

## THE EVOLUTION AND HISTORY OF RELIGION<sup>1</sup>

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In his 1917 Presidential Address to the Folk Lore Society, Marett eloquently distinguished two major approaches to the study of culture, both of which could be substantially traced to pioneering figures in Oxford. One he labelled the 'historical method', exemplified by Sir Laurence Gomme. Gomme wanted to show that culture is transmitted, among people and across generations, through processes of imitation and learning – and thus through the cumulative storage of information and habits. His method involved painstaking description and collation of historiographical evidence over vast expanses of time and space. The other main approach Marett described as 'anthropological'. This approach, he believed, was exemplified by the work of Sir Edward Tylor (among others). The emphasis of Tylor's anthropology, Marett observed, was not on the local and transient *particularities* of human behaviour but rather on patterns of cross-cultural and historical *recurrence*. Like Tylor, Marett believed in the psychic unity of humankind – and in that unity he saw a key to what he called the 'uniformities' of human culture. Universal features of human psychology were to be explained with reference to processes of biological evolution. But this did not mean that cultural *variables* were to be explained solely with reference to historical accidents or prior patterns of learning and transmission. Marett argued for a synthesis of historiographical and anthropological methods, based on sound psychological assumptions. After all, he pointed out, Laurence Gomme couldn't possibly account for patterns of cultural transmission without

recourse to more or less explicit assumptions about the psychic unity of our species. Nor indeed could Tylor explain a given custom without recourse to prior histories of cultural transmission. The two projects, Marett argued, were mutually implicated.

If Marett could somehow be raised from the dead, I suspect he would be astonished at the progress that has been made in the scientific study of culture. Far from having overturned all the central ideas of Victorian scholarship, modern scientific methods have garnered overwhelming support for at least some of the central insights of Marett's generation, as we shall see. But Marett would also have been disappointed, I think, to discover that certain branches of the study of human nature, including much of social and cultural anthropology, had become progressively detached from the natural sciences, and most crucially from the *biological* and *psychological* sciences in the course of the twentieth century.

In Marett's day, major theoretical advances in our understanding of social and cultural phenomena seemed to be inextricably wedded to the future of scientific enquiry. But this optimism gradually evaporated as the consensus of opinion in the social sciences and humanities favoured the partitioning of all things cultural from the rest of the world (so that culture now seemed to be explainable only with reference to phenomena of the same order). We might classify this doctrine as a form of 'idealism' (though of course it took on many different guises and did not consist of a single coherent ideology). The obvious next step, for many students of society and culture, was to relinquish their scientific aspirations altogether. There are various ways in which this intellectual shift could be narrated and illustrated, and it would be easy to conjure up a rich variety of shifting intellectual coalitions, even-handedly populated with villains and heroes. But let us put all of that to one side, and consider where it has left us at the beginning of the twenty-first century.

### **Towards a new holistic Anthropology**

Many contributors to this volume, myself included, are seeking a new kind of anthropology, one that looks outwards to surrounding disciplines with at least as much excitement as it countenances internally driven debates and disputes. For some of us (though not necessarily all) this search beyond our disciplinary boundaries is driven by a growing awareness that a revolution is taking place around us in the human sciences, and especially in various fields of biology and scientific psychology. The last few decades have seen a veritable explosion of powerful new theories and methods in such fields as neuroscience,

genetics, cognitive, developmental, and evolutionary psychology, and linguistics. Disciplines responsible for tracking and evaluating such developments from the sidelines, such as the history and philosophy of science (and especially the philosophy of mind) have been racing to keep up, while many others have simply been left behind. It seems to me that the discipline of sociocultural anthropology has tended to straggle. Many of its practitioners are wary of biological and psychological reductionism and there are probably a number of reasons for this.

Some of the difficulties may arise from misunderstandings. In this volume, Robin Dunbar answers the kinds of misplaced objections that are commonly raised by sociocultural anthropologists in response to theories of human behaviour and culture in the contemporary biological sciences. Many such misunderstandings (if that is what they are) stem from the fact that anthropology and evolutionary theory parted company before Darwinian approaches had fully matured and, consequently, the criticisms of anthropologists may be pointlessly targeted at outmoded (e.g. Lamarckian) models of evolutionary theory. The points that Dunbar makes in his 'philosophical preliminaries' are surely correct and there is little I would wish to add. But it may be worth tackling head on a couple of issues that Dunbar sets aside, but which probably also contribute to the unease with which contemporary anthropologists countenance the biological and cognitive sciences. The first has to do with the stereotyping of scientific research on human nature and the second is mainly about protectionist urges within the professional guild.

Science suffers from an image problem, at least among many anthropologists. For instance, science is often seen as the servant of imperialistic ambitions or related forms of political domination and economic exploitation. There is (unfortunately) considerable evidence to support these stereotypes, although it is equally easy to find examples of more positive contributions of science to humane, liberal and even politically radical projects. Much more dubiously, however, some may assume that if science can serve the wicked then it must itself be a wicked ideology.

An example of how science has got itself a bad name is provided in this volume by Laura Peers' thought-provoking biography of Beatrice Blackwood. Peers shows that Blackwood's extensive investigation of the relationship between 'race' and intelligence in the 1920s has left a legacy of moral and political dilemmas. Quite apart from the threat Blackwood's research once posed to black activists struggling against notoriously extreme forms of racism in the American South, the fate of the hair samples she gathered from Ojibwe children in northern Minnesota continues to raise concerns among those now elderly persons from whom the samples were taken.

