



**Juli Peretó**

## Intelligent design and the assault on science

Creationism is enjoying a new lease of life. Sanctioned by the slogan "teach the controversy", the theory of intelligent design is gaining a foothold in educational establishments in the US and worldwide. Biochemist Juli Peretó delivers a rebuke to the fallacies and dishonesties of the theory of intelligent design and examines the ambiguous attitude of the Catholic Church towards creationism.

Without evolutionary theory, contemporary biology would collapse entirely. Without the evolutionary framework, which is a coherent and fascinating vision of nature, in which cruelty and crudeness are transformed into a marvel of countless forms and behaviours, a glorious view of life connected with the cosmos, Earth, and the rest of the natural phenomena, would lose all its sense and elegance. The only new theory that present-day science could admit would be one that encompasses and perfects the Darwinian view of the natural world, as a step forward that would illuminate the many details of the origins of life that remain to be discovered or that resist our ability to understand the world. There is no way that substituting scientific scrutiny with obscurantism because of lack of data and observations, abandoning confidence in reason and recognising the failure of intelligence, can ever advance knowledge. Why should we accept that there is an impenetrable barrier to reason in the most intimate interstices of cellular structures and the most basic biochemical processes?

Creationism, and its latest variant, the so-called "theory of intelligent design", is inadmissible as an alternative explanation to the theory of evolution because it involves the surrender of reason. If we dare to think in evolutionary terms, we advance our understanding of nature. We have the tools for understanding the marvels of biodiversity or for bringing reason to bear on the threats of pathogens. Moreover, if we allow that an inscrutable wall shuts away natural phenomena from scientific explanation, we abandon forever the realm of reason and fall into the embrace of blind faith and fanaticism. The mind is annihilated by the tyranny of intimate truths over universal truths. Anything positive achieved by intellectual history would be lost.

### Teach the controversy

US President George W. Bush says that schoolchildren have the right to learn about all opinions, all the versions that purport to explain the world. Hence, it is legitimate to teach creationism in biology classes. One does not have to be very intelligent to divine the manipulation and fallacy that lie behind this assertion. First, we have the erroneous use of words such as "theory", which can have other meanings in other linguistic registers. It is evident that we do not have a *theory* of universal gravitation along the same lines and of the same

import as a *theory* we might have about who assassinated President Kennedy. Everybody can have a different conspiratorial version. Talking about universal truths and private truths as if they were equal is cheating.

Again, the public is being given the false idea that evolutionary theory is monolithic and dogmatic. There is nothing further from the truth. Evolutionary theory is richly nuanced, overflowing with controversies, with abundant explanatory power; but it also has its encouraging lacunae, problems that stimulate the intellects of thousands of people all around the world. There is no doubt whatsoever about the educational value of familiarising students with the controversies, reflecting on the arguments, taking up positions in debates, of becoming aware of the intrinsic provisionality and vulnerability of universal scientific truths, or of reaching conclusions and readily accepting that a particular standpoint is mistaken if this is demonstrated by sufficient proof.

In brief, this is not about two opposing sides, despite the efforts of the Discovery Institute, bastion of "intelligent design", to present it as a scientific alternative to neo-Darwinism.<sup>1</sup> What does exist is a political strategy, represented by the slogan "teach the controversy", that is causing a furore in the US. On closer consideration, there is no controversy to be taught because the two sides of the dispute are not on the same plane. There is not, and, because of epistemological impossibility, can never be, any debate between evolutionism and creationism. It is entirely false that they can be put into opposition on equal terms because they represent intellectual positions that move on parallel planes with no chance of intersection. So long as research is carried out rigorously and honestly, an experimental science such as biology is based on the universality of its truths, which are contrastable and verifiable by anyone anywhere, independently of his or her religious or ideological affiliations. Creationist truths, however, are not universal. They are heavily dependent on culture and education. Not all religions are creationist in the same way, or inspired by the same principles, or governed by the same dogmatic obligations. Not all religions call for belief in a single, personal divinity. They do not all offer the same account of how it all began and neither do they have the same concept of the origins of everything that exists. There are even faiths that have no creation myths, or that have a cyclical notion of time with no beginning or end. Belief in miracles and supernatural powers is by definition excluded from the realm of science. Moreover, the provisionality and vulnerability that are part and parcel of scientific knowledge are not inherent to theology.

