The Skeptical Razor

Political lies and their social consequences

ALLIANCE OF LIBERALS AND DEMOCRATS FOR EUROPE

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Monográficos EUROMIND - 2

«Ignorance may be as fatal to good government as corruption»
Robert Lynn Batts

TERESA GIMÉNEZ BARBAT

Political lies and their social consequences
(Introduction)

The question of truth in politics lies at the very origin of western thinking. Plato considered it necessary for a good and ordered city to lie to its citizens about their natural origin and the true nature of the class distinctions. This lie is considered "noble", however, as it apparently guarantees social harmony, loyalty and peace between the rulers and the ruled.

The efficacy of this Platonic "noble falsehood", that causes man to forget the lie behind their citizen education, instilling a sense of brotherhood and loyalty to the system based on pious fictions, is easier to understand against the background of a more profound history.

According to the hypothesis put forward by the evolutionary anthropologist, Christopher Boehm, human beings lived for hundreds of years under

"reverse dominance hierarchies" in which the norm was not to submit to a lying ruling class, but to form coalitions against dominant heads unwilling to share. Only with the agricultural revolution and formation of central states, thousands of years ago, did it become necessary to form stronger dominance hierarchies. This partially contradicts the "egalitarian" predispositions of the human brain, which would explain the need for the new obedience to be taught, including the use of attractive religious fictions.

This conflict is never entirely resolved. With the politics of the Enlightenment and the democratic movement, a process that questions the historical dominance hierarchies was continued, stimulating political systems that limit central power and facilitate greater participation in governance. On the other hand, the rise of democratic politics which to a certain extent recover the ancestral "egalitarian ethos", would be accompanied by what Michael Shermer terms an extension of the "Moral arc" beyond the interests of the small family or tribal group.

Enlightenment politics dreams of a political order free of lies, an *Ethocratie* founded in the style of Holbach on the natural universal moral, capable of keeping the Machiavellianism of the dominant princes at bay. The enlightened "ethos", based on equality in the face of the law and the exten-

sion of universal education to all citizens without any distinctions, is therefore most favourably positioned to decry the governor's lie and ponder its consequences.

Even accepting that such a thing as "noble lies" might exist – Daniel Dennett himself tackles the matter by imagining what a dispute between an army made up of loyal fighters certain that their cause is divine ("golden army") and an army made up of calculating economists ("silver army") – there is no doubt that ignoble lies abound in everyday politics, the consequences of which are far from making us more harmonious, peaceful and loyal.

This determination to lie in politics has increased in recent times, coinciding with concepts such as "post-truth" – considered "word of the year" by the Oxford Dictionary in 2016 – with what politicians call an "emotional twist" on human sciences, that once again places the emphasis on political emotions, but also on socio-political events as specific as the United Kingdom's exit from the European Union, the election of Donald Trump as president of the United States and the sparkle of populism and nationalisms in European territories.

The consequences of political lies are affecting us now more than ever before, in a world that seemed comfortably ensconced in relativism, or at the very least in "weak" and "diluted" truths.

Hence, the decision to attempt to address this matter of political importance from the rational and scientific perspective that characterises the EUROMIND series of conferences.

The seminar organised by the liberal group ALDE in the European Parliament's Barcelona-based centre in November 2016 provided the starting point for the attempt to reflect this concern in the shape of a book. The seminar enjoyed the presence of Michael Shermer, well-known sceptic and scientific author, the British philosopher Julian Baggini, and José Miguel Mulet, professor at the Universidad Politécnica de Valencia, an educator and author of numerous books on science

Shermer, Giménez Barbat, Mulet, and Baggini during the event «The Skeptical Razor: political lies and their social consequences», organized by Euromind on November 2, 2016 in Barcelona

and food. For this issue, we have been fortunate to receive original contributions from Julian Baggini, Michael P. Lynch, Michael Shermer, Manuel Toharia, Matteo Motterlini, Jean Bricmont, Robyn Blumner, José Miguel Mulet, Sissela Bok, Bjørn Lomborg, Félix Ares and Adolf Tobeña.

The result is a monographic issue that simply aims to provide a first-aid guide to a better understanding and perhaps a slightly more effective treatment with the inevitable political lies.

FÉLIX ARES

Politics with a pinch of scepticism

«*Politics is the art of looking for trouble, finding it everywhere, diagnosing it incorrectly and applying the wrong remedies*»
Groucho Marx

Politicians attempt to solve issues that affect a community. Sometimes the solutions are merely ideological, for instance, whether homosexual marriage should be allowed or not. When you put it like that it's a clearly ideological matter and some will be in favour and others against, and there is no objective way – at least to my knowledge – of solving the problem. Some claim it's an aberration because their religion says so, others see it as an increase in individual freedoms that doesn't harm anyone and which, therefore, should be allowed. There is yet another group, at least in Spain, that believes homosexual marriage should be allowed but these

couples should not be allowed to adopt children as the latter need both a father and a mother.[1] And that education is incomplete if there are two fathers or two mothers. In this instance we can take a qualitative leap and state that it is not a matter of opinion but a social fact that can be studied and demonstrated. Indeed, not only can this study be done but already has been, time and time again,[2] and the studies show that children are educated perfectly well in a homosexual family and, therefore, it would be reasonable not to discriminate. It is not, in any case, my intention here to emphasise the results, but rather the existence of these results, the fact that studies have been done or can be done and hence, the politician, who theoretically should work for everyone, must set aside their personal beliefs and turn to what the facts say. That is, the politician must offer «evidence-based politics» rather than speculations or beliefs. Evidence-based politics[3] is an evolution of «evidence-based medicine». That is, medicine rooted in scientific articles and scientific methodologies and not more or less widespread anecdotes or beliefs. This is what we call

1. http://www.hazteoir.org/node/22191
2. http://www.xatakaciencia.com/genetica/los-padres-homosexuales-perjudican-el-desarrollo-de-sus-hijos
www.felgtb.org/.../estudios-sobre-homoparentalidad-revision-cientifica-y-ana.pdf
3. https://en.wikipedia.org/wiki/Evidence-based_policy

scepticism: the decision to disagree with anything that we are not given proof of, or in layman's terms, «we're not just going to swallow anything».

In my opinion, Madrid's mayor, Manuela Carmena, has given us a paradigmatic example of «politics NOT based on evidence». The policy of Carmena's party, «Ahora Madrid», advocates for turning Spain's capital into a «non-GMO zone».[4] The absurdity of this endeavour is such that it has caused the Spanish scientific class to react and ask Carmena to rectify. If I were a diabetic living in Madrid I would start to worry: the insulin I am provided with is GMO: it's produced by bacteria with human genes.[5] In other words, it is produced by the Frankenstein-type monsters referred to by the multinational Greenpeace.[6] But human insulin is just one of the medications made from GMO bacterium. The long list also includes: proteins for haemophilia, dwarfism, anaemia... and it is also used in laboratory animals – like rats, for example – to study cancer and many other diseases.

I find it hard to understand how parties and people who call themselves progressive can speak of

4. https://goo.gl/UEdVut
5. http://www.soitu.es/soitu/2009/03/03/salud/1236098657_242635.html
6. http://elpais.com/elpais/2016/06/30/ciencia/1467286843_458675.html

ancestral, outdated and mistaken medicines, who are against scientific progress, etc. Let us not forget that «traditional» medicines were ignorant of bacteria and viruses and prions. They occasionally got it right through a process of trial and error, but in the majority of cases they are idiotic nonsense. One such example was the practise of leaching blood when a patient was sick and weak. If you are ill and they take blood from you, the only thing that can happen is that you'll get worse.

However, don't let what I have just said make you think I am on right wing's side. To give you an idea, in 2010 the president of the Madrid Region at the time, Esperanza Aguirre, inaugurated the restoration of the homeopathic institution, Instituto Homeopático y Hospital de San José. The building located very close to Plaza de Cuatro Caminos, is very pretty, but there is a big difference between restoring a building and the regional government[7] endorsing the «services offered by the entity, particularly highlighting the homeopathy and acupuncture seminars and courses it offers».[8] There is an abyss in terms of credulity and incompetence. In my humble opinion, public money cannot be spent on nonsense.

7. https://goo.gl/vV6PwL

8. https://hipertextual.com/2015/05/homeopatia-politica-espana

We need to travel back to the origins of homeopathy in 1796 to understand it. Back then leaches were used to draw blood. The homeopathic technique of doing nothing, of not giving any active element, is far better than harming the patients. Homeopathy was «discovered» in a world without any bacteria, or viruses or prions. It was a strange world, that cannot contribute anything to modern-day scientific knowledge. That a figure such as Esperanza Aguirre should assign funds, not only to restoring the hospital – which could be justified on historic grounds – but for courses and seminars in homeopathy and acupuncture demonstrated that the right wing is just as mistaken as the progressives.

Whether you are right wing, centrist or progressive, scepticism is necessary. Evidence must be demanded.

To conclude, I'd like to talk about an issue that outrages, stirs and inflames me. I am referring to the anti-vaccination movement. In 2005, I spoke on many radio programmes, on the radio and television channels I collaborated with, more or less a dozen of them, applauding the fact that measles was about to be eradicated from the world. At that point, like smallpox, it would have disappeared from the world and so it would no longer be necessary to vaccine against it. Measles would be the second human disease to be eradi-

cated. In reality, the second disease to have been eradicated was the rinderpest.

Unfortunately, not only has measles not been eradicated but it has returned to Europe, an out and out failure. There are multiple reasons, for instance, refugees have come from places in which the measles still exist; but that is not the most important reason. The main cause is that a movement has arisen among the wealthy European and American classes to NOT VACCINATE. Initially, due to a mistaken article attributing autism to vaccines. It was an article by Wakefield[9] that was subsequently proven wrong, its statistics erroneous, but the damage was already done. Many believed it and refused to vaccinate their children. There is even a nun[10], who claims to be a doctor, who preaches NON-VACCINATION. And that has led to the fact that today, in 2016, we still have measles in the world.

What should those of us who believe that vaccines are INFINITELY better than NON VACCINES do? On the one hand, I think parents should be free to choose. On the other, I think that the common good requires EVERYONE to be vaccinated. So, what should we do? I don't know. But

9. http://www.escepticos.es/node/647

10. http://elpais.com/diario/2009/11/01/sociedad/1257030001_850215.html

I'd like to be able to vote for politicians who had a clear view, based on evidence and not on slogans or tweets.

Felix Ares de Blas *(Madrid, 1943) is a Spanish scientific communicator. He is the author of* El robot enamorado: una historia de la inteligencia artificial *(The Robot in Love: A story of artificial intelligence).*

JULIAN BAGGINI

Political lies and their consequences

It's easy to condemn political lies and catalogue their awful consequences. It's more difficult and important to examine the consequences of *not* lying. In a world where opponents are using every devious trick in the book to defeat you, can anyone afford to be so high-minded?

This is the challenge set in *Primary Colours*, a fictional account of Bill Clinton's first presidential campaign. At the end of the film adaptation, the president tells a disillusioned young activist:

"This is hardball... This is the price you pay to lead. You don't think Lincoln was a whore before he was President? He had to tell his stories and smile his back-country grin. He did that so one day he'd have the opportunity to stand before the nation and appeal to our better nature. That's where the bullshit stops."

This debate is often framed as a battle, or trade-off, between principle and pragmatism. But that

dichotomy glosses over a more intimate relationship between the two. Political principles centrally concern outcomes: we want to create a fairer world, a more equal society. And when principles relate to outcomes, there can be no neat distinction between principles and practice. If, for example, you refuse to tell a lie that will enable you to make society fairer, you have not preserved your principles, rather you have given up one relating to outcomes for one relating to process or personal integrity.

The danger here is of what Bernard Williams called "moral self-indulgence": keeping our hands clean to make us feel more virtuous at the price of making life worse for others. "Let justice be done, though the world perish, " as Ferdinand I, the Holy Roman Emperor put it.

The most obvious minor concession to a politics of purity is to accept that politics may require a certain amount of economy with the truth, but to insist that this is not the same as outright lying. This distinction, however, is sophistical. The ethically important line is drawn not between lies and partial truths, but between truthful sincerity and deception. Our reaction to certain half-truths reflects this. Until recently at least, when politicians have deceived without technically lying, no one has accepted that as reasonable economy with the truth. Bill Clinton, for example, famously looked

the American people in the eye and said he "did not have sexual relations with that woman, Monica Lewinsky". Given the exact way "sexual relations" is typically used in his native Arkansas, he might have been technically correct. But no one saw that as justifying his denial. Whatever might be problematic about political lies is equally problematic about any kind of intentional deception.

Morally and socially, it would then seem that any kind of self-serving deceit is regarded as bad. So why is it that recently the electorate increasingly seems not to care about truthfulness at all? To take just two examples, many people who voted for Trump also said that they didn't believe a lot of what he said. Few expect him to implement all the policies he proposed. Similarly, in Britain the campaign to leave the EU, Vote Leave, in particular said some outrageously false things, most famously that leaving the EU would save £350 million per week which would be spent on the National Health Service. Not only was this figure a complete fantasy, this was a referendum on EU membership not a general election, so the leave campaign had no say at all in what any money saved would be spent on.

Some of the public were indeed fooled by this lie but most saw through it and didn't care. They didn't expect the campaigners to tell the truth. They responded not to the literal substance of the

claim but the central thrust of the message: a vote to leave puts our money back in our control. People voted on broad, clear, simple intentions and principles not on concrete, contested facts and evidence. They had a disinterest in objective facts most famously expressed by the government minister Michael Gove who said, "people in this country have had enough of experts."

Importantly, however, this disregard for truth is selective. Only populist insurgents are given a free pass on truthfulness while the "political establishment" is still held to the old, higher standards of integrity. Hence Clinton suffered from the label of "Crooked Hillary" while Trump was even allowed to not reveal his tax returns. Facts and statistics offered by remain campaigners were dismissed as unreliable and evidence of the mendacity of the elites, while Vote Leave's dubious numbers were taken with a shrug.

How did we get to this? Part of the answer is that in the name of realism, the political mainstream allowed truth and accuracy to be degraded. Without endorsing the idea that lying or deception is "the price you pay to lead", it embraced another kind of wilful separation of message and substance, rhetoric and reality. In this form of rhetoric, words and deeds neither contradict nor match each other. Rather, two parallel discourses are used, one which

objectively and clearly sets out the reality of the situation while the other presents it as palatably as possible. One analogy is with religious discourse, where some believe that myths and stories are ways of conveying the core of more complex theological truths to simpler folk.

In politics this translates into the maxim espoused by former New York Governor, Michael Cuomo, that "You campaign in poetry. You govern in prose." Barack Obama's first presidential campaign fitted this template. "Yes we can" is hardly high poetry but it is a memorable, emotive cry, not a systematic exposition of what makes this "can" possible. The slogan didn't contradict anything in Obama's programme but that was largely because it didn't say anything of substance about it either. Like a religious myth, it gives the masses a simple narrative to move them and leaves it to the political elite to work through the politico-theological details.

This would appear to offer a way of doing politics in the public domain that permits glossing over facts and detail, but it does not involve deception either. It looks benign, and it is indeed more or less how all political parties now work. And there is a word for it: spin. Spin is not supposed to lie or evade the truth, but it aims to always present it in the most favourable way.

But if spin is benign and non-deceptive, why has it become a dirty word? After all, no one has ever expected politicians to present the objective, impartial truth. In that sense, people expected politicians to spin before there was even a word for it.

To understand public distaste for spin, we need to see how the distinction I made between rhetoric which departs from substance and rhetoric which presents the substance differently is not as neat as it seems. In reality, there is a continuum between the two, and that means benign presentation can easily slide into malign misrepresentation. To return to religion, this is reflected in the debate over whether religious myths are merely simple ways of presenting deep truths or noble lies to keep the stupid masses on the straight and narrow.

In politics, the problem of benign spin degenerating into malign deception is all too real. As Bill Clinton's "sexual relations" claim illustrates, the point at which the public started to object to spin was the point at which reasonable people would draw wrong conclusions from it, not the point at which it literally departed from the truth. And spin is likely to reach this point since its whole purpose is usually to encourage people to draw more positive conclusions from the facts than a more objective look would warrant.

