

INVITED ESSAY

Arguments Over Anomalies: II. Polemics

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Abstract—Arguments over different anomalies have common elements. An awareness of those commonalities can be useful in **considering** the possible reality of a particular anomaly. As in all arguments, **beliefs** and not facts are at issue; but the participants do not recognize that, and so red **herrings** abound and opponents are not persuaded. Again as in all disputes, the longer the disagreement persists, the more polarized the issue becomes, which further encourages the antagonists to become preoccupied with irrelevancies. Within science, disputes are to some degree constrained by the existence of a widely shared paradigm and by widely accepted conventions, supported by entrenched institutions and by consensus over how and when disputes become settled; but arguments over anomalies are not so constrained: they are messy and may continue long after they—on purely **epistemic** grounds—"should". Insofar as arguments over anomalies take place in the public domain, they involve not only proponents and opponents but also pundits and an audience; however, a **purported** pundit may behave more like a disbeliever (or, more rarely, like a proponent). Some features of these arguments result from the fact that the believers are usually amateurs (though they commonly include a few maverick experts in the presumptively relevant fields of mainstream science). Although most of the experts tend to be disbelievers or at least non-believers in a given anomaly, the converse is by no means true—most of the disbelievers have little or no expertise in related areas, and they may not even be particularly knowledgeable about the given anomaly. **Typically**, both sides claim that the evidence is already conclusive when—virtually by definition—it is evidently not. Believers tend to close ranks, even with quite unwelcome bedfellows, for fear that their subject will seem even less **respectable** if the existence of frauds or hoaxes or incompetence becomes widely known; and that enhances the tendency for outsiders to view the **believers** as unanimous on all major points, which is anything but true. Both sides (and also the pundits) typically appeal to the **authority** of science; and typically they misunderstand the nature of science. Also characteristic of these arguments is ignorance of matters that (but only by hindsight) are highly relevant.

Introduction

If one's interest is in the truth about a given anomaly, is there any reason why one would take an interest in what may be common with other anomalies? Is not the possible reality of a Loch Ness Monster quite unrelated to the possible reality of a Bigfoot, let alone to the possible reality of clairvoyance, say?

Quite generally, recognition of commonalities can deepen one's understanding of singularities. In chemistry, for example, an appreciation of the periodic law provided firm ground for deciding whether a claimed new element was real or only a pseudo-element, for predicting the existence of yet undiscovered elements, for understanding chemical behavior and atomic structure: knowing what is common to elements results also in a deeper understanding of individual elements. So too can knowledge of what is common among anomalies help in the study of any given anomalous claim. The study of anomalies as a class was dubbed by Wescott (1980) "anomalistics"; but this seemingly useful term has not come into general usage. A number of important generalizations within anomalistics have been ventured, notably by Truzzi (1977, 1987) and Westrum (1976, 1978 [with Truzzi], 1982).

Arguments over anomalies have in common that they are controversial (Bauer, 1988); and they exemplify misunderstanding of scientific activity and certain typical illogicalities.

In "scientifically exploring" anomalous phenomena, it is well to recognize that controversy has different consequences in these matters than in the intra-scientific disputes with which scientists are familiar. For instance, in science there is always tacit agreement that any matter will ultimately be settled when enough of Nature's facts become understood, and so there can often be a consensus to leave the matter undecided until then; whereas with anomalous phenomena one finds both sides arguing that the crucial facts are already in. In science, resolving controversial issues involves chiefly substantive matters of method and theory and data; over anomalies, resolving the issues means chiefly or primarily disentangling arguments. In science, the relevant data are accessible to all, whereas with anomalies one often has to be content with the hearsay of others about the data that are claimed to exist (or to have once existed). In science, the experts are readily identified and are (within their specific specialties) generally trustworthy, whereas with anomalies it is never obvious who is expert, and some of the most knowledgeable about a given matter may be quite untrustworthy and not even particularly competent in their knowledge.

Arguments in General

Beliefs, not Facts are at Issue

Arguments are over differences in belief but are carried on as though they were over facts. Arguments are attempts to persuade people to change their opinions, but the protagonists typically seem not to understand what must happen if beliefs are to change. Most of us know little about how human beings acquire beliefs or about what causes us to maintain or to change beliefs once we have them. We tend to assume that we believe a thing because it is true and we tend further to assume that the truth of the matter is

convincingly demonstrated by looking at the facts. Consequently we cannot comprehend how other people can fail to share our own convictions.