It is tempting to argue that Blackwood's work was an example of 'bad science', driven as it was by a scientific agenda on the decline and subsequently overturned by new discoveries in the biological sciences. The very idea of searching for a connection between race and intelligence is, from a twenty-first-century vantage point, somewhat absurd since culturally prevalent racial categories simply are not founded in biologically significant clusters of differences.<sup>2</sup> But thanks in large part to Blackwood's scientific training, she gathered her data in a highly systematic fashion and therefore her work continues to be of potential value for modern research. For example, in this volume Stanley Ulijaszek explains that anthropometric data, of the sort collected by Blackwood in North America, provides an effective means of assessing environmental stresses, with potentially significant implications for public health policy in a range of areas. Even though the hair samples Blackwood gathered are still stored in unopened envelopes in the Pitt Rivers Museum, it is conceivable that they too may have some genuine scientific value in the future.<sup>3</sup>

Thus, the moral and political implications of biological (or more generally scientific) approaches to the study of culture are much less straightforward than it may first appear. Scientific theories, and particularly the rigorous methodologies upon which they rely, give rise to knowledge that can be used for good or ill. Good science, in and of itself, is neither good nor bad in moral terms, and neither reactionary nor radical in its political orientation. It is only a means to knowledge which, though provisional, is (by virtue of its rigour, precision, and testability) more *reliable* than other kinds of knowledge. What we do with that knowledge is another matter.

Another cluster of concerns among anthropologists, however, relates to the position of their professional guild among surrounding sciences. Some may fear that scientific reductionism is rapaciously imperialistic, seeking to overtake and swallow up any friendly disciplines that are foolish enough to let it in. The cognitive sciences are currently in the throes of a revolution, embracing a broad coalition of subject areas that take the evolution of specialized psychological capacities in our species as axiomatic and assume that the systematic testing of precisely formulated hypotheses must provide the bedrock of further theory building. Researchers in such fields as experimental psychology, neo-Darwinian evolutionary biology, and the neurosciences are increasingly working with a broad range of social scientists, philosophers, archaeologists and others to develop a robust and testable body of knowledge about human nature, and in particular to explain our uniquely human capacities for cultural innovation and cumulative transmission. In doing so, these researchers trespass ever more deeply into topics that lie historically in the heartland of social and cultural anthropology.

What should we, as anthropologists, do about these developments? One option would be to ignore them. But such a strategy could carry heavy costs. As our relevance to surrounding sciences diminishes we may find our own abandoned agendas being taken up successfully by our competitors. And if we do allow our intellectual and institutional heritage as a discipline to be plundered by others, then what would remain for us? Having abandoned our most valuable explanatory tools we may be condemned to endless *descriptions and re-descriptions* of cultural phenomena, enlivened only by speculative interpretations and reinterpretations.<sup>4</sup> If, as anthropologists, we side exclusively with interpretive and hermeneutic traditions, we run the risk of becoming merely an irrelevance to potentially powerful allies, and a feeble adversary to our real rivals.

Alternatively, we may elect to join the revolution. The reason many of the cognitive sciences are growing so fast is because their theoretical frameworks are increasingly integrated, sophisticated and empirically productive. We can both gain from and contribute to this process. We can gain by rebuilding confidence in the questions we once asked, refining them, and seeking more convincing answers (with the help of others). What are the causal dynamics that govern kinship relations, exchange, communication, technology, art, gender relations, religion, and so on? What are the limits of institutional and behavioural variation in these and other domains? To what extent do differing contexts of development and learning impact on the way we think? Anthropologists were among the first to pose such questions and we can still help to answer them.

We (anthropologists) arguably know more than anybody else about continuities and differences in human culture, at least in the modern world. Taking that body of knowledge together with the findings of historians and archaeologist this constitutes quite a lot of information. We also have our own distinctive methodologies for gathering data. Long-term, intensive fieldwork in a single location allows in-depth observation and empathetic learning which provides a *necessary* backdrop and corrective to many other types of investigation (e.g. quantitative or experimental). There is also great scope for refinement of our ethnographic techniques. Generalizations about what people do and say are no substitute for systematic study of how declarative knowledge differs by age and gender, for instance, or how it may be primed by subtle differences of context or developmental history. The usefulness of ethnography for other disciplines will always depend on our capacity to be precise about such matters.<sup>5</sup>

Aside from the data it commands, anthropology has another valuable gift to contribute – and that is its intellectual breadth. Others specialize in particular aspects of human nature: our minds, our

societies, our economic behaviour, or the way we exercise power, for instance. Anthropologists study all those things and more. As such, we have a potentially major role in the new integrative movement. Indeed, we should be at the very centre of it.

### Re-framing Marett's problem

Approximately 50,000 years ago, humanity underwent what archaeologists commonly refer to as the 'Upper Palaeolithic Revolution'. Up to that point, evolved changes in behaviour (as is typical of evolutionary processes in general) tended to correspond closely to changes in *anatomy*. From about 50,000 years ago, however, behaviour began to show unprecedented plasticity against a background of *minimal anatomical change*. This behavioural plasticity heralded both cultural diversification and the transmission across generations of potentially *cumulative* bodies of cultural knowledge. Another way of putting this is to say that whereas behavioural variation in our archaic human ancestors is most effectively tracked in evolutionary time, behavioural variation in modern humans is to be explained in terms of both *evolution and history*. On this fundamental point Marett was surely correct. My aim in what follows is to identify some of the general contributions of evolution and history to the development of culture, and to illustrate this argument with reference to the domain of *religion*. I choose religion mostly because it is my own area of specialism but it is doubly apposite since religion was a principal interest of Marett's as well.<sup>6</sup>

Much recent research in experimental psychology and the neurosciences suggests that the human mind incorporates a complex repertoire of specialized mechanisms. These mechanisms are the outcome of a common evolutionary history in our species and they are fundamentally the same regardless of differences of culture and ecology. There is, as Marett and Tylor imagined, a bedrock of psychological commonalities among members of our species. The challenge confronting us now (as in the past) is to show that significant features of the content, organization, and spread of religious phenomena can be explained in terms of the ways in which these evolved psychological mechanisms are activated. Part of the challenge is clearly to explain religious *universals*: much of what we have learned from modern ethnography, historiography, and archaeology (for instance) points to a massive amount of cross-cultural recurrence not only in human behaviour but in the form and content of religious phenomena. Our first task is therefore to consider how universal features of human psychology serve to shape and constrain the repertoire of religious

thought and behaviour in our species. But we must also rise to the challenge of explaining religious *differences*: why do religious ideas and practices vary from one tradition to the next? This question holds particular importance for anthropologists like myself who have devoted extended periods of their lives to understanding particular local traditions and wondering why they have the distinctive features they do. Let us approach these two questions in turn.