I would contend that decades of spin means that even those voters who don't believe politicians are all lying do assume that they have no interest in the truth of what they say, only in its effects. A culture of spin makes the categories of truth and lies irrelevant. Its focus on presentation leads people to correctly conclude that truth and falsity are not the priorities of those addressing them. This is one factor which has led us to the so-called "post-truth" politics. In this environment populist parties can campaign on the basis of little more than opposition to the establishment and empty promises of a brighter future.

So when we find ourselves worried about political lies and their consequences, we need to understand that many political lies today are themselves consequences of what can seem like nothing worse than trying to give the best impression. The obsession with presentation set western politics down a slippery slope where reality played second fiddle to experience and emotional appeal trumped rational argument. All this degraded the value of truth, and so also decreased the negative value of lies, until truth and falsehood became of marginal importance.

If there is to be away back from here it will be long and hard. Somehow, mainstream, credible political parties need to re-establish their honesty

and integrity, to prove that they can be trusted to tell the truth, not just what focus groups tell them goes down well. The only good news is that honesty and authenticity are now highly valued. Indeed, one reason why Trump got away with saying so many outrageous things is that people saw that as proof that he was a fallible, real human being, not a slick product of the party machine. We must start proving our honesty now so that we are ready

Julian Baggini during the event «The Skeptical Razor: political lies and their social consequences», organized by Euromind on November 2, 2016 in Barcelona

to pick up the pieces when the populists' lies are revealed for what they are.

Julian Baggini *(1968) is a British philosopher. One of his latest published works is* The Edge of Reason.

ROBYN BLUMNER

Why are there no open atheists in the U.S. Congress? Here's why.

During this year's American presidential race, atheism became an issue, and it wasn't pretty.

In the Democratic primary battle between former Secretary of State, Hillary Clinton and Vermont Sen., Bernie Sanders, an idea was hatched by a member of the Democratic National Committee (DNC). The DNC is expected to remain neutral on the question of which candidate should win the party's nomination. But thanks to hacked emails, the public was made privy to a private exchange among its members discussing how to hobble Sanders' resurgent campaign.

How? Label him an atheist.

That idea was the brainchild of Bradley Marshall, who, at the time, was the DNC's chief financial officer. "My Southern Baptist peeps would draw a big difference between a Jew and

an atheist," Marshall wrote in an email to colleagues.

Sanders had said in the past that he is a secular Jew who isn't much involved in organized religion. But once this email became public, Sanders firmly declared a belief in God.

Marshall and others in the DNC resigned over this. He issued an apology to the DNC on Facebook. But there is one group Marshall did not apologize to: the group he maligned, atheists. No one within the Democratic Party establishment stood for atheists.

Had this been any other group – for instance, had Marshall sought to tar Sanders as gay rather than an atheist – the Democratic Party would have expressed solidarity with the targets of Marshall's attack. Atheists received no such consideration.

As an atheist myself, I would have liked to have heard something like this: "The Democratic Party is proud to have the votes of so many of America's atheists and it condemns the ongoing, unfair anti-atheist bigotry that pervades much of this nation."

One would think the Democratic Party would be friendlier to its atheist supporters. According to the Pew Research Center, 69 percent of America's atheists either are or lean Democratic. This strong support is crucial to winning elections, but the favor is not returned.

Anti-atheist prejudice is the last acceptable prejudice in America. Atheists make up 3.1 percent of Americans, according to Pew. Agnostics are another 4 percent. And these are the nonbelievers willing to admit their views to pollsters. Further studies suggest that similar numbers hold atheist or agnostic worldviews, but choose not to check the "atheist" or "agnostic" boxes on surveys. Overall, America is following the example of other western democracies and secularizing – only more slowly. There is a growing population of "nones" who, when asked about a religious affiliation, say they are nothing in particular. This group, which includes atheists and agnostics, now makes up 22 percent of the U.S. population, and for younger millennials, "nones" represent a whopping 35 percent.

Compare those numbers to Jews at 1.9 percent of the U.S. population, Muslims at.9 percent and Mormons at just 1.6 percent. Atheists, agnostics, and the nonreligious should be a political juggernaut – and yet this group has virtually no political power. A country that owes its economic prosperity to its prowess in science and technology, and was founded on a core principle of church-state separation, nonetheless holds in contempt its nonbelieving citizens who embrace science over supernaturalism. The very citizens who use evidence rather than beliefs to evaluate claims about the true nature

of reality and who would assiduously avoid injecting religion into government affairs, are considered weirdos and immoral outsiders.

Polls show that half of Americans do not want a family member to marry an atheist, and about the same number are not inclined to vote for an otherwise qualified presidential candidate who is an atheist. For a politician, an atheist scores worse than being an adulterer or a marijuana smoker.

Maybe that is why zero members of the U.S. Congress – a body composed of 535 men and women, 100 of whom sit in the Senate with the remainder in the House of Representatives – are open atheists. Not one.

Recently, there has been only one openly atheist sitting member; Rep. Pete Stark, a California Democrat admitted to being an atheist in 2007 in response to a questionnaire sent by the Secular Coalition for America.

To get a sense of just how politically risky it is to admit a non-belief in a supreme being, Rep. Barney Frank "came out" as an atheist fully 26 years after admitting to being gay, and even then, he only openly attested to his atheism after retiring from the House of Representatives. Frank represented a liberal district in Massachusetts and had by any measure a very safe House seat.

It is no wonder Ohio Gov. John Kasich, a recent Republican presidential contender, felt no compunction about spontaneously attacking British actor Daniel Radcliffe for being an atheist.

"You know that Daniel Radcliffe has declared himself an atheist?" Kasich said recently while touring a bookstore in New Hampshire and spotting a Harry Potter book. "I'm serious. What a weird thing. Why would a guy who has had all that success just, I mean, what the hell is wrong with him?"

Nice.

Statistically, it is nearly impossible that there are no atheists in Congress. There are probably dozens of non-believers, but they think it is too politically risky to admit it.

Why are atheists in America so openly disdained? Difficult to say, exactly. It could be a holdover from the Cold War with the Soviet Union. Opportunistic American politicians drew sharp lines between what they called godless communists, and patriotic, God-fearing Americans. Atheists were conflated into a group of people who represented America's enemy.

There are still many Americans who think you can't be moral without religion. Of course, anyone who has bothered to read the Bible would know that no truly moral person draws his or her view of

right and wrong from an ancient book that defends slavery, capital punishment, and genocide. Atheists like to suggest that too many people accept the Bible the way people accept a new software agreement. They don't read it, simply scroll to the end, and check "I agree". Nonetheless, the pernicious, untrue sentiment remains that being religious equates to being moral, and being non-religious equates to being amoral.

This is not only bad for atheists, it's bad for America.

By excluding atheists from public office, the American electorate pushes public policy in the direction of privileging religion and religious tenets. Tens of millions of American atheists – often among the most scientifically minded of citizens – are precluded from political power and the public policy table.

This exclusion directly impacts a host of issues, including the way public policy skews on abortion rights, same-sex marriage, funding for embryonic stem cell research, whether tax money should go toward religious schools, whether sex education is taught in schools, how climate change policy will be shaped, and even – incredibly – whether evolution is taught in public school science classrooms.

Because atheists and agnostics are not among the country's lawmakers, we do not have a vote

when laws and rules that benefit religion are considered. For instance, in the United States, religiously affiliated groups receive millions of tax dollars annually for social work and educational activities, yet they are allowed to discriminate in hiring on the basis of religion. A homeless shelter can choose to hire only the Christian faithful, yet be funded in part with taxes from non-believers, Jews, Muslims, etc.

The great American experiment in self-government included a very deliberate decision to bar religion from the public purse. Religious ideas were to flourish or fail based on their credence and the public support they could muster independently of the taxman.

In the late eighteenth century, when the nation was being founded, Europe's religious wars and strife were a reasonably fresh memory. America's founders set upon a task of keeping their new nation free of it, both for the sake of a peaceable civil society and freedom of conscience. James Madison, a primary author of the U.S. Constitution, wrote an impassioned plea to keep the state of Virginia from assessing taxes to pay preachers.

But America has lost its way since President John Adams signed, and the U.S. Senate unanimously ratified the Treaty of Tripoli in 1797, which declared, "the government of the United States of

America is not in any sense founded on the Christian Religion."

Today, America's two major political parties bend over backward to seem pro-religion. The recently adopted platform of the Republican Party tells lawmakers to ensure that man-made law is consistent with God's law when writing legislation. Another provision suggests that teaching the Bible in public schools is essential for "an educated citizenry."

Republicans have made a devil's bargain with America's religious fundamentalists. In exchange for their electoral support, the party is in the grip of those who would impose religious practices and tenets through the power of law. The party's opposition to church-state separation has caused a startling erosion of this individual liberty, and further marginalized American atheists.

But even the Democrats embrace religious privilege as a hedge against being labeled anti-religion. President Barack Obama has kept open and funded a part of the federal government established by his predecessor, the overtly religious George W. Bush, that encourages faith-based non-profits to apply for federal funds. Obama hosts clergy for prayer sessions in the White House, and it's a rare major public address when "God Bless the United States of America" isn't his finale.

Despite this, in record numbers and at a remarkable rate, Americans are sloughing off the faith they were born into and rejecting organized religion entirely. The scandals involving pedophile Catholic priests and the right-wing politicization of evangelicals are part of the reason. But the most important reason has to be that science is undeniably better than revelation at helping us understand reality. Science has demonstrated it can uncover what is true about the natural world, and then rain down wonderful medical and technological advances that make our lives healthier and better. With each new scientific breakthrough religion is confined to a smaller and smaller sphere.

What we need now is for American politicians to catch up with the electorate. Those who are closeted atheists need to come forward and declare their non-belief. The small lie they offer by pretending to be among the faithful is much more consequential than they realize. It not only hurts the country by making public policy more hidebound and conservative, it models behavior for nonbelievers in the general population who then feel they too must hide in plain sight. Religious politicians need to help by standing up for atheists, the way they would for any minority, when they are insulted, discounted or denounced.

Non-governmental organizations such as the Center for Inquiry and the Richard Dawkins Foundation for Reason & Science are working to wipe away the stigma through a nationwide Openly Secular campaign to encourage non-believers, including celebrities and politicians, to come forward. (In the United States the word "secular" is often used as a catchall for nonbelievers and the nonreligious.) Just as this approach dismantled baseless prejudice against gays and lesbians, so can the act of atheists coming forward to friends, neighbors, coworkers and loved ones, change attitudes.

Once a tipping point is reached it may not take long for members of Congress to reflect the rising atheism in the United States. The trend is

Robyn Blumner in the European Parliament in Brussels, during her speech at the event organized by Euromind on November 29, 2016

moving in our direction, but it's not there yet. Raising public awareness is the key to vanquishing for good the damaging lie that there are few atheists in America, and the few that are here are unpatriotic and immoral. The truth is just the opposite.

Robyn E. Blumner *(USA) is CEO & president of the Center for Inquiry, and managing director of the Richard Dawkins Foundation for Reason & Science.*

SISSELA BOK

Long-term costs of political lies

"How can you tell if politicians are lying? Their lips are moving." These mocking phrases, coursing through uTube and the social media, speak of deep layers of distrust for politicans and public officials: distrust further fueled as political opponents bandy about accusations and counteraccusations of corruption and lying. And dishonest politicians themselves, convinced they are doing nothing unusual, only add to the distrust in their honest colleagues.

There is little mystery about the long-term costs of deceit and corruption among politicians and others in public life that the media document daily. A climate of at least minimal trust is needed if nations are to meet the environmental, economic, humanitarian, and other challenges that now confront them collectively. Meeting these challenges calls for unprecedented levels of international cooperation and, in turn, for a minimum

of mutual trust. Yet every new revelation about suspected or documented cases of deceit eats away at public trust. Right now, we see governments East and West, North and South hobbled by citizen distrust, many unable to marshal anything like the public support needed for even the most urgent reforms.

Economists describe trust as a fragile social resource, an essential element in our social environment, necessary for cooperation and effective government – a resource that can be damaged, polluted, even poisoned just as much as the natural resources of water or air. Liars, functioning as free riders in this social environment, rely on a modicum of trust to dissemble, even as their own conduct helps to wear it down. They have been compared to those who spread counterfeit coins among the public. The more such practices are exposed, the more distrust is awakened, rendering even the most reliable politicians and organizations suspect in the public eye.

Cynics shrug their shoulders, maintaining that it is only to be expected that a politician will lie. *"Their lips are moving."* Such a view presupposes a broad definition of lying that includes, not just statements intended to deceive listeners, but also all manner of unspoken deception, factual mistakes and slip-ups, even hypocritical winks and smiles.

This expansive view of lying effectively blurs all moral distinctions between the larger concepts of error and deception and the narrower concept of telling lies. It helps perpetuate an exaggerated view of the mendacity of politicians. Just as the eighteenth century French thinker Proudhon's claim that "all property is theft " makes it harder to see how robbing a bank differs from having a savings accounts in that bank, so the notion that smiles and winks count as lying makes it difficult to distinguish them from libel and perjury. Journalists and sociologists often include what they call "lies of omission" – namely deceit through silence – along with "lies of commission" under the general heading of lies. This allows some to make what would otherwise be preposterous claims about the countless lies told by the average person every day. Still others expand the category of lying to include metaphors, ironic remarks, jokes, and works of fiction.

If we ask, instead, about the telling of genuine lies in politics, is it possible to know whether they are more common today than in the past? Not necessarily. To be sure, we are all at the receiving end of many more lies, conveyed by the media. However mendacious politicians may have been in earlier centuries, the public could not, as now, actually observe them looking straight into the TV camera while telling what turn out to be lies.

Entire new professions have sprung up with the express purpose of altering the public perception by means of every form of rhetoric, persuasion and sometimes deceit. They are specialists in disinformation, propaganda, public relations, spin-control, dirty tricks, false accusations; and even spin doctors who reject that outright lying may be equally effective in deceiving or confusing the public by misleading statistics, partial quotes, euphemisms, and misplaced emphases. Of course there were precursors to these professionals in earlier times; but they are now more numerous and have access to new technologies such as the Internet and the social media. In the age of globalization and the Internet, any one source can send false messages to millions of recipients.

Yes, there is much more deceit in circulation, therefore, and yes, many of the instances of lying are echoed in the media in entirely new ways, reaching far more people; so that though there is not necessarily more lying by the average politician, many more lies are coming our way as recipients, listeners, viewers. I am always skeptical about claims, decade after decade, that there is more lying than ever in politics. Forty years ago, I was working on my book *Lying: Moral Choice in Public Life in the aftermath of Vietnam and Watergate*. I find it hard to imagine that the webs of deceit and secrecy

at that time have now been surpassed. The underlying conflicts about lying and truthfulness have not changed, nor the moral challenge they pose to politicians and everyone else, about the kind of persons they want to be, the kind of lives they want to lead. But although lying by politicians and other figures in public life is hardly new, these new contexts give it vastly greater scope. As a result, far more people feel personally cheated and betrayed than ever before and develop protective shells of distrust and skepticism.

Rarely are the consequences of politicians' lying more devastating than when their lies draw citizens into war. The burden that public officials impose on citizens by advocating war on the basis of faulty information and poor judgment is already great; but it is even greater if they knowingly resort to lies or other forms of deceit in presenting reasons for going to war or exaggerate the need for haste. As Thomas Jefferson said, insisting that citizens have a right to full information about the possibility of a war: "It is their sweat which is to earn all the expenses of the war, and their blood which is to flow in expiation of the causes of it."

Once we see trust as the fragile social resource that it is, then the same questions arise for politicians as for each of us: To what extent do our actions debilitate or help restore that social resource

of at least minimal trust needed for any society to thrive? How can we avoid being free riders damaging that environment? What can *we* do to help shift the balance? And what would it take for an individual, a company, or a government to offer leadership in this respect?

Although there may well be a shift, in some quarters, toward greater tolerance for deceit, even toward open advocacy of lying, so there are also new forces mobilizing to counter deceptive practices: strong, sometimes innovative, countervailing practices, stressing the search for truth and the need for truthfulness, including the possibilities offered by the new media. Truth commissions in countries such as South Africa, El Salvador, and Guatemala have worked to bring an end to decades of secrecy and deceit regarding torture, massacres "disappearances" and other abuses. Just as new technologies have revolutionized the potential for deceit and secrecy among human beings, so they have also opened the door to innovative ways of investigating such practices and to seek greater accountability.

