct divine intervention?

scientism[5] and creationism (*cf.* Scott 2004; Sweetman 2015; National Academy of Sciences 2008; Ruse 2008). The latter position, vocally and fanatically voiced by many devout Christians, holds that the creation of life out of dead matter in Earth's early history, a few billion years ago, necessarily required the intercession of a personal creator god. Kirsch's outcome seems to amount to the ultimate refutation of creationism. This is why his results are deemed to be so worrying to the world's religious leaders – three of whom (a top-ranking Jewish Rabbi, a Roman Catholic bishop, and a prominent Muslim scholar) he has given a preview of his findings a few weeks before divulging them through digital media on a global scale. Convinced that Kirsch's findings will do devastating damage to existing religious beliefs concerning creation, these religious leaders ask him to postpone the public presentation, and soon afterwards two of them are murdered as a result of what looks like a global conspiracy against Kirsch. When Kirsch finally goes public with his findings and stages a major media events for this purpose, he himself is shot down by a Spanish retired admiral belonging to an obscure Christian sect. This happens halfway Kirsch's initial presentation, before the essence of his findings has even been disclosed. Langdon and Ambra Vidal witness the murder at close quarters, and go on a wild chase (with extensive parallels in earlier Brown books, always along the world's major architectural and sculptural sites – this time Antonio Gaudi's *Sacrada Familia* cathedral in Barcelona) in order to procure the password that can unlock the essential part of Kirsch's intended presentation from his supercomputer and thus divulge his findings even after his death. In the process – which ultimately proves successful – they are greatly assisted by a personalised sub-programme in Kirsch's supercomputer, 'Winston', complete with British name and accent, who keeps feeding them with information, backgrounds, internet searches etc. In the end however it perspires that 'Winston' himself is responsible for the conspiracy against the world-religion leaders, and even for the murderous plot against Kirsch himself – not out of a machine version of malice, but in a simple but eminently successful bid to maximise the media attention and possible impact of his master's presentation, who was already destined to die from pancreatic cancer a few days after the presentation anyway.[6]

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[5] Note my distinction between *science* (see my definition below) and *scientism* (i.e. the essentially fundamentalist and anti-scientific mis-appropriation and reification of scientific ideas and results as lastingly and universally true.

[6] One of the ways in which science fiction has managed to create a veridical illusion of rendering a real future life world is through *intertextuality*: the same concepts, such as *warp speed, hyperspace, co-existing multiple worlds branching off whenever a specific choice is made between alternatives*, crop up in very different narratives written by very different authors, and

'Winston' is at the same time a fascinating illustration of the heights of achievement which Artificial Intelligence research has reached in the hands of Kirsch and the likes of him; a warning of the dangers which such technology (*i.e.* thought unmitigated by human values and ethics) may entail; and a prelude to the answer of the *future-directed* other main question posed by Kirsch (and Gauguin): *where are we going*. On this point the time span becomes greatly compressed: no longer several billions years between the origin of life on Earth, and the present – but only half a century between now, and the total mutation of humanity. By the mid-21st century CE, as Kirsch's supercomputer simulations bring out, the human species as we know it will be radically changed in that it will have been incorporated by, or supplanted by, now still unpredictable forms of Artificial Intelligence, whose materiality will only be partially carbon- and cell-based, and largely amount to further developments of the quantum computer technology now still in its infancy.[7]

When Kirsch's full message to the world is finally broadcast as a result of the heroic exploits of Langdon and Vidal', and his vision of the past and future of humankind has been unfolded, it ends in an optimistic and inspiring eulogy of science. Rather than eclipsing all previous religion, this is claimed to constitute the formulation of a new religion of science – not unlike the futuristic vision of the future of human knowledge as formulated by the French pioneer sociologist August Comte in the 1830s. The opposition between science and religion, did not only dominate much of Early Modern European intellectual developments (with Galilei as an exemplary case), but also, half a millennium earlier, led to the eclipse of science and philosophy in medieval Islam. And after recently precipitating the science wars of the North Atlantic region around the year 2000 CE, this opposition finally turns out – at least within *Origin* – to be false and unnecessary: science can only have its beneficial impact on human society once it becomes religion in its own right. Kirsch, rather than being the

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this produces the converging illusion of a truth rendering of an existing reality. The prominent science-fiction writer and natural-science professor Isaac Asimov has greatly contributed to this common pool, for instance by formulating 'the three laws of robotics' – the principal of which is that a robot cannot turn against its master. In *Origin*, 'Winston' certainly does just that. Langdon, when realising that this is the case, explicitly declares that a programming line 'you shall not kill' should have been added to 'Winston"s software – but the immense implications against the background of converging science-fiction worlds (where, intertextually, all robots are invariably built to comply with the three laws of robotics) seem to escape Brown.

[7] Here Brown is taking up an idea that has been circulating in the world of Artificial Intelligence and its philosophy for at least two decades: the replacement of the human natural brain by computer hard discs, so that minds will be downloaded there and humanity will finally be able to shed its allegedly embarassing and imprisoning 'carbon chauvinism' – as Jos de Mul used to put it, one of my Rotterdam philosophical colleagues in the 1990s-2000s.

destroyer of all religion, thus, quite deliberately, finds his true calling by becoming a new religious prophet in his own right.

While Brown's adventurous novel *Origin* is entertaining, convincing, and moving, right to the very end, the main point I wish to make here is not so much to stress its unexpected literary and visionary quality, and its closeness to contemporary scientific and ideological research and debate. Admittedly, these are considerable achievements, but my personal fascination with this book lies elsewhere: as food for thought about cosmology, about humans and their place in the universe, and about the existence and nature of God.