Forming Beliefs

In actuality, however, our beliefs are formed under a variety of influences. At first, we are enormously influenced by parents, peers, and teachers, and we act and react out of emotion rather than intellect; only after a time do we learn to become somewhat analytical and critical, to choose opinions for ourselves among the available alternatives or to generate genuinely individual ones. Thus at first we typically follow our parents' and our society's religious and political and social inclinations—or we reject them and embrace diametrically opposite views; only later and only occasionally do we evolve significantly individual opinions through judicious thought. So too in formal and higher education, we begin by accepting what the instructors and the texts say and only later become able to judge and to investigate matters for ourselves. (And even then we usually maintain to some degree the biases of those with whom we learned: that is why, for instance, one can identify research traditions associated with particular laboratories or eminent individuals, and why scientific genealogies are constructed and are instructive.)

Beliefs and Evidence

Since each of us grows and learns under a unique set of circumstances, we become predisposed to find plausible different things, or a given thing to different degrees. Each of us forms opinions on specific issues through some interplay between individual predispositions and the available evidence; since the predispositions vary, we reach different conclusions on the basis of the same evidence. Yet, because we harbor the illusion that our opinions are formed by the evidence, we argue as though only the evidence were at issue; simply because we happen to believe, we assume that we have only to make the evidence clear whereupon others will adopt the same belief. Therefore arguments typically focus overtly or apparently on the evidence; yet that is only one of the factors that influences belief and often not the decisive one. That has important consequences. For participants, it means that they usually argue ineffectively: to alter the antagonists' opinion, it would need to be shown that the evidence *as seen in the light of their own prejudices* can lead to our conclusion; or that their prejudices are inappropriate in this instance; or that their prejudices should altogether be altered (and none of those would be easy, of course). For observers or analysts of arguments, it is necessary to look not only at the purported evidence but also to identify the biases that inform the opposing sides; without that, it may not even be possible to determine what the actual evidence is.

In considering the available evidence we usually fail to make the crucially important distinction between weight of evidence adequate to support one's

own belief and weight of evidence adequate to convince others. Since preconceptions vary, estimates of plausibility and probability also vary: what seems likely to some seems quite unlikely to others—for example that human behavior is genetically controlled, or that God exists, or that acupuncture could work. When something occurs that seems *to us* plausible, we accept it even on quite slender evidence (or actually no evidence at all, for example the pre-1956 belief that parity would be conserved [Bernstein, 1967, p. 52]); when however a thing seems implausible to us, we demand a mass of proof before accepting it and may even then remain unconvinced, as for example those who still hold that the Earth has existed for only some thousands rather than billions of years. So two people can look at the same evidence and reach opposite conclusions because their initial estimates of probability differed; even more to be emphasized, they can disagree over whether the evidence is slender or compelling, superficially an "objective" point over which antagonists ought easily to be able to agree.

On the whole, those who accept the reality of an anomaly (the "believers") and those who do not (the "disbelievers" or "debunkers") have characteristically different preconceptions: for instance, the believers are somewhat predisposed to doubt the conventional wisdom whereas the debunkers tend to feel (over)confident that the conventional scientific wisdom is correct. In well-known consequence, believers tend to judge compelling an array of evidence that others find less than compelling; whereas debunkers tend to dismiss entirely an array of evidence that others find at least suggestive.

To make sense of these arguments, one needs to realize that the antagonists are always to a certain extent talking past one another: the manifest issue may be a proximate cause of the argument, but the real cause is a different set of preconceptions; the prime mover in a dispute is often a clash of ideologies, a struggle for power, or the like. Thus two siblings are not concerned fundamentally with the toy over which they seem to be fighting but rather with their relative status within the family—no matter what the toy or the issue, they are likely to find themselves in dispute; again, strikes by militant unions may be less about working conditions (economics, the manifest issue) and more about the class struggle—no matter what the wages and benefits and working conditions happen to be, there will be dispute about them. Similarly one can often predict what attitude a given person will take toward anything to do with anomalies: there are inveterate believers and inveterate debunkers.

