

tinue to mean that God has perfect knowledge of all events in the universe. That knowledge, if it really is knowledge, renders God powerless to effect changes that contradict that knowledge. All human actions must also conform to that knowledge, thereby making free will an impossibility.

In their treatment of miracles, Kane and Walmsley have stated that science requires "the assumption that what happens today will happen tomorrow, given the same set of circumstances." They have called this assumption "the uniformity of nature." I agree that science requires this assumption. This was, in fact, a major point of my letter. Christians assume that God makes science possible by providing the uniformity of nature. This is fine as far as it goes. The problem arises when Christians make the additional assumption that miracles occur. Miracles are events that violate the uniformity of nature. The assumption that such events occur contradicts the previous assumption that nature has this uniformity.

Kane and Walmsley have claimed that the existence of God may be known through reason while his attributes may be known only through faith. This claim may easily be shown to be absurd. If a person decides to acquire his beliefs concerning God by this method, he has two choices. His first choice is to attempt to determine rationally whether or not God exists—without knowing what God is—and then to attempt to determine what God is by means of faith. The only problem is that if he does not first know what is meant by the word "God," the question "does God exist?" can have no meaning to him. He may as well ask himself, "does snarb exist?" His second choice is to attempt to determine, by means of faith, a definition of the word "God" and then attempt to determine rationally whether or not an entity conforming to this definition exists. The problem with this is that because the definition of any word is a matter of choice, it cannot be a matter of faith. To define "God" as "a pencil," "a car," or "a cigarette" has as much validity as the use of any of the more traditional definitions as long as the intended meaning is clarified by the user of the word.

Truth, as Kane and Walmsley have implied in their conclusion, may be arrived at through faith. Knowledge, however, may not. A man in a completely dark room may happen to make a correct guess as to the color of the walls, but he will not know his guess was correct until someone turns on the lights. Science does not have a monopoly on truth. It has managed, however, to acquire a disproportion-

ately large share of the market.

Moorad Alexanian has attempted to discredit my refutation of the God of Christianity by branding it as philosophical and, therefore, in his view, unscientific. In taking such a position he has disregarded the fact that not only is philosophy itself a science, but it is the science which makes all other sciences possible. Without a proper philosophical foundation, the physical sciences cannot survive for long. The fact that the ridiculous theories of the creationists have gained such widespread acceptance is a result of the lack of understanding on the part of scientists as to the importance of such a foundation. If the destruction of science is to be prevented, it is imperative that scientists become much more aware of the value of a rational philosophy in defending their profession against the onslaughts of religion and other forms of organized irrationalism.

The letter of Rodney Hall is the most blatantly irrational. After correctly stating that Christian doctrines are illogical, Hall confesses that he believes in them anyway. The consequences of such a position are evident when he equates a questioning attitude with immaturity. Asking questions is a necessary part of the process of obtaining knowledge. If this is a sign of immaturity then I hope to remain immature for the rest of my life.

Faith is not a valid cognitive procedure. When it is accepted as such, the process of rational argumentation degenerates into a contest of whims, and any idea, no matter how absurd or evil, may be successfully defended by claiming that those who advocate it feel, somehow, that it is right. In such a philosophical environment ideas are accepted not on the basis of how logical they are but rather on the basis of how much "feeling" their advocates seem to have. Unfortunately, the acceptance of ideas on this basis has been and continues to be the dominant epistemological trend in the world.

It is possible to ignore the facts of reality but it is not possible to avoid the consequences of doing so. For example, it was Hitler's appeals to faith and his denunciations of reason that convinced people in Germany that mass murder was necessary for the common good of civilization.

Without a widespread rejection of faith in favor of reason it will not be possible to alleviate the problems faced by civilization. For those interested in promoting such a rejection, I recommend the following books: *Atheism: The Case Against God* by George Smith, *The Ominous Parallels* by Leonard Peikoff, and all books by Ayn Rand.

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10/82

More on fear

I would like to thank you for giving me the opportunity to respond to W. H. Henry's comments (July, page 13) concerning my response to J. A. Eades in January's issue. I say "would like to." I'm not *going* to thank you because you did, in fact, not give me such an opportunity. Therefore, I am requesting it now. I'm not sure whether I was not given this opportunity because of a simple oversight or because of censorship. However, I'll be charitable and assume the former—in spite of the fact that this appears to be the third such occurrence. I'm certain that you are aware of the solely negative results of censorship and I cannot believe that you would resort to it.

I am surprised that W. H. Henry finds it so unexpected to be frightened by reading *PHYSICS TODAY*. One of the purposes, if not the sole purpose, of the letters section, I would think, is to encourage and promote the free exchange of ideas. I think that ideas are probably the most dangerous things that there are. (Think how much easier it would be for "the powers that be" to maintain the status quo if all the intelligent people in the world would just quit thinking!) For an idea to be frightening must mean that the idea was radically new and the reader's mind was engaged and working while receiving the idea. I am flattered that I am the first person to present Henry with such a new idea. I do not feel that Henry has any reason to be afraid of me. However, he does have a reason to be afraid in general and I can't understand why he wasn't before reading my letter. I'm glad my letter "woke him up."

Henry appears to have somehow concluded that, because I can conceive of things more detrimental to human happiness than a nuclear war (but admittedly, those things aren't numerous), that I would therefore want to have one—I can't think of anything else he could have been scared of in my response to Eades. I have to say that I resent his attitude and think that he should take some elementary lessons in logic. Nothing that I have ever said in these letters pages or anywhere else could possibly indicate that I think that a nuclear war is a desirable thing to occur! Although I've never done it, I'm quite sure that there are a lot of tragedies, for example, worse than having my hand exposed to a high-energy CO₂ laser beam. Nevertheless, just because there are things worse than that, I wouldn't want it to happen to me or anyone else!