Enters Teilhard de Chardin

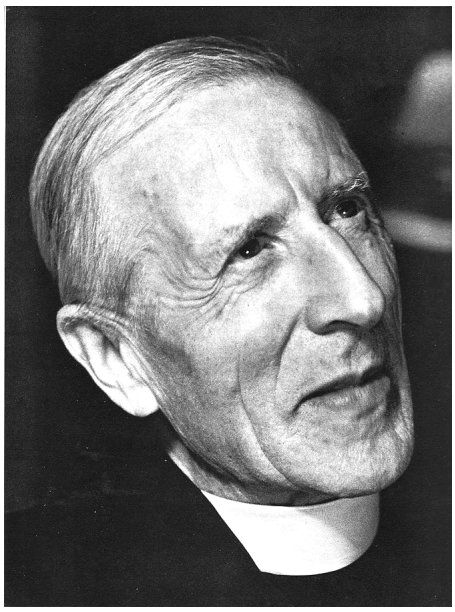

Fig. 4. Pierre Teilhard de Chardin S.J. (1881-1955) in 1947 – the present author's year of birth (source: Archives des Jésuites de France).

I have taken a great personal interest in some of the underlying themes for well over half a century: evolution, the origin of life on Earth, Man's place in Nature and in the Universe, the religious implications of any scientific findings bearing on these topics. As an adolescent I was already conversant with the life's work of Teilhard the Chardin then being published in French after its author's death in 1955. Teilhard is nowhere mentioned or even hinted at in *Origin*, and I am confident that Brown has not been directly influenced by the French thinker, whose struggle for the complementarity

of science and religion rocked the Roman Catholic intelligentsia and leadership in the mid-20th century, and some of whose ideas have gradually been adopted in diffuse, attenuated and implicit form in modern intellectual life in general. If Brown had been more specifically aware of Teilhard's work, he would have keenly realised that Kirsch with his simulation of the origin of life was only providing a partial answer, and that recent Creationism is largely barking up the wrong tree. Also in a thoroughly theistic world-view, as Teilhard's, life can emerge from natural causes without requiring direct divine intervention.

In a nutshell, Teilhard de Chardin's vision of the history of the universe is as follows. The emergence of life and that of thought in the history of the Earth, and of the universe, present obvious difficulties if life and thought are considered – as has been usual throughout the history of Western thought since Antiquity – to be phenomena totally alien to lifeless matter. Teilhard's ingenious solution is the following:[8] Spirit is not an epiphenomenon of relatively late appearance in the evolution of the universe, but a universal and perennial quality. Not just since the origin of life, but throughout the existence of the universe, matter has always had two aspects – a material, apparently lifeless, outside, and a potentially spiritual inside. The evolution proceeds from simple to more complex material forms, and the more complex a material form, the more conspicuously and articulatedly the spiritual inside may manifest itself. With increasing complexity, a threshold value was crossed and life emerged, several billion years ago. With increasing complexity of life forms and especially of the brain, human self-reflexive thought emerged, by today's specialists' consensus a few million years ago (Largely because of the lack of essential data meanwhile provided especially by African material, Teilhard's time scale for humanity was still more compressed and remained well under one million years). Throughout the Palaeolithic, Mesolithic and Neolithic periods the consistent progress persisted towards complexity and the unfolding of spirit; despite Teilhard's biological, evolutionary language and his lack of a professional philosophical frame of reference, there is a genuine parallel with Hegel here.

After the geological phase of the *lithosphere* ('stone spherical layer'), and after life forms had enwrapped the Earth in a *biosphere* ('life spherical layer'), Teilhard sees

[8] I cannot go here into the antecedents of Teilhard's solution. His ideas come close to the concept of 'subtle matter', whose world history of ideas has been painstakingly traced by Poortman 1978. 'Emergence' is a concept frequently resorted to in theories of evolution.

the emergence of humans lead to a new layer, that of the *noosphere* – the 'consciousness spherical layer. This geological imagery brings him, regrettably, to almost totally ignore the dazzling specific forms of social and cultural evolution and their proliferation on the various continents of the world since the Palaeolithic. Remarkably out of touch with significant developments in 20th-c. CE archaeology (which yet shades over into palaeoanthropology, one of Teilhard's specialties), naïvety and ignorance in the face of social and cultural phenomena is a major shortcoming of Teilhard's work. Toulmin could even reproach him for having lived in China for twenty years and yet remaining devoid of the slightest knowledge and appreciation of Chinese language, culture and history. However, Teilhard did work closely together with Chinese colleagues, and published with them (Black *et al.* 1933; Teilhard & Yang 1929).