### Evolved cognition and religious Universals

I would venture that certain features of religious thinking and behaviour are universal and ancient. Humans everywhere (and throughout the opaquely visible past) have entertained notions of *essentialized religious coalitions*, *supernatural agency* and of *life after death*; have attributed misfortune and luck to *transcendental causes*; have assumed that certain features of the natural world were *created by intentional design*; have performed *rituals* and endowed them with *symbolic meanings* and have regarded certain kinds of *testimony or obligation as divinely 'given'* and unchallengeable.

If we concede that there is indeed an invariable core of all religious thinking and behaviour – a universal religious repertoire, if you will – then it seems to me that this is potentially explainable as an outcome of biases in our species' evolved cognitive architecture. A useful starting point is provided by the psychological finding that people acquire certain basic assumptions about the nature of the world around them according to a linked series of universal stages, or 'developmental schedules'. This kind of knowledge emerges in a series of distinct domains. For instance, in the domain of knowledge concerned with the behaviour of *physical* entities, people everywhere expect unsupported objects to fall earthwards (a principle known as intuitive gravity). We also expect objects to move in continuous paths, to displace each other in space, etc.<sup>7</sup> In the domain of knowledge concerned with *biological* phenomena, we assume that organisms have essential properties that assign them immutably to particular classes of natural kinds. From an early age, children reason that although an artifact can be altered so drastically that it becomes a legitimate member of an entirely different class of artifacts (e.g. a kettle can be converted into a bird feeder, thereby ceasing to be a kettle), natural species cannot be transformed in this way.<sup>8</sup> Thus, no matter how convincingly a cat may be transformed (e.g. by means of radical surgery) to appear exactly like a dog, subjects assume that it still possesses some hidden essence of feline qualities that prevent it from joining the dog category. The origins of these domain-specific systems are ancient and we have increasingly detailed

accounts of their specialization in the course of hominid evolution.<sup>9</sup> Research in developmental psychology on the emergence of these systems in childhood<sup>10</sup> has recently been augmented by evidence of how these systems operate at the neurological level and also how they malfunction in cases of brain damage and disease, based on both clinical observations and experimental research.<sup>11</sup>

Closely related to intuitive thinking about natural kinds is the way we reason about social categories. Although there has been some debate about whether our folk notions of the social domain rest on intuitive biological reasoning or constitute a distinct type of intuitive ontological knowledge in their own right, what is not in doubt is that people everywhere treat the differences between classes of fellow humans as *similar* to the differences between natural species, at least insofar as they are endowed with heritable essences.<sup>12</sup> Such reasoning appears to lie at the core of racial thinking – in particular the idea that there are invisible essentialized components to the differences between races that are somehow passed on from parent to child. But such reasoning also figures prominently in the way religious specialists and coalitions are cognized. Religious thinking typically postulates distinct classes of persons defined by heritable essences in virtue of which they are entitled to assume sacred office (e.g. in the case of shamans, divine kings, emperors, etc.) or by means of which their persecution may be justified (e.g. in the case of witches, heathens, untouchables etc.).<sup>13</sup> The same intuitive reasoning commonly underpins our representations of religious coalitions, for instance the way Catholics and Protestants in Northern Ireland or Muslims and Jews in the Middle East construe the differences that divide them.<sup>14</sup>

Intuitive ontology becomes important in religious thinking in other ways as well. For instance, cognitive processes that *violate* intuitive ontological expectations may be referred to as *counterintuitive* ways of thinking.<sup>15</sup> Counterintuitive concepts figure prominently in the domain of religion, and they come in two main varieties. First, there are concepts that entail *breaches* of our intuitive expectations. For example, many supernatural agents (ghosts and gods) are assumed to think and feel in much the same way as ordinary human beings but are accorded special physical properties, such as the ability to pass through solid obstacles or to appear in more than one place at a time. Second, there are violations that entail the *transfer* of properties from one intuitive domain to another. For instance, inanimate objects (statues of gods or paintings of saints) might be accorded properties normally restricted to the domain of biological organisms (the ability to weep or bleed). Recent experimental evidence suggests that simple counterintuitive concepts are easier for people to recall than simple intuitive concepts, regardless of cultural differences.<sup>16</sup> This would



help to explain the ethnographic finding that simple counterintuitive concepts are globally recurrent and historically ancient features of religious thinking.<sup>17</sup>

Another feature of human cognition that impacts substantially on the universal religious repertoire is our unique capacity (indeed nagging obligation) to reflect on what others may be thinking. This capacity involves a number of complex psychological mechanisms that have come to be known as 'Theory of Mind'<sup>18</sup> (or ToM), which leads us to make continual inferences about the mental states of other people, to adjust our behaviour in light of those inferences, and to plot and scheme on the basis of what we think others may or may not know (including what we think they know or don't know about our own intentions).

Some recent *evolutionary* accounts of the emergence of ToM have emphasized the reproductive advantage conferred on individuals capable of tracking the strategic interests of allies and enemies and to manipulate social relations accordingly.<sup>19</sup> These evolutionary models are complemented by evidence of ToM operations at the level of brain function.<sup>20</sup> Some of the neuroscience literature is directed to the study of pathological conditions.<sup>21</sup> Serious deficits in ToM capabilities are associated with the condition diagnosed as autism.<sup>22</sup> We have some evidence from ethnography that ToM mechanisms develop and operate similarly in different cultural environments though much more research in this area is needed.<sup>23</sup>

ToM capacities appear to play a crucial role in the production of 'afterlife' concepts. Recent experimental research suggests that people are strongly biased to attribute mental states (desires, sensory responses, intentions, etc.) to dead persons, based on basic ToM operations, even though they are readily able to represent biological and physical functions as having terminated.<sup>24</sup> Part of the reason for this bias may be the impossibility of representing one's own consciousness as 'no longer existing' even though one can readily imagine (or directly experience) the loss of particular biological and physical capacities. Our bias to represent dead persons as having mental/emotional capacities that outlive their physical bodies provides a compelling foundation for notions of free-floating agency, separable from any corporeal anchorage. Such a notion in turn affords the possibility of other kinds of bodiless agents, such as deities and primordial ancestors.

