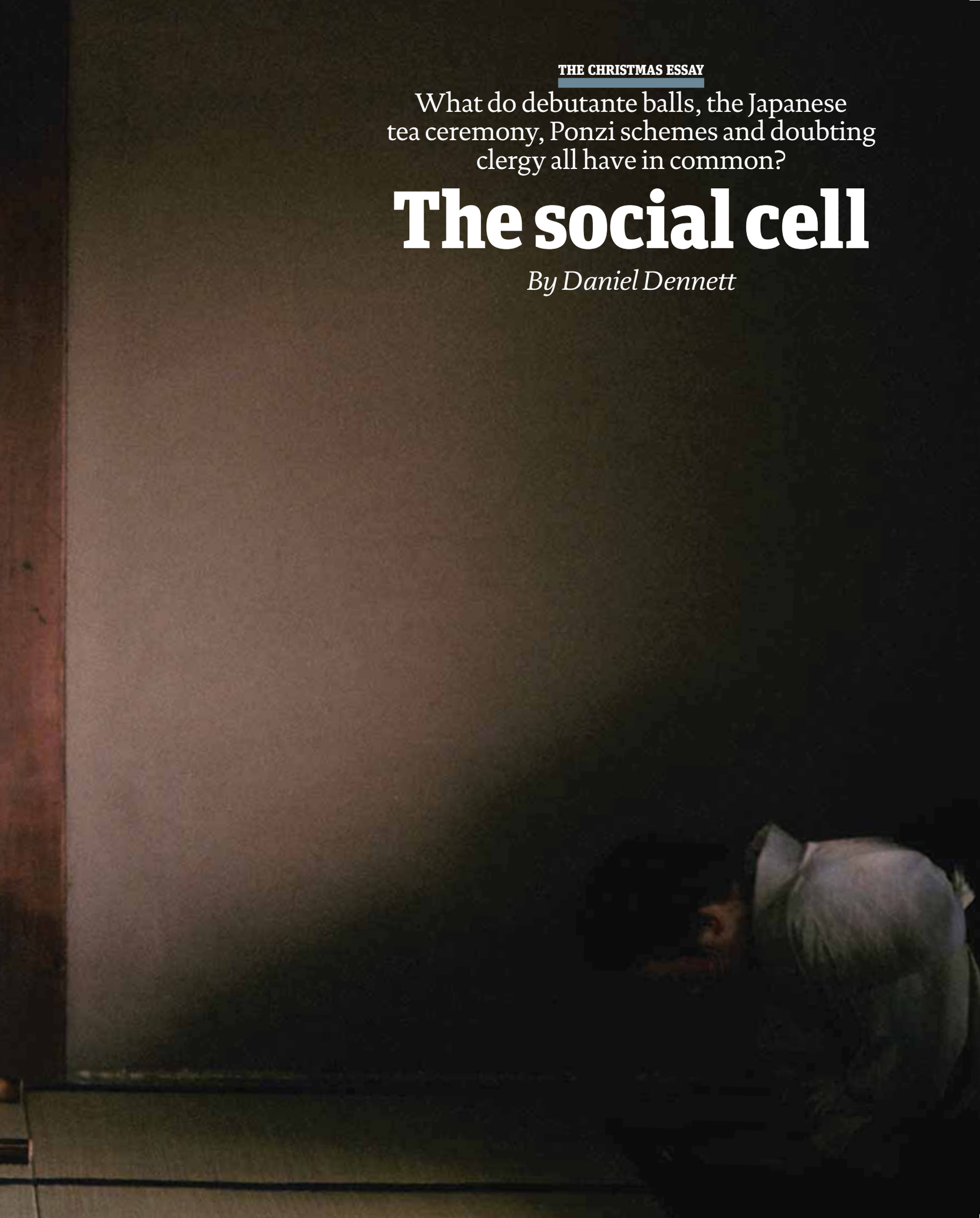
THE CHRISTMAS ESSAY

What do debutante balls, the Japanese tea ceremony, Ponzi schemes and doubting clergy all have in common?

The social cell

By Daniel Dennett



A single cell, such as a bacterium, is the simplest thing that can be alive. In addition to the materials from which it is constructed, it needs three features: a way of capturing energy (a metabolism), a way of reproducing (genes or something like genes) and a membrane that lets in what needs to come in and keeps out the rest.

