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Mae'r Copi Digidol hwn ac unrhyw gopi digidol neu argraffedig a ddarparwyd ar eich cyfer neu a wnaed gennych o dan amodau'r Drwydded i'w defnyddio ar gyfer y Cwrs Astudio hwn. Gallwch gadw copïau o'r fath ar ddiwedd y cwrs, ond ar gyfer eich defnydd personol yn unig.

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Magic, Religion, Science, and Secularization

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The object of this paper is not to analyze the distinctions between magic and religion and magic and science as categories of participants or societies under study but as categories of observers, the social scientists themselves. The problem here is not how distinctions have been defined in order to establish and protect social boundaries and normative rules, but how social scientists have defined them in order to present a sociological thesis. On occasion social scientists' discussions of the definitions of magic, religion, and science have become arid debates with no clear reference to any sociological or historical question, but for the most part anthropologists and sociologists have proposed defining these terms in such a way that will assist them to ask comparative and historical questions about modes of thought and social practices.

The social scientists' definitions may diverge from those of the populations they study, but the question of whether it is legitimate or appropriate to define terms of differently from the persons under study is not a concern of this paper. The focus here is on how anthropologists and sociologists have formulated and used distinctions in order to support or oppose arguments about secularization in Western society. The intention is not to provide a general review of theories of secularization but to concentrate on how social scientists have considered the relationships between magic, religion, and science in a historical process that they have

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called secularization. A distinction can then be made between the argument that the advance of science has caused, or at least been accompanied by, a decline of both magic and religion (a "general" thesis of secularization), and the argument that the advance of science has caused, or been accompanied by, a decline of magic but not of religion (a "partial" secularization thesis). The analysis will not deal so much with the empirical evidence that has been brought to bear on these theses, but on the logical and analytical value of the distinctions insofar as they relate to the question of secularization.

A number of contemporary writers have inclined toward a partial secularization thesis, and their arguments concerning the negative association between science and magic have involved postulating both a crucial similarity, which makes magic and science alternatives or competitors, and a crucial difference, which results in science replacing magic. Religion, in contrast, is defined only in terms of its difference from science so that there is no question of its being replaced by science. Two of the schools of thought in the anthropology and sociology of religion, the "intellectualist" and the "functionalist," will be reviewed, but it will be found that there is a considerable overlap in their arguments concerning the relationship between science and magic in the process of secularization.

The two most important Victorian exponents of the intellectualist approach were E. B. Tylor and James George Frazer. They both viewed magic and religion in primitive societies as beliefs and practices that attempted to interpret the world rationally and achieve worldly goals. Although primitive beliefs were derived from observations of the world and involved rational processes of thought, the observations were mistaken or incomplete and the deductions were faulty. Intellectual development was the essence and drive of progress, and in time observations were improved and deductions were corrected until science as we know it was achieved.[1]

Both Tylor and Frazer distinguished between magic (analogous to science), a belief in impersonal forces, and religion, a belief in personal supernatural beings. Tylor believed that magic or "occult science" belonged to the lowest level of civilization, and wrote that its basic erroneous assumption was that an association in thought entailed a similar association in reality; a subjective or ideal connection was mistaken for an objective or real connection. Modern educated persons had forsworn such thinking, but magic continues as a primitive survival among the ignorant masses, and there was even a revival of "savage philosophy" in the form of modern spiritualism.[2]

Frazer noted that magic was still found among European peasants, but he put less emphasis than Tylor on the theme of survivals and more on a

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commonality between magic and science. Although magic was the most primitive form of belief in the evolutionary scale, it shared with science the assumption of immutable laws whose operation can be foreseen and calculated precisely. Magicians may deal with spirits, but they related to them in the same way as they did to inanimate agents; they can be constrained or coerced, for they are subject to impersonal forces. The flaw in magic was not in its assumption of immutable laws but in its misconceptions of those laws. They are based on two misapplications of the association of ideas: the law of similarity, which assumes that like produces like, and the law of contact, which assumes that things that were once in contact will continue to act on each other after they are no longer in contact. Magic is, therefore, "a spurious system of natural law," a "false science"; its laws are necessarily false: if they were true, they would be science.

The masses have continued to practice magic, but at some stage in the past more thoughtful persons recognized that magic was ineffectual, and the blow that this gave to their confidence resulted in the development of a religious system in which the emphasis was on dependence on the gods. The religious belief that the course of nature was determined by conscious agents reflected a "higher degree of intelligence and reflection," but the assumption in religion that natural events are variable was contradicted by precise observations, and "keener minds" came to postulate explicitly what had only been implicit in magic: "an inflexible regularity in the order of natural events."[3]

Thus, the classical intellectualist interpretations included a clear secularization thesis in which magic is replaced by science as a consequence of intellectual development. Magic had not disappeared, but it represented a survival among the uneducated of a previous stage of civilization. Religion was also analyzed in intellectualist terms and Frazer at least pointed to its replacement by science, but religion was not described as a survival and its place in modern society was not explored. By emphasizing that religion did not share the basic assumption in immutable law of magic and science, Frazer opened up the possibility that religion and science could coexist.

Contemporary intellectualist interpreters of magic and religion, who have called themselves, or been called by others, "neo-Frazerians" or "neo-Tylorians,"[4] have written little about secularization or about magic and religion in modern societies. They are anthropologists or philosophers rather than sociologists, and they have applied themselves to a comparison of traditional "magico- religious" thought and modern scientific thought. Their arguments do, however, have clear implications for a secularization thesis.

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Writers of the intellectualist school have continued to emphasize a similarity between magic and science, but they have not followed Frazer in his argument that magic and science share a common assumption of basic natural laws. Some writers have followed Frazer in defining magic in terms of impersonal conceptions of, or coercive orientations toward, the supernatural,[5] but the ethnographic evidence is overwhelming that the personalistic idiom is predominant in the mode of thought of those societies ("primitive," "preliterate," "traditional") that are said to have the most magic. Relationships between persons and supernatural agents can rarely be neatly divided in terms of coercion or supplication; it is difficult to determine the degree of freedom of action that supernatural agents are perceived to have, and a ritual directed toward a single agent may include both requests and commands, both entreaties and admonitions.[6]

If the neo-Frazerians to be discussed below have not followed Frazer with respect to the similarity that he made between magic and science, neither have they followed the difference that he made in terms of the falsity or truth of beliefs. Philosophers and sociologists have debated whether the question of the truth or falsity of beliefs should enter into a sociological analysis of those beliefs,[7] but even those who argue that the veracity of beliefs should and in fact has to enter any sociological analysis have not suggested that science and magic should be distinguished in these terms. The reason is simple. It makes little sense for scientists' hypotheses or theories that have been found false to be automatically recategorized as magic.