Much recent research has focused on the role of ToM operations in the construction of concepts of extranatural agency. Counterintuitive constructs (based on violations and transfers of intuitive ontological knowledge) enjoy a mnemonic advantage over intuitive concepts in laboratory conditions but that may not be sufficient to explain why

simple counterintuitive concepts become culturally widespread. What we find in the global ethnographic record is not simply a host of counterintuitive concepts (e.g. artifacts that resemble organisms) but, much more strikingly, a plethora of *agents* that have special (counterintuitive) powers. A counterintuitive agent is far more salient than a counterintuitive artifact or plant. This appears to be because an agent has a *mind* that can process information of strategic importance.<sup>25</sup> More importantly, a counterintuitive agent can access and utilize information in ways that ordinary mortals cannot. For instance, a spirit capable of overcoming the physical constraints of gravity and solidity will be able to move around with superhuman speed and stealth – flying through walls or appearing invisibly in more than one place at a single moment. Such counterintuitive abilities allow spirits to listen in on conversations or to observe misdemeanours in a way that human surveillance normally cannot. Consequently, spirits tend to know very much more about what is going on than the rest of us could possibly hope to do. Such a conception of supernatural agency clearly requires ToM operations. We have to be able to represent the spirit as taking an interest in what we are up to – and paying attention in particular to those behaviours that have consequences for others. Typically, we imagine that spirits use this kind of information to mete out punishments and rewards. In order to produce such concepts, we must attribute a mind (i.e. intentions, beliefs, and desires) to our supernatural construct. Often, extranatural agents are construed as having special kinds of minds – capable of reading our thoughts (rather than having to infer them from our behaviour) or being able to see into the future (and thus to provide warnings or to lay traps).

ToM capacities are also clearly essential for representations of spirit possession and mediumship. Here, the idea is not merely that a person's mental/emotional capacities can live on after the body has expired but that, in virtue of being separable in this way, minds and bodies can be temporarily dislocated and recombined. Minds can leave bodies and be replaced by other minds (for instance the minds of dead persons or deities), before being restored to their original location. For such a process to make any sense, those who experience or observe possession episodes must be able to represent their own and other people's minds as discrete entities whose identities can be revealed on the basis of complex signals.<sup>26</sup>

In the construction of religious concepts a crucial role is also played by psychological mechanisms dedicated to the detection of agency. The Agency-Detection System develops at a strikingly early age in humans.<sup>27</sup> Even newborn infants have rudimentary biases to distinguish animate agents from inanimate objects and this early predisposition rapidly develops into a system that treats a wide range

of inputs as possible signs of agency.<sup>28</sup> Children and adults alike are highly susceptible to the over-detection of agents in their environments. It is all too easy to see the outlines of faces in the striated patterns of a rockface or the changing configurations of clouds in the sky. And we rapidly attribute agency to unexpected or ambiguous noises or movements. It has long been appreciated that such a system would have been highly adaptive in an environment replete with dangerous predators.<sup>29</sup> This would help to account for the hyperactivity of the system in question: the costs of raising the alarm when detecting harmless agents (or sounds and movements not caused by agents at all) would, one might surmise, have been a small price to pay for the successful avoidance of genuinely dangerous creatures.

Although the Agency-Detection System is not capable in itself of creating a full-blown concept of extranatural agency, it appears to play a supporting role in persuading people (who have already acquired such concepts) that spirits and deities really are around, lurking in the environment. Of course, many instances of agent over-detection are readily dismissed: it turns out to be a rustling of leaves or the whistling of the wind. But not all unexpected sounds and movements are traceable to obvious causes and if somebody were to claim that even one such occurrence had been caused by ghosts, it would be well nigh impossible to disprove such a claim. Thus, the Agency-Detection System is capable of supporting concepts of supernatural agency generated by the ToM system.

Supernatural agents, however, are also quintessentially *moral* agents. They do not simply supervise or monitor our behaviour, by means of their special powers; they punish us when we transgress and reward us when we behave well. Whereas rules of convention are highly variable cross-culturally, moral rules exhibit a number of universal features.<sup>30</sup> For instance, moral thinking everywhere delivers the intuition that *harming others* is wrong.<sup>31</sup> Moral infractions are universally treated more seriously than violations of convention. Of special significance is the intuition that moral rules are not contingent on authority in the same way as rules of convention. Regardless of whether figures of authority forbid or condone harming behaviours, those behaviours are still intuitively judged to be immoral. This applies equally to supernatural and worldly authorities alike. For instance, an early study of moral reasoning among Armish youths revealed that the conventional rule forbidding labour on the Sabbath was contingent on God's authority whereas harming behaviours (use of violence to achieve one's goals) were perceived to be wrong whether or not they were subject to divine sanction.<sup>32</sup>

Moral thinking, together with the operation of ToM mechanisms, plays an especially prominent role in the way people manage their

*reputations* in the eyes of others. The maintenance of alliances and support networks of all kinds, and perhaps most crucially (in terms of gene transmission) the task of attracting a mate, depend upon the successful management of one's reputation (through the suppression of harmful information about one's behaviour and the promulgation, where possible, of a virtuous self-image).<sup>33</sup> A person of dubious moral integrity (with a history of harming others whether through physical abuse, treachery, stealing, or character assassination) runs the risk of exposure and thus of becoming saddled with a poor reputation in the community. Religious thinking provides unique opportunities for this kind of management. First, it may serve to inhibit antisocial behaviour (by postulating extranatural agents with special capacities to observe and punish wrongdoing). Second, those who can convince others of their moral fibre through costly displays of religious devotion may derive the benefits of a high reputation (whether or not their concealed thoughts and behaviours are congruent with a laudable public image). Third, religious thinking can provide a means of restoring damaged reputations (or forestalling and thereby limiting potential damage) through mechanisms of confession, absolution, reconciliation, expiation and so on. All these processes depend, of course, on the presence of a moral thinking system as well as an awareness (based on ToM capacities) that others are capable of monitoring one's intentions and making judgements of character on that basis.