Converging lines of research from various schools in biology agree on these three necessities, but there is substantial unresolved controversy about the order in which they must have emerged at the origin of life. If the history of evolutionary biology continues along the paths it has followed so far, it is likely that the solution to this problem will prove to be some ingenious and indirect process of chance combinations and gradual refinements, in which metabolism-like cycles and reproduction-like processes joined forces with non-living membranes that were already floating around, *objets trouvés* that could be appropriated and exploited. Whatever their origins, the resulting designs have now been refined and optimised for more than three billion years and have proven remarkably hardy. Not only are such single cells the most abundant form of life on the planet, but all living things, from trees to fish to human beings, are constructed of them, harnessed by the trillions into co-operating multicellular teams.

Cells may be the simplest life forms on the planet – even the simplest possible life forms – but their inner workings, at the molecular level, are breathtakingly complex, composed of thousands of molecular machines, all of them interacting to provide the cell with the energy it needs to build offspring and maintain its membrane. Echoes of the design wisdom embodied in this very effective machinery can be found in human culture, which is dazzlingly complex, too, composed as it is of about seven billion interacting people, with their traditions, languages, institutions, occupations, values and economies. Some cultural phenomena bear a striking resemblance to the cells of cell biology, actively preserving themselves in their social environments, finding the nutrients they need and fending off the causes of their dissolution.

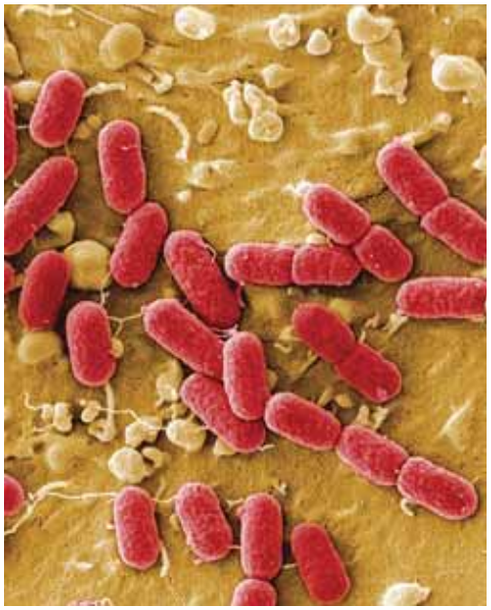
Consider four unrelated species of social cell that share some interesting features. What do the Japanese tea ceremony, debutante parties, Ponzi schemes and many Christian churches have in common? They are all variations of an insidiously effective social mechanism that:

1) thrives on human innocence, and

2) nobody had to design, and

3) is threatened with extinction by the rising tide of accessibility to information.

Like bacteria, as we shall see, they have – and need – metabolisms, methods of reproducing, and membranes, yet there is no need to suppose that these shared features arose from a common ancestor, nor even that the features of one of them inspired copying by the other. Wherever



Go forth and multiply: bacteria thrive by replication

there is a design that is highly successful in a broad range of similar environments, it is apt to emerge again and again, independently – the phenomenon known in biology as convergent evolution. I call these designs "good tricks". For instance, flight has evolved independently at least four times, in insects, birds, pterosaurs and mammals, and vision has evolved more often than that.

Seeing and flying are very good tricks, for obvious reasons. It is also obvious that human culture has its own roster of good tricks: bows and arrows, boats, writing and the wheel, to name a few. (It is not known if the wheel has been invented many times or just once, with all later wheels being copies of some original wheel, the brainchild of the mythic inventor of the wheel –

Cultural phenomena bear a striking resemblance to cell biology

and it doesn't matter! Almost certainly wheels would have appeared eventually one place or another.) The typical if tacit assumption is that these good tricks were independently reinvented by intelligent designers among our ancestors, and although this may sometimes have been true – we will probably never know – it is quite possible that they arose in the same way the good tricks of biology did: by mindless processes of differential reproduction in which understanding of what was going on was at a minimum, if not zero.

Let us consider the four cultural phenomena, chosen for their relative simplicity and vividness from a much larger array of possibilities, to see how this might have happened.

The Japanese tea ceremony is a set of traditions that has accrued over at least a millennium, and now consists of a considerable range of formal ceremonies, varying with the season and with the station of the participants, composed of highly elaborate and scrupulously observed rituals of greeting, preparation, serving, cleaning of the utensils, formulaic comments on the quality of the tea and so forth, all conducted either in a tea-house built for that purpose or in a specially furnished tearoom.

The neophyte participant in a tea ceremony dutifully complies, silent and respectful, like a visitor at a religious service, though the ceremony is not specifically religious – unless you define religion in such a way that ceremoniously eating foie gras or caviar also counts as a sacrament of sorts. Some people, after all, are said to worship fine wine.