In their intellectualist interpretation of magic, Jarvie and Agassi[8] criticize Frazer's evolutionary scheme and his conception of science, but they give qualified support to Frazer's rational interpretation of magic and use this as a foil in their polemic against symbolist interpretations. They contrast their argument that persons perform magic because they believe that it will realize or help realize practical goals with the more favored interpretation of English anthropologists who analyze magic as symbolic of abstract notions and social values. Jarvie and Agassi argue that symbolic interpretations are entirely arbitrary, and inasmuch as persons are not aware of their symbolizations, these cannot explain why they perform magic. Magic has to be explained in terms of personal beliefs, and persons in primitive societies believe that their magic—like their technical skills, which they do not conceptually separate from magic—will achieve or help to achieve their goals.

The symbolist interpretation does not distinguish magic from religion; both are expressive forms of behavior to be distinguished from the instrumentalism of technology and the concern with explanation in science.

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Jarvie and Agassi dispute this view,[9] but their own distinction between magic and religion is undeveloped. They argue that, because magic is directed toward the attainment of goals, it is rational in what they call "the weak sense." Rationality in "the strong sense" is the application of standards of rational criteria, such as openness to criticism, and it is this that distinguishes science from magic. They note that many persons would argue that religion is not rational in either the strong or weak sense, but they hold that religion is rational in the weak sense for it has goals, such as the worship of God or the survival of life after death. However, they maintain that they follow Frazer in acknowledging that in modern society religion and science are not intellectual competitors; religion in modern society deals with morality and no longer seeks practical aims.

These statements imply that a partial secularization has occurred; religion has become differentiated from magic and coexists with science whereas magic, a "proto-science," which continues to share practical aims with science, must have been damaged by the advance of science which has the advantage of being rational in the strong sense. The problem with this interpretation is that, as Jarvie and Agassi acknowledge, magic is a cosmology or worldview that has an explanation for everything including failed magic and successful technology. This is contrasted with the Western worldview, which acknowledges that it cannot explain everything, regards refutability as a desirable quality, is more interested in questions than in answers, and endorses the rejection or improvement of previous answers. The assumption in the magical worldview that it is necessary to both plant and chant to produce crops raises the interesting question of how societies break out of that view, but although they pose this question Jarvie and Agassi do not attempt to answer it. A thesis of partial secularization is implied, but there is no indication of how the intellectualist approach could begin to explain it.

Another contemporary exponent of the intellectualist approach, the anthropologist Robin Horton, admits to the tag "neo-Tylorian," but his explication of the principle of "neo-Tylorianism" does not differentiate it from "neo-Frazerianism." His position is that the major concern of both traditional religious thought (as observed in sub-Saharan Africa) and modern Western science is explanation, prediction, and control. Accounts in traditional societies of events such as illness, death, and the weather as actions of supernatural beings are to be considered serious attempts at explanation, and ritual acts are to be considered serious attempts to predict and control such events.[10]

In a widely discussed article, published in 1967,[11] Horton argued that

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an enumeration of the similarities of African traditional thought and Western science should precede an explication of their differences in order that differences of idiom not be mistaken for differences in substance. Although traditional thought works in a personal idiom, with frequent reference to spirits and gods, and scientific thought works in an impersonal idiom, their goals and procedures have much in common. Both place the apparent diversity of experience within unified frameworks, and they move beyond commonsense thinking to theory when there is a demand for wider causal explanations. In a more recent article, published in 1982,[12] Horton replaced the contrast between commonsense and theoretical modes of thought with a distinction between primary theory, or "given" objects and processes, and secondary theory, or "hidden" objects and processes. Horton's formulation of these levels of thought, which he emphasized are present in all societies, has been criticized by Penner,[13] but the concern here is with Horton's delineation of the differences between traditionalistic and modernistic modes of thought.

In his 1967 article, Horton compared traditional and scientific thought in terms of "closure" and "openness." He argued that the key difference of scientific thought from traditional thought was not its nonpersonal theoretical idiom but the developed awareness of alternatives to the established body of theoretical tenets. The lack of awareness of alternatives in traditional thought meant—and here Horton drew on Tylor—that concepts and words appear bound absolutely to reality. From this follows the assumption that words can bring about events or states of being. Explanations are bound to occasions and there is no possibility of formulating generalized norms of reasoning and knowing. Failures in prediction will either not be recognized or they will be excused and the theoretical assumptions will be protected by "secondary elaboration." Phenomena that do not fit into the system of categorization will be avoided as taboo. Science, in contrast, assumes that ideas and words change in relation to a constant reality, distinguishes "mind" from "matter," formulates norms governing choice among alternative explanations, is prepared to reject or demote theories that predict poorly, and accepts anomalies as challenges that can lead to the invention of new classifications.

In the 1982 article, Horton discards the closed/open contrast and reformulates the absence or presence of awareness of theoretical alternatives with a comparison between the lack of intertheoretic competition in traditional societies and its prominence in modern societies. Whereas traditional societies have a consensual mode of theorizing or a single overarching framework of secondary theoretical assumptions,

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modern societies have a competitive mode of theorizing or mutually incompatible frameworks of secondary theoretical assumptions.

