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THE *CONSENSUS GENTIUM* ARGUMENT

Loren Meierding

In antiquity the *consensus gentium* argument for God's existence was believed to have merit (cf. Cicero, *De Natura Deorum*, Book II, sect.2,4), but has been considered blatantly fallacious during more recent times. In this article Bayes' Theorem is applied to show that the argument is in fact a valid inductive argument. A two hypothesis and a four hypothesis version of the argument are analyzed. Perusal of available statistical evidence suggests that when better worldwide opinion polling data becomes available it will turn out to be sound as well.

In antiquity the *consensus gentium* argument for God's existence was taken seriously. As its name indicates, it is the argument that the common consent, agreement, or belief among human beings that God exists justifies believing that God does truly exist. The argument dates back to the Stoics. It is the argument which Cicero invokes in his *De Natura Deorum* (Book II, sect. 2, 4). Cicero implies that it is the fact that men believe in the gods that warrants believing that they exist. Indeed, he claims that human belief in them grows stronger with the passage of time. Consequently, there is little need to discuss the question of their existence. The main question of interest is what nature they have. Cicero repeats the reasons Cleanthes the Stoic gives on why people believe in the divine. The reasons cited are augurial predictions of future events, the blessings people enjoy, the display of force in nature, and beauty and design of nature (Book II, sect. 5). The argument from design is really the chief basis for people's belief in the divine according to Cicero, but the general belief people have in divine beings is the fact that settles the question of their existence.

Although the *consensus gentium* argument was considered important by ancient writers, in modern times the argument is not taken seriously. Indeed, the argument seems so blatantly fallacious that when Paul Edwards wrote his article on the *consensus gentium* argument for the *Encyclopedia of Philosophy*, he did not find any philosophers among the exponents of the argument.[1] However, despite the poor reception the argument has received during the modern period, when it is examined as an inductive argument, I believe that it is not fallacious, is not devoid of value, and does offer support for theism.

Appropriateness of Applying a Bayesian Approach

The *consensus gentium* argument argues for the truth of the hypothesis that God exists based on the evidence of the common belief of men and women that he exists. Although Cicero may have thought that this evidence by *itself* was sufficient for believing in God's existence, of greater interest is whether the argument provides any support for God's existence. With the exception of the ontological argument, the arguments for God's existence are essentially inductive arguments claiming that belief in God is justified based on various kinds of available evidence. Evaluating the *consensus gentium* argument depends on determining whether a rational person is justified in increasing his or her degree of belief in God when the *consensus gentium* inductive evidence is added to the background evidence he or she already has. We ask—should a rational person who learns that people, or at least a majority, believe that God exists increase his or her degree of belief that God exists, perhaps tipping the balance in favor of believing that God exists? The Bayesian model for scientific and inductive reasoning provides a powerful conceptual framework for evaluating valid inductive arguments and inductive inferences.[2] The Bayesian approach provides a method to evaluate the impact of incorporating additional evidence with previously known or background evidence to determine whether specific new evidence supports or is evidence against a particular belief or hypothesis. It will help us judge more objectively the warrant for believing God exists from the *consensus gentium* evidence.[3]

The Bayesian model is in accord with the basic facts about our epistemic situation. We are limited in knowledge concerning past, present, and future events and the existence of various hypothetical entities. Some conceived entities are clearly more probable and likely to exist than others. Presumably we should generally believe statements and hypotheses that have high probability on our evidence and reject those that have low probability. If we are rational, we must also be consistent. The axioms of probability impose constraints on the probability values we can assign to statements and hypotheses without being guilty of inconsistency. The Bayesian approach applies these constraints to the analysis of inductive inference illuminating the rationality of inductive arguments.

