

# Scientists are still keeping the faith

**Although the suggestion eighty years ago that four in ten scientists did not believe in God or an afterlife was astounding to contemporaries, the fact that so many scientists believe in God today is equally surprising.**

**Edward J. Larson and Larry Witham**

To measure the strength of religious belief in an era of ascendant science, the eminent researcher James Leuba conducted a landmark survey in 1916. He found that 60 per cent of 1,000 randomly selected scientists did not believe in a God, and predicted that such disbelief would increase as education spread<sup>1</sup>. To test that prediction, we replicated Leuba's survey as exactly as possible. The result: about 40 per cent of scientists still believe in a personal God and an afterlife. In both surveys, roughly 45 per cent disbelieved and 15 per cent were doubters (agnostic).

Eighty years ago, Leuba wrote that scientific knowledge would demand "a revision of public opinion regarding the prevalence and future of the two cardinal beliefs of official Christianity". He asserted: "The essential problem facing organized Christianity is constituted by the widespread rejection of its two fundamental dogmas<sup>1</sup>." Though a noted psychologist, Leuba misjudged either the human mind or the ability of science to satisfy all human needs. Such is the risk of making historical predictions.

In the intervening years, religious belief has become more diverse. But, to the extent that both surveys are accurate readings, traditional Western theism has not lost its place among US scientists, despite their intellectual preoccupation with material reality. But it should not be forgotten that Leuba's finding of widespread disbelief among US scientists was astounding in its day. And today, even more than in 1916, most scientists have no use for God or an afterlife.

Speaking for this majority, one 1996 respondent to the question about desiring immortality said, "It is pointless to desire the ridiculous". Leuba's interest in psychology prompted him to insert this secondary question, asking whether respondents who did

not believe in personal immortality nevertheless desired it. More than any other of his questions, it addresses the tension between intellect and emotion in some scientists. In 1916, 73 per cent of nonbelievers nevertheless desired immortality<sup>1</sup>. That hope has dwindled over 80 years (see Table 1).

Despite the stability in the overall proportion of believers and disbelievers, there has been a significant shift in views held by the three professions surveyed — mathematics, biology and physics/astronomy. The 1996 survey showed that mathematicians are most inclined to believe in God (44.6 per cent). And although biologists showed the highest rates of disbelief or doubt in Leuba's day (69.5 per cent), that ranking is now given to physicists and astronomers (77.9 per cent).

Higher belief among physicists in Leuba's survey might have been expected at a time when leading physicists such as Lord Kelvin, Robert Millikan and Sir Arthur Eddington publicly defended religious belief<sup>2</sup>. We also expected a higher proportion of belief among physicists and disbelief among biologists, particularly with some prominent astrophysicists in the 1990s entertaining the anthropic principle and certainly the advent of Big Bang cosmology — whereas most prominent biologists still stick hard by darwinian naturalism<sup>3</sup>. But we were wrong.

Leuba's documentation of disbelief had a political impact, particularly his data on the decline in belief among US college students. The populist Democratic politician Williams Jennings Bryan and some conservative Christians seized on Leuba's data in the 1920s to show the social evils of modernism, and its ultimate impact on the country's morality. They accused academic scientists of leading college students into disbelief<sup>4-6</sup>.

Although Leuba's data caused a scandal, the same findings for 1996 may do just the opposite. Today, many people presume that

scientists are far less likely to believe in the supernatural than the general population, so religious Americans will doubtless be pleased to know that as many as 40 per cent of scientists agree with them about God and an afterlife. Nowadays, the US scientific enterprise is fixated on the battle for federal funding, spawning calls for the "civic scientist" or "scientist as citizen", ultimately to promote the cause of science to taxpayers. If more than one-third of scientists hold beliefs dear to many conservative Americans, the knowledge that scientists are "just like us" may evoke in them a sympathetic response.

Compared to the technology used in modern surveys, Leuba's effort was quaint. Nevertheless, his was among the earliest efforts to apply the science of statistics to sociology. In two separate mailings, he sent his survey to a total of 1,000 scientists drawn randomly from the 1910 edition of *American Men of Science*. He received about a 70 per cent response. We randomly drew 1,000 names from the current edition of *American Men and Women of Science*; our response was about 60 per cent. We stuck to Leuba's apportionment: half biologists and a quarter each in maths and physics/astronomy.

Oddly, in Leuba's survey about 20 per cent of the scientists who did not believe in God nevertheless reported a belief in personal immortality. We obtained a more logical response in that belief in God and in immortality were almost always held together. It is unclear from Leuba's research just what scientists earlier in the century thought of as life beyond death, even with no God — though it might have meant the conservation of energy or, in Cicero's terms, being remembered by later generations. The questions go to the issue of the theological definitions. Leuba recognized this, but kept the format of his questionnaire to a simple two questions of three choices each, saying that "in attempting to refine, I should probably have made matters worse".

Leuba viewed the great challenge to science as orthodox Christianity, which is why he defined God in very conventional terms: "A God to whom one may pray in expectation of receiving an answer". We believe that because such traditional tenets still prevail in American culture, retaining Leuba's 1916 definition of God — hearing prayers and giving immortality — still gives the best simple question.