These are just a few examples of the ways in which our species-specific cognitive systems may give rise to universal features of religious thinking. Much more could be said on this subject and of course there are other features of the universal repertoire that I have not even touched upon. But this should suffice to give a flavour of the ways in which the cognitive science of religion is beginning to provide precise and testable explanations for cross-culturally recurrent religious concepts, commensurate with the findings of surrounding sciences.

Let us move swiftly on to another, equally daunting but potentially soluble problem: the causes of religious *variation*. To put it concretely, how might our knowledge of the kinds of minds we have help us to explain what makes the richly textured and distinctive features of Yolngu religion and cosmology, as described by Howard Morphy in this volume, *different* from those that might prevail among parishioners of an Oxford church?

### **Historicized cognition and religious variation**

Some species-specific behaviour is highly stereotyped and *fixed* by biological design features. Other behaviours are more malleable

and diverse within the species. One way of grasping this point is to distinguish between 'open' and 'closed' behaviour programmes.<sup>34</sup> 'Closed' behaviour programmes are ones that churn out much the same outputs in all known environments. Obvious examples in humans would include the programmes responsible for such universal behavioural displays as sneezing, flinching, laughing, crying, and so on. We might reasonably compare such responses to the behavioural repertoires of other species. Some behaviour programmes are more 'open' than others in that they can undergo significant modification through processes of learning. We know from studies of bird behaviour, for instance, that despite the presence of species-typical vocal repertoires there may also be subtle *regional* differences in birdsong that are the outcome of local innovation and the transmission of distinctive vocal patterns among individual birds.<sup>35</sup> Such patterns of innovation and transmission are even more striking among our closer primate relatives, like chimpanzees – who are now known to invent and pass on a variety of skills, for instance involving simple tools.<sup>36</sup> But in modern humans, these same types of processes operate on an altogether different scale. Not only are humans highly inventive creatures (just like some of our primate cousins) but crucially we also have highly developed methods of *storing*, both by means of cognitive memory and through the use of various kinds of external repositories, the innovations and discoveries of our forebears. And for this reason many features of human culture are capable of developing *cumulatively* over time. Instead of having to rely more or less *exclusively* on behavioural repertoires that are characteristic of the species as a whole, and thus forged in *evolutionary* time, humans are able to master massive bodies of skills and information gradually assembled by their ancestors in the course of *locally distinctive histories* of transmission.

The accumulation of cultural knowledge over time constitutes a source of quite dramatic ecological change. It is not simply that, in building on the shoulders of our ancestors, we have transformed the landscape or built skyscrapers and jumbo jets. Of course we have certainly done this, with increasingly grave consequences, as cultivable land diminishes, as non-renewable resources become scarcer, as levels of pollution rise, as climate change accelerates, and so on. But in addition to this, humans have created significant changes in the way social relations are conceptualized and reproduced. Consider, for instance, David Parkin's discussion in this volume of the implications of changing levels of density of interaction and effervescence for patterns of conflict, alliance, co-operation, and competition in human populations. And there are other examples in the present collection of essays. Consider Tim Ingold's reflections on the possible impact of literacy on conceptual development and embodied skills or Chris

Gosden's observations on the way our uses of artifacts can shape and channel social relations.

Environments (including patterns of social interaction and culturally distributed knowledge and tools) may well be capable of influencing some features of the development of our cognitive architecture.<sup>37</sup> But it also seems likely that varying ecological contexts serve to *prime* and *constrain* the way our universal cognitive capacities are activated. This latter hypothesis has proved to be an especially fertile area of research in recent years and holds great promise for further investigation.

While there is currently a range of candidate hypotheses with regard to the cognitive causes of religious diversity, much of my own work has focused on domain-general features of the human mind and, in particular, our capacity for conscious remembering. By 'domain-general' I mean that any kind of information we consciously recall can (at least in principle) become the trigger for any other, regardless of the domain to which that particular knowledge relates. For instance, your telling me that this chapter needs cutting could in principle remind me that my lawn needs mowing, even though texts and gardens belong to different ontological domains subject to different types of intuitive expectations and inferences. Being able to create novel *connections* of this kind is part of the key to understanding religious innovation. And being able to *store* those connections and *pass them on* is the foundation for cumulative religious transmission, and thus of the history of religion. The challenge, as I see it, is to isolate the principal causes of creative innovation in religious traditions and to identify the core mechanisms by which those innovations are preserved in memory and transmitted to others (both horizontally, across populations, and vertically, across generations).

It is probably useful to distinguish a number of different kinds of religious innovation but let us consider two. First, there is a kind that we might describe as 'revelatory' or 'epiphanic', whereby in a flash of insight (often attributed to some kind of divine or miraculous intervention) the religious innovator comes to see things in a radically new and persuasive light. Second, there is a kind of innovation that is more incremental, involving stepwise advancement from one idea to the next until a new network of connections is completed.<sup>38</sup> These two types of innovation are often intimately entangled – epiphanic revelations can give rise to gradual reworking of complex doctrinal problems and, conversely, more incremental changes in a doctrinal framework can trigger sudden and consequential moments of insight. But it also seems to be the case that these two types of innovative responses can be primed and suppressed in ways that are socially regulated.

Consider, for instance, the area of ritual performance. One of the defining features of ritual actions is their irreducibility to technical and intentional motivations.<sup>39</sup> Whereas all the constituent procedures of technically motivated actions contribute in some intuitively graspable way to a given outcome, many of the procedures entailed in ritual performances do not. The relation of such procedures to the outcome is opaque. Why do the ritual participants have to dress up in peculiar clothes (not just any clothes, but these particular clothes)? Why do they have to repeat this phrase or that action three times rather than just once? Why perform the procedures in this sequence rather than that? The question of how ritual actions contribute to particular outcomes (assuming those outcomes are specified, which is not always the case), is somewhat mysterious. Given that humans are inveterate 'mindreaders' (forever wondering what intentions lie behind the behaviour of others), rituals present another distinctive kind of problem: *who* told us to carry out the rituals a certain way, and *why*? It is clearly insufficient to say that the priest or the shaman told us to do it because we assume that any religious authorities in the present acquired these rules from their predecessors, going back into ancestral time, thus inviting an infinite regress in search of the answer. The riddle of intentionality posed by ritual behaviour<sup>40</sup> can invite four types of response. First, one might initiate a search for intentional meaning but more or less immediately give up and simply say that this is 'the tradition' or 'the will of the ancestors or gods'. Second, one might accept at face value whatever the religious authorities declare to be the meaning of the ritual procedures (or indeed of the ritual as a whole). Official exegesis of this sort may well provide a substitute for independent exegetical rumination and thus be combined with the 'giving up' response. Third, one may generate some kind of off-the-cuff speculation as to the meaning behind the ritual procedures (for instance in response to the badgering of anthropologists who want to fill their notebooks!). Fourth, one might engage in prolonged spontaneous exegetical reflection resulting in a rich and complex body of interpretations of a personal and idiosyncratic kind.