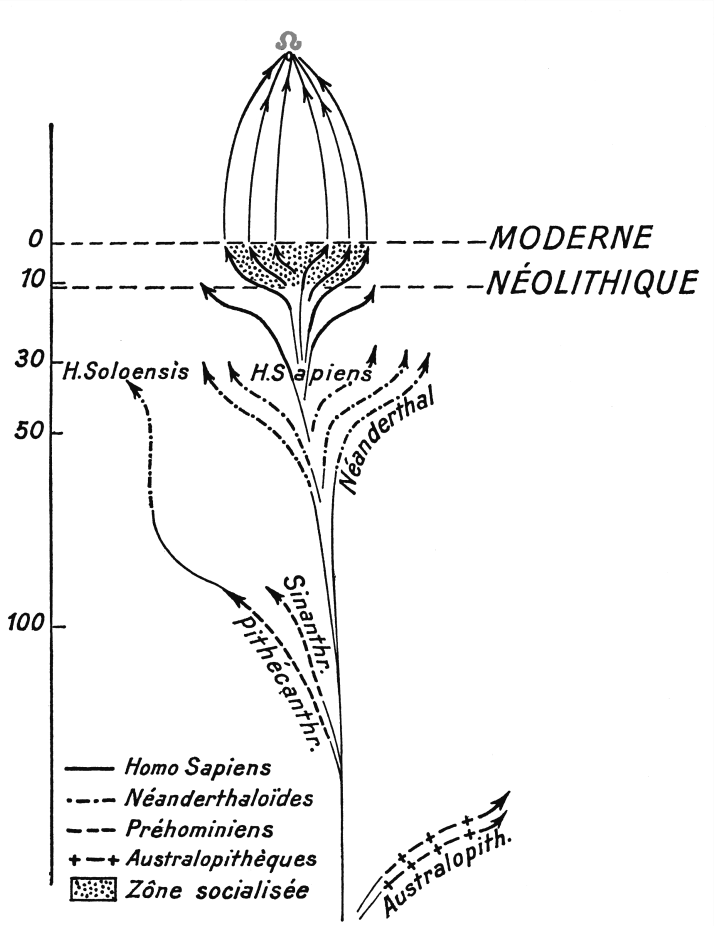

Fig. 4. Figure schématique symbolisant le développement de la Nappe humaine. Les chiffres à gauche comptent les milliers d'années. Ils représentent un minimum, et devraient sans doute être au moins doublés. La zone hypothétique de convergence sur Oméga (en pointillé) n'est évidemment pas exprimée à l'échelle. Par analogie avec les autres Nappes vivantes, sa durée serait de l'ordre des millions d'années.

Fig. 5. The evolution of humanity according to Teilhard de Chardin: towards the Point Omega (Teilhard 1955: 212).

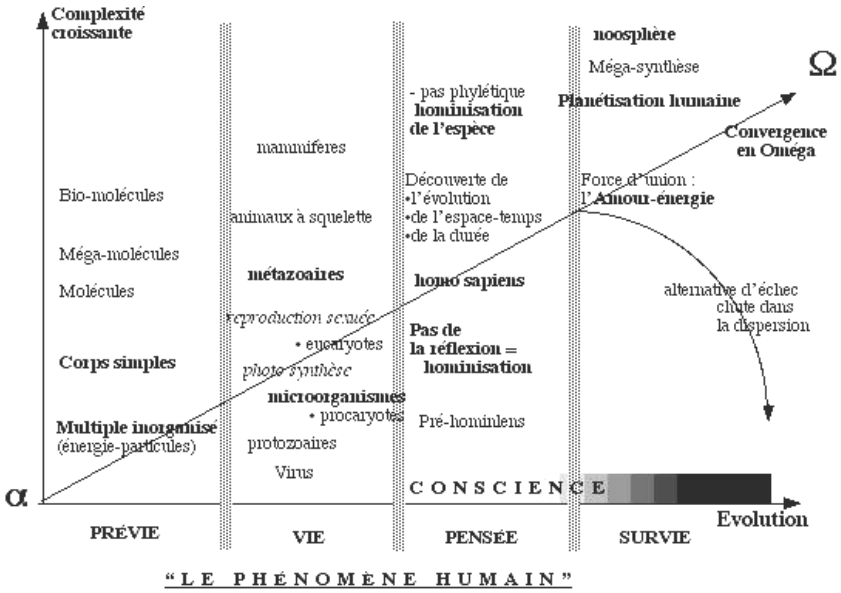

Fig. 6. *Teilhard de Chardin's vision of cosmic coherence through progressive complexity, all the way to the Point Omega (from Teilhard 1956).*

And, like Brown's protagonist Kirsch in the 2010s, Teilhard also believed he could make out the direction of human evolution. He sees the entire universe as involved in one all-encompassing progress towards ultimate complexity and ultimate spirit – a so-called 'Point Omega'[9] to be reached in the distant future (a few million years?) when, through an evolved and unified humanity, the universe, which has become self-reflexive through Man as its most advanced product,[10] will reach its consummate develop-

[9] The *omega* is the final letter of the Greek alphabet, and in Christian theology Christ is known as the Alpha and Omega – the beginning and the end (*cf. Revelation* 1:8). Theologically, Teilhard's Point Omega merges with the established Christian concept of the Second Coming of Christ, and this has been a major point of criticism which Christian orthodoxy has levelled against Teilhard.

[10] Here both Brown / Kirsch and Teilhard fall victim to the same antiquated geocentrism ('earth-centredness') – as if humankind, and the Earth that produced it, constitute the self-evident unique centre and end point of the universe. Science fiction was thriving, but actual space travel was still non-existent when Teilhard wrote his principal works; the first unmanned artificial satellite was launched from Earth by the USSR two years after his death. Since, the discovery of hundreds of planets *outside* our Solar system, and the study of possible conditions for life outside the Earth (e.g. Seckbach 2004), have made us suspicious of such terrestrial chauvinism. However, if science fiction can realistically evoke the vision of extraterrestrial travel and socio-political organisation (Asimov's immensely successful *Foundation* series is a case in point), it would be relatively easy to rewrite Teilhard's vision of the future in this direction. In fact, Teilhard himself foresaw these developments, and addressed them in a 1953 piece whose English title is: 'A sequel to the problem of human origins: The plurality of inhabited worlds' (in Teilhard de Chardin 2002). Incidentally, the idea of a plurality of

ment and realization in total unity with God. Whether at that stage a distinction can still be made between God and the universe, or whether throughout the history of the universe God has been nothing else but the self-realising universe itself, are questions which Teilhard could not explicitly go into, as a Roman Catholic priest precariously balancing – throughout the second half of his life -- on the sharp edges of Christian heresy, inviting specifically the reproach of pantheism.