By applying the highly plausible and powerful Bayesian approach, it is possible to develop the *consensus gentium* argument in a fashion which shows the argument does have inductive validity, that is, if evidence of the common consent variety is possessed, then that evidence offers support for God's existence. Actual possession of evidence of common consent would then make the argument sound and strengthen the support for belief in God's existence. Although the evidence available tends to suggest this inductively valid argument is probably sound, a definitive pronouncement on its soundness at this point in time is premature, since the evidence about the religious beliefs of the majority of people is so sketchy—opinion polls have been taken in the U.S. and Europe, but not worldwide. Deeper investigation of the evidence about people's beliefs about the divine is needed. Although the argument is inductively valid

and apparently offers support for theism, this does not mean that it, by itself, as Cicero thought, must provide sufficient justification for belief in God's existence. It may, when combined with other evidence, however, provide sufficient support for rational belief in God's existence. With the addition of the evidence of common consent to other available evidence, the scale may be tipped in the favor of theism. We are concerned here only with whether possession of common consent evidence offers support for God's existence.

The Bayesian Approach

We are interested in deciding what a rational human being should conclude when presented with evidence that a majority of people believe that God exists. There are various theistic and non-theistic views that a person can adopt. When a rational person adds the *consensus gentium* evidence to the evidence he or she already possesses, it may increase, decrease, or leave unchanged the probabilities of the different belief options. The analysis requires a distinction be made between the evidence offered in an inductive argument to justify accepting or strengthening one's belief in an hypothesis, let us call this evidence M, and the background evidence which a person whose rationality or warrant for making an inductive inference is at issue already possesses. Let the background evidence be E. E includes all evidence possessed by a person making an inductive inference except M and any evidence entailing M. E is all the evidence that a rational person possesses, but not all the evidence available. No one can have access to more than a very small fraction of all the experiences of billions of people.

In order to apply the Bayesian approach, that is, apply Bayes Theorem, the hypotheses analyzed must include a set of mutually exclusive and exhaustive hypotheses. For each hypothesis in the set there are three probabilities which must be distinguished. The first is the *prior probability* of an hypothesis. It is the conditional probability of the hypothesis on the background evidence E alone. The second is the *liklihood* of an hypothesis. It also is a conditional probability. Unlike the other probabilities which are probabilities of the hypotheses, it is a probability of obtaining the evidence M we are evaluating. It is the probability that one should assign to obtaining evidence M given the background evidence and knowledge that the hypothesis is in fact true. The third probability is called the *posterior probability* of an hypothesis. It is the conditional probability of the hypothesis on the total evidence a rational person possesses, that is, on the background evidence E together with the evidence M.[4]

Bayes Theorem relates the three probabilities for each hypothesis.[5] It states that *the posterior probability of an hypothesis is equal to the product of the liklihood of the hypothesis, the prior probability of the hypothesis, and a constant*. The constant factor is the same for all hypotheses and ensures that, like the prior probabilities, the posterior probabilities will sum to one. Bayes Theorem has great value because it reflects a very basic fact about inductive inference. When we are trying to decide between two

or more possible hypotheses, we may draw some inferences about what is likely to be observed for each hypothesis given the background evidence that we have. Some outcomes may have a high probability if one hypothesis were true and a low probability if the other were true and vice versa. If we then observe one of the possible outcomes, we will justifiably conclude that the hypothesis which implied a high probability for it is more likely to be true than we previously believed and the hypothesis which implied a low probability is less likely than before. If the prior probabilities and the liklihoods for the hypotheses can be estimated, then Bayes' Theorem can be applied to produce the resulting posterior probability that an individual hypothesis is true on the new evidence (here the evidence of common consent) taken together with the prior information already known.

Since this approach is fundamental for inductive reasoning in practical matters, in science, and in statistics, many examples could be offered. Consider an urn that we are told contains 50 black or white balls. We can draw 10 balls without replacement. All 10 are black. This outcome has a probability of 1 if all the balls are black but is .31 if only 5 are white. The probability that no more than 5 are white is .79 and the probability that no more than 10 are white is .95. Although it is possible that as many as 40 are white, we have reason to conclude that all are black or very few are white. Determining liklihoods for hypotheses is analogous to developing consequences of scientific theories and testing them (these consequences are deductive with probability of 1). When Einstein formulated the general theory of relativity he derived predictions of the number of degrees that light rays from Mercury would bend as they passed by the sun in an eclipse and also the number of degrees of arc that the perihelion of Mercury advances per century. The predictions differed markedly from the predictions of non-relativistic mechanics. When measurements were made, they agreed closely with Einstein's predictions. The observed evidence greatly increased the probability that the theory of relativity was true and non-relativistic theories were false.

