

RESILIENCE

The UK should resile from its decision to leave the EU

By Andy Ross

British Sovereignty

Most of the votes cast in England in the 2016 referendum on whether the United Kingdom should leave the European Union were in favour of leaving. The result was marginal and unexpected, and it was widely seen as having been driven by a mixture of anger and pride. Cooler heads continue to say it provides no good basis for redirecting national policy.

Analysed in more detail, the result reveals regional contrasts. Many voters in the north of England were angry that their regional interests and concerns were apparently being ignored by the governing class in Westminster, while many voters in the south of England were proud of their British heritage and felt that political union with continental European states was intolerably humiliating. Despite majorities against leaving the EU in Scotland and Northern Ireland, the result in England and Wales prevailed, precipitating a political crisis that has rocked the UK ever since.

Northern England was once famous as the workshop of the world, with pioneering industries in a range of sectors that collectively built the trading and military strength behind the British Empire. Since those days of a century or two ago, the region has suffered a decline into a state today of deprivation and decay, enlivened only by such political initiatives as the Northern Powerhouse and the HS2 railway project. Large immigrant communities have settled in the major cities, which has done little for the economic vibrancy of the region but added to the shared burden of providing adequate social services and ensuring a functional level of integration within the cities. Traditional Labour voters have felt abandoned and retreated into angry nationalism.

Southern England outside London is largely rural, with provincial interests that emphasise tradition within historical lifestyles and landscapes. The defining experience of the older generation in the region was of the Second World War, where an upstart continental power sought to impose a brutal dominion over the British Isles and to terminate a sovereign status that had lasted since 1066. Still today, England has an ancient and honourable democratic tradition to uphold and a continuing claim to global relevance through its financial and trading ties and its military establishment. Its southern citizens are not happy about ceding UK sovereignty to an EU they perceive as another upstart continental power. Traditional Conservative voters have become proud nationalists.

Zooming out a step further, the UK is a union of four nations with a complicated history. England and Wales were united as Britannia in the Roman Empire but fell apart into small fiefdoms during the dark ages. Once England had been partly repopulated by Danes and north Germans, an invading army conquered Wales and absorbed it into the Kingdom of England in 1284. Scotland, which had never fallen to Roman rule and persistently rebuffed later attempts at English rule, finally united with England in 1707 to form the Kingdom of Great Britain. This kingdom is now under strain as Scots agitate for an independent national identity for Scotland within the EU.

Zooming out again, Ireland endured centuries of conflict and rebellion against British rule before accepting that rule in 1801, to form the United Kingdom of Great Britain and Ireland. But an Irish

famine and mass emigration led to a new rebellion and establishment of the Irish Free State in 1922. Technically a British dominion, the new state included the Catholic south of Ireland but not the Protestant north, which remained in the union. The new state then became the independent Republic of Ireland in 1949, leaving the United Kingdom of Great Britain and Northern Ireland in its present form. Agitation for a united and independent Ireland continues today.

The present sovereign identity of the UK is thus superficial and fragile. It has survived the dissolution of the British Empire largely on the strength of a sentimental attachment to its royal family. This ruling family began as the German Hanover dynasty in the eighteenth and nineteenth centuries and was rebranded as the Windsor dynasty in the twentieth century. Its family tree ramifies throughout the old royal dynasties of Europe and is no more British than the English language, which is the recent result of a fusion of vulgar old German with later aristocratic French that has displaced the regional Celtic languages of Wales, Scotland, and Ireland only since political union.

Over a longer time period, the continuing sovereignty of the British Isles has probably had more to do with its antique parliament than with its monarchy. Claiming an ancestry as far back as 1215, parliament remained a poorly regulated and rotten tool of the landed gentry until well into the nineteenth century, when a spate of reforms in the Victorian era, plus a new Palace of Westminster to accommodate the House of Lords and the House of Commons, created a political structure that has survived into modern times. With an extension of suffrage to allow almost all adult citizens to vote, the Westminster parliament claims to be the political heart of the UK. A first-past-the-post (FPTP) voting system for filling seats in the Commons has reliably returned one-party governments in the great majority of the general elections held from the Victorian era to date.