Political lies cut at the very roots of democracy. To the extent that citizens cannot trust what public officials and candidates for office say, they are disempowered, bereft of the reliable information needed to vote or to decide about public policies on, for example, immigration, taxation, or mili-

tary action. As James Madison wrote, "a popular government, without popular information, or the means of acquiring it, is but a prologue to a Farce or a Tragedy; or perhaps both."

Sissela Bok *(Stockholm, 1934) is a moral philosopher of American nationality. She is the author of* Lying: Moral Choice in Public and Private Life.

JEAN BRICMONT

On War and War Propaganda

All wars need preparatory war propaganda and are usually justified by lies and gross exaggeration. Sometimes major wars can be averted, sometimes not. The Cuban missile crisis is an example of the first category, the Tonkin Gulf incident an example of the second. In both cases, exaggerated claims and fears led or did not lead to wars with catastrophic consequences. A nuclear war and annihilation of a great part of mankind in the case of the Cuban missile crisis and the mere slaughter of a few million Indochinese in the case of the Tonkin Gulf.

The most famous recent example of a war with catastrophic consequences that are still with us is of course the Iraq war, based on the lie of weapons of mass destruction. It must be noted that a tentative scientific evaluation of the number of deaths in the "war on terror" arrives at a total of 1.3 million

casualties,[1] which dwarfs the "crimes" attributed to Assad, Putin, Gaddafi, even when put together.

Here, I will consider another example of what is very likely a war-provoking lie, but that so far has not led to a major war, namely the alleged use of chemical weapons by the Syrian government in August 2013 in the East Ghouta near Damascus.

Of course, there have been many claims, by *Human Rights Watch* and the *New York Times,* among others, of having "proof" of the Syrian government's responsibility in those attacks.[2]

But one should also consider contradictory evidence. A significant example is a study entitled: "Possible Implications of Faulty US Technical Intelligence in the Damascus Nerve Agent Attack of August 21, 2013".[3] It was jointly written by a former UN Weapons Inspector, Richard Lloyd and a Professor of Science, Technology,

1. http://www.ippnw.de/commonFiles/pdfs/Frieden/Body_Count_first_international_edition_2015_final.pdf

2. For a critique of the NYT-HRW claims, see https://goo.gl/eS1jt7. The August 2016 UN report that accuses the Syrian government of having used chemical weapons does not deal with the 2013 events: https://goo.gl/wwczDo. For a discussion of this UN report, see https://goo.gl/7GEiMD

3. https://goo.gl/xcbwWZ. For more discussion of the «evidence», see also Gareth Porter: *How Intelligence Was Twisted to Support an Attack on Syria,* https://goo.gl/Xrw251.

and National Security Policy at MIT, Theodore A. Postol.

The conclusions of their study are unambiguous:

- The Syrian improvised chemical munitions that were used in the August 21 nerve agent attack in Damascus have a range of about 2 kilometers.
- The UN independent assessment of the range of the chemical munition is in exact agreement with our findings.
- This indicates that these munitions could not possibly have been fired at East Ghouta from the "heart", or from the eastern edge, of the Syrian government controlled area shown in the intelligence map published by the White House on August 30, 2013.
- This mistaken intelligence could have led to an unjustified US military action based on false intelligence.
- A proper vetting of the fact that the munition was of such short range would have led to a completely different assessment of the situation from the gathered data.
- Whatever the reasons for the egregious errors in the intelligence, the source of these errors needs to be explained.

- If the source of these errors is not identified, the procedures that led to this intelligence failure will go uncorrected, and the chances of a future policy disaster will grow with certainty.

It is unlikely that a former UN Weapons Inspector and an MIT professor would deliberately distort information out of love for the Syrian government, especially given the ideological climate in the United States. It is also unlikely that they would make an error in their analysis, given that it is based on rather elementary physics.

Another piece of evidence comes from the Pulitzer Prize-winning journalist, Seymour Hersh, who wrote: "British intelligence had obtained a sample of the sarin used in the 21 August attack, and analysis demonstrated that the gas used didn't match the batches known to exist in the Syrian army's chemical weapons arsenal. The message that the case against Syria wouldn't hold up was quickly relayed to the US joint chiefs of staff. The British report heightened doubts inside the Pentagon; the joint chiefs were already preparing to warn Obama that his plans for a far-reaching bomb and missile attack on Syria's infrastructure could lead to a wider war in the Middle East. Consequentially, the American officers delivered a last-minute caution to the

president, which, in their view, eventually led to his cancelling the attack."[4]

In a response to criticisms leveled against Seymour Hersh, the authors of the above-mentioned study, Richard Lloyd and Ted Postol wrote: "We do not claim to know who was actually behind the attack of 21 August in Damascus. But we can say for sure that neither do the people who claim to have clear evidence that it was the Syrian government. The mainstream American media have done a disservice to the public by allowing politically motivated individuals, governments, and non-government organisations to misrepresent facts that clearly point to serious breaches of the truth by the White House."[5]

Yet, these facts are rarely brought to the attention of the public or of the politicians. Indeed, when the former French foreign minister, Laurent Fabius, left office, he still complained, in February 2016, that Obama had not enforced his "red line", namely the use of force in case the Syrian government uses chemical weapons.[6]

It is interesting to see what was written at the time of the Ghouta attack in the American and

4. "The Red Line and the Rat Line", *London Review of Books* Vol. 36 No. 8 · 17 April 2014.

5. "Whose Sarin?", *London Review of Books Letters,* vol. 36, n.º 10, 22 de mayo de 2014.

6. http://www.europe1.fr/politique/fabius-sur-la-syrie-la-france-ne-decide-pas-seule-2669505

Israeli press. The *Times of Israel* headlined: "Israel intelligence seen as central to U.S. case against Syria."[7]

Then, in *Haaretz*: "AIPAC to deploy hundreds of lobbyists to push for Syria action".[8] Or, in *U.S. News and World Report*: "Pro-Israel lobby Seeks to Turn Tide on Syria Debate in Congress".[9] According to *Bloomberg*: "Adelson New Obama Ally as Jewish Groups Back Syria Strike".[10] And also, according to the *Times of Israel*, "U.S. rabbis urge Congress to back Obama on Syria".[11]

The New York Times explained some of the logic behind the pressure: "Administration officials said the influential pro-Israel lobby group AIPAC was already at work pressing for military action against the government of Mr. Assad, fearing that if Syria escapes American retribution for its use of chemical weapons, Iran might be emboldened in the future to attack Israel... One administration official, who, like others, declined to be identified

7. http://www.timesofisrael.com/israeli-intelligence-seen-as-central-to-us-case-against-syria/

8. http://www.haaretz.com/news/diplomacy-defense/1.545661

9. http://www.usnews.com/news/articles/2013/09/06/jewish-lobby-seeks-to-turn-tide-on-syria-debate-in-congress

10. https://goo.gl/rBU432

11. http://www.timesofisrael.com/us-rabbis-urge-congress-to-back-obama-on-syria/

discussing White House strategy, called AIPAC 'the 800-pound gorilla in the room,' and said its allies in Congress had to be saying, 'If the White House is not capable of enforcing this red line' against the catastrophic use of chemical weapons, 'we're in trouble'."

According to cables obtained by Wikileaks, Hillary Clinton, when she was United States secretary of state, wrote that: "The best way to help Israel deal with Iran's growing nuclear capability is to help the people of Syria overthrow the regime of Bashar Assad." The logic being that, with a new regime in Syria, "Hezbollah in Lebanon would be cut off from its Iranian sponsor since Syria would no longer be a transit point for Iranian training, assistance and missiles."[12]

Even so, it is not certain that Israel's war aim would be to overthrow Assad, at least in the near future. A clue to Israel's intentions is provided by a September 5 article in the New York Times: "Israeli officials have consistently made the case that enforcing Mr. Obama's narrow 'red line' on Syria is essential to halting the nuclear ambitions of Israel's archenemy, Iran. More quietly, Israelis have increasingly argued that the best outcome for Syria's two-and-a-half-year-old civil war, at least for the moment, is no outcome. For Jerusalem,

12. https://wikileaks.org/clinton-emails/emailid/18328

the status quo, horrific as it may be from a humanitarian perspective, seems preferable to either a victory by Mr. Assad's government and his Iranian backers or a strengthening of rebel groups, increasingly dominated by Sunni jihadis."

"This is a playoff situation in which you need both teams to lose, but at least you don't want one to win – we'll settle for a tie," said Alon Pinkas, a former Israeli consul general in New York. "Let them both bleed, hemorrhage to death: that's the strategic thinking here. As long as this lingers, there's no real threat from Syria."[13]

Efraim Inbar, director of the Begin-Sadat Center for Strategic Studies, stressed the same points in August 2016: "The West should seek the further weakening of the Islamic State, but not its destruction."Allowing bad guys to kill bad guys sounds very cynical, but it is useful and even moral to do so if it keeps the bad guys busy and less able to harm the good guys. The Hobbesian reality of the Middle East does not always present a neat moral choice. The West yearns for stability, and holds out a naive hope that the military defeat of IS will be instrumental in reaching that goal. But stability is not a value in and of itself. It is desirable only if it serves our interests...

13. http://www.nytimes.com/2013/09/06/world/middleeast/israel-backs-limited-strike-against-syria.html?

Moreover, instability and crises sometimes contain portents of positive change. Unfortunately, the Obama administration fails to see that its main enemy is Iran. The Obama administration has inflated the threat from IS in order to legitimize Iran as a "responsible" actor that will, supposedly, fight IS in the Middle East. This was part of the Obama administration's rationale for its nuclear deal with Iran and central to its "legacy," which is likely to be ill-remembered.

The American administration does not appear capable of recognizing the fact that IS can be a useful tool in undermining Tehran's ambitious plan for domination of the Middle East."[14]

At the time of the Ghouta attack, and in order to add to the dramatization, images of the Holocaust were brought into the fray. The Cleveland Jewish News published a letter from "leading rabbis" urging Congress to support President Obama's plans to strike Syria. "We write you as descendants of Holocaust survivors and refugees, whose ancestors were gassed to death in concentration camps," the letter said. By authorizing bombing raids, the rabbis said, "Congress has the capacity to save thousands of lives."[15]

14. http://besacenter.org/perspectives-papers/destruction-islamic-state-strategic-mistake/

15. *Cleveland Jewish News,* 6/9/2013.

Without this dramatization one would realize that, as the examples of Iraq and Libya show, the best way to promote human rights and protect populations is not to wage unilateral wars, destroy what is left of the international legal order and spread chaos.

One of the factors that led the Obama administration to give up its attacks on Syria, besides the information that he may have received (according to Hersh) contradicting the official reports, was the vote of the British Parliament against the war and the mobilization of the American public, putting pressure on the United States Congress not to authorize this adventure.

If Hillary Clinton is the next president of the United States, it is likely that steps toward open war in Syria will only increase. It is incumbent upon Western citizens to demand that claims justifying wars be examined with the utmost scientific rigor and that all point of views be heard and not only those with a militaristic agenda.

Jean Bricmont *(Uccle, 1952) is a Belgian theoretical physicist. He and Alan Sokal jointly wrote* Intellectual Impostures.

HARRIET HALL

Politics, Science, and Health

Carl Sagan said, "We live in a society absolutely dependent on science and technology and yet have cleverly arranged things so that almost no one understands science and technology. That's a clear prescription for disaster." The beliefs that politicians hold affect legislation on public health, medical research, and medical care. If they don't understand science, they are likely to adopt false beliefs and are not qualified to decide public policy.

The general public is appallingly ignorant of science. In a recent US survey, half of the respondents didn't know how long it takes for the Earth to travel around the Sun, and only 40% accepted evolution. Most people get their information from the media. According to Mark Twain, "If you don't read the newspaper, you're uninformed. If you read the newspaper, you're misinformed." He said that a century ago and things

haven't changed. Science reporting in the media is particularly unreliable. People often form strong opinions based on unquestioning acceptance of something they have heard or read.

Outspoken celebrities influence the public with their faulty ideas about health, from Jenny McCarthy's "vaccines cause autism" to Gwyneth Paltrow's vaginal steaming. Quacks offer a multitude of bogus "miracle cures." Questionable health gurus provide questionable information. There is good information but also a tremendous amount of misinformation on the Internet, and the average reader lacks the background in science and the critical thinking skills needed to separate the truths from the lies and distortions.

Politicians are no better informed than the general public, sometimes worse. Some of the congressmen who enact the laws in the United States have made truly idiotic public pronouncements. Todd Akin said women can't get pregnant from rape. Michele Bachmann said the HPV vaccine causes mental retardation. Heywood Broun said "All that stuff I was taught about evolution and embryology and the big bang theory, all that is lies straight from the pit of Hell." And he's an MD and is on the House Committee on Science!

Doctors are not exempt from faulty beliefs. MDs are not scientists; medicine *applies* science,

using scientific knowledge to treat the individual patient. Some MDs lack the training and the critical thinking skills needed to judiciously assess the medical literature. This has resulted in a naïve interpretation of "evidence-based medicine" where the results of randomized controlled trials are accepted even when they are inconsistent with basic science and common sense. Unfortunately, half of published studies are wrong. Promising initial studies are often followed by larger, better-designed studies that reach the opposite conclusions, and studies carried out by imperfect humans are subject to any number of human errors. Rather than relying on a single study, a true scientific thinker waits for replication and confirmation, looks for consistency with other knowledge, weighs all the published evidence pro and con, and considers the size, quality, and design of the studies. It's complicated. Non-experts are at a disadvantage. In fields outside our own, we must rely on experts; and it's hard to know who is really a reputable scientific expert we can trust and who is a poseur or biased by ideology. But having a good grounding in science and reasoning can go a long ways towards identifying sources that should be rejected as untrustworthy.

Doctors who are not good scientists have succumbed to what has been called "quackademic medicine," the infiltration of quackery into medical

schools and hospitals. Health insurance and government programs pay for several kinds of non-science-based treatments. In the UK, the National Health Service still pays for homeopathy, which not only has been shown not to work but couldn't possibly work (except as a placebo). Society is paying chiropractors to adjust spines for nonexistent "subluxations." It is paying acupuncturists to remove mythical blockages in the flow of a mythical life force called *qi* by inserting acupuncture needles into mythical acupoints and meridians. In some places, society is paying for untested naturopathic treatments and nonsensical energy medicine treatments.

"Integrative medicine" is the new buzzword. It is a marketing term designed to promote the infiltration of unproven treatments and sometimes even outright quackery into conventional science-based medical practice. They say they want to adopt those alternative treatments that have been proven to work. The problem is that there is no such thing as an alternative medicine that has been proven to work. By definition, alternative medicine is medicine that is not supported by good enough evidence to have earned it a place in conventional medicine. If it had been proven to work, it would have been adopted by mainstream medicine and we would no longer call it "alternative;" we would just call it "medicine."

Integrative medicine proponents practice deception when they claim that modalities like exercise, diet, massage, prevention, plant-based remedies, comfort measures, and treating the whole patient are the unique province of alternative medicine. They are not; they are all part of conventional clinical practice, and alternative medicine is merely trying to co-opt them.

Governments are licensing chiropractors, acupuncturists, homeopaths, naturopaths, and others whose practice is not based on science. This gives the practitioners validation and a prestige in the public eye that they do not deserve. Much of what they do may seem to work, but only because of two factors: placebo effects and the natural course of illness. Most symptoms fluctuate and many conditions improve naturally over time; and when they do, the alternative treatment may falsely get the credit. It has been argued that placebos are a good thing: the patients say they feel better, and surely that is what we want. But medical ethicists uniformly condemn the use of placebos because it constitutes lying and undermines trust in the doctor-patient relationship. Placebos may affect subjective symptoms but they cannot objectively change the course of illness, and using placebos can interfere with the recognition and effective treatment of serious illness.

Governments are an important source of research funding, especially in the basic sciences. Research funds are being misspent. Studies of implausible alternative treatments are being funded, leaving less money for research that is more likely to produce useful findings. In 1992, the US established the Office of Alternative Medicine, later renamed the National Center for Complementary and Alternative Medicine (NCCAM) and now the National Center for Complementary and Integrative Health (NCCIH). Its mandate was driven by a political agenda. It was not intended to ask *if* alternative treatments worked, but to create evidence that they *did* work and to fund studies that scientists would not otherwise think were worth doing, including new studies on treatments that had already been proven *not* to work. Despite spending over $2 billion, they have yet to find that any alternative treatment is effective. As research methodologist R. Barker Bausell pointed out, "It's become politically correct to investigate nonsense."