Horton's comparisons of traditional and scientific thought, in both his earlier and later formulations, raise the question of the nature of religion in modern societies. Horton argues that "magico-religious" beliefs cannot be usefully broken down into separate components of magic and religion,[14] but he marks out modern Western Christianity as peculiar among religions insofar as it is not concerned with explanation, prediction, and control of this-worldly events. Up to early modern times the concerns of Western religion were like those of traditional religion in sub-Saharan Africa today, and for some time there was little or no sense of a conflict between religious and scientific discourse. The change in religion came when religious leaders and theologians could no longer deny the advantages of science in explanation, prediction, and control of worldly events. Emphasis was then put on those elements in religion that transcend worldly concerns and are not in competition with science.[15]

In order to emphasize the similar intellectualist concerns of traditional "magico-religious" and scientific thought, it is necessary for Horton to emphasize the exceptional nonintellectualist nature of modern religion. His emphasis on the continuity of traditional religious and modern scientific thought implies a radical discontinuity between traditional religion and modern religion. This raises a number of problems. One problem stems from Horton's tendency to compare the thought of the "folk" in traditional societies with the thought of the scientific "elite" in Western societies. In his 1967 article, he suggested that the "open predicament" in Western societies "is almost a minority phenomenon." The moderately educated typically share the impersonal idiom of thought of scientists, but they accept scientific propositions because they come from authoritative agents of knowledge, and not because of intellectual openness.[16] In his 1982 article, Horton did not follow up the question of the extent of the influence of modern scientific thought on the majority in Western societies. He notes elsewhere, however, that the reformulation of religion as a concern with the transcendence of everyday life is not limited to theologians but "is central to the life of many modern Western Protestants."[17] Does this mean that many other Protestants and most Catholics and Jews continue to practice a religion that focuses on worldly concerns? If so, does this mean that science has had little influence on their thought?

The difference between empirical and nonempirical ends has been commonly used as one dimension in distinguishing magic and religion (with magic being distinguished from science in terms of nonempirical

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and empirical means). Horton has not adopted this terminology, but in these terms he is suggesting that, as a result of the successes of science, religion has replaced magic or, less crudely, religion has become differentiated from magic and the latter has weakened or disappeared among a significant section of the population.

Perhaps the vested interests of religious leaders and theologians would explain why they would desire the continuation of religion in spite of its surrender to science in the business of explaining, predicting, and controlling worldly matters. But why should lay persons accept the new form of religion? Is there a social or intellectual basis to religion that did not exist previously? And if many have not accepted modern religion and have continued to follow traditional religion, we need to know more about how science coexists in society with a "magio-religion" in the same business of explanation, prediction, and control.

The characteristics of religion in modern society are barely indicated by the intellectualist perspective, but insofar as religion has lost its explanatory and practical concerns, a process of secularization is presumed to have occurred. When, as in the case of Jarvie and Agassi, a distinction is made between magic and religion, the implication is that science has replaced magic but not religion.

A thesis of partial secularization has been presented far more explicitly by functionalist writers who emphasize that, although magic declines, religion continues because it has functions separate from those of science. Emile Durkheim's writings on religion have been an important influence on the functionalist school, although it should be noted that functionalist analysis was only one strand in his book *The Elementary Forms of the Religious Life*.[18]

Durkheim rejected definitions of religion based on references to the supernatural, and proposed instead that religion be defined as a system of beliefs and practices that distinguish the sacred—things set apart and forbidden—from the profane. The distinction between the sacred and the profane was relevant to both religion and magic, but Durkheim proposed that, although magical beliefs may be widespread and held in common, only religion unites the members of a collectivity into a moral community. The organization of magic is based on the relationships between magicians and their clients, and the contact among clients are likely to be accidental and transitory.[19]

In one of his lectures Durkheim rejected Frazer's conception of magic as a false science,[20] but he wrote nothing about the fate of magic in the modern world or its relationship to the process of secularization. However, by considering both his definitions of magic and religion and his

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writings on the relationship between religion and science, it is possible to draw implications about the relationship of magic and science.

Durkheim distinguished religion's function in maintaining and uniting society through its symbolic representations and its ceremonies from its cognitive or speculative functions. He wrote that the expressive and solidarity functions of religion are universal and indispensable: "There can be no society which does not feel the need at regular intervals to maintain and strengthen collective sentiments and ideas which constitutes its unity and personality."[21] Science does not reduce the importance of these functions, although it does affect the content of the religion that performs them. Because he did not define religion in terms of the supernatural, Durkheim was able to envisage a secular religion, a "cult of man," which emphasized reason and freedom of thought.[22] Durkheim opposed making science into a religion, but he believed that science could contribute to the formulation of the moral ends of a religion in the modern world.[23]

Whatever the changes in its symbolic forms, the unifying function meant that there was "something eternal in religion,"[24] but inasmuch as magic did not share this function with religion, it can be concluded that its future was not so secure. Durkheim's statement that magic tended to pursue technological and utilitarian ends[25] may be taken as indicative that it shares religion's cognitive function, which Durkheim suggested was declining in the face of science.

Durkheim wrote that religion and science had common social origins and, in contradiction to Levy-Bruhl, he argued that they were not antithetical systems of thought. The essential categories on which science is built (time, space, species, and causality) developed within the religious context, but after science became differentiated from religion (a process that Durkheim did not attempt to explain) the two systems came into conflict in the "limited sphere" of explaining the "nature of things." The rationalism, careful observations, and rigorous standards of science erode the cognitive function of religion, beginning with its explanations of nature and moving on to explanations of human behavior and society. Durkheim did not wish to exaggerate the achievements or the foreseeable possibilities of science, but as a rationalist he was uncompromising; there was nothing in reality that could be considered as beyond the scope of human reason or scientific thought.[26]

The cognitive function of religion had by no means disappeared and Durkheim suggested that the cultic or ceremonial aspects of religion, which were part of religion's eternal unifying function, implied at least a limited continuation of religion's cognitive function. Persons had to justify their participation in ceremonies, and although they could do this in

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part by scientific borrowings, science is too far removed from action and too fragmentary and incomplete to provide adequate legitimation. "Life cannot wait" and speculation, although it should not contradict science, will have to go beyond it. There are, however, no limits that can be fixed on the future influence of science, and religion's influence in the cognitive areas would become extremely limited.[27] This suggests that magic had little future, for it shared religion's cognitive inferiority in comparison with science but, unlike religion, it had no other function that would guarantee its survival.

Some contemporary sociologists who support a functionalist approach to religion have made quite explicit what is implicit in Durkheim's writings: the development of science and technology are damaging to magic, but although they may affect particular religious beliefs or particular religious movements, they do not diminish the overall importance of religion in society. This argument will often include references to the distinctions made by the anthropologist Bronislaw Malinowski who wrote little on modern societies but whose distinctions of magic, religion, and science are seen to have clear implications for the secularization thesis.