The influence of preconception concerning anomalies was recently illustrated for this author in the reviewing of his book, *The Enigma of Loch Ness: Making Sense of a Mystery* (Bauer, 1986), which is explicitly an examination of the controversy and not an argument that these creatures do exist or that they do not exist. Reviewers with no great preconceptions (*Atlantic*, 1987; Coburn, 1987; Gragg, 1987; *Kirkus Reviews*, 1986; Martin, 1987; McMahon, 1987; Oldberg, 1986; *Snowy Egret*, 1987; Stein, 1987;

Williamson, 1987) commented on the impartiality of the discussion as an analysis of the controversy; but believers in UFOs thought they found disparagement of the believers' viewpoint (Clark, 1987; Earley, 1987) while inveterate debunkers (Kelly, 1987) were offended by the author's admission that in his personal opinion there are strange, large creatures in Loch Ness.

For all these reasons, an observer rarely finds the antagonists' arguments to clarify an issue: the antagonists are primarily concerned to make their point, to win the argument, to win converts, even when they claim to be attempting clarification—a claim they may quite honestly believe. Again, this is why arguments are replete with what are evidently to observers (but not to the participants) red herrings, *non sequitur*, illogicalities of all sorts, arguments *ad hominem*.

Polarization

Characteristically, arguments become entrenched and polarization grows rather than lessens as time goes by. The nominal issue becomes spoken of increasingly in terms of "either-or", and the antagonists come to feel that those who are not explicitly for them are assuredly against them. Every small detail becomes controversial, and no one will yield an inch lest that lead further; thus in the Velikovsky affair not only did the antagonists go to specious lengths to avoid acknowledging errors, they made much of such trivialities as their opponents' mistakes in punctuation when giving quotes (Bauer, 1984a, pp. 196–198, 241–242). Arguments may begin as attempts to establish the objective soundness of (two opposing) positions; but after a while, the antagonists' purpose becomes to discredit their opposition.

The tendency to polarization can seriously obfuscate significant points through the creation of false dichotomies (whose falsity of course is not evident to the disputants). In cryptozoology there is a characteristic argument about folkloric references: are they symbolic and mythic or are they founded on snippets of information about real animals? That is a false dichotomy, for it is patently possible for real animals to have symbolic and mythic attributes, the Biblical serpent for example. (Indeed, as Bayanov [1982] has pointed out, ape-men or wild-men would almost inevitably, if they exist, become incorporated into folklore, legend, and myth: their absence from folklore would speak against their actual existence.) Similarly with the Loch Ness monster, it is often asked, is the monster real or is it an invention of journalists and tourist entrepreneurs? Again a false dichotomy, for both may be true: if such rarely seen creatures exist, entrepreneurs would surely seek to exploit them, and some might actually come to believe that they had invented them (Bauer, 1986, pp. 155–156).

Committed believers or debunkers may not even be willing to acknowledge that polarization and false dichotomies are undesirable. Thus Gardner (1983a; 1983b, p. 55) argues for making sharply polar distinctions between science and pseudo-science: that night slowly gives way to day does not

vitiates the distinction between night and day, he says, and that unorthodox-yet-legitimate science and pseudo-science are but extremes of a continuum still leaves it possible legitimately to call some things pseudo-science. This might well be called the Gardner *non-sequitur* (by analogy with the Fulton *non-sequitur* [Gruenberger, 1964]): there is never significant disagreement over whether it is night or day, but there *is* typically disagreement over what can legitimately be called pseudo-science. That extreme instances of rank pseudo-science do exist cannot validate the labeling as pseudo-science of matters that are highly and contemporaneously controversial and that therefore seem only to some people and not to others to be pseudo-science (Bauer, 1984b); it is as though someone were to comment on the beauty of the evening twilight and Gardner would seek to brush that aside by insisting that it is already night-time—that Gardner can see things as black or white hardly excludes others from perceiving greys. The Gardner *non-sequitur* is common in disputes over anomalies (though it is not so commonly defended): one side alleges that the other fails to accept some unexceptionable generality, whereas the quarrel actually is over whether that generality can be applied to the specific instance at hand. Stuart Campbell (1988), for instance, accuses others of not invoking Occam's Razor when the difference of opinion is actually over which of the several explanations really is the simplest one.