We see that, whether consciously inspired by Teilhard or not, Kirsch's vision as presented by Dan Brown has much in common with that of the Roman Catholic science visionary – despite the fact that the latter (who lived 1881-1955) missed the entire digital revolution of the second half of the 20th c. CE, and despite the lesser point that for Kirsch the future, total transformation of humankind into a new life form was a matter of decades rather than a million years.

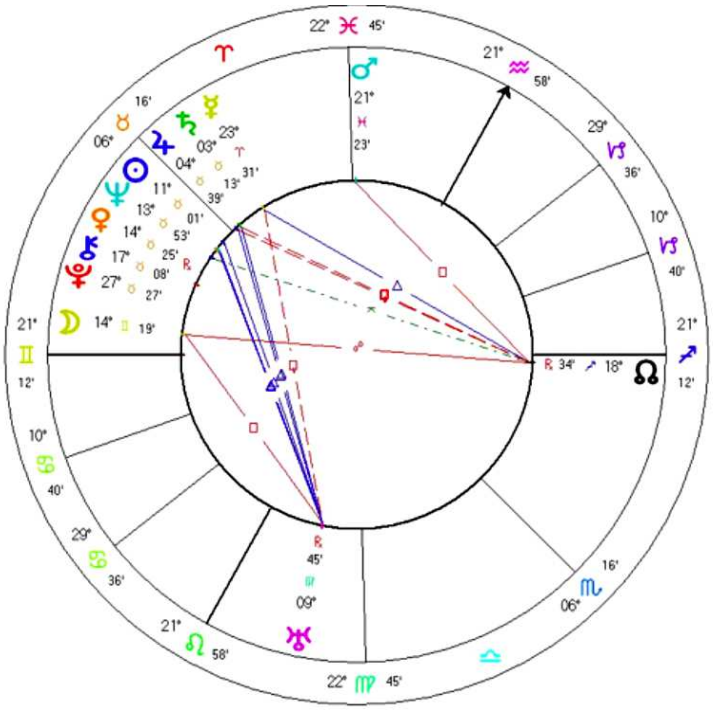

Fig. 7. Teilhard's remarkable birth horoscope, based on the following parameters: born at Orcines, France, 1st May 1881, 7:00 hr (from: http://www.makara.us/04mdr/01writing/03tg/bios/Chardin.html, with thanks). I did not collect independent data on Teilhard's place and time of birth, and did not check the calculations on which the present diagram is based. However, a number of alternative Teilhard horoscopess circulate on the Internet, and most show the same pattern.

inhabited worlds goes back to Antiquity and received several discussions in Early Modern times.

Astrology was, with extispicy, the first proto-science to emerge in the Ancient Near East five millennia ago, and it was taught at European universities right into the Age of Enlightenment. Today, it is generally dismissed as a pseudo-science (Popper 1959): a mere superstition. Yet the *enfant terrible* of modern epistemology, Paul Feyerabend, defiantly chiding the stilted pretensions of his field, shocked his colleagues by displaying his birth horoscope on the cover of two of his major books (1975, 1978). I cannot go into a more detailed discussion here (*cf.* van Binsbergen 2003: 246 *f.*). For whatever it is worth, Fig. 6 presents the birth horoscope of Teilhard de Chardin, with a very strong clustering of planets in the twelfth house, traditionally associated with mysticism and mystery, and suggesting the horoscope owner to be a great prophet...

In passing we should note a remarkably abstruse and abstract attitude on the part of Teilhard. A born scientist and mystic at the same time, Teilhard was convinced of having discovered, single-handedly, the spiritual destiny of the evolving universe and of humankind, and from this insight he nominally, theoretically, derived an inspiring active ethics of *'construire la Terre'* – of constructing the Earth: we should all play our part in bringing about (by work, research, organisation, prayer, enhancing the complexity and spirituality of the noosphere) the realisation of Omega. But apart from a network of scientific colleagues, of religious *confréres*, and of close relatives, this did not bring Teilhard to pinpoint and visualise, let alone to deeply identify with, any concrete sub-sections of humanity in their historic and cultural specificity, nor contribute to their specific self-realisation and historical destiny, if any. One could say that, as essentially a geologist and biologist, he lacked all sociological imagination (Mills 1959) and commitment. Fascinated by the intellectual objectivation and appropriation of his research objects, he remained the proverbial scholar of the 19th c. CE, existentially thrilled by what he was studying, but separated from it by his pith helmet, his insect-proof gauze tent, his priestly habit and dog collar, his excessive body height, his limited linguistic and cultural knowledge and skill. Although a remarkably courageous man, in his braving uninhabitable research sites (the Gobi desert!) for years on end, in the audacity of his thought and his defiance of the Roman Catholic hierarchy, and as a decorated hero of World War I (not an active combatant but a stretcher-bearer), Teilhard's radical cosmological thought (which mainly took shape during the interbellum) did not protect him from the conservative, crypto-fascist socio-political tendencies peculiar to his time and age, his class of provincial petty nobility in France, and the Jesuit religious order he belonged to. Early in life, as still a palaeoanthropological amateur, he allowed himself to be implicated in the Piltdown fraud – out of sheer naïvety or (as Toulmin suggests) perhaps less naïvely so. Since Roman Catholicism has been one of the few niches within which philosophy has thrived in post-independent Africa (van Binsbergen 2005), there is now a remarkable revival of Teilhardian thought among African philosophers – but although they believe they can derive entire social, political and ethical philosophies from the