The purpose of estimating values for the posterior and prior probabilities is to determine whether the new evidence increases the probability of the hypothesis so that the *posterior* probability of the hypothesis is *greater* than its *prior* probability. If it does so, then the evidence can be said to support or provide confirmation for the hypothesis and the argument will be inductively valid.[6] Conversely if the evidence reduces the posterior probability of an hypothesis below its prior probability, then it can be said to disconfirm or reduce support for the hypothesis. We are interested then, in whether the evidence that people believe that God exists, supports or tends to confirm the hypothesis that God does exist by raising or lowering the posterior probability. If it does, the argument is valid. If we happen also to know that M the evidence of common consent is available or true, then the inductive argument is also a sound argument.

Fortunately some consequences which follow from Bayes Theorem permit conclusions to be drawn by merely focusing on the relative probability values that should be assigned to the liklihoods. It is not necessary to determine exact values for all the probabilities. *If we know which*

liklihood for a set of hypotheses has the highest value, then we can show that obtaining M makes the posterior probability greater than the prior probability and provides confirmation for that hypothesis. In fact, it provides the strongest confirmation.[7] Correspondingly, if we know which liklihood has the lowest value, then we can show that obtaining M provides the strongest disconfirmation for that hypothesis. The other liklihoods may or may not provide confirmation or disconfirmation. Obviously, if there are only two hypotheses and the two liklihoods are unequal, the hypothesis with the greater liklihood will provide confirmation and the lesser will provide disconfirmation. Thus, if all we know is that the liklihood of evidence is higher for one hypothesis than each of the others, this is enough to show that the evidence supports or confirms that hypothesis. We will show this for the *consensus gentium* argument thereby showing that it is a valid inductive argument. On the other hand, if all we know is that the liklihood of evidence is lower for one hypothesis than all the others, this is enough to show that it is evidence against or disconfirms that hypothesis. With these prefatory remarks in place, let us begin the analysis of the *consensus gentium* argument.

Specification of Hypotheses for Analysis

Bayes' Theorem is not applicable unless it is applied to a set of mutually exclusive and exhaustive hypotheses. We must therefore distinguish such a set of hypotheses concerning God's existence. In its simplest form the argument is analyzed with two hypotheses which reveal the essential features of the argument. It will be useful to distinguish also a more complex version with four hypotheses to bring out important additional features.

We are interested in knowing whether the *consensus gentium* argument supports theism. There are various ways to define theism. We will take the most fundamental attributes of God to be that he is all-powerful and all-knowing. One of our hypotheses then should be H: an all-powerful and all-knowing personal being exists. To round out the set we take -H, the negation or rejection of H as the other hypothesis. In the discussion which follows, "theism" will refer to the belief that H is true and the belief that -H is true will be termed "the rejection of theism".

A set of two hypotheses does not yield the most natural representation of views about the existence of deities who are personal beings. A more natural division of views produces four hypotheses. We can divide H or theism into two hypotheses by adding the attribute of benevolence to obtain classical theism. It is the view that the hypothesis H_{ct} is true: a *benevolent*, all-powerful, and all-knowing personal being exists. But it is possible that an all-powerful and all-knowing personal being exists but is not benevolent. He might be indifferent or even malevolent. Thus we must add a second hypothesis H_{nt}: a non-benevolent personal being that is all-powerful and all-knowing exists. Let us call this "non-classical theism". We can also divide -H or the rejection of theism into two hypotheses by providing an hypothesis for the view that supernatural personal beings with limited power or knowledge exist. Many people do not ascribe to the-

ism but are polytheists. Thus H_p is: supernatural personal beings with limited power or knowledge exist. The fourth hypothesis needed to form a mutually exclusive and exhaustive set is the hypothesis H_a: no supernatural personal beings exist. This is the hypothesis atheists hold. Some other religious adherents who are not classified as atheists, many Buddhists for instance, would be in agreement. Pantheists are covered by this hypothesis, since their beliefs admit a being that is supernatural in some sense but not personal. Although this hypothesis could be split further into more hypotheses, the analysis would become more complex without any basic change in the results or any gain in understanding. The religious beliefs of most people, if they are not agnostic, will identify them as holding one of the four hypotheses. As noted, the four hypotheses case is related to the two hypotheses case in the following way: theism or H combines the classical and non-classical theism hypotheses H_{nt} and H_{ct}. The rejection of H, or -H, combines the atheism and polytheism hypotheses H_a and H_p. Although more complex sets of hypotheses could be defined, it seems doubtful that any advantage in clarity is to be gained by doing so.