Disagreement over teaching the "controversy" is a hot issue in the US today and has generated a considerable number of public discussions and institutional and academic declarations.<sup>2</sup> The outcome of the Dover Area School Board case is highly relevant, and the verdict of the Federal Judge, John E. Jones III, provides an impeccable and exemplary summary of the issues.<sup>3</sup> There are 139 pages of testimonies and reasoning that radically unmask the "theory of intelligent design", refuting its supposed scientific character and revealing the real intentions of its proponents: to sneak religious teaching into public schools, something that violates the constitutional principle of separation of church and state. For Judge Jones, it was fully demonstrated that intelligent design is a fallacy — nothing other than the same old creationism dressed up as scientific theory. To teach it in public schools is therefore unconstitutional.

At the end of 2004, the Dover School board decided that its biology teachers should read a disclaimer to the students before teaching the subject of

evolution. The note<sup>4</sup> stated that evolution is "only" a theory (while playing with a concept of "theory", which it actually abhors). Students were warned that evolutionary theory is full of gaps and difficulties and that it has not been demonstrated. So that they could learn about "other scientific theories", and following the famous and useful slogan, "teach the controversy", students would be provided with the book *Of Pandas and People* (generously stocked in the school library). This is a classic of creationist gobbledygook, and it turned out to be a determining factor in the trial, as we shall see below. When the teaching staff refused to read the note, the school's administrative staff was obliged to do so.

In one sub-heading of his findings, the judge concluded ironically that even creationism evolves: "An objective observer would know that ID and teaching about 'gaps' and 'problems' in evolutionary theory are religious strategies that evolved from earlier forms of creationism". The decisive evidence was provided by the historian of science Barbara Forrest, who demonstrated that "creationism" had been systematically replaced by "intelligent design" some 150 times in versions of the aforementioned book following the Decision of the Constitutional Tribunal in 1987 that declared it illegal to teach creationism in public schools.

Jones hopes to have unmasked the fraud of intelligent design and thus to avoid further loss of time and money, although the citizens of Dover were a step ahead: in the elections of November 2005, not one of the school board members was returned. However, defenders of neo-creationism continue to hatch new tactics. Not only do they subscribe to the ideas upheld by some scientists, for example the anthropic principle (the idea that basic constants must be fine-tuned in order for life to appear in the universe), but, as demonstrated some months ago in a California high school, they also try to infiltrate philosophy classes. Their influence has extended to government circles (for example in Australia, where the minister of education would love to introduce teaching of intelligent design), which make ridiculous decisions in scientific policy (as in the recent case of the Canadian researcher whose research project on the penetration of creationist ideas into his country was turned down because he had not sufficiently demonstrated that the alternative, evolution, was the correct version). The recent tour of the United Kingdom by a prominent advocate of intelligent design and the fact that some British private schools are already teaching it<sup>5</sup> has prompted a declaration by the Royal Society in defence of evolution.<sup>6</sup> It is undeniable that this is a remarkable and unwonted occurrence in the country where Darwin was born, though it gives an idea of the extent of the problem and raises our guard against complacency.