Malinowski emphasized that primitive societies have science in the sense of a body of rules, conceptions, and theoretical laws based on experience and logic. They have conceptions of natural forces, a disinterested search for knowledge, and are concerned to understand causes of natural phenomena. Magic, which is sustained by emotion and by an optimistic faith "that hope cannot fail nor desire deceive," appears when there are gaps in knowledge. It is found when there is fear or anxiety in dangerous and unpredictable situations where native empirical knowledge, observations, and reason do not provide them with sufficient confidence to cope or carry out tasks. Although magic is founded on principles different from those of science, its importance is related to the limitations of primitive science, Malinowski emphasized that primitive peoples distinguish clearly between empirical knowledge and magic, but the object of magical ritual is to achieve practical aims that cannot be achieved by primitive science alone. Religious ritual, in contrast, does not have practical ends; like magic, it is sustained by the emotions, but it is more expressive and complex, celebrating important events, enhancing values and social attitudes, and sacralizing the tradition.[28]

Contemporary functionalist sociologists are by no means uncritical of Malinowski. They may note, for example, that persons do not always distinguish clearly between what the scientific observer would distinguish as empirical knowledge and magic, and that magical beliefs can produce

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rather than diffuse fear and anxiety.[29] There is a tendency, however, to accept Malinowski's distinctions and to derive from them the thesis that the development of science and technology has secular effects only in the sense of a decline in magic. The functions of religion may be stated somewhat differently from Durkheim's and Malinowski's formulations. In place of the emphasis on the functions of unifying society or reinforcing tradition, which may be more relevant for tribal societies, functional sociologists are likely to emphasize the provision of ultimate values or meanings. Keith Roberts writes that there is an inverse ratio of science and technology with magic, but not with religion; whereas science and magic deal with causality, religion deals with values and ultimate meanings.[30] Milton Yinger writes that conflicts between certain religions and science may be sharp, especially over propositions regarding natural events, but in functional terms there is no general conflict. Some religions may not be able to make the necessary adjustments to rapid scientific advance, but new religions will appear and must appear if society is to survive.[31]

The most recent and the most developed presentation of a partial secularization thesis that is built on a distinction between religion and magic is that of Rodney Stark and William Sims Bainbridge in their book *The Future of Religion*.[32] They reject functionalism as a perspective because of the assertion by a number of functionalists that religion serves to integrate whole societies or legitimate the status quo,[33] but their points about the contribution of religion to rebellion and conflict have been incorporated in functionalist writings on religion,[34] and their own explanation of the persistence of religion as a universal response to a universal aspect of the human condition has more than a whiff of functionalism in it.

The notion of compensators is central to their thesis. Because many rewards are scarce and unequally distributed, persons develop compensators—beliefs that rewards will be obtained in some other context or in the future. Their distinction between religion and magic is one between general compensators and relatively specific compensators. Some desires, such as that for eternal life or for grasping the meaning of life, are of such magnitude that only the assumption of the supernatural can create credible compensators. Religions are defined as "human organizations primarily engaged in providing compensators based on supernatural assumptions."[35] Magic deals in specific compensators that promise fulfillment in the empirical world, such as fertility or health, and these are subject or vulnerable to verification. Thus magic is defined as "com-

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pensators that are offered as correct explanations without regard for empirical evaluations and that, when evaluated, are found wanting."[36]

Stark and Bainbridge note that, although most magic does involve supernatural assumptions, this is not always the case (power may be viewed as inherent in objects or persons), and the point of their definition of magic is to distinguish between magic and science. Magic is distinguished from incorrect science by its disregard for demonstrating validity or falsity.

The development of science, "the development of systematic procedures for evaluating explanation,"[37] has serious consequences for magic, which thrives when humans lack effective and economical means for testing their propositions. Religions that include a significant magical component are likely to become increasingly secularized and to reduce their claims concerning the activity of the supernatural in the empirical world. Inasmuch as the boundary between religion and magic is never clear, science can encourage skepticism toward religions, which in response may then offer only weak compensators. However, a general decline in religion is not expected, for the major compensators of religion are immune to disconfirmation; it is impossible to disprove that souls enter paradise after death or that Jesus will come again.

Stark and Bainbridge acknowledge their debt to Malinowski and write: "That magic is often disconfirmed empirically, although religion *need never* face such tests, provides the key to our arguments about science and secularization."[38] They argue that the fashionable view of a general secularization or the erosion of belief in the supernatural is mistaken. Secularization, in the sense of a decline or dilution of other-worldliness in many religious movements, does occur, but is offset by the emergence of sects that attempt to revive the other-worldliness that has been abandoned in the churches from which they secede, and of cults that present new or innovative formulations of other-worldliness. The authors present a variety of evidence to dispute a general secularization thesis, but they focus especially on the emergence of cults and show that where the conventional churches are weakening, the number and activities of cults are greatest.

Stark and Bainbridge write that the process of self-equilibrium, in which secularization generates countervailing religious tendencies, has occurred a number of times in the past. It is true that the diffusion of science has produced unusual and extreme forms of secularization in modern times, but religion will persist because science does not dispose of such ubiquitous desires as that for eternal life, which can be answered

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only with supernatural assumptions. The authors claim that "the amount of religion remains relatively constant,"[39] although they modify this at another point by noting that they are not positing "a steady state religious economy"[40] in which declines in conventional religion are immediately replaced by new cults. They admit that most cults achieve only limited success, but they expect a future in which a number of vigorous religious traditions will coexist. They emphasize that this future in which supernatural compensators will retain their appeal is a religious, not a magical, one. The decline of religious monopolies has made possible more open expressions of magic in some antiscientific cults, but these are not expected to last. Other cults, such as scientology, have adopted a scientific facade, but because they are really magic, they are vulnerable to empirical evaluation, and the consequence in some cases, such as in Transcendental Meditation, has been an adoption of the nonfalsifiable compensators of religion. "Faiths suited to the future will contain no magic, only religion."[41]

This is not the place for a general critique of Stark and Bainbridge's theory of religion,[42] but I do wish to question their partial secularization thesis insofar as it depends on their distinction between magic and science. There appears to be some inconsistency between the first part of their definition of magic and the second part which relates to their account of the effects of science on magic. Magic has no regard for empirical evaluation, but it nevertheless declines because it is "chronically vulnerable to disproof."[43] The problem here involves an insufficient differentiation of the categories of participants and observers. Participants are not supposed to be concerned with verification, but the observers' evaluation that magic is vulnerable to disproof is supposed to account for its decline among participants. The authors must assume that at some point the participant does take note of falsification and will reject magic because of its disappointments.