The degree of polarization that occurs has been nicely illustrated by Howe (1983) for the case of parapsychology; the fervent skeptic cites only skeptical sources; asserts parapsychology to be a pseudo-science; considers only normal explanations or resorts to personal attack, ridicule, or evasion ("we will never know the answer"); asserts that the acceptance of psychic phenomena will let loose a tide of irrationality that will lead to a collapse of society; applauds the description of the typical fervent proponent but is irate over this characterization of the fervent skeptic; has more dogmatic humanist or philosophic beliefs than the average humanist or philosopher. On the other hand, the fervent proponent cites only psychic or parapsychological sources; asserts parapsychology to be a radically new science; considers only paranormal explanations without first evaluating normal ones; asserts that acceptance of psychic phenomena will revolutionize society for the better; applauds the description of the typical fervent skeptic but is irate over this characterization of the fervent proponent; has more dogmatic religious beliefs than the average religious person.

The fierceness of an argument does not necessarily parallel the degree to which the opposing viewpoints differ; indeed, the most spirited battles take place between individuals or groups whose views differ relatively little, a phenomenon classically termed "odium theologicum" (I. J. Good, personal communication, June 11, 1986) since the Church has so often been more tolerant of heathens than of schismatics; so too, most homicides in the U.S. are committed by relatives or friends; Australian or British travelers tend to be more critical of what they encounter in the U.S. than of what they

experience in Asia; the Soviet Union finds it easier to strike accommodations with the West than with China or its Eastern European fellow-travelers; the Velikovskian journal *Kronos* will at least argue with those who reject Velikovsky's ideas entirely but treats as beneath contempt and ignores Velikovskian deviationists. Once this tendency has been recognized, for passions to be exacerbated by closeness rather than by distance, it can be readily enough understood. One tends to assume implicitly that another person's similar views are actually identical views, and when the recognition comes that this is not so, the disappointment can be shocking and can produce a violent reaction. Moreover, those who are closest can thereby seem the most threatening: given that our differences are so slight, might that not make it very easy for them to syphon support and supporters away from us? And perhaps, as we compare our opinions with only slightly different ones, there comes the fear that we ourselves might be mistaken—for it is surely easier to entertain the notion that we may be slightly wrong than that we might be grossly wrong (yet it is still unpalatable to admit it).

In the rare cases when true believers (Hoffer, 1951) do happen to recognize their error, they do not then adopt a more balanced or judicious stance, rather they typically go to the other extreme. Arthur Koestler's disillusionment with Communism left him implacably anti-Communist; Whittaker Chambers coupled that shift with conversion from atheism to Catholicism. Maurice Burton gave credence to the Loch Ness monsters for nearly three decades and then became a determined debunker; Razdan and Kielar (1984–1985) became injudiciously critical after their own search for the monster was unsuccessful. The switch from believer to debunker is easier than from either of those stances to uncommitted, because the extreme positions are so similar to one another, psychologically and (il)logically. Thus the believers and the debunkers are equally dogmatic—for example, that *the* scientific method exists and that they know precisely what it is; and they can be incisively logical about their opponents' fallacies while themselves committing similar ones (Bauer, 1984a, pp. 223–250). Debunkers, in fact, just as much as believers belong to the type described by Hoffer (1951).

Arguments Within Scientific Disciplines

Though the points just made apply to all arguments, including controversies within science ("intra-scientific" ones) as well as those about claimed anomalies, there are quite important differences in degree. The conventions of science serve to moderate the non-rational aspects of intra-scientific dispute, whereas arguments over anomalies are not so constrained.

In intra-scientific disputes, there is less opportunity for covert ideologies to influence the general course and particular events of a controversy. Most such arguments concern quite well-defined, specific issues: a particular observation or set of results, the efficacy of an instrument or method, the fit of one aspect or corollary of a theory. Overriding the dispute is a shared para-

digm. All the disputants approach the manifest issue in much the same way, with much the same biases and preconceptions about them and with much the same goals: to resolve the dispute and thereby get past that impediment to further progress. Moreover, continuing and explicit lip-service is paid to the ideals of objectivity and empiricism, and consequently there is more opportunity for logic and data actually to be taken seriously.

Scientists are trained not only to discover but also to find sponsors for their work and to publish their discoveries; and getting support and getting published means impressing and convincing others. Through early training, therefore, scientists learn something of the difference between personally holding beliefs and convincing others; they learn to be aware of and to deploy themselves the criteria that others will apply to their proposals and manuscripts. So scientists are trained to become their own critics and learn to become relatively logical and empirical in their work; within science, convincing oneself becomes not so different from convincing others.