### **Irreducible complexity**

Biochemist Michael J. Behe's book *Darwin's Black Box: the Biochemical Challenge to Evolution* (1996)<sup>7</sup> has been, without exaggerating, one of the biggest influences on recent debates on creationism. It is a veritable founding treatise of neo-creationism that has created a huge uproar among proponents and critics.<sup>8</sup> Better said, it has provided an injection of vitality into the moribund creationism movement of the early 1990s. Behe is Associate Professor of Biochemistry at Lehigh University (Bethlehem, Pennsylvania), although his department has officially distanced itself from his ideas.<sup>9</sup>

The central argument of Behe's book is that Darwin failed on the molecular scale. Behe occupies himself with the interior of the cells where, according to

him, there is a myriad of structures of extraordinary complexity, based on the interaction of smaller pieces that fit together perfectly and make no sense in isolation. Neither would a system that lacked any of its pieces make any functional sense. This is what Behe calls "irreducible complexity":<sup>10</sup> the validation of highly improbable molecular structures whose functions we cannot conceive of in incomplete systems. Behe's favourite examples are the bacterial flagellum (the means of bacterial locomotion), the process of blood coagulation and the immune system. However, detailed examination of these and other molecular systems and comparative analysis with similar systems in organisms from throughout the phylogenetic scale clearly demonstrate that the irreducible complexity of the bacterial flagellum, for example, is only apparent. There are examples of bacteria that contain only parts of this mechanism. The problem with the theory is that parts of the system can function differently from the whole, that they may or may not represent ancestral states, and our capacity for observation and imagination is limited. Natural systems do not follow logical schemes. It is we who must deduce, on the basis of molecular documentation that is as fragmentary as it is cryptic, by what paths, and by what processes such complex organisations have been structured over evolutionary history.<sup>11</sup>

Paradoxically, Behe raises a problem that was resolved a century and a half ago by Darwin himself, when he analysed the difficulties of evolutionary theory in his work on the origin of the species.<sup>12</sup> And very well resolved it was. One evident case for Darwin was the existence of organs of extreme complexity and perfection, such as animal eyes, and how to explain their origins via natural selection. Given the impossibility of analysing each and every stage in the evolutionary formation of an eye (because these stages are extinct), imagination and comparative method comes to our aid.

There is no doubt that some closely related species might have retained simpler structures, representing previous stages, that are useful for them in their habitat and lifestyle; we need to be capable of recognising these. Because a half-completed eye could be better and more useful than none at all, we find species that only have light-detecting systems, others that cannot generate well-defined images, and others with sight organs that manifest states of sheer perfection, such as the eye of vertebrates, which is able to focus and correct optical aberrations. On the molecular scale — and this is where Behe resorts to trickery — we can also employ the comparative method and seek simpler molecular structures, for example an eye that is unable to form sharp images but that can function usefully for the survival of the organism that possesses it. This form of functionality, as the crude and unpredictable process of evolution prescribes, will not evolve in exactly the same way in all organisms.<sup>13</sup>

Behe also introduces an epistemological sleight of hand into his argument. He seeks an example of a complex molecular structure. He wonders if scientists have inquired into each and every intermediate step in its evolutionary history. If the answer is negative, this supposedly demonstrates that it has been designed by a supernatural power. In other words, his only criterion for recognising an irreducibly complex structure is that we cannot postulate any evolutionary explanation. If next week, or next month, or next year, or in another century, somebody finds it, what then? In cases where we are able to propose logical evolutionary schemes, Behe accepts evolution. For the rest, he confines himself to partial quotes taken out of context. In other words, his conclusions are frequently based on the elimination of context and the partial information he supplies in his book. The theory of intelligent design is shameless acceptance of ignorance and shameful abdication of the possibility

of abandoning it.

We also find an interesting parallel between Behe's intellectual position and that adopted a century ago by Catholic neo-vitalists with regard to the enigmas of the origins of life. The impossibility of spontaneous generation was elegantly established with experimental persuasiveness by Louis Pasteur and John Tyndall in the latter half of the nineteenth century. From the strictly scientific point of view, coherent acceptance of Darwin's theory required imagining that the original primordial beings came about through natural phenomena. Only those who wished to defend continuity between inanimate and living matter, like the German naturalist Ernst Haeckel, were able to suggest an origin of life without miracles. Again, Pasteur's experiments were at the basis of arguments by different Catholic scientists who, although they accepted that species were transformed by natural mechanisms, saw an insurmountable barrier between chemistry and the most primitive forms of life. For them, only a miracle could explain the origins of life. The German evolutionary entomologist and Jesuit, Erich Wasmann declared that, "we see acceptance of a personal Creator as a true 'scientific postulate'".<sup>14</sup> The Catholic biochemist Behe asserts that there is no *a priori* reason for imagining that these basic developments (the origin of the universe and the development of life) should be explained in the same fashion as other physical occurrences.<sup>15</sup> In brief, the champions of intelligent design are asking science to incorporate other non-physical explanations of the world.