The economic sovereignty of the UK is belied by its dependence on trade with EU member states, with America, and with a variety of other traders worldwide. Its security as a sovereign entity depends on America and the other NATO member states, as well as on the Five Eyes anglophone intelligence community. As for its wider sovereignty, British pre-eminence in science and higher education, for example, is impressive but not uncontested. Science and university education are about equally strong in many countries worldwide, once we correct for the fact that the UK has English as its native language.

Partly as a result of its imperial past, the UK is an active member of numerous international bodies, including the UN, NATO, the EU and a host of smaller organisations, all of which inevitably both leverage and dilute its sovereignty. Internally, the democratic sovereignty of the Westminster parliament is diluted by a devolution of powers to the UK nations and regions, as well as to local authorities and other non-governmental bodies. As for individual citizens, whose sovereign votes form the bedrock of the whole political edifice, thanks to FPTP they must often accept as their sole elected representative in parliament a person who does not agree with their views at all. These facts show that sovereignty is not what it may seem at first sight.

The 2016 referendum exposed the weaknesses in the antique and untidy UK establishment. First, holding a referendum to decide such a fundamental question was unusual. Second, there was no written constitution to specify how the government of the day should hold it. And third, there was no way to separate the strategic issue from the immediate political interests of the Westminster government. All this tainted the result and has poisoned British politics ever since.

European Identity

Like the parts of the UK, the nation states of Europe have a long history of moving into and out of various political unions and alliances and of waging war with each other. The overall historical identity of Europe is as a Christian realm, a status inherited from the fact that its core territories were part of the Roman Empire. This status was confirmed by the persistence for a thousand years, from 800 CE to 1806, of an entity called the Holy Roman Empire across much of central Europe.

In the later years of the empire, as Protestants took over from Catholics in many European nations, religious wars disfigured and finally destroyed the old structure. The worst of these was the Thirty Years War that raged from 1618 to 1638. The resulting Peace of Westphalia refashioned Europe as an unstable patchwork of nation states, many of which were too small and weak to defend themselves against later absorption into the militarised Kingdom of Prussia. The rise in the late nineteenth century of a united Germany, both as a major industrial power and as the beneficiary of the military legacy of the Prussian aristocracy, led to a catastrophic meltdown of the European political order in the two world wars of the twentieth century. The year 1945 marked the end of the old Europe and the birth of the new.

Today, the European Union is the collective achievement of the formerly warring powers of Europe. The EU is built on the Enlightenment values of secular reason and the inalienability of human rights. It is a monument to order and stability in a continental polity that has finally, after two thousand years, pulled itself together.

The history of the EU runs parallel to that of the Council of Europe, which was founded by ten states with the Treaty of London in 1949. The Council of Europe aims to uphold human rights, democracy, and the rule of law in Europe, and it now has 47 member states. The Council of Europe is quite distinct from the European Council, which is a council of leaders within the EU. The Council of Europe sets the legal frame within which the EU can flourish.

The EU has its roots in the European Coal and Steel Community (ECSC), which was founded by six states with the Treaty of Paris in 1952. The ECSC developed into the European Economic Community (EEC), which was founded with the Treaty of Rome in 1957 and had as its aim to bring about economic integration, including a single market and a customs union, between its six member states. Together with Denmark and Ireland, the UK joined the EEC in 1973. A few years later, they were joined by Greece, Portugal, and Spain, to bring total membership to 12.

The EEC was rebranded as the European Community and absorbed into the European Union with the Treaty of Maastricht in 1993. Austria, Finland, and Sweden then joined the union in 1995, and with the collapse of the Soviet Union and the liberation of eastern Europe from Communism, the stage was set for a great expansion eastward. Ten further states joined the EU in 2004, two more joined in 2007, and finally Croatia joined in 2013, to bring the present total of member states to 28.