Scientific ignorance kills. In South Africa in the early years of the 21st century, the President and the Health Minister refused to believe the overwhelming evidence that HIV caused AIDS. Patients were denied lifesaving antiretroviral treatment, and instead were advised to follow a diet of garlic, olive oil and lemon to cure the disease. This

misguided public policy led to 300,000 HIV/AIDS deaths that could have been prevented.

Polio is a contagious disease that is only transmitted from human to human, with no animal reservoir. Just as with smallpox, an effective vaccination campaign ought to be able to eliminate it completely from the globe. By 2003, polio had been eradicated from all but six countries; one of those countries was Nigeria. A plan was developed to immunize more than 15 million children, which was expected to eliminate the disease in that country. Rumors spread that the vaccine had been deliberately adulterated with anti-fertility drugs, HIV virus, and carcinogens in an evil Western genocidal plot to kill Africans. There wasn't a shred of evidence for any of those paranoid imaginings. Political and religious leaders in three northern states led a boycott of the immunization program, the boycott was endorsed by the Governor of Kano State, and the program was suspended by the government for several months. The result was a resurgence of a Nigerian strain of polio that broke out and spread to 16 nations, infecting and paralyzing children as far away as Indonesia.

Both of these public health disasters could have been prevented if politicians had had the scientific tools and critical reasoning skills to unmask the faulty ideas.

Public policy should be determined by evidence and reason, not by rumors, uninformed opinions, and unfounded beliefs. We desperately need policymakers who understand science and who have the critical thinking skills to recognize misinformation, to evaluate the claims of lobbyists and special interest groups, and to recognize the difference between facts and opinions.

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BJØRN LOMBORG

Paris Climate Treaty

There is much to criticize in President Trump's announcement cancelling U.S. involvement in the planet's only real climate policy, the Paris Treaty.

Trump failed to acknowledge that global warming is real. He was wrong to claim China and India are the "world's leading polluters". (China and the U.S. are the largest carbon emitters,[1] and the U.S. is biggest on a per capita basis). Suggesting that the U.S. will "re-negotiate" the deal was just silly. The White House is left without a response to climate change, which is deeply problematic.

But this critique is easy. It is more difficult to be honest about the Paris Treaty's own intrinsic problems.

Environmentalists who were once honest about the Treaty's shortcomings have convinced

1. edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2015&sort=des9

themselves of its supposed virtues based solely on Trump's opposition. As highlighted by writers from the Breakthrough Institute,[2] back in 2015, noted environmentalist Bill McKibben found the Treaty did just enough "to keep both environmentalists and the fossil fuel industry from complaining too much".[3] Now, McKibben fears Trump's withdrawal "undercuts our civilization's chances of surviving global warming".[4]

In Paris, in December 2015, world leaders made fairly feeble carbon-cutting promises, and then declared grandiosely that their commitments would keep temperature rises "well below 2 °C" and even suggested that rises could be kept to 1.5 °C.

This extravagant claim is a mis-statement on the same scale as anything ever tweeted by Trump.

Based on current CO_2 emissions, achieving the 1.5 °C target requires the entire planet to entirely abandon fossil fuels use in 4 years.[5] That is never going to happen.

But even keeping rises to 2 °C is unrealistic. The UNFCCC – the United Nations organization

2. https://goo.gl/pQscPD

3. https://www.nytimes.com/2015/12/14/opinion/falling-short-on-climate-in-paris.html?_r=0

4. https://www.nytimes.com/2017/06/01/opinion/trump-paris-climate-accord.html

5. www.cicero.uio.no/no/posts/klima/should-climate-policy-aim-to-avoid-2c-or-to-exceed-2c

in charge of the Paris meeting – estimates that if every country makes every single promised Treaty carbon cut between 2016 and 2030[6] to the fullest extent possible and there is no carbon leakage, carbon dioxide emissions will be cut by 56 gigatons (Gt) by 2030. Yet, it is widely accepted that to keep temperature rises below 2 °C, we must reduce CO_2emissions by 6,000 Gt. Even in an implausibly optimistic, best-case scenario, the Treaty leaves 99 percent of the problem in place.

According to the UN's own main climate model, the difference between a world with all the promised cuts and one without them is 0.05 °C. Even if all nations including the U.S. extended their carbon cut promises throughout the century, temperatures would be reduced by less than 0.2 °C.[7]

Many Treaty advocates claim that the agreement will achieve a lot more. This rests on sophistry, and specifically on a far-fetched assertion that much stronger carbon cuts happen *after* 2030.

The Treaty commits nations to specific and reasonably verifiable (though non-binding) carbon-cutting promises up until the year 2030. After that, nothing is concrete, and for a very understandable reason: can you imagine a carbon-cutting promise

6. unfccc.int/resource/docs/2015/cop21/eng/07.pdf
7. onlinelibrary.wiley.com/doi/10.1111/1758-5899.12295/full

made by President Bill Clinton in 1993 being fulfilled by President Trump? Can you imagine a Democrat in 2035 (or perhaps even a Republican) feeling honor-bound by an environmental policy set by today's White House? Now ask that question of every other country on the planet.

When you're told that the Paris Treaty will achieve meaningful temperature cuts, the assumption rests on the hypothesis that almost all of the effort will happen after 2030.

History gives good reason for healthy skepticism. Take President Bill Clinton's 1993 announcement that the US would reduce emissions by 2000.[8] According to the Washington Post,[9] just seven years later – under the *same* president – the promise was dumped because "the economy has grown more rapidly than expected." In 1992, every industrialized nation promised to return emissions in 2000 to 1990-levels.[10] Eight years later, almost every single country missed the target.

If the planet requires a carbon "diet", the Paris Treaty is just a promise to eat a salad. Its advocates want us to believe that, after this salad is over, we will undertake an incredibly strict exercise and diet

8. www.presidency.ucsb.edu/ws/?pid=46460
9. www.washingtonpost.com/wp-srv/inatl/longterm/climate/stories/clim102397.htm
10. unfccc.int/resource/docs/a/18p2a01c01.pdf

regime. Mind you, none of the real effort will take place today or even tomorrow, but far, far in the future. Yet, we are expected to celebrate today as though a promise to continue life as normal while eating one, single salad is going to have a huge slimming effect.

Just as fallacious is the claim that solar and wind power are already taking over the world. Although much-repeated by renewable energy lobbyists and politicians, it isn't true.

Just 0.6% of the world's energy is derived from solar and wind energy.[11] The International Energy Agency (IEA) finds that even if the Paris Treaty is fully implemented, we will get less than 3% in a quarter-century. Fossil fuels will go from meeting 81% of our energy needs to 74% – three-quarters – in 2040. In an implausible best-case scenario, 58% of our energy needs will still come from fossil fuels.

Heard that China is the world's new "green superpower"?[12] This doesn't hold true, either. It gets just 0.5% of its energy from solar and wind power, less than hydropower (3%) and environmentally destructive wood-burning (7%),[13] and insignificant compared to the 89% that comes from non-renewables.

11. https://goo.gl/MwqDXX
12. https://goo.gl/4DbkNH
13. https://goo.gl/3DkK7H

Even in 2040, with the Paris Treaty in place, China will get 4.2% from solar and wind, with non-renewables providing 83.5%. (And even then, China's share of green energy will be *smaller* than it was at any point in the 20th century.)[14]

One of the world's foremost energy experts, Professor Vaclav Smil, puts it this way: "Claims of a rapid transition to a zero-carbon society are plain nonsense... even a greatly accelerated shift towards renewables would not be able to relegate fossil fuels to minority contributors to the global energy supply anytime soon, certainly not by 2050."[15]

If solar and wind truly were the cheapest option, the Paris Treaty would be unnecessary. Everybody would dump expensive, inefficient fossil fuels. Global warming would be fixed. Instead, in most situations, solar and wind require direct and indirect subsidies, and cutting subsidies means we get less renewable energy.

There are contexts where renewable is more efficient. But since all the solar panels or wind turbines in one place produce energy at the same time (when the sun is out and the wind is blowing), the value of electricity drops drastically,[16] undermining

14. https://www.wsj.com/articles/a-green-leap-forward-in-china-what-a-load-of-biomass-1486081133
15. https://goo.gl/vt61cd
16. https://www.nature.com/articles/nenergy201636

competitiveness. When there is no sun or wind, we must pay for backup fossil fuels, which now cost more because they are used less.

This year, the world will spend $125 billion on subsidies just for solar and wind. Over the next 25 years, more than $3 trillion will prop up the grand "achievement" of meeting less than 3% of the planet's energy needs.

Al Gore's climate advisor and one of the world's best-known climate change scientist, Jim Hansen, says: Many well-meaning people proceed under the illusion that 'soft' renewable energies will replace fossil fuels if the government tries harder and provides more subsidies... But suggesting that renewables will let us phase rapidly off fossil fuels in the United States, China, India, or the world as a whole is almost the equivalent of believing in the Easter Bunny and the Tooth Fairy."[17]

Another faulty argument is the claim that "green energy creates jobs". However, standard economic theory suggests that jobs created in this area will come at the cost of jobs elsewhere; this has been borne out by analyses in Denmark and elsewhere.

Indeed, the fact that solar energy requires more jobs per kWh than fossil fuels is actually negative. Following this logic, if we wanted dramatically more

17. www.columbia.edu/~jeh1/mailings/2011/20110729_BabyLauren.pdf

jobs in agriculture, we should stop using tractors. Why don't we? Because society gets poorer when we invest in a less efficient way of achieving something we can do already.

This is a crucial point that Treaty advocates often overlook: doing things less efficiently has a cost. Apply this fact to a global pact in which national governments promise to use less efficient, more expensive energy, and it means that the entire world develops at a slightly slower pace.

An understandable response to such concerns is to say that doing *something* is better than nothing. Or to note that the Paris Treaty will help the world's most vulnerable. True: they will still be much more vulnerable in the future than today, but slightly less than they would have been without the Treaty.

Such statements serve to reassure us that we are on the right track – but they rest on faulty logic, ignoring the alternative ways we could spend the political capital, energy, and money devoted to the Paris Treaty.

Few realize the immense expense. The annual cost adds up to $1-2 trillion by 2030 and each year for the rest of the century, mostly in GDP growth loss.[18] This will be the most expensive treaty in history. (Indeed, costs are the key reason the "Visegrad Four" threaten to undermine the European Union's

18. https://goo.gl/wpCyDZ

own carbon-cutting consensus.)[19] This is $150-$300 dollars for every person in the world, every year. It's logical that taxpayers in wealthy nations will ask whether this is money that could be better spent on schools, hospitals, or care for the elderly.

And in the developing world, there are definitely better ways to allocate that money. The world's climate-vulnerable are almost invariably the worst-off today. Climate is a first world concern; for the vast majority of the planet there are more immediate problems. The UN's global poll of almost 10 million people's priorities reveals that climate change comes last behind health, education, food, governance and other issues.[20]

When President Obama invited African leaders to talk about green energy in 2014, they told him they needed more coal, to lift their populations out of poverty.[21] IEA analysis[22] shows that using more energy, mostly fossil fuels, could make these nations $8.4 trillion richer, eradicating indoor air pollution for 150 million and giving energy to another 230 million.

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19. https://www.ft.com/content/f5d017f8-84b2-11e6-8897-2359a58ac7a5

20. data.myworld2015.org/

21. https://www.facebook.com/bjornlomborg/posts/10152702473118968

22. www.iea.org/publications/freepublications/publication/africa-energy-outlook.html

Analysis by the Copenhagen Consensus has highlighted many phenomenal development investments where a fraction of the Treaty's budget would make vulnerable communities much more resilient today than carbon cuts would in 100 years.[23]

This doesn't mean ignoring climate. We could rein in temperature rises more effectively. We need to drastically improve green energy. Research and development is key, according to Vaclav Smil, philanthropist Bill Gates,[24] and the climate economists and 3 Nobel Laureates who participated in the Copenhagen Consensus on Climate research project.[25]

We are far too focused on subsidizing the rollout of technology that remains inefficient and unreliable, rather than investing in innovation to drive the future price of green energy below fossil fuels. Once it is genuinely competitive, the whole world will want to leap from fossil fuels to green energy. Copenhagen Consensus research shows a meaningful R&D budget, worth around $100 billion annually, would be the most effective policy response to global warming.

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23. www.copenhagenconsensus.com/post-2015-consensus/nobel-laureates-guide-smarter-global-targets-2030

24. https://goo.gl/pCKXM4

25. www.copenhagenconsensus.com/copenhagen-consensus-climate

The biggest misfortune for the U.S. isn't that President Trump called time on involvement in the Paris Treaty, but that he shows no signs of investing in green energy R&D.

The tragedy for the rest of the world is that we are so intent on opposing President Trump, that we are left championing a treaty that requires hundreds of trillions of dollars to make no meaningful difference to temperature rises, instead of being open to a more effective, alternative approach.

It is too easy to criticize President Trump's abandonment of climate policy without being honest about the severe shortcomings of the remaining global consensus. We are fooling ourselves if we pretend that the Paris Treaty is what the planet needs.

Bjørn Lomborg *(Frederiksberg, 1965) is a Danish environmentalist. He is the author of the work* The Skeptical Environmentalist.

MICHAEL P. LYNCH

Truth in a Post-Truth Age

Truth, to paraphrase Oscar Wilde, is rarely pure and never simple. Given everything that has happened over the last year – from Brexit to the election of Donald Trump to the U.S. presidency – you could be excused for wondering if it exists at all. As more than one commentator has noted, we seem to be living in a "post-truth" society where lies are tolerated and facts ignored.

So, what *is* truth, anyway?

That's a question so philosophical as to seem rhetorical. But it is not rhetorical. As today's dark political situation makes clear, it is an absolutely fundamental political question. Reflecting on this question – on what truth is, can help us see why truth still matters for democracy.

When we ask about the nature of truth, we are usually interested in what makes a belief or statement true (and others false). Unsurprisingly

philosophers (being, you know, *philosophers*) have been divided. Historically speaking, two ideas, each organized around a central metaphor, stand out.

The first idea is that true statements are like maps. The roadmap Google pulls up on your phone is accurate when it represents the roads as they are, and inaccurate when it doesn't. In the same way, the thought goes, a statement is true when it corresponds to the facts as they are. Truth is found; it is a matter of correspondence to the world.

The correspondence theory is an old idea, going back to Aristotle. But it is not without problems. The prevailing objection echoes Wilde: the theory seems to make truth *too* plain and simple. It may be plausible when we are talking about physical things in our immediate environment: roads and bridges, roses and bees. But most of the statements we make are riddled with value judgments, and it is harder to see statements about values as maps. That's because statements like "deporting immigrants is morally wrong" aren't empirically verifiable. You can't verify it in a lab – which is precisely what makes some think that political or moral truth is a philosophers' fantasy.

But such cynicism is unwarranted and dangerous. Give up on the thought that there is any truth in values or politics and you give up on both the idea that people can make moral and political pro-

gress and the idea that they can make moral and political mistakes. You can't make sense of political progress without the idea of truth because to make such progress requires that a culture has improved in its political judgment. What was once thought true (racism) is now known to be false. We must appeal to truth to understand that we got it wrong, and to remind ourselves that we may still have it wrong.

This last point is doubtless what is most salient to us now. As George Orwell knew, without the idea of truth, we can no longer make sense of talking truth to power. Political criticism becomes just an expression of sentiment, not something that can be justified by, or defeated by, evidence.

So the correspondence theory of truth is promising, but it fails to explain political and moral truth. And that can, sadly, encourage people to be cynical about the possibility of such truth.

It has also encouraged other thinkers to construe truth as something else entirely, to see it as a coherent story that we all agree on. According to this second view, true statements are those that fit into a workable narrative, one that we can use to explain things to ourselves and others. False statements are those that don't fit, that we can't use, which run up against the other things we believe. Call this the coherence theory of truth.

There is something right about the coherence theory. Not all statements are like little maps. Statements about values and politics *are* more like stories; very messy, disorderly stories with which we weave the fabric of much of our lives.