A consideration of verification or falsification in relationship to magic requires a distinction between, on the one hand, the particular magical actions and what Stark and Bainbridge call compensators and, on the other hand, the magical worldview. With respect to the former, participants are often very concerned with verification; they expect to obtain the "compensator," and if it is not forthcoming, they may seek an explanation for the falsification. With respect to the latter, magic is not chronically vulnerable to disproof; failure to achieve compensators can always be explained within the magical worldview by such factors as countermagic, a mistake in the charm or spell, or the absence of "correct" relationships with the supernatural beings involved.

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Debates on magic have occasionally included an unnecessary argument between those who emphasize that magic is a worldview and those who emphasize the pragmatic aims of magic.[44] Magicians and their clients are not likely to be indifferent to the outcomes of magical actions, and in this sense they are concerned with verification. The ability to recognize falsification may result, as Stark and Bainbridge note, in a high turnover of magicians, but this ability will not by itself lead to a rejection of the magical worldview. This is not to say that falsification has exactly the same status in science and in magic. There is likely, for example, to be far more rigorous testing to permit falsification in science than in magic, but the question is whether this would lead persons with a magical worldview to reject magic in favor of science.

We have seen that although the intellectualist and functionalist approaches may differ significantly in their theoretical claims and emphases, they are remarkably similar with respect to their interpretations of the relationships between magic and science in the process of secularization. Among the functionalists there is a far more extensive treatment of religion in modern society. The intellectualists may indicate that religion continues in modern society, but although they usually remark that it no longer has important cognitive and instrumental functions, they make little attempt to deal with the problem of its survival. The functionalists emphasize the noncognitive, nonempirical functions or other-worldliness of religion, and this permits them to argue that religion can coexist comfortably with science. Both schools, however, stress that magic and science have common concerns of explaining worldly events and achieving practical aims, and it is either implied or stated explicitly that magic is replaced by science because a crucial difference makes science superior in these endeavors. The difference is formulated in terms of rationality "in the strong sense," the awareness of alternatives, an openness to criticism, and a concern with verification or falsification.

Writers who support a symbolist approach have argued that the cognitive and instrumental components of magic are unimportant when compared with its expressive and symbolic components.[45] It may then be inferred that the similarities between magic and science are trivial, and science need not necessarily damage magic any more than it might damage religion.

The problem with the symbolist approach is that it tends to ignore important distinctions among the overt or manifest orientations and goals of supernatural beliefs and actions. It does appear important to distinguish, for example, between supernatural beliefs and actions that focus on the interpretations and curing of illness from those that focus on

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ultimate meanings and salvation. These distinctions have often been categorized in terms of magic and religion, and have been usefully applied in a number of studies.[46] If it is agreed that cognitive and instrumental functions are important components in both magic and science, a critique of the partial secularization thesis should address the question of whether magic and science are different in the crucial ways that are said to result in the replacement of magic by science. There is the possibility that magic and science are different in a crucial way that relates to their common cognitive and instrumental functions, but allows them to coexist even when science advances.

In emphasizing such features as openness to criticism and falsification, the exponents of the partial secularization thesis have portrayed science in ways similar to those of certain philosophers of science, particularly Karl Popper.[47] Their presentation of science may be an ideal picture of how science should be practiced rather than how it actually is practiced, and a number of writers, including some sociologists of science, have argued that Thomas Kuhn's portrayal of science is closer to reality.[48]

Although Kuhn would no doubt deny it, his portrayal of science would appear to make the distinction between science and magic far more problematic than that of Popper. Similarities may be noted between the practice of magic and the practice of what Kuhn has called "normal science"—that is, the practice of science within an accepted paradigm that provides broad conceptual and methodological propositions and "standard examples." The paradigm encompasses the types of questions that can be asked, the kinds of observations that are made, the types of explanations to be sought, and the types of solutions that are acceptable. The fundamental assumptions of normal science are not questioned; falsification of propositions or predictions derived from the paradigm do not ordinarily result in the rejection of the paradigm. Scientists will quite legitimately retain a paradigm despite the falsification of a deduction from it. They may introduce auxiliary hypotheses to remove the disagreement, they may specify a theory's limitations by stating "other things being equal," or they may set aside the falsification as an anomaly.

The parallel with magic is that, although particular magical explanations or actions may be recognized as falsified, the fundamental assumptions need not be questioned. Magical practitioners and clients may explain failures by introducing auxiliary hypotheses ("secondary elaboration") or by arguing that other things were not equal (there was, for example, countermagic at work).[49] What magic does not countenance is an anomaly, and there cannot, therefore, be an equivalent in magic of

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what Kuhn calls "revolutionary science." Normal science is science for most of the time, but a growth of anomalies may lead to a sense of crisis and precede a period of revolutionary science in which a new paradigm will replace the old. The two paradigms are incommensurable; there are no common observation language, criteria, or rules by which they may be comparatively evaluated. There will be new questions, concepts, observations, methodologies, and solutions.

In his comparison of astrology and science, Kuhn does not distinguish science by the place of anomalies or its revolutionary periods, but rather by "puzzle-solving," which is the major activity of normal science.[50] Puzzles arise from the paradigm or theory that scientists accept as the rules of their game, and scientists share criteria according to which a puzzle will be recognized as solved or not. If the scientists fail to solve a puzzle, it is their ability that is impugned, and not the corpus of current science. A "practical art" such as astrology lacks a highly articulated theory and powerful rules, which are preconditions for scientific puzzle-solving. Particular failures in astrology did not give rise to research puzzles or to criticisms of the practitioner, because there were too many sources of difficulty, such as the precise instant of a person's birth or the exact configuration of the stars, which learned astrologers agreed were beyond their knowledge or control.[51]

Because puzzle-solving is related by Kuhn to the tightness of theory, the difference between his position and Popper's emphasis on the possibility of falsification becomes a matter of emphasis. If there is a basic difference between Kuhn and Popper, it is related to what is being tested; whereas Kuhn argues that scientists test puzzles that are determined by their agreed upon theory, Popper argues that tests are performed in order to attempt to falsify the theory itself. With respect to this difference, Kuhn's portrayal of normal science is much closer to magic. Magicians are likely to have ready answers to failures, but repeated failures can lose magicians their reputation and learned magicians may treat a failure as a puzzle that might be explained by study and experiment within the magical paradigm.