Specification of Evidence for Analysis

In order to evaluate the argument, it is necessary to clarify the nature of the consent to which the argument appeals. The historical version appeals to actual belief in God by a majority of people. We are interested in whether the *consensus gentium* argument provides support for the existence of a personal being who is all-powerful and all-knowing. The evidence can be formulated in various ways. One form the *consensus gentium* evidence may take is:

> (M) The majority of people believe that an all-powerful and all-knowing personal being exists.

As stated this implies that at least 50% of humankind (+1 person) believes an all-powerful and all-knowing personal being exists.[8] M defines the common consent evidence as a simple majority of all people.[9] Including the beliefs of all people is the simplest choice and is most easily related to the data currently available on religious belief. More complex representations of the evidence would require more complex analysis without changing the nature of the argument or the conclusions.[10]

Evidence about whether people actually do believe in God's existence does not limit the possibilities. We might include in our evidence, not only a snapshot of the state of current belief, but also the trend over time. For example we might have evidence not only that a majority of people now believe God exists, but also that the percentage of those who believe has been increasing over a very long time. It is the trend of increasing belief that Cicero finds so compelling. Thus we might specify:

> (M′) The majority of people believe that an all-powerful and all-knowing personal being exists and the percentage who believe has been increasing for centuries

as our evidence for the *consensus gentium* argument. A more specific statement might be made with percentages and levels of confidence and perhaps an average rate of increase per century for a given number of centuries.

Evaluation of the Two Hypothesis Case

As is clear from the analysis above, the validity of the two and four hypotheses versions of the argument turns on the relative value of the liklihoods. It is necessary therefore to take up the question of their relative value. For the two hypothesis version of the *consensus gentium* argument we must impose some constraints on the possible probability assignments for the liklihoods of H and -H, that is, the probability of our common consent evidence M on H and -H respectively. We are interested in probability assignments that are reasonable—that can be justified by plausible arguments. In the case of scientific hypotheses, deriving consequences is usually fairly straightforward. But when the hypotheses concern the existence of supernatural beings and the probability assignments depend on the actions, purposes, and goals of such beings, the task of constraining the assignments for the liklihoods is much more problematic and speculative. Nevertheless, I believe that there are plausible arguments which do justify imposing some constraints on the values of the liklihoods and, specifically, for concluding that a rational person is quite justified in believing that the liklihood of H is greater than the liklihood of -H.

Consider the situation if -H happens to be true—that God does not exist. Then it would be reasonable to assign some probability to the liklihood of -H, that is, to the majority of people being theists and believing H to be true even though it is false. The appropriate probability value would depend on the various causal factors that we think would affect people's beliefs about God. The causal factors must be factors that may come into play. They must be appropriate on the basis of our background evidence *when we do not know what people's beliefs about God happen to be*. The hypothesis -H as stated allows for the existence of supernatural beings although not beings which are all-powerful and all-knowing. The supernatural beings could act in ways which would convince some people that an all-powerful being was at work. Consequently, the factors which cause people to believe theism may have a naturalistic basis or a supernaturalistic basis.

Next, let us consider the naturalistic and supernaturalistic causes present in the -H case in comparison with the case if H or theism is true. It is not obvious that any of the naturalistic factors which tend to cause people to accept H if God did not exist, would cease to be present if God existed. Now consider the causes originating from supernatural action. If God exists he might have the same motives as the supernatural beings in the -H case to demonstrate his power. But if he did so he would be able to demonstrate far more power. We would expect him to convince more people. If we knew that an all-powerful being existed, but not whether he is benevolent, indifferent, or malevolent, it seems that there should be a rea-