But the mere coherence of a story can't by itself make it true. That's because you can make any story internally coherent as long as you are willing to say enough crazy stuff. Nonetheless, there has been a disturbing tendency in both the US and certain parts of Europe to mistake coherent narratives for truth. This is a tendency that has only been encouraged by social media – platforms that encourage coherence by wrapping our communications into tightly formed webs or "social networks" of like-thinking individuals. It is incredibly easy – too easy – to achieve coherence on platforms that, by their very design, encourage consensus. If we make our political claims only to our friends and fellow travelers, then it is no wonder we are lulled into thinking that their unchallenged internal coherence makes them true.

Mistaking mere internal coherence for truth is a grave mistake, just as it is a mistake to think that all truth must be a matter of correspondence with a physical world. The truth about political truth is that it is a combination of both.

To be true, a political narrative has to more than internally coherent; it also must cohere with

what else we know about the world. *It has to be nailed down to the outside facts.* White supremacists can (maybe) tell an internally coherent story about what they value; but their whole story isn't true because it contains assumptions like "science tells us non-whites aren't as intelligent as whites". And that sort of statement would have to correspond to certain measurable facts in the world were it to be true. (Newsflash: it doesn't).

In short, we need both metaphors: stories and maps. Truth is not just about making up coherent stories, but it is not always about charting the world either. Truth can come in more than one form; but it is still real for all that.

There is an important lesson here. When it comes to values, aiming at truth is as important as it is in science, even if it is messier, greyer, more confusing. But it is a mistake to think that our stories of values are wholly separate from what else we believe about the world. The coherent narratives we weave about justice and values can be true, as long as they also fit whatever evidence the world supplies. Of course, knowing when that happens is the hard part, especially – as is the case in our polarized, digital society – we don't agree on what "evidence" is. But while that's so, it doesn't excuse us from taking truth and evidence seriously, and from holding others to account for not doing so.

Truth is a complicated and distant target; one that is difficult to know you've hit. But there is value in even aiming at it; and we must continue to do so, while there are still arrows left in our quiver.

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MATTEO MOTTERLINI

Keeping democracy fit, or policies of proven effectiveness

Our governments have squandered enough time on ideologies and clichés concerning the Italians. If they ceased to assume that they know what they are doing and began to check the effectiveness of their assumptions, we could make use of the knowledge of the behaviour patterns underlying our decisions and, in general, exploit the behavioural sciences for our own benefit.

In other words, we could frame and implement more effective and efficient policies, because they would be based on evidence (and not on somebody's convenience). This is what is becoming increasingly well known as the 'nudge theory' and its benign practice (from the book by Sunstein and Thaler – 750.000 copies sold, translations into 32 languages): the nudge strategy is a new way of governing which is currently

being applied with considerable success around the world.

Small and carefully crafted changes in the environment in which our everyday decisions are taken can produce enormous effects on our choices. Not surprisingly, private businesses seeking to maximise their profits were quick to grasp this. The public authorities, which ought to maximise the wellbeing of citizens, are now beginning to catch up. Nudges – of a more or less gentle nature – now come from all sides on a daily basis and, more or less visibly, have an impact on everybody's decisions. The world is full of 'cognitive predators', who exploit the limits of our rationality. And you may rest assured that the 'industry of human frailty' is always in business. The nudge industry is an invisible force (like electromagnetism or gravity), which has always existed and always will, which we cannot genuinely resist but which – so long as we understand it – we can pragmatically apply for more worthwhile purposes for the betterment of society.

Behavioural approaches to policy-making aim to create environments for choice structured on the complexity of the cognitive and social factors that influence decision-making. They are applied in the light of evidence from results achieved by implementing measures. In this way, if policy-makers are properly motivated and well-intentioned, and

do not merely act for purposes of propaganda and electoral advantage, they could indeed effectively acquire an instrument to promote virtuous behaviour by individual citizens and by people collectively, increasing freedom of choice and simplifying regulatory policies.

How can we ensure that certain public-policy measures will have the desired effects? How can we tell whether a nudge is working? What tells us that this choice of architecture is effective?

Here is a quite new project: psycho-economics as a guide to formulating ideas about good governance measures, with evidence on the ground as a test. Simple and at the same time revolutionary. This is the way to do it. First, exploit the cognitive processes which govern people's choices and decisions. Second, check that the measures that we believe to be effective will actually have the desired effect once put into practice. Third, adopt suitable legislation to implement them.

However, traditionally, the planning of economic and other public policies has neglected two important factors. On the one hand, little use has been made of results obtained from the behavioural and social sciences. On the other, policy-makers have not succeeded in exploiting the strengths of the experimental method. The practice has been rather to follow the line suggested by neoclassical

economic theory, which regards each individual as a rational calculator of his own anticipated advantage. As a result of using this abstract model, which in the light of recent experimental findings is a poor match for the real mainsprings of human choice, policy-making has sought to regulate individuals' behaviour mainly by altering economic incentives and using prohibitions and rules.

However, in the past ten years, the fertile combination of two innovative approaches has sought to transform this panorama. The nudge revolution shows how to exploit social and cognitive factors which influence decisions with a view to promoting virtuous behaviour by guiding individuals' freedom of choice without restricting it. Evidence-based policy introduces experimentation to assess which policies really work and which do not, on the basis of evidence provided by results gathered, thus removing the planning of public policy from the sphere of sterile debates governed by prejudice and ideology.

Choice architecture is the way in which options are presented in a decision-making process. Just as the structure of a building places physical limits on the possibility of moving and interacting with it, so the way in which choice space is structured influences the outcome of a decision. Any detail may prove to be important, and the scope

for conditioning is ubiquitous and never neutral. In the case of the disposition of food at a meal, for example, the way in which dishes are presented and the size of the plates and glasses affect what people choose to eat and in what quantities. It has been found that placing healthy dishes in a prominent position increases their consumption, while reducing the diameter of servings reduces the amount of food wasted.

In general, we never take decisions in a vacuum but always in a particular context. Structuring the context is the task of every architect of choice. In policy-making processes, institutions have the option of exploiting cognitive mechanisms – which are increasingly well understood by the neurosciences of decision-making and increasingly applied in cognitive (or behavioural) economics – to guide people towards 'virtuous' behaviour by means of a nudge, to the benefit of both the individual concerned and of society.

This being so, it is necessary to define an appropriate skill set for those who draw up plans and design choice architectures. It should be noted that there is no question of allowing the abstract and idealised economic theory of rational choice to dictate public economic policy: rather, it is a matter of designing measuresbased on how we actually take our decisions. It is the awareness of how limited our

rationality is that can help us to control it, placing the transparency of policy measures at centre stage. This is the main point of an epistemological analysis serving as a background to the correct use of nudge theory, based on two elements: (i) the training of competent architects of choice, equipped with method and methodological awareness; (ii) the gathering of evidence concerning the effectiveness of action and, ultimately, its transparency.

Who, after all, would willingly take a medicine whose effectiveness had not been rigorously tested? Why should we adopt a different attitude to public policies? They too affect the wellbeing of millions of people and, just as in the case of clinical and pharmaceutical research, it is necessary to check the validity of possible types of 'treatment' in practice. The product of this applied research will be policies based on evidence rather than on someone's convenience. A methodology which, if adopted for public policy measures, also has the major advantage of increasingly bridging the gap between the 'dismal science' – as economics is customarily called, being the discipline that studies the allocation of scarce resources – and other sciences 'which work'. This also makes it possible to separate the stages of planning, implementation and assessment of such measures from a political debate which, not only in Italy, is too often ideological, if not demagogic, and therefore vitiated by cri-

teria and considerations which have little or nothing to do with effectiveness. Heather Smith, President of Rock the Vote – an influential independent political activism association in the USA whose mission it is to provide political representation for new generations – has called them 'prescriptions for democracy'. The definition is apt, and it cannot be denied that our democracy is to some extent in need of prescriptions. It is true that experimentation costs money; but how much might it cost us to continue not to engage in it?

Political effectiveness and economic growth are linked: the quality and effectiveness of public policies are the key to countries' competitiveness and their capacity to attract investment. In Italy, it is fair to say that the regulatory context in which individuals, businesses, investors and the public authorities themselves operate is not ideally suited to promoting flexibility, competitiveness and rapidity. Everybody laments the fact. But when people try to change this situation, they do so on the basis of preconceptions, hypotheses or, at best, partial data. Why does it not occur to anyone to commission research to establish what the result one measure or the other will be? When it comes to pursuing the common good, reducing energy consumption, paying taxes or preventing behaviour detrimental to the personal interests of the person displaying it, such as overeating,

smoking, drinking too much or gambling, the key to the success of any policy measure is correctly predicting how individuals will behave.

In recent years, growing numbers of academic disciplines have encouraged the application of the experimental method to policy-making. In this way it is possible to establish which projects work and to reduce the degree of uncertainty which characterises all measures undertaken in the complex social world. Evidence-based policy bases the practice of policy-making on proven effectiveness. As a result, it is possible for the planning and implementation of economic, public and social policies to cease being guided by intuition, dogmas and prejudices, which typically characterise the ideological debate. This renewal is due both to the transformation of economics, which has become much more open to experimental approaches, and to the successes achieved in the medical sciences. This Randomised Controlled Trials methodology forms the basis for the experimental assessment of most of the research carried out so far in the field of behavioural approaches, among which that implemented by the Behavioural Insights Team in Britain is particularly noteworthy. From the use of social messaging to collect taxes to the attempt to create new re-employment programmes, everything is based on the idea of isolating two groups and then applying a

measure to one and not to the other. The results obtained – if they are different – are imputed to the variable which has been manipulated, to the application of a nudge. This assessment of effectiveness and understanding of chance factors on the ground can be carried out on various scales, depending on the instruments available and the complexity of the behaviour which is to be influenced.

Nudge theory and its methodology unquestionably raise ethical issues. The mere fact that something is effective does not intrinsically make it right in its specific applications. When something is altered which has an impact on the wellbeing of millions of citizens, it is necessary to be responsible in communicating aims and above all to be transparent about how it is intended that the action should be taken. But is a government that spends public money on measures based on guesswork really ethical? Can we continue to allow ourselves to make do without evidence when trying to select the most effective measures?

Not according to the President of the United States. On 15 September last year, a glorious day for the cognitive sciences around the world, the White House issued an executive order with a title which constitutes a programme: 'Using Behavioral Science Insights to Better Serve the American People'. It states that there is a mass of evidence to show that

the behavioural sciences make it possible to plan better policies, to achieve results at lower cost and to increase the effectiveness of government. The executive order encourages all departments and executive agencies to apply them.

In conclusion, behaviourally informed approaches are just one of the possible approaches to evidence-based public policy, but they have a huge element of originality on their side. Intelligent choice architectures, which are citizen-friendly, are the alternatives to contexts dominated by explicit rules and dictates, with the attractive consequence that it finally becomes possible, to some extent, to do without regulation as a primary instrument to guide behaviour. Empirically, this burgeoning prospect has already achieved its first successes. The aim of future research is to develop a theoretical and pragmatic framework which is methodologically aware and ethically informed and can guide policy-makers, so that those who plan environments of choice that are simpler, sustainable and beneficial to the individual can do so in a responsible manner.

Matteo Motterlini *(Milan, 1967) is an Italian philosopher of science. He wrote* Trappole mentali *(Mental Traps).*

JOSÉ MIGUEL MULET

Pseudoscience in the European food regulations

Food production is the main limitation for development. Nowadays Europe imports about 35% of the food it requires and this tendency has been increasing in recent years. EU agricultural policy is strongly supporting practices such as organic farming and impeding the development of alternatives such as biotechnology-based agriculture, which has proven to be successful in other regions of the world such as the USA, the Americas or Asia. The main concern that I will present in my talk is that this policy lacks a scientific basis and is grounded in superstition and pseudoscience, and the results may be catastrophic.

Is it a wise policy to officially support organic production? Although the consumption of organic food is increasing in Europe and other parts of the world, overall it is a minor option accounting for less than 6% of the total agricultural land in Europe

and less than 1% worldwide. Most consumers think that organic food has better nutritional value or that its production is more sustainable but to date there is no scientific evidence confirming these assumptions. In addition, productivity is very low and as a result the price is higher. What is the origin of the problem? A close analysis of the European Council regulations on organic food production gives some hints as to the roots of the problem. Pseudoscience is present throughout the regulations, either indirectly or explicitly.

Here are some examples of the explicit reference to pseudoscience in some European regulations:

Spirituality in the European regulations for food production

Organic regulations are based on the principle that everything used in agriculture must be of natural origin. This goes against our basic knowledge of chemistry, whereby the properties of any material depend on its composition, not its origin. But there are also some explicit references to pseudoscience. For instance, in chapter 2, article 12 (plant production rules) (c) of the Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products, which re-

peals regulation (EEC) No 2092/91, it states that "the use of biodynamic preparations is allowed". Many consumers consider biodynamic agriculture a similar method to organic farming, but in fact it is much older. Biodynamic agriculture is based on a series of conferences given in 1924 by Rudolf Steiner. Biodynamic agriculture hinges on spiritual and mystical perspectives, from the anthroposophy movement, which was also an invention of Steiner. It originated as a segregation of the theosophy movement, an esoteric philosophy created by Helena Petrovna Blavatsky in 1875. Biodynamic practices are a compendium of superstition and beliefs, with no scientific support or proof, and a strong presence of oriental spirituality and astrology. Biodynamic believers consider the aerial part of the plants to be regulated by certain planets and the roots by others. Does this work? The very few available studies comparing biodynamic production with conventional production have failed to find any improvement at any level (nutritional quality, productivity, food safety). In fact, the assumptions of Steiner were based on spiritualistic inspirations but not on an agronomical experimental programme or anything of the kind. One example of this lack of a scientific basis is the formulation for some biodynamic preparations. For instance, Number 503 consists of "cutting chamomile flowers before 10 a.m., drying

them and placing them into a fresh cow's intestine, tying both sides and burying them in the soil during Autumn in an unglazed earthen jar and digging it up in early spring". Or the biodynamic preparation number 505, which consists of "grinding oak bark into powder in Autumn and then placing it in a cow or sheep skull and then burying it in a swamp or stream. Another practice includes the use of animal horns filled with manure". It is obvious that these practices are not related to science-based agriculture or food production, but to superstition. Another concern about the explicit inclusion of biodynamic preparations in the European regulation is the fact that biodynamic certification depends mainly on a single company, Demeter, related to the theosophy movement, that is, the group created by Steiner himself and which includes other well-known companies such as Triodos Bank and the cosmetics company Weleda, but biodynamics is not the only pseudoscience present in the regulations.

Homeopathy in the European regulations for food production

Articles 14 and 15 from the aforementioned regulation of 2007 state that: (ii) "disease shall be treated

immediately to avoid suffering of the animal; chemically synthesised allopathic veterinary medicinal products including antibiotics may be used where necessary and under strict conditions, when the use of phytotherapeutic, homeopathic and other products is inappropriate." In addition, the Commission Implementing Regulation (EU) Number 354/2014 of 8 April 2014 point (9) says: "In the amended wording of Article 24(2) of Regulation (EC) No 889/2008, 'homeopathic products' had erroneously been omitted. Since those products appeared in that provision before the amendment by Implementing Regulation (EU) No 505/2012, they need to be reinserted.", and point (1) of Article 24 states that "in Article 24, paragraph 2 is replaced by the following: '2. Phytotherapeutic and homeopathic products, trace elements and products listed in Section 1 of Annex V and in Section 3 of Annex VI shall be used in preference to chemically-synthesised allopathic veterinary treatment or antibiotics, provided that their therapeutic effect is effective for the species of animal, and the condition for which the treatment is intended."

The explicit mention of homeopathy in different regulations is something that strengthens the idea of a lack of scientific evidence supporting many European regulations. Homeopathy is based on the ideas of Samuel Hähnemann, a German

doctor who died in 1843. Hähnemann developed several principles based on his own experience. The homeopathy principles determine that "like cures like" and that the more diluted a remedy, the more effective. The level of dilution used in most homeopathic preparations usually continues well past the Avogadro number, that is, a 30CH homeopathic dilution is less than a molecule with a sphere the size of the solar system. Therefore, the final product is just water, which usually is sprayed on sugar pills. Chemistry considers homeopathy nonsense and it lacks any biological plausibility. None of the principles or assumptions postulated by Hähnemann in his book "*Organon der rationellen Heilkunde*" have been confirmed by science so far. There are practically no studies with positive outcomes using homeopathy. Systematic reviews have not provided any evidence in favour of homeopathy, either in medicine, veterinary science or farming. A clear fact against the validity of homeopathy exists. 200 years have gone by since the works of Hähnemann and there is still no homeopathic treatment which is in official use in medicine or veterinary agronomy. Hence, the regulation for organic food production recommends the use of homeopathy but there is no scientific evidence to support this recommendation. Homeopathy is plain pseudoscience.