Science is to be distinguished less by its puzzle-solving than by its treatment of anomaly. If in normal science scientists do not succeed in accounting for a puzzle, it is set aside as an anomaly, and it is not necessarily assumed that it will be explained in the future. In magic there is no such thing as an anomaly; either an explanation will be forthcoming or it will be argued that the failure could be explained by magicians if only they had all the relevant information at their disposal. The magical worldview takes for granted explanatory completeness; the scientific

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worldview accepts not only that its explanations are incomplete but that all future explanations will be incomplete.[52] It is this difference, rather than criticism or falsification, that distinguishes magic from science, and it is a distinction that does not necessarily entail the substitution of magic by science.

The acceptance of incompleteness in science is particularly obvious at the level of explanations of individuals or of individual events, which are, of course, a major province of magic. The scientific view accepts that there are "coincidences" or "accidents" with respect to questions concerning why particular events occurred to particular individuals. As Evans-Pritchard showed clearly in his study of the Azande, the magical worldview does not accept such incomplete explanations; the Azande will accept the natural causes of deaths, illnesses, and mishappenings, but these cannot ever fully explain why whatever happened occurred to a particular individual and not to another.[53] Magical or witchcraft explanations will answer questions that science leaves unanswered. Thus, the development of science and technology will not alone result in the disappearance of magic. Magic will disappear only if persons accept the scientific worldview, including its incompleteness, but this involves a conversion that cannot be assured by the empirical disconfirmation of magic or the advance of science.[54] Moreover, scientific and technological developments can widen those areas where magic can be brought into play. Magic is used, for example, to ensure the regular and safe working of machines.

The adoption of scientific and technological innovations and applications does not require the adoption of the scientific worldview with its recognition of explanatory incompleteness. It is widely recognized that persons have no problem in turning to both modern medicine and magical curing. When persons reject magic in favor of science, it may be because they have an ideal image of science, far distant from reality. The ideal image may include beliefs in the absolute objectivity of science, its ability to supply proof, the possibility of discovering "facts" and the laws of nature thought of as existing independently of scientists' concepts and theories, and its potential to provide complete explanations of everything. We have, in fact, little information about popular conceptions of science. Sociologists of science have concentrated on the study of scientists rather than nonscientists' notions of science, and phenomenologically inclined sociologists have tended to distinguish between commonsense thinking and science without considering what might be called commonsense notions of science.

The adoption of an ideal image of science and an accompanying mechanistic worldview can also have implications for religion, but it may be

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argued that, insofar as religion reduces the involvement of the supernatural to an otherworldly or distant realm, it opens up possible accommodations with science not available to the traditional magical worldview with its emphasis on activistic supernatural beings in this world. However, some modern magical movements have adopted in part the idiom of science, if not the basic analytical assumptions of scientific practice. Frazer was mistaken to attribute common basic assumptions of immutable laws to traditional magic and science, but in a society where science is institutionalized and prestigious, its ideal images, and what many scientists might regard as an outdated mechanistic idiom, are imitated by some magical movements.

In summary, I have agreed with the proponents of the partial secularization thesis that magic and science do share manifest cognitive and instrumental functions, but I have questioned whether the differences they have emphasized—openness to criticism or falsification—are as fundamental as they suggest or likely to account for a decline in magic. The difference that I have emphasized, the assumption of incompleteness in science, allows for the coexistence of magic and science. Many persons may hold an ideal image of science, that it can eventually explain everything, but insofar as science has penetrated the worldview of the majority of the population, its major influence has been through adoption of the idiom of "natural causes" and "mechanistic laws."

Recent historical research has shown that early modern scientists had by no means rejected the traditional magical worldview,[55] but around the middle of the seventeenth century many Western investigators of nature were moving from an animistic to a mechanistic conception of the universe,[56] and the new idiom subsequently spread, particularly in the nineteenth and twentieth centuries, to large sections of the population. We are a long way from convincing explanations of the origins and spread of naturalistic and mechanistic conceptions, but Max Weber's analysis of the disenchantment of the world within the Middle Eastern and Western religious traditions must surely enter into any account of at least the cultural background of these changes. Weber's thesis and its implications cannot be taken up here, but I believe that my conclusions are in accord with his perspective.

The proponents of the partial secularization thesis, who focus on the effects of science on magic, go both too far and not far enough in their consideration of the effects of science on supernatural beliefs and practices. They go too far when they argue that the advance of science necessarily leads to the disappearance of magic. They do not go far enough

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when they exempt contemporary religion from the influence of science. Weber argued that one of the consequences of scientific rationalization had been the rejection of the religious claim to be able to discover an objectively meaningful world. The "cosmos of natural causality" and the "cosmos of ethical, compensating causality" are not just different but in opposition. The religious defense that religious knowledge moves in a different sphere from scientific knowledge is countered by the claim that science is the only reasoned view of the world.[57]

The comfortable division between science, that provides a cognitive interpretation of the world, and religion, that provides it with meaning, was too neat a solution or formula for Weber. Science does not mean the end of religion, any more than it means the end of magic, but although Western religion has made considerable accommodations to science, tensions remain and a more general thesis of secularization, which relates to religion as well as to magic, has still a lot to be said for it.

Notes

1. Edward Burnett Tylor, *The Origins of Culture* (New York: Harper & Row, 1958 [part one of *Primitive Culture*, 1871]); James George Frazer, *The Golden Bough: A Study in Magic and Religion* (London: Macmillan, 1950 [abridged edition, 1922]). For secondary analyses, see E. E. Evans-Pritchard, *Theories of Primitive Religion* (Oxford: Clarendon Press, 1965), pp. 24–31; J. W. Burrow, *Evolution and Society: A Study in Victorian Social Theory* (England: Cambridge University Press, 1966), pp. 234–58; Robert Ackerman, "Frazer on Myth and Ritual," *Journal of the History of Ideas*, 36 (1975) 115–34.