thought of this palaeontologist / mystic, few dare confront the implicit elitism and perhaps racism of his writings, and what this means from Africa. For Teilhard, humanity essentially derives from Asia, and in his mind a *'bifurcation précoce'* – 'an early split' (Teilhard de Chardin 1953) separated the apparently viable Asian branch of early hominids from the apparently doomed African branch.[11] This reflected the North Atlantic contempt of Africans during the Age of Colonialism. The current scientific consensus is just the other way around.

The origin of life on Earth, and divine intervention

Brown's book revolves primarily on the question of the origin of life on Earth, and it is on this point that we must dwell a bit longer. When life first manifested itself on Earth as elusively indicated in the geological record (Dodd *et al*. 2017; Anonymous 2018 'Abiogenesis'), more than four billion years ago, the oceans were still very young, and the Earth not much older. With an estimated age of 14 billion years for the universe as a whole since the reconstructed 'Big Bang', the period of the origin of life by no stretch of the imagination can be equated with the origin of the universe. The order and complexity, semi-autonomous dynamic equilibrium vis-à-vis the environment, and self-reproduction, which are all characteristics of life, may require special conditions to cross the threshold so as to emerge from pre-organic matter, but they are not in themselves the essence of creation if by the latter we mean the origin of the universe. Creationism as the claim of divine intercession requisite for the origin of life on Earth is little more than an underestimate of the built-in creative capabilities of matter and the natural laws that govern it. On closer scrutiny (as in the experimental work of Miller and Urey, its theoretical preparation by Oparin, Haldane, Beernal etc., or the bio-philosophy of Teilhard de Chardin – all from the middle of the 20th century CE) the step from lifeless matter to life remains a considerable one, from chaos to order, counter-intuitive in the light of the Second Law of Thermodynamics (which stipulates

[11] The idea that Africa has constituted a dead end of human biological, cultural and linguistic evolution was inveterate in both the natural sciences and the socio-cultural sciences up to the middle of the 20th c. CE, and may still be encountered today in fields as diverse as linguistics, comparative mythology, and genetics – despite the fact that the Out-of-Africa hypothesis which emerged as a result of the decoding of the human genome in the 1980s (Cann *et al*. 1987), has now been widely accepted by specialists. Much of my research work during the last two decades has been orientated towards affirming the underlying fundamental unity of humankind, and stressing (from a transcontinental perspective) the historical continuity of Africa with the other continents. For a recent discussion of my work on these points (mainly dealing with van Binsbergen 2012), *cf*. Osha 2017; also *cf*. van Binsbergen 2010, 2011, 2015, and in press.

an continuous progress from order to entropic chaos – quite the contrary), *yet most probably well within the range of capabilities of natural laws.*

The point is not so much whether life emerged directly on Earth itself or (as the panspermia theory proposes) only landed on Earth after an extraterrestrial origin. The panspermia theory has a venerable ancestry (it originated with the Presocratic philosopher Anaxagoras, and a few eminent modern champions such as the astronomers Arrhenius (1908), Hoyle and Wickramasinghe (1981, *cf.* Hoyle 1983). The attestation of fairly complex molecules in interstellar space, and the failure so far to produce life from scratch on Earth, are strong points in favour of an extraterrestrial origin, but in fact the precise location of life's emergence is only a secondary issue. Whether in Earth's 'primordial soup' or under extraterrestrial conditions in space, the same natural laws would be deemed to be at work – or, failing which, the same divine intervention would be deemed necessary.

(Another, usually avoided, question arises at this point. Habitually, natural laws are considered to be constant through all times, immune to the *historicity* that, since Vico and Hegel, North Atlantic thought has recognised as the central feature of every aspect of the universe, and especially of life, humanity, society and culture – after the idea of cosmic history as unilinear progress towards the goal of salvation had been pioneered by selected Old Testament texts and reformulated in early Christian thought. In the course of the 20th c. CE, extensive theorising of the idea of the Big Bang made specialists realise that time, matter and the laws that govern it, could not have been universal and immutable givens but instead emerged from a previous state of non-existence, and evolved rapidly and dramatically in the first split seconds, years or millennia after the universe came into being. It is not unthinkable that also in later periods, say during the last ten billion years, minute changes occurred in the natural laws as we know them today – that universal constants acquired slightly different values, that quantum mathematics followed slightly different rules, etc. Earlier formulations that proved to be satisfactory for centuries (e.g. Newton's laws of mechanics) were not so much proved wrong by later theoretical developments (e.g. Einstein's Special and General Theories of relativity), but on closer scrutiny turned out to be special boundary conditions of more comprehensive and complex relationships which only recent measurement apparatus could gauge and provisionally ascertain in detail. If these very relationships underwent slight changes in the course of billions of years, we would be none the wiser unless new theories and method would enable us to measure such changes – or to interpr*et al*ready known data in the light of such changes. Perhaps at one point in time conditions prevailed which,

although commensurate with the natural laws then in existence, caused life to emerge, whereas such conditions may no longer obtain today. However, unless we equate the idea of God simply with that of Nature (for which there are respectable precedents in the philosophical works of Spinoza, and among the Neo-Platonist Plotinus), such an argument is very far removed from the idea of the origin of life as a separate divine creation in defiance of natural laws – as the major variant of Creationism has it.)