### **The gospel of diminished intelligence**

There is, moreover, an asymmetry in intelligent design's explicative requirement vis-à-vis evolutionary theory that has no precedent in other scientific disciplines. Nobody wants to know, centimetre by centimetre, how the Alps were formed over the last 200 million years. Nobody questions the theory of plaque tectonics because there is no — there can be no — such detailed narrative. Nevertheless, Behe denies the validity of evolutionary theory because we do not have a step-by-step explanation of the origins of complex structures contained within the cell. Implicitly admitting the defeat of reason, he wants to force us to take a non-scientific path: we cannot explain it because everything is the result of the whim of an inscrutable mind. As Douglas Futuyma has remarked,<sup>16</sup> instead of advancing and honing scientific knowledge, Behe advises us to abandon all hope of understanding.

The theory of intelligent design cannot be classified as scientific by any of the usual criteria. Judge Jones provided a meticulous analysis of this. However, to put it briefly, we might say that the theory of intelligent design, by definition, is not vulnerable, or provisional, or universal. It is a case of general evolutionary incredulity. The level of detail required in its explanations is absurd. It is based on an absence of explanation and at best is the product of scientific impatience, if not of ignorance. Perhaps it is the proposal of idle scientists who wish to introduce supernatural, untenable, and unnecessary explanations into the description of nature, which is to say it is an assault on science by religious fundamentalism. In this regard, the disturbing fervour with which the idea of intelligent design has spread beyond the United States, where it receives considerable government support, is indicative.<sup>17</sup>

Although the United States is the stronghold of creationism, anti-evolutionism is exporting its propaganda everywhere. Evangelists use creationist texts in various languages apart from English, for example Afrikaans, Albanian, Chinese, French German, Italian, Japanese, Portuguese, and Spanish. In

Russia, evangelist texts tend to be used for teaching English. Again, the endeavours of a Turkish "Foundation for Scientific Research" to promote creationist texts are remarkable. The display of methods on its website is fabulous, with free online books and videos translated into many languages and with references from the Koran. Texts by Harun Yahya (pseudonym of the most popular Islamic creationist, Adnan Oktar) are rehashes of texts on intelligent design from the American Discovery Institute. There are some small disparities that betray the lack of universality of these explanations: references to the Flood are eliminated because this "geological phenomenon" is not part of the Koranic tradition! Again, last January, Moshe Tendler, an orthodox rabbi and biology lecturer at the Yeshiva University, proclaimed before a large audience of Jewish scientists and intellectuals at an international congress on "The Torah and Science"<sup>18</sup> that, "It is our task to inform the world [about intelligent design] [...] Or the child growing up will grow up with unintelligent design [...] Unintelligent design is our ignorance, our stupidity." I think that the problem is not so much these differences but exactly the reverse. Religious fundamentalists can reach agreement at least in their radical opposition to scientific explanations of nature.