sonably good probability that he would act in ways which would reveal his existence to people through answered prayer and implanted beliefs, but also some probability that he would not do so. Further, if an all-powerful being did act to reveal his power we would expect a high probability that a majority would believe in his existence, since there are many things an all-powerful being could do to reveal himself. Thus, there is a non-zero probability that if H is true the supreme being is benevolent and there is a reasonable probability that if he is benevolent, he would want people to know the truth about his existence. There is also a non-zero probability that if H is true and the supreme being is not benevolent, he would act in ways that would provide people with evidence about his existence. The possibility that God will act in ways which provide sufficient evidence for people to believe he exists, adds a factor for the H case which increases the probability that the majority of people will believe God exists above the probability for the -H case. The liklihood of H must be greater than the liklihood of -H. It follows from Bayes' Theorem that the posterior probability of H is greater than the prior probability of H and M confirms H. *The probability of the hypothesis of theism is greater if we know M to be true than if we just know all the other evidence.* It also follows that the posterior probability of -H is less than the prior probability of -H and M disconfirms -H lowering the probability of views which reject theism.

These results are independent of the *prior probabilities* of theism and the rejection of theism on the background evidence. It might be that the falsity of theism is more probable than its truth on available background evidence excluding M. Nevertheless, M will support theism and raise its probability, even though it may not raise the posterior probability of H above -H. On the other hand, if the prior probabilities of the two hypotheses on the background evidence happen to be equal or the theistic hypothesis has a greater prior probability, then the posterior probability of H is greater than the posterior probability of -H. In any case, whatever values we would assign the prior probabilities, M confirms H and disconfirms -H. M provides confirmation for theism no matter what the prior probabilities for the hypotheses are, because the *posterior probability* has shown an increase over the prior probability. Thus, we can conclude that the *consensus gentium* argument based on evidence that a majority of people believe in the existence of an all-powerful God is an inductively valid argument.

While the liklihood of H is greater than -H, the disparity in probability values may range from small to great depending on judgments made to evaluate the liklihoods. If one judges as unlikely that an all-powerful being would act in ways which would give people evidence that he exists, then the difference between the liklihoods will be quite small. If we judge these probabilities to have larger, and I think more reasonable values, a substantial difference in the values for the liklihoods of H and -H will occur. Nietzsche, for example, argued that God had a moral duty to provide abundant evidence.[11] If so, assigning .9 to the liklihood of H would seem reasonable. However, we cannot be so certain that the agenda and motives of a supreme being will make providing human beings with overwhelming evidence of his existence a top priority, especially since H

does not entail he is benevolent. A more pessimistic value of .3 for the liklihood of H seems reasonable. If an all-powerful being does not exist, the probability of a majority being theists should be quite low. It is quite unlikely that a majority would come to believe theism, because there would be very little legitimate evidence for theism. In the following section a number of arguments are offered to show that functionalist arguments do not give grounds for expecting widespread theistic belief if -H is true. Also, an analysis on the background evidence E alone, prior to knowing which hypothesis is true, with very limited information about people's religious beliefs, using a classification of religious beliefs with three or more categories, indicates there is a very high probability that none of the beliefs will be in a majority. It warrants assigning majority belief in theism a probability less than .01.[12] If we assign a more generous .1 to the liklihood of -H, the liklihood of H at .3 will exceed the liklihood of -H by 200%. If our background evidence does not give us reason to prefer either hypothesis, that is, the prior probabilities of H and -H are both .5, then a 200% larger value for the liklihood of H will yield a posterior probability for H of .75 and for -H of .25, a 50% increase and 50% decrease respectively.

The liklihood of H always exceeds the liklihood of -H, but there is considerable variability in the degree to which it does, depending upon the considerations taken into account to evaluate the liklihoods. It is important to keep in mind that we are not dealing with probabilities whose value we can specify exactly. There is an inherent unavoidable subjectivity in evaluating inductive argument. When we assign probabilities, we cannot generally assign a precise number, but we can, if we possess some relevant evidence, narrow it down to a range or make a judgment about which of two liklihoods should be greater. There will be some divergence between the values different persons assign to liklihoods on the same evidence. Nevertheless, after a discussion of various considerations which affect the probabilities, rational men and women should in most cases come to some rough agreement about the relative numerical values of two probabilities.