A quick glance at biology invites us to ask the following question: why hasn't the Japanese tea ceremony become extinct? What has sustained it over so many centuries? The system must in some sense keep reproducing itself, ensuring a supply of new officiants to serve as hosts and new participants to serve as guests, and maintaining and replacing all the exquisite equipment used. It requires a lot of energy to keep going. What is its metabolism and how does it work? The Japanese tea ceremony exploits the human desire for status and influence in order to raise the money to capture the energy, and has evolved an elaborate developmental programme for enlisting and training new hosts who can eventually reproduce their own schools (with mutations) for training yet another generation of hosts, and so on, all of this within the kind of protective shell that can readily be constructed and defended in a stratified society.

Young girls – and some boys as well – from financially comfortable families are readily induced to enrol, at considerable expense, in "circles" that train them to perform the rituals. It is – or has been for a long time – a path to high status. The cultural virtues of obedience and respect for one's elders, together with a standard helping of youthful naivety, tend to ensure a ready supply of ideally compliant and attentive initiates allowed inside the gates.

At first, as apprentices, they watch quietly, memorising the rituals, inculcating in themselves the ideals, while their parents pay for the operating expenses. Some of them graduate to higher stages, each tier of students educating the lower tier, with the prospect held out of rising to the status of teacher, at which point the energy flow – the money – turns around. Teachers earn a living, but only a few climb that high up the pyramid. And teachers have their own pyramid to climb: associations of circles that in effect compete for prestige with other circles. Once you're enrolled in the system, there is a strong incentive not to criticise or rebel: we're all in this boat together – don't rock it. It doesn't matter that much whether the initiates continue to believe in the tea ceremony as an important part of life. They are all committed to a trajectory with high costs of leaving and some promise of future benefits.

No doubt many of the participants – including the parents paying the bills – feel trapped, but keep their feelings to themselves. Do you want to be an insider or an outsider? The difficulty in answering that question creates the semi-permeable membrane that preserves the machinery. As Japanese society becomes less stratified, more homogenised, the contrast has become less effective.

Notice that this account remains silent about the value of the Japanese tea ceremony. It may, like university education, be helping both society and the individual in all manner of ways. It may be nurturing the arts, instilling virtues, preserving knowledge and wisdom, stabilising the mores of society – or it may have had, but lost, these roles over time. It may survive today as a sort of self-perpetuating parasitical growth that reproduces itself because it can. It seems on the face of it, however, to be a benign – mutualist, not parasitic – element of society.

Can the same be said for the debutante ball or cotillion, which has occupied much the same niche in the US, especially in the South? If you are rich enough, and arriviste, you want your daughters to "come out" to society, and expend considerable effort and sums of money manoeuvring into position to accomplish this initiation. If your family arrived generations ago, you may still feel the pressure to preserve your position in society by participating in the prolonged and expensive rituals, something you might think you owed to your daughters, however ungratefully they respond to the pressure.

A look at the website of the National League of Junior Cotillions (nljc.com) shows much the same structure as the Japanese tea ceremony: "chapters" in place of "circles", a hierarchy of volunteers, assistants and (paid) instructors, and – most interestingly – a "strong emphasis on volunteerism, patriotism and involvement in community activities". Biologists know that you can infer much about the dangers in an organism's environment by studying its defences, which have been crafted to protect it from the most salient challenges. The entire debutante tradition is threatened by the spreading opinion that it is a superannuated cultural parasite, so it is sporting its good-works overcoat, instead of a mink stole, to protect its high status, on which its life depends.

It is important to remember that there is very little inertia in culture; an art form or practice (or language or institution) can become extinct in a generation if its elements aren't assiduously reproduced and reproduced. Not so many years ago, most city newspapers in the US devoted an entire section to "Society" and covered the ceremonies of debutantes with the same respectful care still accorded weddings and funerals. Today's coverage tends to make note of the diminishing numbers of debutantes taking part, and often has the same snarky tone of amusement and withheld approval that distinguishes Hollywood gossip – except that the people named are not celebrities. Farewell, debutantes, except in Texas, where they will no doubt hold out for another decade or two.

Ponzi schemes share the pyramidal entry structure. They are obviously parasitic invaders, benefiting neither the individuals entrapped nor the society in general. Charles Ponzi (1882-1949) did not invent the scheme (and neither did Charles Dickens, who describes one in *Martin Chuzzlewit*), but Ponzi may have added a few wrinkles and hence, to some degree, may deserve the authorial recognition.

How does a Ponzi scheme get started? It doesn't have to be born in villainy, though it always ends up there. An eager and sincere entrepreneur with what he takes to be a good idea raises the initial capital in good faith and then finds his project running into unanticipated snags. But there is an informational lag that lets the investors keep coming in, and this provides fresh energy – money – to expend in protecting the whole project by providing a dividend to the early investors. The rules forbid this, but . . . can't we bend them just a bit to get through the storm and keep this wonderful project afloat?