The European Union now comprises over 500 million people. Economically, it has a gross domestic product of some \$20 trillion, making it about equal with the United States of America, although at purchasing power parity the EU is significantly wealthier. Moreover, the union is still open to further expansion. According to the Copenhagen criteria, membership is open to any European country that has a stable free-market democracy and respects the rule of law and human rights. However, any member state must accept a limited sharing of sovereignty in what is billed in the EU founding documents as an ever-closer union.

European civilisation is the ruling paradigm in the social and political organisation of the world today. Its achievements lie behind the rise of America as a global power, the rise of living standards across the former territories of the European colonial empires, the continuing rise of the great powers of Asia, and even the rise of a potentially countervailing paradigm in Communist China. The Christian identity of the ruling paradigm has long since been effaced in the Enlightenment character of science and its social applications in technology and industry, but the monotheistic roots of that paradigm are there for all to see. The traces of those roots are visible in continuing friction on the margins of modern civilisation, as competing branches of the old faiths contend for thought leadership in more traditional societies. Millions of immigrants have imported that friction into modern Europe, where most of the major EU member states host Muslim communities that include Islamist activists who threaten to disrupt the Enlightenment consensus.

So far at least, and some nasty fighting in the territory of the former Yugoslavia aside, the EU has prevented any new war in Europe. Wars are acute symptoms of a breakdown of shared values,

where dialogue fails. In wars, violence takes over, in an attempt to establish an order that disregards the wishes of the people subjected to that order. By contrast, politics is war by other means, where delegates air their disagreements within the polite conventions of political debate.

In the political analogue of warfare that distinguishes a democratic polity, the delegates who fight with their words are singled out as champions by their respective communities on the basis of free and fair elections. Slowly, over centuries of bloody conflict, this method for achieving consensus on values has prevailed over more brutal methods involving warlords, despots, dictators, autocrats, and so on. Various implementations of democracy are recognised within the European paradigm as among the right and proper means of selecting the champions who will fight the political proxy wars that can spare the masses from the horrors of shooting wars. The British FPTP election system is one such method, but probably not the best and certainly not ideal.

European identity today, for the citizens of the largely sovereign nation states that recognise the institutions of the union, is a layer cake based fundamentally on a human identity associated with inalienable rights to life and so on, less fundamentally on an ethnic or cultural identity that may be associated with a faith, such as Christianity or Islam, and alongside that on a social and economic identity that reflects language community, educational background, career path, family status, sexual orientation, and the like. All this is part of the identity of a European citizen, and accompanies all the other properties a citizen may have, such as his or her nationality within the union, or his or her place of worship, or golf club, or membership in a political party or coffee circle, or taste in clothing. The great mosaic built up from some half a billion people thus identified creates a rich and vibrant community, much like other communities worldwide but distinguished from them by a shared basis in law and political culture. European citizenship, like Roman citizenship two thousand years ago, is a cultural treasure it would be folly to abandon or devalue or deprecate.

Western Solidarity

The Western world, based historically on Christian religion and today on Enlightenment values, is at risk from various forces. The obvious risk is from Communism as a competing ideology, one which radically refashions the political and economic foundations of the state and finds its most perfect contemporary expression in China. Communism was planted in China by the Soviet Union, and when the People's Republic of China was founded in 1949, the Maoist ideology of its early years was indistinguishable from Stalinism. Since then, China has advanced out of all recognition and now boasts a nominal gross domestic product of some \$14 trillion, which is equivalent at purchasing power parity to a GDP of \$27 trillion, making it about equal economically to the other two main economic behemoths on planet Earth.

When it comes to global influence, politics follows economics. If an exclusively Chinese sphere of influence were to expand in the coming years to embrace Russia and Korea, and perhaps also Japan and the smaller states of southeast Asia, the stage would be set for the West, led by an aggrieved America that for decades has regarded the eastern seaboard of Asia as something like its own back yard, to launch us all upon a new world war of cataclysmic proportions. In that horrifying case, all bets would be off regarding the human future. But the economic interdependence of America and China makes that an unlikely scenario.