Once more, in insisting on the need for divine intervention in the very emergence of life, Creationism, while seemingly taking its lead from a Biblical inspiration, in fact underrates what many have chosen to consider 'God's creation', and does not do justice to the otherwise perplexing, apparently limitless powers of creation and innovation of Nature. If we want credit to go to a god (whose personal characteristics, including the attribution of a gender and an anatomy, a voice, differential sensitivity to light and darkness, even capability of being enticed and manipulated by human promises and offerings, clearly betray that he or she was merely imagined after the self-reflexive image of humans themselves!) would it not be the greatest tribute to god's divine qualities to consider her or him capable of investing her or his creation with such immense creative powers (natural laws) as to lead to the emergence of life and of self-reflexive thought? Creationism is a slight on the creative greatness of the universe.

Fig. 8. Images of evolution: Scutosaurus and Sauroctonus, Late Permian geological period, c. 250 million years BP, as depicted (under expert palaeontological tutelage) by Zdenek Burian, from Beneš & Burian 1980.

One of the greatest astronomers of Early Modern times was the Frenchman Pierre-Simon Laplace (1749-1827) about whom the following apocryphal anecdote is in wide circulation. After explaining his view of the solar system to Emperor Napoleon I, Laplace, answering the latter's question as to the place of God in this system, is reported to have said *'Je n'avais pas besoin de cette hypothèse-là* – I did not need that hypothesis'. In all probability (Faye 1884: 109 *f.*; Anonymous, 2018, 'Laplace') Laplace did not mean to address a theological question about God's existence, but instead a fine point of celestial mechanics: whatever the achievements of Newton (1642-1726/27), the latter had been unable to understand the solar system as a totally stable system, and hit on what he thought to be perturbations which, in his opinion. only God's occasional intervention could prevent from causing the collapse of the system; a century later, Laplace's greatly evolved physical insight in the mechanism of the solar system and access to more advanced mathematics (much being of his own invention, incidentally) enabled him to give, without recourse to God, an exhaustive mathematico-physical description of the Solar system as known then (including the planets known in Antiquity, and recently discovered Uranus, but not yet Neptune which, although spotted by Galilei, was only recognised as a planet decades after Laplace's death).

This anecdote, however apocryphal, at least has the merit to alert us to the various apparently irreconcilable dimensions (and pitfalls of perversion and corruption) of the questions so captivatingly raised in *Origin*. Much depends here on what we decide to mean by science. In my opinion, as an empirical social scientist and a philosopher, *science is the pursuit, by explicit and intersubjective empirical methods, of essentially ephemeral answers (meant to be discarded as quickly as possible in the light of more adequate, more recent, truer answers!) to theoretically grounded questions about reality as accessible to us humans*.[12] The question as to the origin of

[12] I am afraid my views here differ, for epistemological reasons, from various vocal specialists writing today on evolution. One of them is John H. Relethford, who in his book *50 Great Myths of Human Evolution: Understanding Misconceptions about Our Origins*, lists, as the very first and presumably most important myth about evolution: 'Evolution is a theory, not a fact'. So in Relethford's opinion, the correct statement would be: 'Evolution is not a theory, but a fact'. Many modern scientists, while experts on method and measurement, take their scientific *habitus* for granted and are not interested in epistemology. Thus they tend to reify the findings of their expert field, and to misjudge the epistemological status of their pronouncements. A more sophisticated approach we find with the famous cosmologist Stephen Hawking:

> 'In order to talk about the nature of the universe and to discuss questions such as whether it has a beginning or an end, you have to be clear about what a scientific theory is. I shall take the simpleminded view that a theory is just a model of the universe, or a restricted part of it, and a set of rules that relate quantities in the model to observations that we make. It exists only in our minds and does not have any other reality (whatever that might mean). A theory

life on Earth could be a scientific one, -- although in the hands of Creationists it ceases to be so and merely becomes a point of theological debate. The question as to God's existence can never be a scientific one – it cannot be answered, neither negatively nor positively, with scientific data and methods. Scientists who engage in the debate with Creationism on the basis of the so-called 'facts of science' seem to be mistaken about the nature and purpose of their results, take their scientific insights to a level of essentialised debate where they can no longer be appreciated as provisional and ephemeral, and in fact allow themselves to be pushed into an impossible, theological, rather than empirical-scientific position. Most of the so-called debate between belief and science (or rather, scientism *i.e.* the mistaken conception of science as universal, immutable and infallible truth), such as that around Creationism, is governed by the 'fallacy of misplaced concreteness' (Whitehead 1997 / 1925) and amounts to an impossible exchange between the proverbial deaf-mutes.