Is the European GMO ban based on scientific evidence?

Agronomical politics in Europe is strongly focused on promoting organic agriculture, yet the use of crops based on genetically modified organisms (GMO) is strongly impaired. So far Maize (MON810) is the only crop commercially produced on European soil, but almost 80, including other varieties of maize, sugar beet, cotton, soy beans and rapeseed Some other crops, many of them developed in Europe are under evaluation, but many of them, in spite of having a positive EFSA evaluation, are not authorized. This is strongly impairing the development and progression of European agriculture and creates many paradoxical situations. For instance, Europe spends millions of euros analysing whether food imports contain any unauthorised or unlabelled GMO, but any European travelling to the USA will likely eat food containing some of these unlabelled GMOs. This situation dates back over the last twenty years, without any reported problem. Unlike organic production, farmers opting for GMO have no access to any public subsidies, even though the production of GMOs in Europe (cultivated mainly in Spain) is growing.

The direct or indirect support of anti-GMO campaigners by the EU has other harmful effects,

not only on the economy. Over 40 attacks against experimental fields have been reported, causing serious harm to scientific installations and damaging effects on science projects, many of them funded by the EU itself. The most dramatic case was in June

José Miguel Mulet during the event «The Skeptical Razor: political lies and their social consequences», organized by Euromind on November 2, 2016 in Barcelona

when a member of the GMO panel of the EFSA received a letter bomb. As the French philosopher Voltaire said "Those who can make you believe absurdities, can make you commit atrocities".

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MICHAEL SHERMER

The Rise of the Nones

Before the rise of the religious right in the 1980s most politicians kept their faith to themselves. In 1945, for example, President Harry Truman, wrote: "I'm not very much impressed with men who publicly parade their religious beliefs." After his election in 1953 President Dwight D. Eisenhower joined a Presbyterian church, but when he heard the minister was publicly boasting about his new member, the general commanded: "You go and tell that goddam minister that if he gives out one more story about my religious faith I will not join his goddam church!" John F. Kennedy discussed his Catholicism only when forced to do so by critics during the 1960 presidential campaign. In a 1964 interview with the *Baptist Standard,* President Lyndon Johnson explained, "I believe in the American tradition of separation of church and state which is expressed in the First Amendment to the Constitution." Richard Nixon

was famously a Quaker, but what he practiced can best be described as religious expediency – whatever worked politically. Gerald Ford called his religiosity "very personal" and wrote, "I am most reluctant to speak or write about it publicly." Even the openly evangelical Christian, Jimmy Carter prioritized his religiosity below that of most political issues.

This all changed in the 1980s when evangelical pastor, Jerry Fallwell and his Moral Majority (famously characterized as "neither") convinced Christian politicians that evangelizing for the Lord included knocking on doors within the beltway. Throughout the 1990s and 2000s Christian sects and faith-based organizations such as Ralph Reed's Christian Coalition of America and James Dobson's Focus on the Family used rallies and donor support to convince politicians and candidates that if they didn't pander to religious voters they stood little chance of being elected. The result has been a nauseating display of political cheerleading for Christ, from proclaiming Jesus as your favorite philosopher to petitioning the almighty at the end of public speeches to "bless the United States of America."

Those days may be over. To those of us who are atheists, agnostics or "spiritual but not religious," and who prefer to keep the Constitution and the Bible in separate drawers, the Pew Re-

search Center has just published data from a massive representative survey of 35,000 adult Americans, revealing that the fastest growing religious cohort in America are the "nones" – those who check the box for "no religious affiliation." Such unaffiliated numbers have been climbing steadily out of the single-digit cellar in the 1990s into a now respectable two-digit 23 percent of adults of all ages, up from 16 percent since just 2007. More telling for politicians who cater their campaigns toward younger voters, 34 percent of millennials – those born after 1981, and the nation's largest living generation – profess to having no religion. A third! That's a viable voting bloc.

It is really the raw numbers that should give pause to any politician or candidate contemplating ignoring this voting bloc. Today, there are about 245 million adult Americans. This translates into 56 million religiously unaffiliated adults of all ages, more than either mainline Protestants or Catholics and second only to evangelical Protestants. This translates into 19 million more people who have no religion since just 2007, an encouraging trend for those who have grown weary of America's slide towards theocracy.

The trend lines are as unmistakable as they are consequential. As the religious pig makes its way through the generational python – from the Silent

Generation (b. 1928-1945) to Baby Boomers (b. 1946-1964) to Generation X (b. 1965-1980) to Older Millennials (b. 1981-1989) to Younger Millennials (b. 1990-1996) – the number of the faithful coming out the other end will inexorably diminish in both number and influence. In addition, people are changing religions – the Pew survey found that 42 percent of Americans currently adhere to a religion different from the one into which they were born and raised, further eroding the quaint notion of there being One True Religion. Yes, some people raised with no religion became religious (4.3 percent of U.S. adults), but four times as many went the other direction.

Imagine no religion. This is no figment of your imagination. It is happening now and it may be the most important trend of the new century. Indeed, pulling back for a big history perspective, the shedding of religious dogmas and the demolishing of ecclesiastical authoritarianism has been underway ever since the Enlightenment, and in my new book *The Moral Arc* I claim that this may well be the most important thing that has ever happened to our civilization.

Why?

The rules made up and enshrined by the various religions over the millennia did not have the expansion of the moral sphere to include more

and more people as their goal. Moses did not come down from the mountain with a chiseled list of the ways in which the Israelites could make life better for the Moabites, the Edomites, the Midianites or for any other tribe of people that happened not to be *them*. The Old Testament injunction to "Love thy neighbor" at that time applied only to one's immediate kin and kind and fellow tribe member. It would have been suicidal for the Israelites to love the Midianites as themselves, for example, given that the Midianites were allied with the Moabites in their desire to see the Israelites wiped off the face of the earth – a problem modern-day Israelites are familiar with if you substitute Iranians for Midianites. It is in this way that religion is tribal and xenophobic by nature, serving to regulate moral rules within their community and impose them on other groups through force or conversion. In other words, faith forms an identity of *those like us*, in sharp distinction from *those not us,* variously characterized as heathens or unbelievers.

Yes, of course, most Jews and Christians today are not nearly so narrowly tribal as their Old Testament ancestors, but why? It is not because of some new divine revelation or biblical interpretation. The reason is that Judaism and Christianity went through the Enlightenment and came out

the other side less violent and more tolerant. Ever since the Enlightenment, the study of morality has shifted from considering moral principles as based on God-given, divinely-inspired, Holy book-derived, authority-dictated precepts from the top down, to bottom-up individual-considered, reason-based, rationality-constructed, science-grounded propositions in which one is expected to have reasons for one's moral actions, especially reasons that consider the other person affected by the moral act.

But the West only rejected religion as a valid system for determining political decision recently, and the change has been only relatively progressive – relative to more extreme and fundamentalist religious sects in the world. There are enough religious extremists in America today that we must be vigilant and insist that our political process – one design for all of us to participate in – not be taken over or unnecessarily influenced by particular home-grown sects bent on tearing down Mr. Jefferson's wall separating church and state. Here the trends are also positive. In the case of same-sex marriage, for example, where only a few years ago religions like the Latter Day Saints (Mormons) could pour money into campaigns to block bills that would grant homosexuals the same rights as heterosexuals, but those strategies

no longer work. Why? Because secular values are winning out over religious values in the marketplace of ideas.

We see too well everyday what religion can do to a state. The Enlightenment secular values that we hold dear today – equal treatment under the law, equal opportunity for all, freedom of speech, freedom of the press, civil rights and civil liberties for everyone, the equality of women and minorities, and especially the separation of church and state and the freedom to practice any religion or no religion at all – were inculcated into the minds of Jews and Christians and others in the West, but not so much in Muslim countries, particular those who would prefer a return to a 7th century theocracy.

Herein lies the most profound meaning of this seismic shift in the tectonic plates of religious belief – militant Islamism and what happens when people take their faith seriously and refuse to accept the hard-won secular values of the West. As ISIL forces destroy the remnants of thousands of years of civilization in the name of their religion it is time we renounce faith altogether as a reliable method of determining reality and morality. It's time we stop electing politicians who put their religion before the Constitution or insist that they will pray before making political decisions (like going to war), and

instead rely on the best tools ever devised for advancing humanity out of the trees and to the stars – reason and science.

Michael Shermer *(Glendale, 1954) is an American science popularizer. Editor-in-chief of* Skeptic *magazine, he wrote* Why People Believe Weird Things: Pseudoscience, Superstition, and Other Confusions of Our Time.

ADOLF TOBEÑA

Demanding doubt

Skeptics are always in the minority. They tend to be frequently perplexed and even shocked at the unalterable preeminence of credulity. They bear an expression of weary frustration at the perseverance of those beguiled by the endless preaching of charming spells and unfounded hopes. Although the seduction and compelling capacity of many doctrines, theories or prescriptions may have blatant holes in them, new versions or slight alterations in the old ones renew the script and the devotional gathering. And often, with overwhelming success. It happens in all fields: religions, political ideologies, philosophical theories or models of social reform or hygienic intervention are dressed up in different terms to attract processions eager to dispense with any precise and objective comparative measures. With any solid and replicable data.

This is the way it is, and the way it will remain. Not much can be done apart from abiding by the principles of systematic and demanding doubt, in all situations and circumstances, in spite of their minority impact. This recurring and excessive propensity towards credulity has its roots in the workings and networks of the neural networks. It rests on preferential attributes used by the brain to try to understand the physical and social environment. The brain produces, from one moment to the next, versions or representations of the world that should have consistency, continuity and a degree of predictability. They generally do and that reduces uncertainty and provides security enough for us to move through life and behave relatively successfully. They appear within mental versions of the physical world and much more often yet, in versions of social environment. For two main reasons: because the degree of overlap between those world versions, between different brains, is far from consistent and social competition involves deception, distortion and deliberate manipulation. All of which multiplies the uncertainty. And therein lies the crux of the matter: we must generate, unavoidably, a margin of predictability and certainty in multiple and randomly distorted environments. Complex neural systems have set up quite demanding filters to detect inconsistencies and deceptions, but often they

are not enough. Facilitating credulity automatisms also helps to mitigate the problem.

Because there are other drawbacks that do not depend on the reliability and filtering of external inputs. Let's take a look at one. Every night, in dreams, the brain spontaneously sets in motion different versions of the world that do not conform to those properties of consistency, continuity and a certain degree of predictability. Things happen in dreams that transgress all kinds of restrictions and natural limits: from interactions with non-existent beings or with deceased characters from ancient times, to impossible time travel or physical transmutations that are totally unfeasible. But the brain makes these contents plausible and gives them credibility as they occur. Upon awakening they must be discarded, of course, if they're still lurking in our minds, to try to regain consistency and plausibility in everyday interactions. To do this, to suppress the emergence of that bizarre imagery a neuro-cognitive attribute that experimental psychologists call "inhibitory control" is needed. Simple: mechanisms to discard chaotic, absurd and implausible ideation, even if some of the flashes or ingredients perceived may have carried an enlightening signal or connection allowing for deep mysteries to be deciphered. It does, of course, contain an enduring mine for merchants of credulity. If everyone routinely and

normally makes legends, the field is ripe for those who capable of fabricating and selling them with the best persuasive skills.

The credulous, that is, the majority of people, have an inhibitory control (that is not entirely efficient) over the distorted, ambiguous or inconsistent mental elaborations, whether their own or others'. Skeptics have much stricter inhibitory controls. In children and the elderly there is less inhibitory control, hence those are the life periods with greater propensity for credulity. The region of the brain that deals with ways to implement the task of discarding or suppressing spontaneous "esoteric" or "magical" ideation are the lower, anterior and lateral prefrontal cortex areas, in the left hemisphere. Just in front of the territories responsible for building the intricate articulatory sequence of verbal and gestual languages, with its efficient syntactic organization. People who score high on credulity about the paranormal phenomena and the spiritual and transcendent features of human experiences, show less operativity in those territories dedicated to "inhibitory control" of the bizarre or incongruous ideation.[1] And often they also perceive

1. Lindeman M., Svedholm A. M., Riekki T., Raij T. T. and Hari R. (2013), «Is it just a brick wall or a sign from the universe? An fMRI study of supernatural believers and skeptics», SCAN, 8, 943-949.

and report many more signs, signals or connections loaded with special meaning to different varieties of visual input noise.[2]

This is just one of the neural systems responsible for handling or mitigating credulity. There are others which help shape a very important and distinctive feature of human temperament that had received little research attention until recently.[3] Genuine skeptics, those who show a propensity to spontaneous and demanding empirical pragmatism are a minority, but they are essential to ensure and consolidate advances in robust knowledge. Hence, despite fatigue and frustration they have no choice

2. Riekki T., Lindeman M. and Raij T. T. (2014), «Supernatural believers attribute more intentions to random movement than skeptics: an fMRI study», *Social Neuroscience*, 9, 4, 400-411.

Partos T. R., Cropper S. J. and Rawlings D. (2016), «You don't see what I see: individual differences in the perception of meaning from visual stimuli», *PLOsOne*, DOI: 10.1371/journal.pone.0150615.

Krummenacher P., Mohr Ch., Haker H. and Brugger P. (2009), «Dopamine, paranormal belief and the detection of meaningful stimuli», *Journal of Cognitive Neuroscience*, 22, 8, 1670-1681.

3. Lindeman M. and Lipsanen J. (2016), «Diverse cognitive profiles of religious believers and nonbelievers», *The International Journal of Psychology of Religion*, DOI: 10.1080/10508619.2015.1091695.

Tobeña A. (2014), *Devotos y descreídos: biología de la religiosidad*, Valencia: PUV.

but to persevere in the area of demanding doubt. This should also apply to false skeptics: those "anti-magic" or "anti-esoteric" activists, who are also capable of retaining steadfast partisan allegiances elsewhere.

Adolf Tobeña *(Graus, 1950) is a professor of Psychiatry. One of his latest published works is* Neurología de la maldad *(The Neurology of Evil).*

MANUEL TOHARIA

Why it's important to fight lies and erroneous concepts in politics

Politics is the art of the possible, according to Machiavelli. A very pragmatic conception of the art of governing and legislating is likely to lead us to seek only that which appears possible, forgetting other more difficult, or even almost utopian, challenges. Whether questionable or not, this outlook probably pervades the majority of our "decision-makers" when regulating the lives of citizens and deciding how to use the public money they administer on our behalf. The bad part is that often, lies take root in this political power, generating significant problems, or even diverted and generally harmful directions for the people governed in this way.

This is particularly true of science. Those of us who have been in close contact with the world of scientific research for years, half a century in my

case, are familiar with notorious examples of how politics have had a generally negative influence on the development of a better and more fertile scientific knowledge, proclaiming half-truths if not blatant lies on matters that eventually come out. Or what's even worse, committing serious errors in the administration of public funds assigned to these tasks due to simple ignorance and a blatant inability to understand the implications of their decisions for the administered subjects.

Historically, the most significant political interference in matters of science is perhaps the imbrication, as old as humanity itself, of religious thinking in political governance. Suffice to think of current-day theocracies, such as Israel or the Gulf countries, in which the civil legislations are based on religious texts, the Torah or the Koran.

However, if we go back to antiquity, Theogony by Hesiod and the tales of Homer succeeded in establishing in Greek politics an interpretation of knowledge based on deities that was completely removed from reason or observation, eight centuries before Christ. Those "absolute" religious figures imposed their will without question, regardless of the evidence of multiple "relativists" who questioned what was being claimed as truth yet obviously wasn't.

Religious meddling in political spheres not only took place in classic Antiquity; even today

in Spain we have a Concordat that binds us to the Holy See and inspires many of the legal regulations that govern us.

It is no surprise, in any case, that centuries ago humans saw the cause of all sorts of powerful and destructive phenomena, from earthquakes to storms, in certain superhuman powers. And, of course, how not to regulate the lives of these humans with laws aimed at placating said divine powers? Everything appeared to be governed by supreme deities; how not to legally dedicate the donations and zeal of the citizens to them?