These types of responses to the puzzle of what rituals might mean are not randomly generated. It is quite possible that, due to personality differences, for instance, some people may be more inclined to accept official exegesis whereas others might be more ruminative and creative.<sup>41</sup> But there are also features of the way ritual performances are organized and carried out that affect how we respond to problems of exegesis at a population level. Rituals that are very frequently performed eventually come to be encoded in procedural memory and are thus capable of being carried out as entrenched embodied habits without any need for deliberate thought or concentration.<sup>42</sup> Once there

is no longer any need for conscious thought about *how* to conduct the ritual, we are considerably less likely to wonder *why* we have to do it in a particular way.<sup>43</sup> Consequently, routinization of ritual procedures tends to be associated with the suppression of exegetical rumination (the 'giving up' response). At the same time, frequently-performed rituals provide opportunities for the reiteration of official exegesis, thus making us more susceptible to the learning of standardized and widely shared interpretive meanings. In some traditions, the guardians of doctrinal orthodoxy may despair of the laity's apparent sloth and ignorance in matters of exegesis and try to prod them into thinking more deeply about such matters (perhaps coercing out of the hapless mouths of participants 'off-the-cuff' responses that, more often than not, may be ridiculed or dismissed).

A very different pattern of exegetical thinking tends to accompany rituals that are rarely performed. For reasons we must put aside here,<sup>44</sup> low-frequency rituals typically involve comparatively high levels of emotional arousal. In many cases, such as initiation rites and the climactic ceremonies of millenarian cults, a person undergoes the rituals only once in a lifetime (although they may subsequently help to orchestrate such rites for others) and the experience is likely to be highly traumatic. For instance, we know from ethnographic research in regions like Melanesia, Amazonia, Aboriginal Australia, and Africa that traditional forms of initiation may involve terrifying ordeals (including beatings, bodily mutilation or scarification, burning, and coerced participation in acts that would normally be considered immoral, unacceptable and disgusting, such as cannibalism, ritualized homicide, and so on).<sup>45</sup> For most or all peoples, not only are these kinds of experiences intrinsically shocking, but sometimes the element of sadism is greatly emphasized and the tortures exacerbated through the use of trickery, blindfolding, threatening, and scapegoating. Participation in such rituals is capable of triggering long-term rumination on questions of meaning in a way that participation in more humdrum, routinized rituals is not. Initiates assume that there must be good reason for having to endure such ordeals but the meanings of the ritual tortures and privations are tantalizingly opaque. Somewhere in the details of what occurs and the cryptic murmurings of the initiators, clues must be buried. The initiate thus embarks on a lifetime of potentially irresolvable ruminations, a process of exegetical reflection that may unfold in fits and spurts but never entirely fades.

Ritual ordeals can thus provide a stimulus for spontaneous exegetical reflection. And there are undoubtedly other routes to such an outcome. In some cases, the analogue of participation in a highly arousing, shocking, and personally consequential collective ritual may be found in a more personal and solitary experiences.



A state of delirium, a brain seizure, a close shave with death or an apparently miraculous intervention or visitation, for instance, might well have similar effects. These are the kinds of episodes that one tends to remember and reflect upon. Like rituals, they may have puzzling components that trigger a search for intentional meaning – why did this happen to me, at that particular time and place, with such-and-such a set of consequences? The sensation that there must be an agent behind it all is a natural consequence of our ‘mindreading’ minds. But it is also the kind of question to which doctrinal systems may supply ready-made answers. Often, they provide a schematized framework for the interpretation of such experiences, which may by turns enfold our experience and give it meaning or fail to deliver a satisfactory solution and drive us on to further acts of doctrinal creativity.

The two routes to religious innovation just outlined also generate distinct modes of storage and transmission. The reiteration of a creed, through repetitive sermonizing and the continual re-reading of sacred texts, leads to the storage of standardized narratives, dogmas, and exegetical commentaries in *semantic memory*.<sup>46</sup> Information of this kind, codified in language, is ideally suited to efficient transmission across wide areas by potentially quite small numbers of proselytizing individuals (e.g. priests, missionaries, prophets, gurus, and messianic leaders). As long as the Word is subject to frequent reiteration in the far-flung locations to which it spreads, people will readily notice when unauthorized versions are proposed. And if mechanisms for policing the orthodoxy can be introduced, heretical innovation can be punished and suppressed. In general, determined innovators can only succeed by setting up rival organizations of their own, often via processes of schism and splintering. By contrast, the kinds of revelations generated by traumatic rituals are much more costly and difficult to spread or to regulate. They are hard to spread because they arise out of forms of collective action rather than individual oratory or the written word. Transmission across populations generally requires either contiguous contagion or wholesale migration and carries great risk of mutation of both the practices and their meanings as the tradition spreads. And because the mysteries behind the rituals can only be divined through personal reflection and revelation, creative outputs tend to be diverse and idiosyncratic. If there is no forum for public rehearsal or inscription of these outputs, they remain esoteric (as personal or localized mystical exegesis and cosmology). The best chance of preserving such knowledge is to convert it into a more routinized orthodoxy, and so there is often a dynamic interaction between these two modes of religious innovation and transmission.