Pieces of science ultimately must pass the test of Nature itself. Scientists take enormous risks if personal or ideologic motives lead them into logical fallacy or into ignoring or fudging data; at any time the honest work of others, in the same or in a similar field, could expose them as incompetent or dishonest and their whole career could be ruined. Adherence to the ideals of science, to the extent humanly possible, is for scientists a plain matter of self-interest.

Arguments within science, then, are somewhat less at the mercy of human vagaries than are other arguments. When scientists become involved in disputes about anomalies (or in other public arguments, or in arguments about politics or social questions), their experience of intra-scientific dispute can prove to be a handicap: they are not aware that there exists no shared paradigm, and so they are not prepared for the degree to which the disputes are actually about other things than the nominal question, they are not accustomed to disputes that are so much over beliefs and so little over facts; they do not understand why or how there can be such a multitude of illogicalities and red herrings. And so scientists are often ineffective in such arguments: over creationism, over Velikovsky, over Star Wars.

It is not being suggested that intra-scientific disputes are less intemperate or raucous than others, only that within science the arguments stick more closely to the manifest issues and are quickly settled once the relevant facts are in. By contrast, arguments over anomalies can persist, through the activities of small groups of proponents, long after the objective facts are in: to take an extreme case, there still exist Flat-Earth societies. Outside the disciplines, there is no system or authority to settle intellectual disagreements and to keep them settled.

Public Arguments

In public arguments as in all others one finds ideologic differences behind the manifest issues, one finds the antagonists seeking to win the argument

rather than to clarify the matter, and one finds progressively greater polarization over time. In public debates, though, one's ego may seem even more at risk than in private argument and saving face may become even more essential. It would make sense, therefore, for antagonists in public debate to look for ways by which it might become easier and less self-threatening for their opponents to recant; but examples of that seem to be rare. Thus Velikovsky was ridiculed harshly, misrepresented sloppily, paid scant respect; and so—if for no other reason—Velikovsky's critics were quite ineffective in swaying Velikovsky or his supporters.

Speaking to an Audience

A partial explanation for such apparently inept behavior as that of Velikovsky's critics is that they were not in fact trying to persuade Velikovsky or his followers; the aim was to discredit Velikovsky in the eyes of the public. In all arguments there are proponents and opponents, but in public arguments there is also an audience to be reckoned with. Most commonly, what the disputants say is actually addressed to that audience, the public, even when they may seem to be addressing one another; and things are said differently—or different things are said—than when it is the opponents who are being directly addressed. Sometimes, to be sure, the disputants do substantively address one another; but at other times again they appear to be talking only to themselves. Thus the typical publication by believers (for example, MUFON Journal, *Kronos*, *Nessletter*) or by debunkers (for example, *Skeptical Inquirer*) serves only the purpose of speaking to the already converted: those writings, as also conferences arranged by such groups, are better understood as rituals of self-motivation and self-reassurance than as attempts to make a case that might persuade opponents or the general public, let alone as attempts to clarify the substantive issue. For example, *Skeptical Inquirer* has published several debunking pieces about the Loch Ness controversy but was not interested in a survey of the strongest evidence, giving as reason that the magazine's purpose is not to consider what the best evidence for anomalous claims might be but to argue against them (Kendrick Frazier, personal communications, February 26 and October 6, 1984).

Pundits

In public debates one also encounters another type of role besides those of proponent and opponent: that of the observer or pundit, who takes an active part in the argument as an explicator of the issues or as a mediator between the extremes: ideally, the pundit serves to educate the public and to help it reach the truth of the matter. But pundits have their own opinions too, and those are likely to be more to one side of the issue than the other, and so it is by no means always easy to distinguish pundits from disputants—as for instance with the social scientists and humanists who entered the Velikovsky debate in the 1960s (Bauer, 1984a, pp. 52–56).

A common ploy by debunkers masquerading as uncommitted observers is to declare that educating the public is the same as having the public accept the debunking view: for example, in several instances the only criterion used by debunkers to judge whether students had become critically minded was whether they had lost their willingness to contemplate the possible reality of certain anomalies (Bainbridge, 1988; Blackmore, 1984–1985; Lee, 1985). That illustrates the fact that in intellectual disputes (as generally in democratic societies) lip-service only is paid to the notion that all are entitled to their own opinions: in practice, on any given issue one finds few people actually content to have others believe differently from themselves. Thus liberals tend to doubt that free speech for fascists or creationists is really good for society—or, what has the same effect, liberals become very agitated when widespread credence is given to, say, creationist views. Again, science popularizers tend to doubt that publishers should put out books like those of Charles Berlitz or Eric von Daniken. Liberals, scientists, and science writers profess to believe that aberrant views ("error") would disappear if only the public were well enough educated, in particular in science; yet they usually take part in public dispute not as educators and uncommitted explicators but as proponents of specific views, and they tend to view the public as "educated" only to the extent that it accepts their opinions.