2. Tylor, *Origins*, pp. 112–44.

3. Frazer, *Golden Bough*, pp. 11–12, 48–59, 711–13.

4. W. G. Runciman, "The Sociological Explanation of 'Religious' Belief," pp. 59–101 in *Sociology in its Place* (England: Cambridge University Press, 1970); Robin Horton, "Neo-Tylorianism: Sound Sense or Sinister Prejudice," *Man*, 3 (1968) 625–34; Gillian Ross, "Neo-Tylorianism—A Reassessment," *Man*, 6 (1971) 105–16.

5. Edward Norbeck, *Religion in Primitive Society* (New York: Harper, 1961), p. 49; Eli Sagan, "Religion and Magic: A Developmental View," *Sociological Inquiry*, 49 (1979) 87–116. For discussions of the numerous distinctions that have been made among anthropologists, see William J. Goode, *Religion Among the Primitives* (New York: Free Press of Glencoe, 1964), pp. 50–55; Dorothy Hammond, "Magic: A Problem in Semantics," *American Anthropologist*, 72 (1970) 1349–56; Robert Towler, *Homo Religiosus: Sociological Problems in the Study of Religion* (London: Constable), pp. 40–61.

6. J. Skorupski, *Symbol and Theory* (New York: Cambridge University Press, 1976), pp. 128–31.

7. Barry Barnes, "The Comparison of Belief Systems: Anomaly Versus False-

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hood," pp. 182–98 in Robin Horton and Ruth Finnegan, *Modes of Thought: Essays on Thinking in Western and Non-Western Societies* (London: Faber & Faber, 1973); Steven Lukes, "On the Social Determination of Truth," pp. 230–48 in ibid.; W. H. Newton-Smith, *The Rationality of Science* (London: Routledge & Kegan Paul, 1981), pp. 247–65.

8. I. C. Jarvie and Joseph Agassi, "The Problem of the Rationality of Magic," pp. 172–93 in Bryan R. Wilson, ed., *Rationality* (Oxford: Basil Blackwell, 1970).

9. Jarvie and Agassi directed their criticism particularly at J. H. M. Beattie (*Other Cultures* [London, 1964]), as providing the symbolic school's fullest exposition of their interpretation of magic. Beattie replied in "On Understanding Ritual," pp. 240–68 in Wilson, *Rationality*. Jarvie and Agassi continued the debate in J. Agassi and I. C. Jarvie, "Magic and Rationality Again," *British Journal of Sociology*, 24 (1973) 236–45; see also Tom Settle, "The Rationality of Science versus the Rationality of Magic," *Philosophy of the Social Sciences*, 1 (1971) 173–94.

10. Horton, "Neo-Tylorianism."

11. Robin Horton, "African Traditional Thought and Western Science," *Africa*, 37 (1967) 50–71, 155–87; abridged version in Wilson, *Rationality*, pp. 131–71.

12. Robert Horton, "Tradition and Modernity Revisited," pp. 201–60 in Martin Hollis and Steven Lukes, eds., *Rationality and Relativism* (Cambridge, Mass.: MIT Press, 1982).

13. Hans H. Penner, "Rationality and Religion: Problems in the Comparison of Modes of Thought," *Journal of the American Academy of Religion*, 54 (1986) 645–71.

14. Robin Horton, "A Definition of Religion and its Uses," *Journal of the Royal Anthropological Institute*, 90 (1960) 201–26.

15. Idem, "Professor Winch on Safari," *Archives Européennes de Sociologie*, 17 (1976) 157–80.

16. Horton, "African Traditional Thought." One problem here is that if most persons have remained within a closed perspective, it is difficult to understand the transition from the personal to the impersonal idiom. How could persons make such a change if they remained in a mode of thinking whose theoretical tenets are absolute and sacred? Even if Horton exaggerated the absence of awareness of alternatives in traditional societies, a closed perspective is surely a more precarious one in modern societies where persons are generally aware of conflicting belief systems. Once efforts have to be expended in order to protect a favored perspective, it can hardly be said to remain a closed one; other perspectives are criticized because they are recognized as possible alternatives.

17. Horton, "Professor Winch."

18. Emile Durkheim, *The Elementary Forms of the Religious Life* (New York: Collier Books, 1961 [1912]).

19. Ibid., pp. 37–63. Durkheim noted the frequent hostility between religion

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and magic, and referred to Robertson-Smith's suggestion that magic is the antithesis of religion as the individual is the antithesis of society (p. 61, note 62). Because the socialized individual cannot precede society, it follows that, contrary to Frazer, magic must presuppose religion. Durkheim was careful to note that he was not suggesting that there was ever a time when religion existed without magic or that the two systems corresponded to distinct historical phases (pp. 404–5). For comparisons of Durkheim and Frazer, see Robert Alun Jones, "Durkheim, Frazer, and Smith: The Role of Analogies and Exemplars in the Development of Durkheim's Sociology of Religion," *American Journal of Sociology*, 92 (1986) 596–627. The theme of the opposition of religion (society) and magic (the individual) is developed by Daniel Lawrence O'Keefe, *Stolen Lightning: The Social Theory of Magic* (New York: Vintage Books, 1983).

20. W. S. F. Pickering, *Durkheim on Religion: A Selection of Readings with Bibliographies* (London: Routledge & Kegan Paul, 1975), pp. 332–33.

21. Durkheim, *Elementary Forms*, pp. 474–75.

22. Emile Durkheim, "Individualism and the Intellectuals," *Political Studies*, 17 (1969) 19–30. Also in Pickering, *Durkheim*, pp. 59–73.

23. Steven Lukes, *Emile Durkheim, His Life and Works* (Harmondsworth: Penguin Books, 1975), pp. 73, 359.

24. Durkheim, *Elementary Forms*, p. 474.

25. Ibid., p. 57.

26. Ibid., pp. 477–96; Durkheim's review of Levy-Bruhl in Pickering, *Durkheim*, pp. 169–73; Emile Durkheim, *Moral Education* (New York: Free Press, 1961), pp. 3–4; W. S. F Pickering, *Durkheim's Sociology of Religion* (London: Routledge & Kegan Paul, 1984), pp. 457–75; Robin Horton, "Levy-Bruhl, Durkheim and the Scientific Revolution," pp. 249–305 in Horton and Finnegan, *Modes of Thought*.