A gradual and unalarming entry on to a slippery slope is often a good trick, found in nature and in culture. It is relied on by the pitcher plant and other insectivorous plants, which do not have to comprehend the rationale of their design to benefit from it. Ponzi schemes, and even their proprietors, can also take advantage of this design feature without understanding it. Those schemes that have it thrive; the others do not. Ponzi schemes do, however, have to be composed, unlike plants, of parts – human agents – which understand quite a lot. All these social cells depend critically on language-using, comprehending people. Language is the main medium of interaction, but also of reproduction. Words play a foundational role rather like that of genes and, like genes, they are highly effective transmitters of information that similarly evolved without a helping hand from any intelligent designers. (Words are the pre-eminent vehicles of cultural transmission and evolution.)

So language and comprehension are an essential part of the workings of social cells, but here is a surprising twist: it is very important in each case that the participants not understand too much. It is not just that the invention and refinement of these social cells do not depend on any intelligent designer; it is that the cells' effective operation depends on the relative cluelessness – or innocence – of the participants. The membrane that restricts information flow is just as important as the membrane that restricts entry of outsiders, precisely because inside the barrier there are participants who are capable of understanding that information, information that can quickly transform them into outsiders. Bacteria don't have to worry about the disillusionment of their motor proteins, willing slaves that do so much of the heavy lifting. For social cells, this is a big ecological challenge.

Money, not social prestige, is the bait that attracts people to Ponzi schemes, but once you're caught, you encounter the same pressure not to blow the whistle, because it would destroy the gains you have accumulated. And perhaps the anticipated shame of becoming known as a dupe is more motivating than the prospect of financial loss, or the dishonour of being considered a philistine or a social outcast, in the case of the Japanese tea ceremony or the debutante cotillion. These are all strong inducements. The extended success of Bernie Madoff shows that it is still possible for a Ponzi scheme to thrive for some time, in large measure because it exploits networks of trust – a fine feature of a society – and politeness – a fine endowment of individuals – to circumvent the requirements of due diligence that would otherwise expose the fraud. It is no accident that it is typically good, honest people (a bit greedy, maybe, but otherwise trustworthy and trusting) who are lured into Ponzi schemes.

Now what about religions? They, too, thrive on the goodness of people. For the past few years, Linda LaScola, a clinical social worker, qualitative researcher and psychotherapist, and I have been investigating the curious, sad phenomenon of closeted non-believing clergy – well-meaning, hard-working pastors who find they do not believe the creed of their denomination, but also find that they cannot just blow the whistle and abandon the pulpit. We knew that many churchgoers have lost whatever faith they had but continue their membership for social and psychological reasons, and surmised that there might be clergy who were similarly attached to their church. What is it like to be a non-believing pastor? We found some examples who were willing to tell us, and are now completing a second survey of volunteers.

We want to know, ultimately, how this happens, and how common it is. It is apparently not rare – nobody knows what percentage of clergy fall into this category, not surprisingly. Our first study reported on five pastors in different Protestant denominations, who were interviewed in depth and in strict confidence by LaScola. Because it was published electronically (on the website On Faith) and under the headline "Preachers who are not believers" (*Evolutionary Psychology*, volume eight, issue one), this first pilot study has received considerable attention and brought us a host of new volunteers for our ongoing research.

There are many paths into this predicament, we find, but a common thread runs through most of them: a certain sort of innocence and a powerful desire, not for social prestige or riches, but rather the desire to lead a good life, ▶

▶ to help other people as much as possible. The tragic trap is baited with goodness itself.

Here is how it often works: teenagers glowing with enthusiasm decide to devote their lives to a career of helping others and, looking around in their rather sheltered communities, they see no better, purer option than going into the clergy. When they get to seminary they find themselves being taught things that nobody told them in Sunday school. The more they learn of theology and the history of the composition of the Bible, the less believable they find their creed. Eventually they cease to believe altogether. But, alas, they have already made a substantial commitment in social capital – telling their families and communities about their goals – so the pressure is strong to find an accommodation, or at least to imagine that if they hang in there they will find one. Only a lucky few find either the energy or the right moment to break free. Those who don't break free then learn the tricks of the trade, the difference between what you can say from the pulpit and what you can say in the sanctum of the seminary, or in your heart. Some, of course, are unfazed by this.