Arguments About Anomalies

Controversies over anomalies are often public arguments, so what has just been said applies here too; but one can be more specific about who are the adversaries, about typical overstatements, and about the manner in which science is brought into the dispute.

The Disputants

Those who push the reality of an anomaly are typically amateurs or laymen with respect to the most apparently relevant disciplines, as are some of the most vociferous of their opponents. The experts and professionals are almost all skeptics or opponents or debunkers: thus physicians typically do not practice faith-healing or homeopathy or acupuncture (although some do); nor are many psychologists active in parapsychology (though a few are). That many of the proponents of an anomaly are amateurs has corollaries that make widespread acceptance of the anomaly more difficult (Bauer, 1984a, pp. 189–193; 1986, pp. 77–98): their work is not coordinated, many are less than competent, their reports are not rigorously refereed, the literature is inchoate; studying an anomaly is not doing science, and the investigations cannot realistically be judged as pieces of science.

Although most of the experts are skeptics or debunkers, one usually finds a few maverick professionals who espouse an anomaly or call for further investigation of it: Wilhelm Reich has followers among physicians and so-

cial scientists, Hynek was an astronomer and ufologist, Grover Krantz is an anthropologist who believes Bigfoot to be real; Velikovskians counted some physicists among their number; biologists Roy Mackal and Denys Tucker (among others) believe that Loch Ness monsters are real. There is almost always a distribution of belief among the experts about the reality of an anomaly; and that is one reason why anomalies cannot be dismissed simply by reliance on intellectual authority — that authority, insofar as it exists, is not sufficiently consensual on the matter.

Overstating the Cases

Disputants in all arguments tend to overstate their cases. With anomalies, the claimants typically say, "It is so", when it should be patently obvious that the evidence is insufficient to convince many intelligent, educated, appropriately qualified people, among them most of the professional experts. It would be more palatable to the pundits and even to the experts if the proponents were merely to say, "There is good evidence for this, it is not unreasonable to entertain the possibility". Here is an instance where the distinction between personal belief and demonstrable proof cries out to be applied: it may often be quite reasonable for the proponents to believe the anomaly to be real, but that does not necessarily make it reasonable for them to attempt to convince others of that or it (Bauer, 1986, Ch. 10).

The opponents, on the other hand, do not content themselves with making the eminently reasonable statement, "The evidence is not strong enough; and anyway the matter is implausible in the extreme; there is no reason for me to take an interest". No: they typically say, "It is not so, because it cannot be so"; and thus they lend support to the charges typically brought by the proponents, that scientists are arrogantly dogmatic, unwilling to examine revolutionary new phenomena or theories, and (unwarrantedly) confident that science already knows all the important things.

Deceptive Unity

Because the proponents of an anomaly can readily see themselves as a beleaguered minority, there is a tendency to close ranks against the debunkers even when the ranks are then closed on bed-fellows that the proponents would rather not have. For that phenomenon in the Loch Ness controversy, see Bauer (1986, pp. 76–77, 81–84); similarly in parapsychology (Hoebens, 1981–1982, p. 39): "The psi community has never completely freed itself from the pernicious *idée fixe* that overt criticism of a colleague may damage the cause and play into the hands of the enemies of parapsychology. Some parapsychological researchers began to suspect Tenhaeff long ago. Seldom, however, did they voice their doubts openly. And, when they did, some sociological mechanism seems to have prevented an adequate follow-up". Surely the cause is damaged more in the long run when the proponents close ranks with frauds or incompetents rather than admit

that some participants cannot be relied upon. On the other hand, since there is no overarching community of proponents of any anomaly—all are free publicly to declare themselves believers or investigators—no discipline can effectively be enforced, and the attempt to keep out undesirables may become hopelessly ineffective as well as unpleasant. It is a typical dilemma: the believers tend to close ranks because they do not trust outsiders to be capable of distinguishing—or even willing to distinguish—honest from fraudulent or competent from incompetent anomalists; but as the ranks are closed it becomes even more unlikely that such distinctions will in fact be made by anyone.