In fact, we have good grounds for hoping that a much less apocalyptic scenario will come to pass. It is not hard to imagine a peaceful convergence or accommodation between East and West that results a shared conception of how global civilisation can develop further, based on shared interests regarding trade and technology and a shared perception of larger threats, such as resisting the spread of militant Islamism and tackling the causes and consequences of climate change. The reason for this is that Communism, stemming as it does from the Germanic philosophy of Marxism, is at root just another Western ideology, or more precisely a mutant offshoot of the Enlightenment tradition.

Communism is not necessarily antithetical to the Western way of organising political and economic life, which we can summarily label as capitalist democracy. Formerly Maoist Communism has evolved substantially in Chinese hands, and its new incarnation invites a huge role for the private deployment of capital to fund major and innovative industrial and technological developments. But in addition, because of the active role of the state in the economy, such globally significant infrastructure projects as the One Belt, One Road (OBOR) initiative are possible on a scale that even the largest private corporations in the West, which so far have individual market capitalisations of up to about a trillion dollars, would find it all but impossible to match.

As Communism evolves into something more sensible, we in the West have discovered that our old model of casino capitalism is straining and also requires substantial evolution to keep up with the times. We have found that traditional robber-baron capitalism is unsustainable and that a substantial social welfare infrastructure is needed to cushion the great mass of losers against their defeat in the economic competition that throws up a handful of billionaire winners. To keep the losers in the game, where they can continue living as consumers while they pursue their other goals, less appreciated in the world of money but no less important for the ongoing health and vitality of civil society, we need to pay them. An organic model of an economy as a circulatory system for money can only work if it includes a mechanism to ensure that the circulating funds reach the peripheral members of the economic body, also known as civil society. Otherwise, the financial equivalent of gangrene sets in, and the rot infects the entire body.

The fundamental disagreement between these two great social models is over the role of property. In any organised state, there is an underlying tension between the state and its citizens about who ultimately owns the strategic assets that enable the state and its citizens to function. In a Communist state, the default owner of capital and land is the state, which in practice may mean a privileged class of state functionaries, whereas in the West the default owners tend to be private individuals, acting for example as shareholders or landlords. In the end, in states that find a way to function, this tension finds a pragmatic resolution, where who owns what is decided for legal reasons hammered out at a finer level of granularity. Communist ideals are no more a hindrance to such resolutions than Islamic ideals are a hindrance to modern banking.

A more serious problem with Communism from the political point of view is that it endorses, or even requires for its proper fulfilment, a transition to a one-party state. Effective opposition is outlawed, political debate is stymied, and public accountability fails, with the result that the ruling party develops an inner elite of members who can game the system for their own benefit and ignore the interests of the masses. The only way out of this endgame is for all party members to feel the compulsion of goals or ideals that transcend the imperatives of party discipline. Major national emergencies, such as those that once faced Stalinist Russia or Maoist China, can provide that compulsion. Alternatively, religious imperatives that outreach state control can do so, as happened in Poland during the latter years of Soviet hegemony. Or, as in the West, the sacred status of Enlightenment values can undo Communist parties even before they take control, as we saw in several European states on the western side of the Iron Curtain.

A less serious risk to the West is that Islamist ideals take over more widely to fuel an overt challenge to Westernisation in the band of Muslim-majority states stretching from Morocco to Brunei, where we have already seen a hideous attempt by ISIS to ground a new fundamentalist caliphate. Islamist militancy is best seen today as a marginal and atavistic response to the perceived evils of transition to modern political and economic organisation, but it could in principle become more dangerous. A sober assessment, however, is that this risk is small, since the band where Islam still holds sway is dependent on the West for technology and on the rest of the world for trade, so much so that an overt challenge to Western dominance in the foreseeable future would simply lead to military defeat. We can reasonably say that a defiantly anachronistic caliphate scenario is a distraction from the challenge posed by integrating Chinese developments into the global fabric.