One can be initiated into a conspiracy without a single word exchanged or without a secret handshake; all it takes is the dawning realisation, beginning in seminary, that you and the others are privy to a secret, and that they know that you know, and you know that they know that you know. This is what is known to philosophers and linguists as mutual knowledge, and it plays a potent role in many social circumstances. Without any explicit agreement, mutual knowledge seals the deal; you have no right to betray this bond by unilaterally divulging it, or even discussing it. A social membrane is made of such stuff, and it can make a prison for anybody inside who wishes to get out.

Like reluctant debutantes or privately suspicious Ponzi victims, they button their lip for an abundance of good reasons. (Redundancy is always a good trick; it allows a collection of individually porous defences to overlap into a nearly impregnable shield.) Historically, pastors have had slender economic resources, and if they live in a parsonage they build up no equity in real estate. Hanging on until the kids are out of college and one can collect one's meagre pension is an option that can look better than making an honest dash for the door. But a tentative finding of our study so far is that the economic incentive to hang on is sometimes of less importance than the social and psychological factors. As one of our pastors says, "I'm thinking if I leave the church – first of all, what's that going to do to my family? And I don't know. Secondly is, I have zero friends outside the church. I'm kind of a loner." And what about telling his wife? "It's going to turn her life upside down."

So pastors tend to stay put and search for ways of protecting their conscience from the pangs of hypocrisy. Redoubling one's efforts to take good care of one's flock is probably a frequent

No question of faith: observant against the odds

effect, and hence it could be one of the side benefits of this system, a bonus that could almost pay for itself by turning its shepherds into goodness slaves. Guilt is a potent enzyme in many social arrangements, and has been especially promoted in religions.

Religions changed more in the past century than they changed in the previous two millennia, and probably will change more in the next decade or two than in the past century. The main environmental change, as many have suggested, is the sudden increase in informational transparency. Religions were beautifully

One can be initiated into a conspiracy without a word being exchanged

designed over millennia to work in circumstances in which the people within them could be assumed to be largely ignorant of much that was outside the membrane.

Now that mobile phones and the internet have altered the epistemic selective landscape in a revolutionary way, every religious organisation must scramble to evolve defences or become extinct. Much has been made of the growing attention to religion in the world, and this has often been interpreted as a revival, an era of expanding religiosity, but all the evidence points away from that interpretation. The fastest-growing religious category worldwide is no religion at all, and the increasing noise we hear is apparently due to the heightened expenditure of energy by all the threatened varieties in their desperate attempts to fend off extinction.

What will the various religions evolve into? That is hard to say, because evolution is a process that amplifies unpredictable accidents into trends and then novel structures. But there are patterns in how this plays out, and if we examine the good tricks that religions have evolved over the millennia, we may be able to see what new applications are in the offing.

Are these biologically inspired reflections on religion offensive? They discuss topics that many people would rather leave unexamined, but, unlike most earlier criticisms of religion, they do not point a finger of blame. It doesn't take conniving priests to invent these cultural contraptions, any more than it took a devious social engineer to create the Japanese tea ceremony, or debutante cotillions, no matter how resentful and trapped some of the participants in those traditions may feel. Just as there is no Intelligent Designer to be the proper recipient of our gratitude for the magnificent biosphere we live in, there need be no intelligent designers to be the proper targets of our anger when we find ourselves victimised by social cells.

There are, to be sure, plenty of greedy and deceitful people, who often rise to power in any of these organisations, but if we concentrate on hunting the villains down, we misdirect our energies. The structures can arise quite innocently out of good intentions and gradually evolve into social mechanisms that perpetuate themselves quite independently of the intentions and values of their constituent parts, the agents who bustle about inside them executing the tasks that keep the whole going.

We need to look dispassionately at possibilities that can illuminate – and might eventually eliminate – some serious sources of suffering in the world. Once we appreciate the necessity of metabolism, reproduction and protective membranes for social cells as much as for protein-based cells, we can see more clearly the effects that novel environmental factors are likely to have on the prospects for these phenomena. Will the Japanese tea ceremony morph into something different in order to stay alive, or will the recent destratifications of Japanese society lead to the disintegration of the membrane that has protected the ceremony for a millennium? What will replace debutante balls, and will the niche be taken over by a descendant species of social cell, or by another phenomenon entirely? Ponzi schemes are probably harder to sustain now, and a few minor changes in the flow of information around such phenomena may make them all but impossible – though who knows what entity will invade that niche.

The parallels I have noted do not suggest anything like a Law of Nature, nor is there any good reason to believe that all social phenomena are reducible to social cells. Societies are complex in more ways than colonies of bacteria are. What does shine through is a principle of good design. Darwin showed us that the secret of life is the differential reproduction of effective designs for fending off dissolution. When we approach social phenomena with the same spirit of reverse engineering, we find a bounty of insights that can help us plan intelligently for the future. ●

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