The first philosophers, probably from Mesopotamia, subsequently imitated and improved on the Greek and Latin thinkers, perhaps they knew how to reason on these powers and how humans could conjure and placate them. Certainly, their thinking was orderly, and they sought to understand what they observed, but they nonetheless formed part of those societies and rarely questioned the beliefs imposed by law and accepted by most.

In reality, if we think about it, this same thing has been happening ever since, though the Industrial Revolution introduced some significant nuances and, in particular, the separation of the mystic powers from the power of the human mind. The famous *Deus exmachina* explains a great deal...

In any case, up until recently, the vast majority of societies, and in turn their political rulers, have unquestionably believed the world to be governed by the capricious will of some superior beings, different for each civilisation but always superhuman; that is, divine. And when certain ancient, and not so ancient, rationalists attempted to reconcile the beliefs of their time with the dictates of reason, their success was always at the very least tempestuous. More than one risked their life to oppose the dominant ideas: Socrates 23 centuries ago, Hypatia 16 centuries ago or Giordano Bruno just over four centuries ago. These are all significant examples of this permanent socio-religious, and ultimately political, intolerance that only admits and preaches what the authority decides should be believed and done.

Nowadays, science is guided by a rational, demanding and critical methodology that should only take into consideration what can be observed, deduced, experienced and demonstrated, within accepted margins of error and which, in the end, can be summarised in a phrase as sceptical as it is explanatory: science is only science until proven otherwise. But politicians almost always totally or partially ignore this obviousness. Even today, more than a few who continue along these lines linger on...

The fact is that it has never been easy, either in Antiquity or the Renaissance or even nowadays to separate oneself from the idea, that's quite comfortable at the end of the day, that everything around us forms part of a divine plan, obeying powers over and above our own and that we needn't necessarily understand; on the contrary, we should adore and please them to avoid being punished with their power. And if the politicians in power reflect that feeling, all the better. Even if it is all based on one big lie, or worse, a vast ignorance.

There is no need to quote the classic cases of Copernicus, Giordano Bruno and Gallileo and their heliocentric conception of the Universe when the legal and religious laws claimed that the Earth was at the centre of everything, suffice to recall again the case of Hypatia, the 4th century Alexandrian mathematician murdered by a mob of Christian fundamentalists who were enemies of reason... The astronomer, Laplace, did not suffer the same fate when he was required by Napoleon Bonaparte to explain his cosmology treaty to him; he managed to get out of the fix brilliantly by replying simply and brilliantly to the imperial reproach that in all that, there was not the slightest reference to God: *Sire, je n'ai pas eu besoin de cette hypothèse-là*.

What's remarkable about this anecdote is that the person reproaching the scientist's audacity was

not a religious leader, but none other than the Emperor whose social laws, by the way, continue to form part of the Civil Codes of many countries, including Spain.

The meddling of many rulers in scientific matters justified by religion have been constant; there's no need to mention Darwin and Wallace, who in the 19th century had to deal with numerous difficulties when defending their hypotheses grounded in the purest rationality applied to their observations before the not so much religious, but civil, authority. The Catholic Church, thanks to a great scientist and outstanding Jesuit from the first half of the 20th century, Teihard de Chardin, ended up accepting the Darwinian evolution; but the same cannot be said of other religions, which would not matter in the least were it not for the fact that their conceptions are applied to the legislations of various societies. Even the most powerful nation in the world; in some North American states, it is obligatory to teach Creationism and Darwinism as theories that have not been scientifically proven. And they subtly add that, even so, creationism is more credible as it is of divine origin...

But perhaps the worst, because the most recent, examples of political powers interfering in the world of science were Nazism on the one hand, and the Bolshevik and then Stalinist regimes, on the

other. These are not trivial matters, particularly if we consider, for instance, the worrying resurgance of neo-Nazi ideologies in European countries, the legislators of which can become steeped in this absolutist culture that tends to be so contrary to rationality.

The Nazi behaviour towards what they, obviously arbitrarily, called deviant and corrupt science when it came from Jewish researchers, may sound ridiculous to us. The Jewish scientists who were forced to flee, and whose work was denied, burned and erased (luckily, only provisionally) from the history books by those political exterminators of work produced by anyone other than the theoretical and legendary Arian race (whatever one understands by Arian race, as utopian and false as the very concept of race itself), had already been or would subsequently be rewarded with none other than 16 Nobel prizes. Not bad at all for a "Jewish" science that, during the years of Nazi rule, was considered little more than despicable rubbish.

As for the Soviets, before the war against the Nazis and above all just a few years later, the political meddling in all sorts of scientific matters is well known, preventing the development of research that was progressing at an astonishing rate in the United States and some European countries. The most notorious example is genetics, derided by the

Soviet regime as false and antisocial. Who was the Plotiburo to dismiss nothing less than Mendel's Laws as bourgeois science?...

Russia survived the Nazi invasion and following the defeat of Hitler's regime began to blatantly devote itself to the very varied misleading conceptions of science that Stalin elevated to the category of supreme law for and by the people. In 1948, in fact, the Central Committee of the Communist Party announced that the heated dispute between the Soviet biologists regarding the laws of inheritance had been definitively resolved. The importance of this event was such that for a week the *Pravda* newspaper dedicated half of its space to the sessions of the Lenin Academy of Agricultural Sciences. Because in reality, the matter was about the adaptation of the impersonal laws of material determinism, the central axis of the Marxist philosophy applied strictly by political leaders to the everyday reality of the people, in such a way that all their actions were absolutely based on this philosophy.

But the Plotiburo theorists had come up against a philosophical obstacle (in this case ideology took the place of religion, which had done so much damage to scientific progress in other eras and numerous places) resulting from the scientific knowledge of genetics and their influence on the evolution of the environment and living beings.

Because genetics appeared to demonstrate that inheritance is a decisive factor of evolution through mutations, and therefore these could no longer be the fruit of the revolutionary changes. Colossal heresy!... Because for the Stalinism of the social and natural environment it had to be the formative factor as only thus could the revolutionary changes induced in said environment directly modify the character of a people. Which was the ultimate goal of the soviet regime.

And that was how genetics fell so far behind in Russia and its satellite countries, a gap that even today they find very difficult to close. In Germany, however, this did not happen as many German physicists returned to their homeland after the war, and because some of the great Nazi scientists, such as Heisenberg, deep down were aware of the lie behind the physics of the regime they believed in. They knew that the physics of Einstein, Bohr and so many others, supposedly Jewish and therefore synonymous of rubbish, were not only spot-on but could even have provided them with a lethal weapon, as was the American case. It could not have been mere coincidence that the Manhattan project was led by an eminent group of Jewish scientists.

In short, history demonstrates how political lies can end up penalising those who preach them,

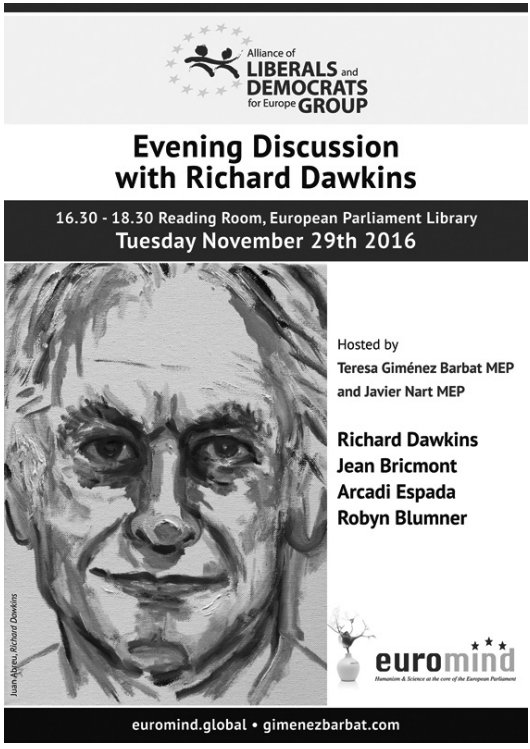
although sadly, the everyday citizens also suffer the consequences. We believe we have made this clear, at least, in this rapid review of the aberrations committed by certain political governors in questions directly related to scientific activity.

Manuel Toharia *(Madrid, 1944) is a Spanish science popularizer. He is the author of the work* Historia mínima del cosmos *(Minimal History of the Cosmos).*

Conversation with Richard Dawkins

This conversation took place in the European Parliament (Brussels) on November 29th 2016, at an event organised by Euromind. Dawkins was joined in the conversation by Jean Bricmont, who was responsible for posing the questions, and Teresa Giménez Barbat.

M. T. Giménez Barbat: You, Mr. Dawkins, have often said that what you appreciate most about the times we live in is that so many questions have been given a scientific answer, and replies are no longer based on mythology, the supernatural, etc. I am organising a series of conferences with a view to extrapolating scientific thinking, that wealth that science is providing us with, to the social field too, to my political colleagues. My question is: do you think I am on the right track? Am I doing the right thing?



To promote the event, the painter Juan Abreu drew a portrait of Richard Dawkins

R. Dawkins: First and foremost, I'd like to point out that here in Brussels, more so than any other place, in the heart of enlightened Europe, I feel ashamed to be English. I wouldn't feel ashamed to be Irish or Scottish, but I do to be English, and I hope with all my heart that the «Brexit» fiasco will never actually happen. To answer

your question, of course we need scientific answers. We need answers based on reason and evidence, and not on emotions, so I applaud your initiative and am grateful to have been invited to this meeting.

J. Bricmont: Thank you so much for your invitation and the wonderful opportunity to put some questions to Professor Dawkins. To mention an anecdote that some of you may be familiar with, it has been said that the *The Selfish Gene* has led many budding physicists to switch to biology. Because, as you know, there are people researching in biology now who have a background in physics. But, for better or for worse, I have to say that this book came too late for me, because at that stage I was already a physicist and couldn't turn around and become a biologist. In any case, allow me to play the devil's advocate for a moment, a role that is not always popular, so I beg you not to assume my true opinions from the questions I ask. So, for my first question, I'm going to draw on the following simile to defend those people who are sceptical about science. Let's imagine a sentence is handed down to us in incomprehensible legal-speak, or perhaps in a foreign language, and that the only thing we know is that the judge

is being paid by one of the parties. Would it be rational to believe in the impartiality of the sentence? It may be fair and there may be no reason to object, but if that's all one knows about it, one might say: «I'm not going to accept this sentence knowing what I know». So, how is that any different to the man or woman on the street, or the MEP, who knows nothing about science (me neither beyond my small field) and the only thing they know is that the major corporation and powerful governments finance research programmes? That is all they know. They know there are certain vested interests and that makes them wary of science. And they also know that there are disagreements between scientists. I am not saying that they systematically oppose science, because they do acknowledge the findings of Newton, Einstein or Darwin, and they believe in evolution and all that. But they distrust modern-day science, because of the issue of who finances the study in question. One example of this is a recent article in the *New York Times* on a study of fats (the debate on saturated and unsaturated fats, the effect of cholesterol on longevity, etc.). This research has a long history behind it and I won't go into details, but to make a long story short, the article is basically about whether we should

avoid saturated fats and replace them with poly-unsaturated fats. The author's answer is: «I honestly don't know». And he continues: «I think the studies in this field of research are scandalously faulty». I have no idea about this, so being ignorant in the field, I can't give an opinion on this type of discussion. The author claims the studies are biased, but that is the sort of science that's being put into practise nowadays. What do you think of this?

R. Dawkins: One of the best things about science, one of its most important trademarks is that scientists have no trouble saying «I don't know». We are stimulated by what we don't know, because it gives us something to work with. One of the healthiest lessons from my student days, about which some of you have already read, but that I will repeat here, was when my biology professor asked us a question (the question itself doesn't matter, it was a factual question). He asked a student what the answer was, and then walked all around the classroom asking the same question. We all invented an answer, and were then dying to know if we'd got it right: «Sir, sir, what's the answer?». He waited until there was total silence, and then, very slowly, exclaimed: «I don't know... I don't know!». None

of those present have ever forgotten that lesson. It's a lesson for any scientist: to admit to not knowing something is a challenge, because we can see it as a subject of research. As for the question of the saturated and unsaturated fats, it's tricky. One of the problems is that people naively interpret a dose-response curve. Is such-and-such a chemical compound good or bad for us? The answer to that question is almost definitely going to be a U-shaped function. Some substances we consider good may become harmful in excessive amounts, which we tend to forget. Thus, there is no simple answer to the naive question of whether something is good or bad for us, or how good or bad. The fact that scientists from one field do not know what scientists from other fields are doing is a very relevant issue. As the biologist I am, I don't understand modern physics, so you could say I have no choice but to have faith in what my scientific colleagues in a field far-removed from my own are doing. But in reality, it is not a question of faith in the religious sense of the word, because in science we employ methods to tackle this problem. We have repeatability, the fact that experiments can be repeated, we have double-blind procedures to deal with the personal biases, and a set of procedures that give

science a series of fundamental advantages over other fields of study also come into play. Jean, you spoke of the problem of faith in science, the difficulty of believing in science, but you didn't mention another issue that in my opinion is far more serious, which is the interference of religion. This is something I have to fight relentlessly in my own field of evolutionary biology, where not only do we encounter errors of interpretation but open hostility from a rival point of view, which is erroneous, and boils down to simple biblical creationism. Particularly in the United States, and not just the Islamic world, we have to fight not only mere ignorance, but against a systematically promoted error, and I consider that a vastly important problem.

J. Bricmont: Well, I didn't bring up the subject because it's something we agree on. I completely agree with you on the matter of religion, we have nothing to debate and neither do the majority of those present here. But the question I posed is whether we should be somewhat more critical with current science, or more understanding of the scepticism that the distribution of large sums of money awakens. Returning to the issue of the saturated and unsaturated fats, perhaps I am being idiotic, but what comes

to mind is the consensus among the scientific community on whether unsaturated fats are preferable to saturated fats for reasons which, according to the article I mentioned, are unknown to be correct or incorrect. I didn't say the experts say «I don't know», but that they claim the idea that unsaturated fats are healthier is a well-known fact.

R. Dawkins: I forgot to talk about the question you pose regarding money and where it comes from. Of course, it's a worrying issue. Everybody knows that when tobacco was starting to be revealed as a main cause – the main cause – of lung cancer, some scientists (including, and I'm sorry to have to say this, the great R. A. Fisher, who in all other areas is one of the great heroes of statistics and evolutionary biology) sold their souls to the tobacco industry and offered arguments – that now seem quite ridiculous to us – defending tobacco from the doctors' accusations. It is certainly a problem. It is something we need to fight, and something us scientists do fight. But you are right, it's true that it requires caution.

J. Bricmont: Ok, let's move on to another subject, which is religion versus secularism. According to a recent article in *The Independent,*

your prime minister, Theresa May, has said that the fact of being a practising member of the Church of England «lies behind what I do» (to quote her exact words), which is why she's so convinced she's doing the right thing. What do you think of that, what's your reaction? Do you think it's appropriate for political figures to express their opinions on religion, one way or another? Or would secularism imply that they should keep their opinions on these and other philosophical matters to themselves? I wonder what would happen if a Muslim were to say the same thing. That would be a real contrast. As a Belgian, I am really surprised that we have one Christian Democrat party on the Flemish side and another on the French-speaking side, and that neither ever tend to mention God in their discourse. Sarkozy in France does allude to religion from time to time, but he is the only exception. Obviously, Hollande is not religious and neither is Mitterand, but they have never brought up the subject.

R. Dawkins: I wasn't familiar with Theresa May's comment, and like you I am also disappointed, though not very surprised. She knows she should consider the electorate of the conservative party, and has perhaps been playing a role.

It's not like in North America where, paradoxically, the United States is a nation based on secularism and the nation's founding fathers were very clear in this respect. It was afterwards that the American politicians started to refer to religion to conclude the majority of their speeches. In Great Britain this does not happen by rote, but it is a resource used by the conservative party at least, and I suspect that was what Theresa May was trying to do. I wouldn't be the least surprised to find that in reality she is not a religious person, but is trying to present herself as such. With regards to how this conditions her political decisions, I don't know whether she should clarify which decisions she was referring to...

J. Bricmont: You were referring to «Brexit». You say it's a complex issue and that's why she leans on faith. That's how she put it word for word. If you like, I'll show you the article.