Humanism is as close as we can expect to get to a religion in the world of the Enlightenment. It shares with old religions a high appreciation of the value of human life and of such virtues as compassion and tolerance, and it also finds a natural practical expression in humanitarian activism. Humanism is the common denominator of all the traditional religions and is the obvious or default platform on which to build societies that overcome religious divisions, essentially by regarding the respective traditions as ethnic or cultural identifiers that converge on a shared set of underlying values. Humanist values are anthropocentric by definition, and for this reason they are not deep enough for the far future, but they dominate our present political world and may be expected to serve us well for many decades yet.

Eventually, however, we must confront questions regarding the species chauvinism of humanism, given our increasing scientific recognition of animal sentience and of the interdependence of all DNA life in the great biospheric ecosystem of life on Earth. Even DNA chauvinism is too limiting in view of the prospects for the development of artificial life in the near future, not to mention the possibility of life beyond Earth and beyond our solar system. All this requires a moral perspective that humanism may not be deep enough to provide.

The issues surrounding climate change, disappearing species, and maintenance of a healthy ecology on our planet are ones that will increasingly dominate our political debates in the decades to come. We in the Western world are well placed to confront these issues, since appreciating them requires a good understanding of the science that flags them up as issues, obviously, and solving the problems they raise requires mastery of the technologies that people in the Western world are already developing. But solving them will also require more, namely political will to accept their reality and strength to accept the extended time horizons associated with effective solutions. Even from a Chinese viewpoint, it is clear that solidarity on a global scale will be essential, and the competitive appetites encouraged by economic and sporting relations between states will need to be suppressed in favour of a sharp appreciation that our identity and survival as living beings demands disciplined cooperation at global level.

Global Opportunity

The West is not acutely endangered in the near term except by its own susceptibility to atavistic nationalism and populist politicians, like those that have arisen in America and in several European countries, including the UK. In the longer term, the Chinese update of Communism and religious aftershocks in the Islamic band stretching from Morocco to Brunei present dangers that can with prudence and good fortune be overcome. In the yet longer term, the risks associated with climate change, such as runaway global warming or mass extinction, and those that come with post-human technology incorporating or leveraging artificial intelligence in new ways, for example to create artificially designed bionic lifeforms, could emerge as much bigger dangers, most of which are still amorphous and hard to quantify.

Overcoming all these threats in a way that preserves the cultural continuity of Western civilisation will require ever-tighter regimentation of our societies. We will find this much easier if we learn to transcend traditional identity barriers and let our inner selves evolve toward an ideal or asymptotic limit of a unified post-human global identity, for example as bionic appendages of a single planetary lifeform. Whether such a new identity is consistent with the traditional religions and philosophies that people have grown used to will become a big question in decades to come.

Artificial life is less a danger than an opportunity, at least for those who are in a position to help steer its development and who are realistic about the transformative effect it will have on natural life in all its forms, including human. Technology today has reached the nanoscale where we can manipulate nature at the level of individual atoms, and its application to computing hardware is leading to artificial intelligence with superhuman powers. Its application in biochemistry has already given us genetic engineering and genome mapping and looks set to give us a lot more in the course of this

century. The outcome is that not only are we now in a position to build robots that do most jobs better than humans can do them but also that we will soon be able to build deliberately designed organisms that improve upon natural life. Obvious practical applications that would make good use of such organisms include, say, the direct photosynthetic conversion of atmospheric carbon dioxide and water to liquid hydrocarbons for burning as fuel in transportation systems, or the industrial conversion of simple organic foodstuffs into meat-like products for human consumption to avoid the industrial slaughter of sentient animals, or the public-health provision of facilities offering racks of biomimetic wombs for reliably growing human embryos into healthy babies.