The above features form aspects of two distinctive ‘modes of religiosity’ which I refer to as ‘doctrinal’ and ‘imagistic’ respectively.<sup>47</sup>

Both independently and jointly these modes of religiosity facilitate the creative elaboration of our most exotic and cumulatively intricate religious ideas. Our exceptional capacities as a species for cross-domain analogical thinking and inductive reasoning provide the motor driving innovation, given appropriate triggering mechanisms, while our capacity for semantic memory provides the principal means of storing those innovations, given the necessary conditions of doctrinal reiteration and institutional routinization.

### **The evolution and history of religion**

So how are we to connect the *universal religious repertoire*, deriving from our evolutionary heritage, and the great *diversity of religious thinking and behaviour*, that derives from distinctive histories of innovation and transmission?

A simple but powerful way of envisaging the role of evolution and history in religion is to think of the entire process as a sort of 'ratchet effect'.<sup>48</sup> A ratchet does two things: it *turns* a bolt so that it moves progressively into its thread but it also *holds* the bolt in place so that the tool remains connected to it. The holding function is the equivalent of our evolutionary heritage, which remains constant across the world's cultural environments. Regardless of local histories of cultural innovation and transmission, our fixed, generic cognitive capacities churn out more or less the same kinds of religious outputs in all places and at all times (the 'universal religious repertoire'). Insofar as this is a creative process, it is only minimally so, in much the same way that small variations in birdsong or in tool use among chimpanzees might be seen as an outcome of creativity. To say that we are always 'reinventing the wheel' is to understate the situation, since the universal religious repertoire is certainly more ancient than the wheel and has probably been reinvented many more times. By contrast, the turning of the bolt is equivalent to the cumulative effects of history through which more rarified religious ideas are created, stored, and passed on. Such ideas are more 'rarified' in the sense that they are relatively hard to cognize and thus require special care and attention (e.g. techniques of public reiteration or codification in sacred texts) if they are to endure. Notions of the Christian Holy Trinity or the Noble Truths of Buddhist scholarship, for instance, are too distant from our intuitive ways of thinking to stand much chance of independent invention or indeed to survive in the absence of pedagogic support or external mnemonics.<sup>49</sup>

The universal religious repertoire may have emerged around the time of the cultural explosion about 50,000 years ago,<sup>50</sup> though some

writers attribute concepts of supernatural agency to archaic *homo sapiens* and even to some earlier hominid species.<sup>51</sup> The emergence of the *imagistic mode* is probably rather more recent, though it certainly pre-dates the first appearance of the doctrinal mode and by a very substantial margin. Some evidence of imagistic practices can be found as far back as the Upper Paleolithic,<sup>52</sup> whereas the doctrinal mode appears probably no less recently than 6,000 years ago.<sup>53</sup> Thus, whereas *intuitive* religious thinking is at least as old as our fully-modern species, imagistic and (subsequently) doctrinal modalities of transmission, seem to have emerged during *historical* rather than *evolutionary* time. Nowadays, all three ways of acquiring and transmitting religion are widely distributed in the world's religious traditions. And these three modalities of transmission inevitably influence each other.

Consider the following example. All religious traditions dominated by the doctrinal mode by definition incorporate highly repetitive forms of ritual and oratory. Under certain conditions, this kind of routinization can give rise to boredom and lowered motivation (what's become known as the 'Tedium Effect').<sup>54</sup> In conditions of demoralization, techniques of policing the orthodoxy typically become less effective, resulting in the emergence and spread of more intuitive ideas and practices. Whenever this drift towards the universal religious repertoire becomes sufficiently entrenched within a doctrinal tradition we tend to find a backlash in the form of movements of doctrinal reform. Often these entail high levels of religious excitement, triggering imagistic-type revelations and a rejuvenation of doctrinal authority. Once the religious police are back in power, we see a return to routinization. Many aspects of this pattern were famously described by Max Weber and a variety of other distinguished scholars.<sup>55</sup> What we now have in prospect, though, is a cognitive explanation for these phenomena.

## Conclusions

Marett and his colleagues recognized that the causes of religious continuities and differences around the world and over time were to be explained in terms of a combination of evolved psychological universals and historically contingent ecological contexts. The extent to which we will be able to demonstrate this in detail, and thereby truly to *explain* religion (and other cultural phenomena), will depend in part on how successfully anthropologists can connect their empirical and theoretical activities and ambitions to those of neighbouring sciences. Concerted efforts are also needed *within* our discipline. In Marett's

day, highly erudite and learned scholars could very nearly master *all* the information available on patterns of variation in a field such as religion (the extraordinary accomplishments of Sir James Frazer, for instance, spring to mind). Nowadays, however, this is unthinkable. It is difficult enough for anthropologists to keep abreast of findings in their own specialist areas of regional and topical interest, let alone to command expert knowledge of the ethnographic record as a whole. Consequently, comparative anthropology must increasingly become a collaborative enterprise.

An example of the direction in which I believe we need to go is provided by recent projects designed to test and refine the 'modes of religiosity' theory. This work<sup>56</sup> has generated startling new discoveries about the way doctrinal and imagistic modes affect each other, and are in turn affected by more cognitively optimal religious practices.<sup>57</sup> Because of the explanatory potential of these sorts of theories, the cognitive science of religion has become a rapidly expanding field over the last fifteen years. There is now a growing demand for postgraduate training in this area and funding bodies are increasingly supporting this kind of research. Publishers are rapidly establishing new journals and textbooks on cognition and culture,<sup>58</sup> and there is also scope for the creation of new projects and centres for the scientific study of cultural phenomena.<sup>59</sup> I think Robert Ranulph Marett would have approved of at least some of these developments. The question is whether *contemporary* anthropologists will see the potential that lies before us – and join the revolution.

## Notes

1. This chapter is based on the Marett Lecture presented at the University of Oxford on 16 September 2005, as part of the Oxford Anthropology Centenary Celebrations and while I was at the time Director of The Institute of Cognition and Culture, Queen's University, Belfast. I thank Exeter College and the Institute of Social and Cultural Anthropology, at the University of Oxford, for inviting me to present the lecture.
2. Hirshfeld 1996.
3. Although any such potential would need to be offset against the moral arguments for disposing of the material in a manner commensurate with the wishes of those who originally provided it.
4. According to Tooby and Cosmides, our fate is already sealed: 'mainstream sociocultural anthropology has arrived at a situation resembling some nightmarish short story Borges might have written, where scientists are condemned by their unexamined assumptions to study the nature of mirrors only by cataloguing and investigating everything that mirrors can reflect. It is an endless process that never makes progress, that never reaches closure, that generates endless debate between those who have seen different reflected images, and whose enduring product is voluminous descriptions of particular phenomena' 1992: 42.