R. Dawkins: «Brexit»? What on earth does that have to do with religion? I'm not asking myself this question, I'm asking her. I can't even begin to imagine what drives her decision to insist on her slogan «Brexit means Brexit», in spite of the fact that 48% of the electorate (and by the way,

The conversation with Richard Dawkins
took place in the European Parliament library

participation was not that high) voted against it. What does religion have to do with the decision on «Brexit», which is obvious? It's the will of the British people. By the way, one of the slogans used by those in favour of Brexit was «Taking back control from Brussels». Taking back control indeed! And the first thing she does is try to deny the British parliament any objection to the details of «Brexit», not to mention the possibility of suspending it. That's a funny way of getting back control, and I can't think of any way it's connected to religion.

J. Bricmont: Very good, allow me to ask you another question on a politically sensitive issue,

global warming. I'd like to ask you whether the scientific emphasis as opposed to the religious or anti-science approach may have caused scientists to be less self-critical or less open than they should be. Because if a person criticises science, they are immediately labelled anti-science or pro-religious, which is not necessarily the case at all. I said before that a lot of people are sceptical about modern-day science, but they are not anti-scientific in a philosophical sense. They simply believe it is corrupted by money, which is another matter. We have already touched on the issue of the tobacco business, so let's turn to the IPCC, the International Panel on Climate Change. I know, because I have heard the comments, that a lot of people are more or less sceptical about what the IPCC says. This does not mean they deny climate change. They may believe that perhaps its impact will not be as big or catastrophic as claimed. I am not sceptical, but I in my search for truth I have become partial to organizing debates between the orthodox and the sceptical. And I listen, which is at least possible in the countries around here, because often sceptics are not allowed into the auditoriums or not permitted to speak. I am not referring to televised debates, but debates of an academic nature. Sceptics are always branded as

«denialists», lumped together with Holocaust denialists, they are insulted, accused of being in the pay of the industry, which is not always true. It's a very unpleasant way of approaching a scientific discussion, that I also find counter-productive, as it only serves to increase scepticism. To quote an author to the liberals' liking: John Stuart Mill, the reason we should believe Newton's laws is that they can hold up against any attack (we now know this is not true, but in Mill's times it appeared to be). One of science's strengths is that one can criticise all that one wishes, but if the grounds are solid it will hold up against the attack. However, it is clear that if debate is suppressed, as I believe they suppress it, defaming the opponent in the process, science suffers. What would you say to that?

R. Dawkins: The way I see it, the evidence of global warming is overwhelming. What is more debatable perhaps, is to what extent the human race is responsible for it. And I think that you're probably right in that this question should be duly debated. I have scientist friends worthy of great respect, who accept global warming, but are somewhat sceptical about human responsibility. And then there are those who believe human inventiveness will find the way to do

Richard Dawkins, Teresa Giménez Barbat, and Jean Bricmont during their conversation

something about it. Hence, if your worry is that we are not taking this debate seriously enough, I cannot disagree with what you say. However, I believe there's a far bigger issue at stake than the lack of debate in the scientific community. The fact is that the scientists' recommendations are systematically ignored by highly influential political and economic leaders. This is particularly true of the Unites States, where the president has declared global warming to be a cock-and-bull story. That worries me far more than a minority of scientists not being listened to as they should. I believe we need to worry more about the politicians who dismiss the relevance of science as a whole, and allow themselves to

be advised by, I don't know, the oil industry, perhaps.

J. Bricmont: Well, the president in question is beginning to change his mind in his public statements on the issue. But the fact is that the two are related. Nobody is saying that global warming is a cock-and-bull story, but I am aware that politicians are sceptical, and I think that scepticism increases due to bad manners or lack of debate. That's how I see it. So, let's turn to a more theoretical and philosophical question, which is the reductionism of science. What is your opinion of it? To begin with, could you define your view of scientific reductionism, and in what way you think biology can be reduced to physics or chemistry? Or perhaps you don't think it is? In which case, what would be the difference?

R. Dawkins: The word «reductionism» is one of the most used as an insult by people who don't truly understand the concept. It is a word I don't use, so I don't feel obliged to define it. Even so, I will try to answer your question. The term «reductionism» is used in many different ways. It is occasionally used in an accusatory tone by those attempting to explain complex matters in

simpler terms, that are sometimes labelled overly simplistic. Others use it in a completely different, though also accusatory, sense, to those who explain human behaviour in excessively biological or «animal» terms (in the sense of animals and not humans). Thus, we have two very different meanings of the word «reductionism». Regarding the first meaning, I firmly believe that scientists have to explain complex matters in simpler units. That's what science consists of. It's what we do when we explain how the nervous system works, how our body works, how computers work. The mistake lies in trying to take reductionism to the lowest level. We can appreciate how absurd this endeavour is in practise if we try to explain how a computer executes a task as complicated, for example, as playing a game of chess on Grandmaster level. If we try to explain the movements of the pieces the computer makes in terms of movements of electrons and semiconductors, it is clearly a lost cause. We have to explain how the computer plays chess in lower level terms, that include subroutines and complex processes, and then drop down another level. In this hierarchical reductionism, the explanatory unit of each level is the level that immediately precedes it, and then the level before that, and so on and so forth. We don't just leap to the lowest possible level in

one fell swoop. We don't explain computers in terms of electrons in semiconductors, even if we know that in reality this is how they work. Similarly, in the case of the nervous system, we don't explain the psychological phenomena in terms of psychological units. Hence, there is nothing erroneous about this hierarchical reductionism. It's the only reasonable way to proceed when explaining how complex things work. The other type of so-called reductionism is applied to human behaviour in overly simple terms of non-human behaviours. This criticism is occasionally justified, like when people compare themselves to Tinbergen's sticklebacks, or something of the sort, and attempt to explain human behaviour as if we were fish. This is neither sensible nor in any way frank, and the only thing I can think to say about it is that it's not at all reasonable. But this is a completely different type of reductionism to the previous. The problem is that the word «reductionism» is being used with these two very different meanings, and these two uses generate confusion when used indistinctly.

J. Bricmont: Right. I don't know if I'm asking the expert in the subject, but I hope you have an answer to my question (I'm sure you do). I hope you understand what I'm referring to, because

I myself am not entirely sure. At the moment, there is a lot of talk about epigenetics, which would appear to go against the core dogma of molecular biology. And there is also a great deal of talk about group selection, by E. O. Wilson, among others. I simply wanted to know what you think of all this, and I would also ask you to explain these terms to the public so that we can all understand the issue.

R. Dawkins: The core dogma of molecular biology was put forward by Francis Crick, and it states that information goes from DNA to RNA to protein, and not the other way around. This is a molecular version of the Weismann doctrine on the continuity of the germ line and the separation between the soma and the germ. In layman's terms, we could say that it opposes the idea of the acquired characters inheritance, in other words, it opposes Lamarck's theory of evolution. A few decades before Darwin, a French biologist called Lamarck put forward a theory now known as Lamarckism, based on the inheritance of acquired characters, the idea that animals improve by striving to meet their needs, exercising the muscles and body parts that they put to work to do so. As a result of this exercise, these parts develop and strengthen. We are

all familiar with how the muscles in our arms grow when we exercise them, or the soles of our feet harden when we walk barefoot. These are acquired characters. If they were hereditary, babies conceived by people who had been exercising their muscles would have to be born with more developed muscles. This would be the inheritance of acquired characters, and it was Lamarck's idea of how evolution happened. It was Lamarck's idea of how evolution advances in a positive direction. Over the decades, there have been numerous unsuccessful attempts to resuscitate Lamarckism, which is completely contrary to the Darwinian concept of evolution. The latest attempt to revive a sort of Lamarckism is what has been called epigenetics. It's a curious term, because in reality the epigenetic processes are essential for the development of the organism, for embryology. And, as everyone knows, embryonic development begins with a fertilised egg, the zygote, which is the only cell that divides, divides again, and then again, and as these divisions occur differentiation takes place. This means that cellular clones are different in liver cells, muscle cells, renal cells, nervous cells, etc., which are different to each other in spite of sharing the same genes. They are different even if they have the same genes, and the

reason is that in each tissue type different genes are activated. This is epigenetics. The modern use of the term that has become so fashionable refers to a particular set of experiments suggesting that part of this differential genetic activation in specific cells can be transferred to subsequent generations. If this were the case, it could to a certain extent be interpreted as a Lamarckist inheritance, and there is a certain amount of evidence to suggest that this does actually occur. However, this phenomenon is unlikely to have any significance for evolution, because it disappears after just a few generations. That's what differentiates it from a mutation, which is the genetic change described by Darwinian evolution, that is potentially forever. A mutation perpetuates itself from generation to generation, without any tendency to disappear with the passage of the generations. The so-called epigenetic inheritance does disappear, if not after the first generation, then after the second or maximum the third. It has practically no evolutionary relevance, and in my opinion, in spite of the excessive advertising it has received, it may turn out to be a nine days' wonder. As for the group selection, you are absolutely right, it's true that E. O. Wilson has been trying to resuscitate it. He has done it practically on his own, with the

sole collaboration of a colleague who shares his surname, though they are not related. Given that Wilson is an extremely (and deservedly) distinguished biologist, this attempt of his has received a great deal more attention than if it had come from a more run-of-the-mill biologist. That is one of the perils of publication: if one is a very renowned author, it is easier to get published than if one is less well known. But in truth, this determination of E. O. Wilson and a couple of other colleagues to promote a new version of group selection has barely any support. And a truly rare phenomena is that even in his own field, the social insects (Wilson is the maximum world authority on ants), he enjoys considerable support, for sound scientific reasons.

M. T. Giménez Barbat: I would like to ask you a different question. The study of social matters from an evolutionary psychology or, as it used to be called, sociobiology perspective, is still seen as a controversial issue even in the heart of a liberal political group such as my own. Are you surprised that this continues to be the case, even today?

R. Dawkins: You are asking me about the controversial aspects of evolutionary psychology and

sociobiology, and my opinion of the same, I assume. Could you specify a bit more which controversial aspects you mean?

M. T. Giménez Barbat: Well, for instance, one issue that is really difficult to address, not only in this parliament but also in Spain and in many other forums, is anything related to sex or gender. It often seems that there is a deliberate wish to not introduce the scientific discourse into this type of debate.

R. Dawkins: You are referring to the lack of interest in presenting scientific evidence relating to sex and gender, aren't you? Well, I believe it's important to be sensitive with messages that can ignite feelings. Years and years ago, the selfsame E.O. Wilson found himself at the centre of a previous controversy, the so-called sociobiology controversy. At the end of a talk, a member of the public asked him whether he believed there were psychological differences between the sexes, and he gave a long reply that basically boiled down to him saying that he did in certain aspects. The reaction of the woman who had asked the question made it very clear that for her it was an extremely emotionally charged matter. She almost cried on hearing the reply,

as if her interpretation of all that condemned her to a life of apron-clad servitude in front of the kitchen sink. Yet all Wilson had said was that there is a statistical trend towards certain psychological differences between the sexes. What the word «statistic» expresses here is that there is an overlap between the two sexes, so it makes no sense to believe we are inexorably condemned by our genes to certain social roles. I believe it is fundamental not to confuse the genetic language inevitably used by evolutionists such as Wilson and myself when we speak of (Darwinian) evolution with a determinist conception of embryology. A very significant distinction must be made between the two roles of the genes. One is the role played by genes in evolution, where what matters is that natural selection chooses between alternative genotypes. When we speak of Darwinian adaptation, we are obliged to speak of genes for this and genes for that, and of the selective advantage of one gene compared to another through its phenotypical effects. All this is Darwinism, all of this is evolution. But naturally genes also play another role that is limited to embryonic development. Genes play a different role through their influence on ontogeny, which naturally includes the sexual differences. These two different roles are

easily confused, but should not be. Thus, when biologists (evolutionary biologists) speak of genes for this and genes for that, a mode of speech we are obliged to use for Darwinian reasons, we are not speaking of embryology. Embryology and evolution are two different things, and both are equally important. But there has been a great deal of confusion, and the controversies on selfish genes, on sociobiology, on evolutionary psychology, have to a large extent been triggered by this inability to differentiate between the evolutionary and the ontogenic discourse.

M. T. Giménez Barbat: Some parliamentary forums are more receptive to homeopathy, for instance, than the GMO. Does that surprise you?

R. Dawkins: Yes, well the fondness for homeopathy verges on ignominy. Of all the alternative medicines, homeopathy is the last that anyone should try to defend. The reason is that if we imagine an experimental, double-blind test, comparing a homeopathic product with a control product, all blind, in such a way that neither the doctor, the nurse nor the patient know who is taking what, the effect is null. Homeopathy is based on the principle that the more diluted the dose, the more effective the medicine,

until the optimal dose is reached, in the eyes of the homeopath. Or as James Randi sarcastically put it recently, there would be one molecule in a volume of water equivalent to the entire solar system. Such is the level of dilution that homeopaths consider most effective. Hence, we can assume that the amount of active ingredient is null, or at least considerably lower than the amount of anything that might be found in tap water. As you know, a glass of water is highly likely to contain at least one of the molecules from Oliver Cromwell's urinary bladder. That's easy to calculate. Hence, it's not that homeopathy has not been proven to work, but that it is possible to demonstrate that it doesn't. The only possible way out of this confusion is the idea that the successive shaking of gradually decreasing doses of the active ingredient leaves a memory imprinted on the water, that the water retains this memory of a molecule that was once there, but is there no longer. If there were a homeopath capable of demonstrating this, they would win the Nobel prize for physics, as well as medicine. As far as I know, nobody is working to demonstrate this. They don't even bother trying. Instead, they line their pockets by skinning the innocent idiots who pay for this homeopathic medicine. There is no excuse for

this behaviour, so anyone who prefers to defend homeopathy over genetically modified organisms is either stupid or a charlatan.

M. T. Giménez Barbat: Can you tell us anything else about the GMOs (transgenics)?

R. Dawkins: Well, I think that here we should exercise the principle of caution. Whenever something new emerges, that has not been tried or tested before, or that is just beginning to be tested, it is prudent to be cautious and not leap to adopt something freely until a minute analysis has been completed. So, a compromise needs to be reached between the principle of caution on the one hand, and unconditional acceptance of anything new on the other.

M. T. Giménez Barbat: You are a brilliant writer. Now that Bob Dylan has received the Nobel for literature, do you expect to get one in the future?

R. Dawkins: It is not up to me to answer that, but allow me to say that the Nobel committee for literature should take science more seriously as a vehicle suited to great literature. That is something I find somewhat odd. I

have nothing against novels, I love novels, I love poetry, but the fact is that the Nobel prize for literature always goes to a novelist, poet or playwright. Well, now we have Bob Dylan. Some might say that Leonard Cohen also deserved it. But science is definitely just as marvellous a source of inspiration for great literature, poetic literature (in prose). Think of Carl Sagan, Lewis Thomas, Peter Medawar, Loren Eiseley, or Peter Atkins. They were all of them great stylists with a wonderful subject to write great prose. I'm not sure whether any scientists have won the Nobel prize for literature. Bertrand Russell may have been a worthy candidate, though he was a philosopher, not a scientist. I think there was one dubious case, a

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French mystic in the twenties. In any case, he wasn't exactly a good scientist model. Bergson! Henri Bergson, now I remember. The élan vital. According to Bergson, life was driven by élan vital. As Julian Huxley satirically put it, we could just as well say that a train engine is driven by élan locomotif. It explains absolutely nothing, it is not science. And it's sad to think that the only scientist to have won a Nobel prize for literature is Henri Bergson. So yes, it is about time a scientist received a Nobel for literature.

M. T. Giménez Barbat: To conclude, could you please send a positive message to the European MEPs. What can we do to make more prudent and intelligent decisions in these troubled times?

R. Dawkins: Well, as an Englishman I'm not in the best position to give advice right now, I'm sorry to say. If only I were. If there are any European countries out there who'd like to offer me citizenship, I'd be proud to emigrate from England. I'm thinking that Ireland is going to be the only English-speaking country of the European Union, so Irish citizenship would suit me perfectly. Advice? Be rational, be sensible, base your deci-

sions on evidence, be scientific. Don't base your decisions on emotions when deciding important matters, particularly matters with far more long-term implications than the present term, matters that will stretch over decades, if not centuries. I find it tragic that in current-day Great Britain and North America we've been condemned for what is nothing more than an emotional response to, and I'm ashamed to say it, xenophobic intolerance.

Richard Dawkins *(Nairobi, 1941) is a British ethologist and popularizer. His most outstanding work is* The Selfish Gene.

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