Today we see the world as composed of two distinct kinds of thing, namely living organisms and inert matter, but soon the boundary will in principle be erased, to give us a world where any amount of sentience can be embedded into what looks at first glance like a landscape of physical objects. This will force us to reconceive our ethical principles from top to bottom, and the old anthropocentric humanism will seem like just another obsolete belief system, no more worthy of veneration than belief in the classical Greek gods. As this huge and historic change occurs, human politics and economics will struggle to keep up, but in the longer term we will doubtless find our societies changing as radically as the Roman Empire did when Christianity became its official religion or as violently as imperial China did when Western ideas and ideologies were introduced there.

Space studies, such as planetology, astronomy, astrophysics, and cosmology, are the disciplines that will preserve the sanity of any remaining individualists among the human stock. For those who dream of outer space, such studies will lead their minds up and away from the increasing irrelevance of human affairs to the burgeoning network of artificial life inhabiting the infrastructure surrounding them on planet Earth. Pioneers who find the techno-jungle around them uncongenial will build spaceships and venture out into the solar system, to set up colonies on Mars or the asteroids or the moons of the outer planets, and there to dream of venturing onward to other star systems.

Unfortunately for the rest of us, the spacefaring pioneers will be unable to offer a reprieve for the human species. The human animal evolved on planet Earth to optimize its life chances in terrestrial conditions, and stone-age ones at that, so to imagine that such creatures will find great comfort on Mars and the outer moons, let alone in other star systems, is wishful thinking. It is quite clear that once genetic engineering comes of age as a practical technology for manufacturing industry, we will design new humanoid organisms for such extreme environments, and we will probably find it easier in many cases to start from scratch with cyborgs that no longer resemble human beings at all. Anyone born human will be fated to make the best of life on Earth.

As A-life in all its forms advances, the chances are that life on Earth will slowly but steadily become more hostile to humans. It may sound unwelcome, but the naturally grown breeds of humans who live today will face increasing regulatory and other hurdles to living a nominally sovereign human life, and these hurdles and barriers will become steadily more intolerable to all but a chosen few. Life on Earth will begin a transition to a post-human future, and the billions of humans who live today may turn out to mark the age of peak people, just as the Western world went through an age of peak horses a century or so ago. Today we could be living in the golden age for humanity, before climate change, robots, and cyborgs of every kind begin to make our feral lives impossible.

You may ask who in our human world would ever vote for a such dystopian future, where birthing more humans will no longer be welcome and where those who survive will be ever more penned in and persecuted. To answer that question, we need only look with unblinkered eyes at our present experience, where living in our crowded cities feels ever more regulated and restricted and where young parents have learned not to make as many babies as nature allows but instead to regulate their breeding to suit their incomes and their living space. We tolerate this lifestyle and vote for its continuation and even its intensification, appeased by incremental ameliorations of this or that downside and hopeful that promised panaceas will somehow be delivered to save the day. We buy the advertised benefits and try to ignore their big and ugly costs.

As an ideal contrast to an overpopulated dystopia, imagine a future where cities are not hopelessly congested with people, where you can travel near and far without worrying about the environmental impact, or where you can expect from childhood on to live in comfort, surrounded by nature. Now ask yourself whether such a future would not be reward enough to vote for punitive legislation that outlawed unlicensed human breeding. The only problem is enforcing such legislation, given that no one will tolerate infanticide or the deliberate punishment of children for having been born, but the solution is obvious. Once control of reproduction is in the hands of the medical profession, it will be easy for the authorities, acting through friendly local doctors, to turn the fertility of young people on and off like a tap, and in particular to turn it on only upon submission of an officially certified child licence, which will be issued only to couples with clean genetic records and proven possession of the domestic and financial resources needed to raise a child.

Thanks to centuries of human endeavour, the opportunities for life on Earth are extraordinary and miraculous, so long as we stand back far enough to see the big picture. The challenge is to rise above our tribal loyalties and animosities so far that even continued human participation in terrestrial life can become a topic of reasonable debate. This can only occur if we sink our human identities in a planetary identity, in Gaia perhaps, and accept that expressions of that deeper identity through the human form have a limited value to the global organism as a whole.