5. A sentiment echoed by Morphy, this volume.
6. Marrett 1917, 1920, 1929.
7. Baillargeon 1987; Baillargeon and Hanko-Summers 1990; Spelke 1991.
8. Keil 1986, Atran 1990.
9. Barkow, Cosmides, and Tooby 1992; Mithen 1996.
10. Baillargeon 1987; Gelman 1988; Massey & Gelman 1988; Mandler, Bauer, and McDonough 1991; Gopnik, Meltzov, and Kuhl 1999.
11. Farah and Wallace 1992, Hillis and Caramazza 1991.
12. For a discussion, see Hirshfeld 1996.
13. Stewart 2005.
14. Boyer 2001a.
15. Boyer 1990, 1992, 1993, 1994a, 1994b, 1996, 2001a, 2001b.
16. Boyer and Ramble 2001.
17. Boyer 2001a.
18. Carey 1985, Wellman 1990, Leslie 1994, Bloom 2000.
19. Dunbar 1998.
20. Williams, Whiten, Suddendorf and Perrett 2000.
21. Baron-Cohen, Tager-Flusberg and Cohen 2000.
22. Baron-Cohen 1995.
23. Some anthropologists (e.g. Lutz 1985) and psychologists (e.g. Miller 1984) have argued that ToM is significantly influenced by cultural differences but we require very much more rigorous and systematic research on the topic before much on the subject can be said with any confidence.
24. Bering, McLeod and Shackelford (in press); Bering, Hernández-Blasi and Bjorklund (in press); Bering and Johnson (1994).
25. Boyer 2001; Barrett 2004.
26. Stewart 2005.
27. Meltzoff 1995; Johnson 2000.
28. Guthrie 1993.
29. See for instance Barrett 2004.
30. Turiel 1983.
31. Nichols 2004.
32. Nucci 1986.
33. A primate analogy would be the presentation of status and rank.
34. Mayr 1976; see also Tooby and Cosmides 1992.
35. Catchpole and Slater 1995.
36. Povinelli 2000.
37. Early attempts to demonstrate this, for instance in the form of the 'Sapir-Whorf Hypothesis' did not provide strong evidence for the shaping effects of varying cultural/linguistic (or, more broadly, ecological) contexts on cognition (D'Andrade 1995: 182–83). Subsequent assertions in support of cognitive relativism, for instance in relation to the development of emotions (Harré 1986, Heelas 1986), theory of mind (Lutz 1985, Miller 1984), the learning of embodied skills (Toren 2001) and other core areas of psychology have so far lacked precise and rigorous substantiation. Much more research is needed on this topic before any firm conclusions can be reached.
38. These differences in the creative process have their analogue in other kinds of human endeavour (Eysenck 1995).
39. Humprey and Laidlaw 1994.
40. Bloch 1974, 2004.
41. On the connections between personality and creativity, see Eysenck 1993; for a general consideration of this issue in relation to religious thinking, see Berner 2004.
42. Whitehouse 2004.

43. Some preliminary experimental support for this claim has been gathered (Whitehouse 2004: 83, fn.11) although the main basis for this claim is based on ethnographic observation (Whitehouse 1995).
44. Whitehouse 2005.
45. For ethnographic examples, see Lowie 1924, Turnbull 1962, Meggitt 1962, Allen 1967, Strehlow 1970, Barth 1975, 1987, Tuzin 1980, Herdt 1981, 1982, Verswijver 1992.
46. The distinction between semantic and episodic memory was first advanced by Tulving (1972) and has subsequently given rise to a very substantial body of research (for an overview, see Baddeley 1997: Chapter 20).
47. Whitehouse 1995, 2000, 2004
48. A phrase I adapt from Tomascello (1999) for rather different purposes here.
49. Recent experiments suggest that levels of repetition necessary for successful transmission of the Four Noble Truths of Buddhism to naïve adults (non-Buddhist undergraduate students) are remarkably high (Whitehouse 2004: 84, fn.21).
50. Mithen 1996.
51. Mania and Mania 1988.
52. Whitehouse 2000; see also: Lewis-Williams 1997 and Pfeiffer 1982.
53. Whitehouse 2000.
54. Whitehouse 2004.
55. Max Weber (1930, 1947); see also Benedict 1935; Gellner 1969; Goody 1968, 1986, 2004; Turner 1974; Lewis 1971; Werbner 1977; Barth 1990, 2002.
56. Sponsored in the UK by the British Academy, the University of Cambridge, and Queen's University Belfast and in the USA by the Templeton Foundation, Emory University, and the University of Vermont (for further details, see <http://www.qub.ac.uk/fhum/banp>).
57. See in particular Whitehouse and Laidlaw 2004, Whitehouse and Martin 2004, Whitehouse and McCauley 2005.
58. For details of the Cognitive Science of Religion book series at AltaMira Press, see: <http://www.altamirapress.com/series/>; for details of the *Journal of Cognition and Culture*, see: <http://www.ingentaconnect.com/content/brill/jocc>.
59. These include the Institute of Cognition and Culture at Queen's University Belfast (<http://www.qub.ac.uk/icc/>), the Centre for Religion and Cognition at the University of Groningen (<http://religionandcognition.com/crc/>), The International Association for the Cognitive Science of Religion (<http://www.iacsr.com/>), The Mind and Society in the Transmission of Religion Project at the Academy of Finland ([http://www.mv.helsinki.fi/home/ipyysiai/Project%20second\\_page\\_1.htm](http://www.mv.helsinki.fi/home/ipyysiai/Project%20second_page_1.htm)), and the Religion, Cognition, and Culture Project at Aarhus University (<http://www.teo.au.dk/en/research/current/cognition>).