Pressed into service in an alien and perverse role as theologians, the scientists and science journalists featuring in this debate display, just like their religious interlocutors, all the symptoms of today's most dangerous disease of the mind: *fundamentalism*. The eminently contemporary pathos which fuels Brown's novel and renders today's intellectual and media climate so convincingly, is not the search for scientific truth, but, on the contrary, *the utterly mistaken hope that ultimate, contextless, timeless truth may still be had in today's globalised, mediatised world*. It is the fundamentalist's dream in a post-modern society

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> is a good theory if it satisfies two requirements. It must accurately describe a large class of observations on the basis of a model that contains only a few arbitrary elements, and it must make definite predictions about the results of future observations. For example, Aristotle believed Empedocles's theory that everything was made out of four elements, earth, air, fire, and water. This was simple enough, but did not make any definite predictions. On the other hand, Newton's theory of gravity was based on an even simpler model, in which bodies attracted each other with a force that was proportional to a quantity called their mass and inversely proportional to the square of the distance between them. Yet it predicts the motions of the sun, the moon, and the planets to a high degree of accuracy.' (Hawking 1988: 11)

In terms of this approach, evolution is certainly a theory: it makes sense of a large class of observations, and allows us to make predictions, e.g. that we will not find human remains in geological layers older than 10 million years. The naïve implication that a theory (not unlike that other popular shibboleth, 'myth') is just conjecture and necessarily far removed from the truth, belongs to popular culture, not to the world of science and academia. A fact is a primary datum in reality, exhaustively established by empirical sources accessible through our senses. In this sense evolution, while certainly a plausible theory and possibly a true theory, cannot be a fact – we simply have no direct sense information on processes involving myriad specimens of animal or vegetal species, and taking place of many thousands, usually even millions of years. In the same way, the structure of the water molecule or of the deoxyribonucleic acid molecule, while plausibly established by biochemical means, is not a fact but subject of a highly plausible theory.

where God has been declared dead nearly one and a half century ago (by Nietzsche 1882, 1883-1891) – one that renders us homeless, desperate, and (as the *Origin* illustrates brilliantly, while avoiding all reference to today's Islam) murderous. Ultimately, Brown has written his own version of Arthur Donan Doyle's novel *The Lost World*: the motivating force of modern fundamentalism is dogged defiance in the face of the realisation that a world in which truth was redeeming, has been lost for us forever.

Thinking about god and the universe

'It were better to have no opinion of God at all than such an opinion as is unworthy of him.' Francis Bacon, 'Of superstition', 1612 / 1625; Bacon 1852: 49.

I am not in the least saying that it is nonsense to reflect on the existence or non-existence of God and on the meaning or lack of meaning of the universe. I have considered these questions all my life, during my devout Roman Catholic childhood, my loss of faith during adolescence, my passion for the natural sciences and for evolution, as a poet and novelist, during my periods as an existentialist and Marxist, in my becoming an anthropologist of African religion, an African diviner-healer-priest, and an intercultural philosopher. But as a result of this preoccupation for much longer than half a century, I have now come to the insight that we need a totally different logic to pose, debate, and to answer, such questions.

Table 1 List of the principal propositions of Darwin's theory, extracted from the *Origin of Species* (Darwin 1859, 1872)

1.	Supernatural acts of the Creator are incompatible with empirical facts of nature
2.	All life evolved from one or few simple kinds of organisms
3.	Species evolve from pre-existing varieties by means of natural selection
4.	The birth of a species is gradual and of long duration
5.	Higher taxa (genera, families etc.) evolve by the same mechanisms as those responsible for the origin of species
6.	The greater the similarities among taxa, the more closely they are related evolutionarily and the shorter their divergence time from a last common ancestor
7.	Extinction is primarily the result of interspecific competition
8.	The geological record is incomplete: the absence of transitional forms between species and higher taxa is due to gaps in our current knowledge

Fig. 8. The theological dimension of Darwin's theory of evolution was conspicuous from the very beginning. Not only were theologians his first and most critical interlocutors; also Darwin himself made theological pronouncements a pivotal element of his evolutionary statements, like in the first line of the above table (derived from Kutschera & Niklas 2004: 256). Further textual analysis is needed before it can be ascertained precisely why 'supernatural acts of the Creator are incompatible with empirical facts of nature'; *cf.* Darwin 1859: 167). It would probably be more prudent, and more convincing, to say: 'attempted explanations in terms of supernatural acts of the Creator exist on a different plane from explanations grounded in empirical facts of nature, and therefore the two kinds cannot be considered to be mutually exclusive'.

The question whether God exists, is meaningless; so is the assertion that she or he does, or does not, exist. Such questions belong to the realm of binary oppositions in the attribution of truth and falsehood – a realm which scholarship has carved out ever since the creation of Aristotelian binary logic, but which is utterly insufficient to address the most fundamental existential questions humankind is facing. God exists and does not exist at the same time. God is dead, and (because of our own ritual actions, prayers, myths, offerings) is alive and kicking at the same time. God coincides and does not coincide with the material universe. Therefore

- life was *both* created out of lifeless matter by special divine intervention,
- *and* emerged from lifeless matter by the sheer play of natural laws governing matter, more or less, since the beginning of time.