There are, however, people on the other side of the ocean that sure seem to be behaving as if a nuclear war is not only not the absolute worst thing that could possibly occur but isn't even all

that undesirable. If I were W. H. Henry (or anyone else—such as me), those are the people that I'd be afraid of!

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Astronomical error

An ancient astronomical joke has a little old lady saying, with admiration, that astronomers must be wonderfully wise since among other abstruse things they have even discovered the names of the stars! At least some of us have; unfortunately the reviewer of the Adelmans' book "Bound For The Stars" (August, page 38) erred in stating that Beta and Gamma Centauri are the fainter members of the Alpha Centauri system. They are, in fact, quite respectable stars in their own right, having nothing to do with Alpha.

Incidentally, it is worth mentioning that the separations of the two brighter components of Alpha Centauri at apastron and periastron are considerably overestimated in "Bound For The Stars." The correct values are approximately 35 and 11 AU. Thus its planets, if any, will have somewhat less maneuvering room than might have been thought from the original figures.

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9/82
THE AUTHOR COMMENTS: I had no sooner read the printed version of my review of "Bound For The Stars" (August) than I realized my offhand comment on stellar terminology was quite wrong; alpha, beta, gamma, . . . designating typically the brighter stars within a given constellation and not (usually) members within a binary system. This is sufficiently well known (even to me) that PHYSICS TODAY may have to come out with a special oversized edition to contain all the gleeful letters that must be amassing at the editorial offices. I hope that IAU will not have to set up a special commission to set things straight. Astronomical nomenclature has enough problems without my help.

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10/82

In defense of GRASER

In August (page 76) Charles Holbrow objected to our using the acronym GRASER for the hypothetical analog of the LASER that might generate coherent gamma radiation by stimulated emission¹ and proposes instead to substitute the word GRAYL. May we presume to ask for equal time to explain why we

cannot endorse his suggestion, even though we appreciate his desire to contribute to this field of research?

► Holbrow's proposal comes somewhat late; the present acronym has existed in published literature for nearly two decades.²

► The structure of the present acronym is consistent with those for other devices that Amplify-by-Stimulated-Emission-of-Radiation; GRAYL would not be (nor, incidentally, would GASER, sometimes proposed, because "gamma" alone may not necessarily imply "gamma-ray").

► The quest for a gamma-ray laser hardly resembles the search for the Holy Grail of antiquity,³ which was well-supported, fully staffed, and encouraged by the highest authorities in the land.

► Said Grail is believed to have emitted only in the visible.

► Those few individuals who have persisted in this frustrating but challenging task bear little resemblance, other than dedication, to the knights of yore.

► Were Holbrow more meticulous in his spelling and as bullish as we in assessing the prospects for eventual success and significant application of the results of this undertaking, he would be less disturbed at what he terms "bovine implications" of the established acronym.

References

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3. Sir T. Malory, "Queste de Saint Grael," in *Monte d'Arthur*, Caxton Press (1485); see also articles "Malory, Sir Thomas," and "Grail, the Holy," in *Encyclopedia Britannica*, University of Chicago (1969).
4. A. Lord Tennyson, "The Holy Grail and Other Poems" (1870).

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10/82

Unemployment dispute

Leonard Ball's "Unemployment: a new solution" (August, page 13) presents a concept for legislating an end to unemployment. However, I find an example that shows that Ball's solution creates more hardship than it relieves and demonstrates that the system is unworkable.

Consider: The gardener at the local state university with many years of

satisfactory employment, reasonably secure in his position and living a lifestyle he can afford. Under Ball's scheme he is immediately forced to live on ²⁹/₄₀ of his current income! Mr. Gardener can now endure the hardships and lower his standard of living or, unwilling to lower his standard of living, he can find a job opening with the County Park Department doing the same kind of work for which he is eminently qualified and pick up another 12 hours work each week. Of course his counterpart with the County Park Department is hired by the university and, alas, no new jobs are available.

Might we postulate for a given state of the economy that there exists conservation of jobs and workers? Probably not, as the government intervention surely creates more nonproductive paperwork. Oh! A feedback loop that takes our economic state to a lower level. Of course, Ball might argue that we can make it illegal for the Park Department to hire Mr. Gardener without paying him double time, that is, "self-policing." But those laws will probably be as effective as the ones that make the muggers' occupation illegal.

What is needed is not a redistribution of currently available jobs but the creation of more jobs. Will the social engineers never learn that the biggest parasite on the free-enterprise system is government?

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9/82

THE AUTHOR COMMENTS: Lanny Reed's claim that the gardener parable "shows that Ball's solution creates more hardship than it relieves" is unfounded. The letter fails to identify any hardship, or illusion of hardship, created by my proposal. My proposal specifically re-distributes pre-existing hardship by transforming unemployment into underemployment, and provides both hope and incentive (which do not now exist) for solving both problems through democratic processes.

The parable is hopelessly flawed. To get his second part-time job the gardener must resolve schedule conflicts and compete with hundreds of unemployed applicants (who have no such conflicts) for a place on a waiting list. Bosses will minimize their inconvenience and overhead by collectively taking measures that reduce the reported unemployment rate. To do otherwise would be stupid. Bosses will actively discriminate against those already employed because it will be in their self-interest to do so, precisely contrary to the situation under present law (which encourages moonlighting and inflationary stealing of employees from other employers). If necessary, such discrimination can be further encouraged