All the old religions preached humility in the face of God, and the new techno-religion based on Enlightenment values and furthered through modern science and technology must preach something similar. Given the existential importance for us of the global ecosystem we inhabit and of the climate stability that sustains this ecosystem, it seems no great leap of faith to admit that for all practical purposes the planetary organism plays the role of God for us in our rational and secular lives. Only the most diehard traditionalists in the monotheist faiths will deny that learning how we can best serve this terrestrial god is our best opportunity.

Democratic Legitimacy

We who live and work in 2019 are fated to do our part to get from here to the promised land. We need to navigate a smooth transition from a turbulent world of proud and sometimes angry nation states, where machines are still subservient to human beings, to a world decades hence, where economic coexistence is a solved problem, climate management is a routine item on the global political agenda, and artificial life is challenging our most fundamental beliefs. These three policy items already go some way beyond the agenda that most career politicians today regard as defining their prospective lifetime achievements.

To solve the economic problem, we need, as first priority, to distribute the bounty of the machine world equitably among living humans, second, to ensure that enough spending power remains for maintaining and improving local and global infrastructure, and third, to blow off any surplus on luxuries, on investment in exciting new ventures, and on speculative moonshots. Note the priorities: basic needs first, routine maintenance and upgrades second, and all the rest third. But to achieve even this modest goal consistently on a global basis will require a level of coordination of economic legislation between numerous sovereign governments that exceeds anything ever before achieved in the history of civilisation.

The economic problem looks insoluble until we consider the bleak achievements of Communist central planners in their command economies and imagine how much better the job could have been done with a few simple changes: First, make principled use of the market mechanism and steer behaviour in desired directions by means of taxation; second, use sophisticated computer modelling to simulate local and global economies and sectors at multiple levels of granularity; and third, constrain the entire exercise by an overarching perspective such as liberal humanism that guarantees a proper accommodation to human needs. The result is what we see already in three very different variants in America, China, and the EU. To that approximation, it works.

As for climate management, this will require global coordination from day one. Technical committees to set policy goals and to coordinate big investments, for example in giant plants to scrub carbon from the atmosphere, will need to leverage the work of the global scientific community, which itself has been working in a globally organised and coordinated manner for many decades now. Clearly, the antisocial ambitions and appetites of individual members of the global community of nation states will have to be curtailed in a way that does not collide too crassly with their native sense of national sovereignty, but we are used to the general approach required in such cases from our (admittedly dubious) success in limiting and coordinating military activities.

The relatively new challenge of preparing for artificial life and then of regulating it so that at least initially it serves human purposes and conforms to human values is harder. We are beginning to see just how hard it is to build the appropriate respect for human purposes and values into autonomous robots, both in military weapon systems and in self-driving road vehicles, but this is just a foretaste of the problems we can expect when we start building and deploying biomimetic systems based on biomolecular engineering. Again, however, anything less than global regulation and control will be useless. Rogue biosystems released for improper reasons anywhere in the world will pose some level of risk everywhere in the world, so the imperative for global control is strong.

In summary, global governance will increasingly be regarded as a routine necessity, not only to tackle these three big issues but also to establish a unified legal and regulatory basis for the increasingly important, indeed vital, domain of developments online and in the cloud. The Wild West days of the internet are vanishing, but they have left a toxic legacy in the social media, where fake news, filter bubbles, identity theft, data harvesting, mobbing, trolling, shaming, and so on are blighting the lives of too many people. The cloud may seem to be a merely technical novelty, but the key point is that all the data and all the apps in it are copied and distributed widely, globally, and the question of which jurisdiction should apply for data protection or personal security is insoluble on a merely local basis. Yet free access to the cloud, subject to basic protections, is likely to become as important for human affairs in future as elementary literacy was in times past. The idea that we can simply let an irregular patchwork of local jurisdictions govern that access is delusional.