Evaluation of the Liklihood of H_a for the Four Hypothesis Case

Let us examine the liklihoods of H_a, H_p, H_{nt}, and H_{ct} for the four hypothesis case. The first liklihood we will consider is the liklihood of H_a—the liklihood that atheism or another religious view rejecting the existence of supernatural personal beings is true. We need to reach conclusions about the probability that M is true—that the majority of people adopt a theist position, if we do not know what people believe about God, but do happen to know that neither God nor any other supernatural personal beings exist. It is important to stress that to properly assign a value to the liklihood of H_a, we must place ourselves in the position of one who knows all that is currently known about human scientific accomplishments and the technical achievements of modern life, happens to have a way of definitively knowing that God does not exist, but *does not know enough about human religious beliefs to have any idea how wide-*

spread belief in an all-knowing and all-powerful deity happens to be.

For the liklihood of H_a as well as for the liklihoods of the other hypotheses, we must judge the probability that people's religious beliefs will either be true or be false beliefs. For many states of affairs it may be reasonable to assign a higher probability to a person having true rather than false beliefs about those states of affairs. If relevant evidence is available, we may have *prima facie* justification for thinking that from a set of alternative possible beliefs people are more likely to believe the one that is true than any one of the possible false alternatives. One might note that Freud believed that in the long run people would follow reason and experience and discard religion.[13] People are able to test beliefs and winnow out many false beliefs. Scientists follow a method of formulating hypotheses, developing their consequences and testing the predictions. If the predictions are successful, the hypothesis is held to be true. If not, the hypothesis is false and is rejected. Many false beliefs are winnowed out by a process of trial and error until a true belief is found. The winnowing process occurs over long periods of time, although with modern communications, discovery of truths can lead to adoption of the new discoveries by majorities in a very short period of time. One might also expect a process similar to natural selection in biology to operate for human beliefs. Natural selection causes retention of genetic changes and mutations resulting in changes in animal and human physical characteristics which are better adapted to the environment. One might expect that the most successful societies are more likely to have correct beliefs. An individual, group, or society may hit on a truth that allows manipulation of circumstances to yield practical results. As a result, that individual, group, or society may become more successful. Successful individuals now may be copied by other comparable individuals or groups leading to success for the latter if the ideas are true. Successful organizations or groups often will also propagate themselves. When the success includes political or economic success, the successful groups have an increased capacity to produce and care for more children who are taught the new correct ideas. Over many millenia they may multiply their contribution to the earth's population. In contrast we would expect organizations or groups that depend on false beliefs that can affect their capacity to survive to suffer more disasters and loss of life. The net result of all these factors will tend to raise the proportion of people who believe the truth and lower the proportion with false beliefs. Over a long period of time the changes can be quite dramatic. For example, at the beginning of the 19th century the primary economic theories were mercantilism, capitalism, and socialism. At that time only a small proportion of people would have accepted capitalism as the best economic system. However, within two centuries it has emerged victorious, being recognized by the great majority of people as the best means to organize economic affairs. Considerations such as these provide grounds for thinking that for many matters of belief, including perhaps the realm of belief about the existence of deities, the truth is likely to win out in the end.

Functional theories of religious belief offer a possible basis for object-

ing to the claim that when the existence of God is at issue and people have a choice between several beliefs, they are more likely to choose the one that is true. Many writers, whether believing God exists or not, have argued that religious belief serves a function which is very beneficial to society. It is argued that belief systems and myths held widely can provide a strong cohesiveness to societies. Religious teaching may encourage people to act more altruistically promoting the welfare of others in the society. Some theistic religions might promote the most cohesiveness and the most altruism and lead to the most successful societies. Freud argued that society required religious doctrines to tame the asocial instincts and to provide a sense of having a defense against the helplessness people feel when confronted by the activity of nature.[14] One may argue that because such belief systems are beneficial to society, we should expect them to occur even if they are false. It may seem as likely that people would believe what is false in matters of religion as that they would believe what is true. On the basis of the functional theories someone might claim that if H_a is true and no supernatural personal beings do exist, there is still a high probability that M will be true—-that the majority of people will believe that an all-powerful and all-knowing personal being exists.