27. Durkheim, *Elementary Forms*, pp. 478–79.

28. Bronislaw Malinowski, *Magic, Science and Religion, and Other Essays* (Garden City, N.Y.: Doubleday, 1954), pp. 17–40, 85–90.

29. J. Milton Yinger, *The Scientific Study of Religion* (London: Macmillan, 1970), pp. 73–75.

30. Keith A. Roberts, *Religion in Sociological Perspective* (Homewood, Ill.: Dorsey Press, 1984), pp. 71–72.

31. Yinger, *Scientific Study*, pp. 61–62.

32. Rodney Stark and William Sims Bainbridge, *The Future of Religion: Secularization, Revival and Cult Formation* (Berkeley: University of California Press, 1985), esp. chap. 1, 2, 5, 19, 22.

33. Ibid., p. 522.

34. Robert K. Merton, *Social Theory and Social Structure* (New York: Free Press, 1968), pp. 83–84, 96–100.

35. Stark and Bainbridge, *Future*, p. 8. This definition differs from many functionalist definitions of religion, which make no reference to the supernatural (see, e.g., Yinger, *Scientific Study*, pp. 3–16). According to such functionalist

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definitions, a decline in beliefs and practices referring to the supernatural should not be termed secularization. Indeed, many functionalist definitions imply that secularization is impossible if society is to survive. In my opinion Stark and Bainbridge's discussion is more interesting than other functionalist analyses because they assume that secularization means a decline in supernatural assumptions.

36. Stark and Bainbridge, *Future*, p. 32.

37. Ibid., p. 432.

38. Ibid.

39. Ibid., p. 3.

40. Ibid., p. 455.

41. Ibid., p. 456.

42. Roy Wallis and Steve Bruce, "The Stark-Bainbridge Theory of Religion: A Critical Analysis and Counter Proposals," *Sociological Analysis*, 45 (1984) 11–27.

43. Stark and Bainbridge, *Future*, p. 31.

44. Hildred Geertz, "An Anthropology of Religion and Magic," *Journal of Interdisciplinary History*, 6 (1975) 71–89; Keith Thomas, "An Anthropology of Religion and Magic, 11," *Journal of Interdisciplinary History*, 6 (1975) 91–109.

45. Beattie, "Ritual" (n. 9, above).

46. Bryan Wilson, *Magic and the Millennium* (London: Heinemann, 1973); Melford E. Spiro, *Buddhism and Society* (Berkeley: University of California Press, 1982 [1970]); Stephen Sharot, *Messianism, Mysticism, and Magic: A Sociological Analysis of Jewish Religious Movements* (Chapel Hill: University of North Carolina Press, 1982).

47. Karl R. Popper, *The Logic of Scientific Discovery* (London: Hutchinson, 1968).

48. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970 [1962]). For applications of Kuhn in the sociology of science, see Michael Mulkay, *Science and the Sociology of Knowledge* (London: George Allen & Unwin, 1979); Barry Barnes, *T. S. Kuhn and Social Science* (London: Macmillan, 1982); H. M. Collins and T. J. Pinch, *Frames of Meaning: The Social Construction of Extraordinary Science* (London: Routledge & Kegan Paul, 1982). For general reviews of Kuhn, see Gary Gutting, ed., *Paradigms and Revolutions* (University of Notre Dame Press, 1980).

49. Among the writers discussed in this article, Horton, in particular, has understood that Kuhn's portrayal of science presents a challenge to his distinctions between traditional religion and science. When he is emphasizing the similarities between traditional religious thought and science, as in his criticisms of Winch, some of Horton's points about science overlap with those of Kuhn (see "Professor Winch"). In general, however, Horton has rejected the Kuhnian portrayal of science, and has called upon such writers as Feyerabend and Lakatos in order to argue that there is institutionalized competition among different theoreti-

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cal schools in science (see "Tradition and Modernity Revisited"). This point is modified in the article on Winch, by noting that adherents of particular theoretical schools react to failures of prediction very much like traditional peoples such as the Azande. He also notes that, unlike the research scientist, the scientific technologist treats the theory he works with as an article of faith. In his 1982 article Horton was more emphatic in his rejection of Kuhn. In my opinion, Horton overstates the difference between traditional religion and science in terms of consensus and conflict, but understates their differences with respect to the ends of participants.

50. Thomas S. Kuhn, "Logic of Discovery or Psychology of Research," pp. 1–23 in Imre Lakatos and Alan Musgrave, eds., *Criticism and the Growth of Knowledge* (England: Cambridge University Press, 1970).

51. Ibid., pp. 7–10.

52. Settle, "Rationality" (n. 9, above).

53. E. E. Evans-Pritchard, *Witchcraft, Oracles, and Magic Among the Azande* (New York: Oxford University Press, 1937).

54. Although the appearance, form, and responses to anomalies are very different in science and religion, with respect to the process of paradigm change there appear to be greater similarities between science and religion than between science and magic. Kuhn's critics have argued that his account cannot distinguish between scientific change and religious change. See K. R. Popper, "Normal Science and its Dangers," pp. 51–58 in Lakatos and Musgrave, *Criticism*, p. 57; I. Lakatos, "Falsification and the Methodology of Scientific Research Programmes," pp. 91–196 in ibid. Kuhn's responses to his critics have served to increase the distance between science and religion in his formulations, but it may still be argued that, in contrast to magic, it is possible to speak of paradigm shifts in religion and science. On the application of Kuhn to religion, see Ian G. Barbour, *Myths, Models and Paradigms: The Nature of Scientific and Religious Language* (London: SCM Press, 1974); Derek Skanesky, *Science, Reason, and Religion* (London: Croom Helm, 1985).

55. Charles Webster, *From Paracelsus to Newton: Magic and the Making of Modern Science* (England: Cambridge University Press, 1982).

56. Keith Thomas, *Religion and the Decline of Magic* (Harmondsworth: Penguin Books, 1973), esp. chap. 22; Christopher Hill, "Science and Magic in Seventeenth Century England," pp. 176–93 in Raphael Samuel and Gareth Stedman Jones, eds., *Culture, Ideology and Politics* (London: Routledge & Kegan Paul, 1982).

57. Max Weber, "Religious Rejections of the World and Their Directions," pp. 323–59 in *From Max Weber: Essays in Sociology*, H. H. Gerth and C. Wright Mills, eds. (London: Routledge & Kegan Paul, 1948), pp. 351–52.

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