At any rate, one ought to be clear that—quite apart from instances of dishonesty or incompetence—sharp internal disagreements, both intellectual and personal, commonly exist among proponents of a given anomaly even when there are no obvious external signs of it. Thus much of the tension among Velikovskians was long known only to insiders; and though the monster-hunters at Loch Ness indulge in little public criticism of one another, in private it is quite a different matter, and one soon finds that there is little mutual respect or trust—let alone practical cooperation—among a number of competing individuals and groups. The penchant that debunkers and the media have for lumping together all proponents of a given anomaly reveals a lack of knowledge and understanding.

The Role of Science

In arguments over anomalies, science is typically appealed to: the claimants think that science ought to accept the existence of the anomaly sufficiently to study it, while the debunkers call the anomaly pseudo-science. That issue, in point of fact, is a red herring: the question, after all, is not what science should do or say but whether or not the anomaly is real. By insisting that science ought to take an interest, the claimants imply that science ought to study something simply because it may be real, despite the fact that it appears not to be consonant with the prevailing state-of-the-art, and despite the fact that there is no obvious way efficiently to obtain useful data about the matter; thus they display a misunderstanding of the way science actually works. For their part, the disbelievers also misunderstand the nature of science when they label an anomaly pseudo-science just because they think it is not real: as though science only studied matters known beforehand to be real! That both sides—and also the pundits and the media and the public—so readily succumb to this red herring of appeal to science illustrates that this is an age of scientism (whether or not it be, as so often claimed, an age of science).

Scientism means taking science as the arbiter of truth, and nowadays we all do that though we are not necessarily aware of it. The public is assured by advertisers and by politicians that what is being pushed has been scientifically shown or tested—"scientific tests have shown . . ."; what function is served by "scientific" or "scientifically" in such a context except to deliver the seal of certainty?

No one disputes the power or truthfulness of science. The believers insist that science should enter the picture because, perhaps without even knowing it, they believe the imprimatur of science to be the ultimate guarantee that they are not mistaken. The believers may often seem to be moved by resentment of science, and they may often seem to be criticizing it harshly, but the criticism turns out on closer examination to be only that science has gone wrong in this particular instance, science would be quite all right if only it rectified that error: so Velikovskians sought *reform* of science, and saw themselves as building a *correct* Velikovskian science; and fundamentalists are not content to have the divine revelation of creation, they require the reassurance of "creation science".

Misconceptions About Science

Arguing over whether an anomaly is pseudo-science, and appealing to science as the arbiter of truth, though actually a red herring nevertheless serves to make the nature of science a common theme in these arguments, one about which wide ignorance and confusion are then displayed: over whether science is a quest, or the application of a defined method, or a body of reliable knowledge, or an aristocratic pursuit; over how reliable scientific knowledge actually is, especially when laws or theories are applied under novel circumstances; and, in consequence, over how applicable "science" may be to such fields as history, or in everyday life, or in particular to discussions of anomalies. And always there arises the question, who can legitimately claim to speak in the name of science? In fact, one of the most indubitably instructive consequences of looking at arguments over anomalies is that one becomes aware of how little understood is science, never mind that it is universally appealed to.

Ignorance

Ignorance of various sorts, not only about science, plays an important role in arguments over anomalies. By definition, of course, we are ignorant about the main question, whether the anomaly is real or only apparent; but we are also usually ignorant about what sort of knowledge might actually help to answer the question, and certainly we are ignorant about how to obtain that knowledge. Since we are ignorant about *which* discipline might be relevant, it can happen that useful information exists without the disputants being aware of it: for instance that some species of spiders let masses of web fall from high in the atmosphere. Ignorance is a central characteristic of arguments over anomalies. The ignorance may be chiefly on one side or the other: for instance on matters of physics in respect of the flat-earthers or (specifically regarding electromagnetism and gravity) the Velikovskians. Or, both sides may be ignorant: for instance about what science is and how it works, where both Velikovskians and their critics were notably wrong, albeit in different ways.

Most interesting, of course, are those anomalies over which argument persists because we all—humankind—are still ignorant of what is needed to settle the argument; and that ignorance is surely sufficient reason to explore, as scientifically as is feasible, the domain of anomalous phenomena.

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