### The Schönborn affair

Texts that are critical of creationism and intelligent design often refer to the stance of the Catholic Church when confronting the radicalism of certain Protestant groups, followers of biblical literalism. The key quote is the speech of Pope John Paul II on 22 October 1996 to the Pontifical Academy of Sciences, in which he recognised that evolution is "more than a hypothesis" and noted its scientific nature. The Dominican cardinal and archbishop of Vienna, Christoph Schönborn, subsequently published in *The New York Times* a brief but significant text<sup>19</sup> that has had unexpected reverberations. The problem with "Finding Design in Nature" is not so much that its author, an eminent theologian and editor of the *Universal Catechism*, should side with intelligent design — this is legitimate as personal opinion. Far worse is that Schönborn describes the speech of John Paul II as "vague and unimportant", explicitly attempting to discredit all those who refer to it in order to illustrate the compatibility of Church teachings with the scientific theory of evolution. Like Wasmann (see above), He does this with the appropriate omissions, since the Pope's declaration also touched on what Emila Pardo Bazán once called the "rock of the Darwinist scandal", the question of the origin of man as reserved for divine intervention. It is about the ontological leap from matter to spirit, the discontinuity so cherished by the holders of doctrine and still upheld in the last vitalist redoubt holed up in the neurosciences. The hullabaloo that followed the article in *The New York Times*, which surprised even the author, makes one wonder about a change of strategy in the Catholic hierarchy.

Weeks after the article appeared, an open letter to Pope Benedict XVI was published, signed by the theoretical physicist Lawrence Krauss and the biologists Kenneth Miller and Francisco Ayala, requesting Schönborn to clarify the Church's position.<sup>20</sup> Even though some distinguished voices, such as that of the Jesuit George Coyne,<sup>21</sup> director of the Vatican Observatory, have rebutted Schönborn's views, the latter has recognised that he has the support of the present pontiff and has continued to work on his arguments in writings and lectures. It is revealing that the subject he has chosen for his catechism teaching at Saint Stephen's Cathedral in Vienna in 2006 should be creation. It is well-known that certain radical Catholic groups in the United States — who are involved, for example, in anti-abortion campaigning — lend their support to the neo-creationist movement of intelligent design. However, the entry onto

the scene of high-ranking members of the Church hierarchy is an unexpected and disturbing development.

Pope Benedict XVI used his weekly public audience of 9 November 2005 before the Austrian Episcopal Conference, of which Schönborn is the president, to refer to the "intelligent project of the cosmos". This terminology, which is very close to that of neo-creationism, although it has different theological roots, might not, in principle, be incompatible with the evolutionary view of the universe and of life.<sup>22</sup> However, the reference in the papal discourse was ad hoc, while the Vatican's official press note to *L'osservatore romano* did not refer to it at all. This happened the day after Cardinal Poupard, the equivalent of the Vatican minister of culture, had made a number of explicit anti-creationist declarations.

In recent months, Schönborn has conceded interviews and published texts (apart from his monthly catechism teaching in Vienna) and has attempted to refine his ideas in order to distinguish between the scientific study of biological evolution, which he accepts as such, and "Darwinist explanations" — or neo-Darwinism — which he describes as ideological excess. Whatever the case, changes in the Curia and the line of discussion opened up by Schönborn might be keys to understanding and clarifying the true position of the Church vis-à-vis evolution. Perhaps the Church wishes to distance itself clearly from the anti-scientific radicalism that is so obscenely paraded around by evangelists, Islamic fundamentalists, and orthodox Jews. Or perhaps not...

---

<sup>1</sup> See E. C. Scott and G. Branch (2003), "Evolution: What's Wrong with 'Teaching the Controversy'", *Trends Ecol. Evol.* 18: 499–502; T. A. Langen (2004), "What is Right with 'Teaching the Controversy'?", *Trends Ecol. Evol.* 19: 114–115; S. C. Meyer (2004), "Teaching about Scientific Dissent from Neo-Darwinism", *Trends Ecol. Evol.* 19: 115–116; E. C. Scott and G. Branch (2003), "Teaching the Controversy: Response to Langen and to Meyer", *Trends Ecol. Evol.* 19: 116–117.

<sup>2</sup> The dispute has reached all levels, from the National Academy of Science to the Federation of American Societies for Experimental Biology (FASEB), both of which have made solemn declarations against intelligent design. Many scientific journals have devoted space to the issue (see the reports in *Nature*, "Who has Designs on your Students' Minds?" (28 April 2005), and *Science*, "Darwin's Place on Campus is Secure — but not Supreme" (10 February 2006)). One can also find extensive documentation in R. T. Pennock (2003), "Creationism and Intelligent Design", *Annu. Rev. Genomics Hum. Genet.* 4: 143–163.