By the same token, the heated Huygens-Newton debate over the true nature of light, either corpuscular or wave-like, ended in a draw: light is both, but now the corpuscular, now the wave element is more conspicuous to the human observer. This appears to be worlds away from the most basic quality of man-made symbols: the essence of a symbol is that it refers to an aspect of reality – but at the same time it may detach itself from that referent and take on independent life of its own. The first achievement in the invention of the transistor was a compact electronic switch which, without qualitative changes, could 'flip-flop' *i.e.* serially assume two essentially different and incompatible positions. Human life, thought, myth, culture, the interaction of cultures, human's interspecies interaction with other life forms, life's interaction with other material forms, the universe at large, may be seen as one continuous, immense complex circuit of such switches. The binary opposition is a great and relatively recent achievement of human thought and language, and has become the principal tool of scientific thought, but at the same time it is utterly artificial and deceptive: as can be demonstrated from the oldest reconstructed human language forms, those of the so-called *Borean language of the Upper Palaeolithic; and as has recently been stressed by poststructuralist philosophers especially Derrida, every given always carries inside itself, by implication, the very opposite of its contents (on these issues, *cf.* van Binsbergen 2012, 2015; van Binsbergen & Woudhuizen 2011 – the operative concept is 'range semantics' as discussed there). Considering both the contradictions and the interconnections of our human experience, the only way to conceive of a coherent and credible universe is by making allowance for all possible alternatives at the same time, contradictory and mutually exclusive as these alternatives may appear to be. So both Kirsch and his religious opponents are right, but neither can afford (for fear of annihilating one's proper ground to stand on) to explain the underlying meta-logical mechanism, tell us why this joint applicability of apparently

irreconcilable opposites should be the case; and neither side can firmly establish his truth as a result of scientific research procedures.

I have recently bundled much of my life's work in religious anthropology (van Binsbergen 2017), but that has been only the first leg in a more ambitious trajectory. One of my principal current writing projects is a book *The Reality of Religion*, in which I seek to set out what I have learned from a life in which I have continuously straddled religious situations in Europe and Africa. If God can both exist and not exist at the same time, and if this seems to sum up the essence of religion, we may perhaps go one step beyond this already unusual and audacious position. In *The Reality of Religion* I dwell on my extensive experiences as a Southern African *sangoma* (diviner-priest) since 1990 (many of these experiences have already been extensively described in van Binsbergen 1991, 2003). Although I bring to these experiences my academic expertise as an internationally acclaimed anthropologist of religion, and although the distancing debunking / deconstruction of religious beliefs was an implicit principle in religious anthropology during most of the hundred years of its existence, I was in for a very big surprise. Knowing full well that the powers of clairvoyance, divination and healing (not to speak of even more contentious claims such as levitation, bilocality, asity and other such extreme mystic achievements) that are supposed to be the ancestors' gift to the *sangoma* as their chosen representative on earth, constitute a mere fantasy performatively enacted so as to attract clients and to address their existential problems with imaginative but essentially invalid answers, it has yet been my frequently repeated experience, almost invariably, that when acting *ex officio* as the ordained and initiated *sangoma* that I have been since 1991 and donning my ceremonial robes, these powers which could not exist, have turned out to be at my disposal – I could heal, and I could make veridical pronouncements about clients and the details of their lives about which I had no previous ordinary sensory-based knowledge. The conclusion I draw from this confusing lot is that the supernatural beings that do not exist unless as figments of our imagination, through our very ritual action (after all, the entire creative power of the universe self-reflexively flows through us as humans!) are sometimes, somehow, brought to independent life and are occasionally endowed with the ability to have their own demonstrable, material impact on our human reality – not by virtue of an individual or collective placebo or otherwise deceptive illusion, but simply on the ground, on the level of ordinary sense reality. *The reality of religion is that through our rituals and prayers we create gods that subsequently have an impact on reality which we no longer control.* Again: God exists, and does not exist, at the same time. This, I suspect, is a truth even more shattering to organised religion, and to organised science, than anything Dan Brown has imagined in *Origin*. It suggests even that, *because* Brown imagined it, what he describes in *Origin* is actually (does actually create

retrospectively) one of the ways in which life has originated, and is actually (does actually create prospectively) one of the ways in which humankind is currently developing into some amalgamated digital hybrid species. I fully realise that with such pronouncements, my writing on *Origin* as science fiction becomes in itself science fiction raised to the power two. The well-trained and experienced scientist in me revolts against such *Dreams of a spirit-seer* (Kant 1766 / 1900), but the sum total of my life experiences leaves me little choice.

For the contents of world religious such an insight, if taken somewhat seriously, is truly devastating. Today's religiously-orientated conflicts, such as those between Islam and the West, and between Creationism and science, are often interpreted as if people are fighting and killing over *doctrine,* over the contents of religious and cosmological statements and claims. This is also what appears to motivate Brown's many murderers and conspirators throughout his books. There are however reasons to seriously doubt such an interpretation. Most people who are engaged in such fights, have only a second-hand and imprecise knowledge of the doctrinal issues at stake. They are joining a band wagon much like others prefer particular forms of music, or brands of state-of-the-art clothing, home decoration or whisky: in a half-hearted quest for artificial belonging, now that post-modern globalisation and digitalisation have eroded such genuine (or nostalgic?) belonging as might once have come with the sense of belonging to time-honoured social groups and identities. Their violence is not so much a means to an end (the proclaimed end being to let their supposed doctrine become triumphant), but (much as theorised in the work of René Girard and his followers; *cf.* Girard 1972) their violence is simply the most effective means of powerful group formation. Ideas and doctrines are primarily the dummy fillings of processes of group formation and group conflict, but any ideas or doctrines could have served that purpose, and in fact are often demonstrably interchangeable.

These are some of the thoughts that come to mind when reading Dan Brown's masterpiece. The question as to life's origin on Earth, or even as to God's existence, may not be the central preoccupation of most humans now living, yet *Origin* manages to bring out fundamental dimensions of our time and age, and of the human condition at large, in way that commands my greatest admiration.

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