If respondents in Leuba's time did not agree with his survey in general — one respondent said, "This is a lot of damned rot!" — we received unsolicited comments that the definition of God did not allow for enough variation. "Why such a narrow

**Table 1 Comparison of answers to questions in 1916 and 1996 surveys**

Topic of question	1916	1996
<b>Belief in personal god</b>		
1. Personal belief	41.8	39.3
2. Personal disbelief	41.5	45.3
3. Doubt or agnosticism	16.7	14.5
<b>Belief in human immortality</b>		
1. Personal belief	50.6	38.0
2. Personal disbelief	about 20*	46.9
3. Doubt or agnosticism	about 30*	15.0
<b>Desire for immortality</b>		
1. Intense	34	9.9
2. Moderate	39	25.9
3. Not at all	27	64.2

\*Results published graphically by Leuba. All figures are percentages.

A STATISTICAL ENQUIRY

Conflicting statements are confidently made regarding (whether scientists hold a) belief in God and in personal immortality. Nevertheless, sufficient data are not extant to support any such supposition.

The accompanying questions are sent to 1000 persons taken by chance from those listed in "American Men (and Women) of Science", in the hope of securing statistics valid for this group. The condition of success is that all those addressed respond. No satisfactorily definite conclusions could be drawn if many of those addressed refused or neglected to answer.

It will take you only a few seconds to make a mark by every statement true for you. Please do it, if at all possible, on receipt of this paper and return it in the enclosed stamped envelope.

A. CONCERNING THE BELIEF IN GOD.

- .....1. I believe in a God in intellectual and affective communication with humankind, i.e. a God to whom one may pray in expectation of receiving an answer. By "answer" I mean more than the subjective, psychological effect of prayer.
- .....2. I do not believe in a God as defined above.
- .....3. I have no definite belief regarding this question.

B. CONCERNING THE BELIEF IN PERSONAL IMMORTALITY,

i.e. the belief in continuation of the person after death in another world.

- 1. I believe in:
  - a. personal immortality for all people
  - b. conditional immortality, i.e. for those who have reached a certain state of development.
- 2. I believe neither in conditional or unconditional immortality of the person.
- 3. I have no definite belief regarding this question.
- 4. Although I cannot believe in personal immortality, I desire it:
  - a. intensely
  - b. moderately
  - c. not at all

Questions of belief: how Leuba phrased his 1916 survey of American scientists.

definition [of God]?" asked one of our respondents, writing in the survey margin. "I believe in God, but I don't believe that one can expect an answer to prayer."

Surveys in the past decade have shown that religious belief, professed by 93 per cent of Americans, has become more diverse. When Americans are asked to define 'God', a quarter opt for something other than a conventional theistic deity. They see 'God' as higher consciousness (11 per cent), full realization of personal potential (8 per cent), many gods (3 per cent) or everyone as their own god (3 per cent)<sup>7</sup>. A more robust sampling by Leuba and by us would doubtless have provided more confidence that the results reflect what scientists really believe. Yet our findings do corroborate a large survey done in 1969 by the Carnegie Commission, asking 60,000 professors in the United States questions such as "how religious do you consider yourself?". The commission found that 34 per cent of physical scientists were "religiously conservative" and about 43 per cent of all physical and life scientists attended church two or three times a month — on a par with the general population<sup>8</sup>.

Due to the dramatic expansion in the US scientific community since 1916, our survey polled only about 3 per cent of the biological and physical scientists and mathematicians listed in the 1995 *American Men and Women of Science*<sup>9</sup>. From his listing, Leuba reached more than 20 per cent of these groups<sup>10</sup>. In Leuba's day, the editors of the reference book went through the painstaking process of deciding who were "great scientists" compared to ordinary, and an asterisk was put by those names<sup>10</sup>. Thus, Leuba could analyse belief among the great compared to "ordinary". He found a higher amount of disbelief among great scientists, but this was a category we could not test — the asterisks do not appear in modern editions.

Another way to make this distinction would be to compare 'research' scientists to teachers or those working in industrial technology, for example. Names listed in *American Men and Women of Science* are judged by awards, citation or recommendation. The editors tried for several years to highlight 'research' scientists, but abandoned the effort for lack of consistent responses from the tens of thousands of people listed. Our

best indication, therefore, comes from research by the National Science Foundation, which estimates that about 11 per cent of scientists are involved exclusively in basic research<sup>11</sup>. Whatever the stature of respondents, the positive unsolicited responses to our survey were more plentiful than Leuba's. All of our respondents at least attempted to answer the questions, whereas Leuba had a nearly 10 per cent rejection rate, with comments such as "How is it possible for a sane student to answer these questions?"

Under conditions of anonymity, we offered to send the results to the subjects of our survey, and their responses gave us an inkling of the professional landscape with which we had made contact. Letters came from well-known private universities such as Chicago and Johns Hopkins, but more so from land-grant schools. We heard from scientists at national research centres, as well as from technical institutes, medical colleges and commercial labs — and from one Nobel laureate.

The persistent interest in, even struggle with, religious questions among scientists was poignantly captured in one handwritten letter from a Harvard professor. "When backed into a corner, as it were, by questions such as those on the survey, I have to come down on the side of non-belief", the scientist wrote. "This result for me, however (and possibly for others), is an unduly harsh picture. I try frequently to open my mind to an influence of what is good, and the 'subjective and psychological' effects of this can be quite profound, such that I am happy to make contact with the religious tradition by saying that I am praying to God."

Similarly, after indicating no desire for immortality, one of our respondents added wryly, "But it would be nice" □

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