<sup>3</sup> See [http://www.pamd.uscourts.gov/kitzmiller/kitzmiller\\_342.pdf](http://www.pamd.uscourts.gov/kitzmiller/kitzmiller_342.pdf).

<sup>4</sup> The statement read, "The Pennsylvania Academic Standards require students to learn about Darwin's theory of evolution and eventually to take a standardized test of which evolution is a part. Because Darwin's theory is a theory, it is still being tested as new evidence is discovered. The theory is not a fact. Gaps in the theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations. Intelligent design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students to see if they would like to explore this view in an effort to gain an understanding of what intelligent design actually involves. As is true with any theory, students are encouraged to keep an open mind. The school leaves the discussion of the origins of life to individual students and their families. As a standards-driven district, class instruction focuses upon preparing students to achieve proficiency on standards-based assessments."

<sup>5</sup> See: <http://education.guardian.co.uk/schools/story/0,,1244097,00.html>

<sup>6</sup> See <http://www.royalsoc.ac.uk/news.asp?id=4298>. The National Centre for Science Education website (<http://www.natcensci.org/>) offers an excellent way to keep up to date with news on the diffusion of the creationist phenomenon. There are numerous links to papers, essays, book reviews, and educational resources. The main aim of the NCSE is to foster the teaching of evolution in public schools. Its executive director, Eugenie C. Scott, is the author of one of the best books about creationism, *Evolution vs. Creationism* (California University Press, Berkeley, 2004).

Published by the Free Press (New York). There is a Spanish version of the book (Andres Bello, April, 2000). It should be remarked that the factual information on biochemistry offered by the book is essentially correct and painstakingly presented.

- <sup>8</sup> If one types in "Michael Behe" on Google 487 000 pages appear (accessed 13 July 2006). If we use the Scholar version (<http://scholar.google.com/>) on the same search engine, there are 1250 references (last accessed 13 July 2006). If we look for scientific articles published by Behe in peer-reviewed journals (<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed>), there are 36 references, all publications by Behe on different aspects of biochemistry and molecular biology, but none of them directly related to the question of "irreducible complexity" or intelligent design. Behe has published some texts specifically dealing with intelligent design. It is worth reading his response to critics of his book (Behe, Michael, 2001 "Reply to my Critics: a Response to Reviews of *Darwin's Black Box: the Biochemical Challenge to Evolution*" *Biol. Phil.* 16: 685–709).
- <sup>9</sup> See: <http://www.lehigh.edu/~inbios/news/evolution.htm>: "Department Position on Evolution and "Intelligent Design". "The faculty in the Department of Biological Sciences is committed to the highest standards of scientific integrity and academic function. This commitment carries with it unwavering support for academic freedom and the free exchange of ideas. It also demands the utmost respect for the scientific method, integrity in the conduct of research, and recognition that the validity of any scientific model comes only as a result of rational hypothesis testing, sound experimentation, and findings that can be replicated by others. The department faculty are unequivocal in their support of evolutionary theory, which has its roots in the seminal work of Charles Darwin and has been supported by findings accumulated over 140 years. The sole dissenter from this position, Prof. Michael Behe, is a well-known proponent of 'intelligent design'. While we respect Prof. Behe's right to express his views, they are his alone and are in no way endorsed by the department. It is our collective position that intelligent design has no basis in science, has not been tested experimentally and should not be regarded as scientific."
- <sup>10</sup> The literal definition in the book is, "By irreducibly complex I mean a single system which is composed of several well-matched, interacting parts that contribute to the basic function, and where the removal of any one of the parts causes the system to effectively cease functioning" (Behe 1996:39). The example used to explain the idea is that of a mousetrap. The author, recognising its ambiguity on several occasions, has changed and nuanced his definition of irreducible complexity, for example by adding the word "necessarily", so that it reads "a single system which is *necessarily* composed of several well-matched [...]" (See Behe, 2001, 694).
- <sup>11</sup> Extensive discussions of each of the systems favoured by Behe may be found along with explanations why, contrary to what Behe states, they are perfectly "reducible". See in particular Niall Shanks (2004) *God, the Devil, and Darwin* (OUP, Oxford); Matt Young and Taner Edis, eds. (2005) *Why Intelligent Design Fails. A Scientific Critique of the New Creationism* (Rutgers University Press, New Brunswick).
- <sup>12</sup> Charles Darwin (1859) *On the Origin of Species* (John Murray, London), published in Catalan by Edicions 62, Classics del pensament modern 1, Barcelona, 1982. Chapter 6 is devoted to the "difficulties of the theory", with a section specifically concerned with analysing the natural origins of animal eyes (1982, 179 ff.). Richard Dawkins offers a magnificent exposition of the evolution of eyes by natural selection in his *Climbing Mount Improbable*, Penguin, London (the Spanish version was published by Tusquets, Barcelona, in 1998).
- <sup>13</sup> François Jacob introduced the felicitous notion of evolutionary bricolage to refer precisely to the non-designed character of evolution. See, for example, his *Le jeu des possibles*, Fayard, Paris, 1982. The Spanish version was published by Grijalbo, Barcelona, 1997, while the English version is entitled *The Possible and the Actual* (Pantheon Books, 1982).
- <sup>14</sup> E. Wasmann, S.J. (1910), *Modern Biology and the Theory of Evolution*, Kegan Paul, Trench, Trübner and Co., London (translation of the third German edition by A. M. Buchanan, 206). Wasmann had scientist members of religious orders among his followers, for example Agostino Gemelli, Jean Maumus, and Jaume Pujula. In all cases, their criticism of the materialism of the evolutionists (especially Haeckel) was implacable and their option was theist, creationist evolution, in the context of neo-vitalism.
- <sup>15</sup> Behe (1999), op. cit., 300.
- <sup>16</sup> D. J. Futuyma, 1997, "Miracles and Molecules", *Boston Review* (February–March).
- <sup>17</sup> Kevin Phillips, a well-known ideologue and former Republican politician, has recently published *American Theocracy: the Peril and Politics of Radical Religion, Oil and Borrowed Money in the 21st Century* (Viking, New York, 2006), where he offers quite a complete analysis of the influence of Christian fundamentalism (especially in the Protestant