To tackle such issues as internet access, big data, and the cloud, the early work done by the EU in particular will set a useful precedent for things to come. Giant corporations based in America have dominated the internet and filled it with content to suit their commercial interests, but their users worldwide need to fight back. China has chosen to set up a national firewall and cultivate its own regulated environment behind the wall, but the EU strategy promises much better scaling to a global paradigm that will serve our human interest in maintaining an open internet.

The challenge of setting up a constitutional framework for global governance is daunting, but its time is coming. Governance structures worldwide are aggregating into regional and specialised forums that offer partial precedents for wider adoption. In their days, the USA and the UK were models of overarching governance of more limited administrations for the sake of presenting a united front to the wider world. More recently, the EU has achieved a level of unification of European governance that seemed utopian less than a lifetime ago. Now we see in the UN, NATO, ASEAN, WTO, TPP, and other such institutions a recognition of the urgent need for international cooperation even between otherwise fully sovereign entities. As a capstone to such initiatives, the regular G7 and G20 summits and their variants (G2, G8, and so on) suggest an increasing need for global agreement on a wider basis. A natural next step would be a global organisation, GO, that met regularly, perhaps with flexible attendance, at a cycle of capital cities worldwide.

The obvious objection to any forum like the proposed GO is that it would be run by a global elite and for a global elite, with the attendant risk that it would be laughably or even outrageously out of touch with the common people whose interests, ultimately, provide the whole purpose of the forum. This objection needs to be taken seriously, since it undermines not only the proposed GO but also the regional and national governments today that are struggling with populist political movements.

Democracy demands that any elevated levels of governance display their popular credentials openly in order to disarm the populists before they drag all political activities down into anarchy and chaos. The problem is how to ensure that democratic legitimacy.

The only good solution to this problem is to work from the bottom up. Democratic assemblies at local level feed into higher assemblies at regional and national levels. In the case of the UK, for example, ongoing dialogue between democratically elected local authorities and democratically elected representatives in the Westminster parliament ensures that the democratic credentials of the national government are reasonably immune from populist attack except at the party-political level, where partisan rhetoric and extremist slogans are, regrettably, par for the course. At the next level up, in the EU, nations have their representatives in the European parliament, and this can, in principle at least, satisfy national populists that they have a voice in the proceedings. Unfortunately, the structures of the EU are not yet sufficiently fireproofed against populist attack, so from this level up we have to accept that global governance is still work in progress.

One thing, however, is already clear as day. In the future world of global challenges, which is already looming over us, where the injustice of economic inequality is apparent to all, where climate change is causing concern, where A-life is coming, and where traditional human values are in flux, political adherence to national sovereignty, in defiant denial of the need for global cooperation to tackle every important question on the political agenda, is as crazy as insisting that the Earth is flat. Sovereignty must be shared, ultimately on a global basis in GO or a similar forum.

We have made good progress toward reaching a consensus, in the EU at least, as to what constitutes an adequately democratic governance within a nation state. We also understand how to scale that democracy to the next level with a European parliament working alongside national governments. It should not be too hard in principle to scale that model in turn to global dimensions. In practice, the task still looks impossible, but there it is.

The world we live in is changing fast. To continue on a smooth growth path into the future, we need to persuade people who naturally mistrust big government that more really is better when really big problems need solving. Going it alone is not an option for small nations, however glorious their heritage, on a finite planet where the problems of each are the problems of all. The best model we have today for nations to work together for the good of all is that of a grouping like the EU.

In the world we face today, the UK decision to leave the EU, based as it was on the result of a referendum conducted in breach of the referendum guidelines the UK had already agreed with the EU, can only be seen as a finger-flip to all that visionaries, philosophers, and politicians have held high as the crowning values of our human civilisation on Earth. There is still time for UK politicians to resile from that decision. For the sake of all we hold dear, defying the populists who would drag us all into anarchy and chaos, they should show some resilience.

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