churches in the South of the USA) in recent American history. For Phillips, the religious excesses and anti-scientific censorship of the present Bush government (for example, with regard to health and the environment), vast oil-based ambitions, and public and private debt have set the United States on the road to disaster.

- 18 See <http://www.alternet.org/story/30335/>.
- 19 See <http://www.nytimes.com/2005/07/07/opinion/07schoonborn.html>. This text, along with other contributions and views of Christoph Schönborn may be found at [http://www.cardinalrating.com/cardinal\\_97.htm](http://www.cardinalrating.com/cardinal_97.htm).
- 20 See <http://genesis1.phys.cwru.edu/~krauss/papallettxt.htm>. See also, L. Krauss (2005) "The Pope and I". *The Skeptical Inquirer*, November, 46–47.
- 21 See, for example, C. Holden (2005) "Vatican Astronomer Rebuts Cardinal's Attack on Darwinism". *Science* 309, 996–997; or the text of a recent lecture by Coyne entitled "Science does not need God. Or does it? A Catholic Scientist Looks at Evolution" ([http://www.catholic.org/national/national\\_story.php?id=18540](http://www.catholic.org/national/national_story.php?id=18540)).
- 22 Thus it seems to Fiorenzo Facchini, an anthropologist and professor of evolutionary biology at the University of Bologna, in his article "Evoluzione e creazione", *L'osservatore romano*, 17 January 2006, where he applauds Judge Jones's sentence in the case against intelligent design and vehemently refutes this "theory".

---

Published 2006–07–13

Original in Catalan

Contribution by Transfer

First published in *Transfer 2* (2007) (English version) / *L'Espill 22/2006* (Catalan version)

© Juli Peretó

© Eurozine