There are a number of arguments available which suggest that the putative benefits of religion and the need for religion by functioning societies have been greatly overplayed. First, many species of animals form societies and co-operate to protect themselves and protect their young without religion. Surely human societies could likewise have formed, grown and multiplied merely as a result of the great benefits of co-operation without forming religions. Second, if theism and polytheism are not true, societies which relied on the aid of the supernatural beings ought to have been less successful than societies which did not. One would expect that over time the non-religious societies would be more successful and proliferate the most, with the result that belief in the supernatural would be small. Third, as Hume pointed out, virtually all early religion was polytheistic.[15] But polytheism is not a religion which tends to tame social instincts and promote altruism. The gods are poor examples. They do many unlawful things, which if copied by those who worship them, would result in severe punishment at the hands of the societies' government and legal system. In addition the service of the gods requires offerings, but does not require any moral action.[16] Moral behavior in such societies is enforced by the government and legal system. This observation often applies to theistic religion as well. Fourth, it may very well be that there is a strong probability that polytheism would develop, if not to provide cohesiveness and promote altruism then in order to understand the world and from a tendency to project human activity onto nature. But there does not seem to be any necessity that theism would develop out of polytheism.[17]

There are additional problems with appealing to the benefits of religion for evaluating the liklihoods. The main point which must be stressed concerning theories based on the societal benefits of religious belief is that the theories are problematic in this context because they

presuppose knowledge of people's religious beliefs—-the kind of knowledge reported by M. Functional theories are formulated to explain the widespread existence of religious beliefs. Those who formulate them do so from the standpoint of knowing what people's religious beliefs are, including knowing whether M is true or not. In this context this involves a kind of circular reasoning and is contrary to the ground rules for doing a Bayesian analysis of inductive inferences. The condition for evaluating the liklihoods for H_{ct} and H_a is that the background evidence E does not include M nor does any of the evidence in E entail M. We are interested in assessing the *liklihood* of hypotheses about God's existence and to do so we must exclude knowledge of people's beliefs about God and any evidence which would enable us to make inferences about those beliefs. We must assign the liklihood of H_a from a standpoint of knowing the truth of H_a but *not* knowing the truth of M or any evidence which entails it.[18]

This restriction clearly rules out use of function theories as a basis for arguing that theism should be successful in the long run. Attempts to argue that over time theism should be more successful because theistic religions promote more cohesiveness and more altruism require estimating the number of current adherents to classical theism and require reference to the religious beliefs of current advanced societies. Such references clearly violate the ground rules for evaluating the liklihoods. Moreover, it is not inherently obvious why those who believe in theism should be more successful than others, if theism is not true. The more successful advanced societies tend to be more tolerant. They tend to have more citizens with conflicting religious views which is a force that is often more divisive than cohesive.

Perhaps some evidence upon which function theories are based can be included in E, for example, evidence anthropologists and historians have regarding the beliefs of primitive and ancient peoples which are temporally separated from us by millenia. I would argue that even this type of evidence should not be admitted because it is evidence about human beliefs about deities and has some relevance for projecting contemporary beliefs. Nevertheless, suppose that we admit it and conclude that for evaluating liklihoods we should expect religious views to be widespread. It is not clear, however, that evidence of the religious belief systems of primitive and ancient peoples provides grounds for assigning more than a minimal probability to the liklihood of H_a, that is, to the probability that a majority of people adhere to theism when supernatural beings do not exist. Even if it were true that the values of cohesiveness and promotion of altruism may increase the probability that people in societies will adopt common religions, these values can be satisfied by non-theistic religions. A survey of religions of primitive peoples shows that most are polytheistic, the Israelites provide the only example of the adoption of a theistic religion. Cohesiveness results from adopting a set of common beliefs. It does not depend on claims about the power of the supernatural beings worshipped. Nor is it clear that teachings on how to treat others must be better intrinsically in theistic religions than in non-theistic religions.   These considerations and the evidence of the beliefs of primi-

tive and ancient peoples, if anything, tends to support increasing the probability that people would adopt polytheistic rather than theistic views and may render widespread atheistic disbelief in the existence of any supernatural beings less probable. It does not support assigning high probability to widespread belief in theism and M being true.

In order to estimate an appropriate probability to assign to the likli-hood of H_a one might adopt the following perspective. Before obtaining evidence about common consent, we may know only that beliefs must fall into one of several categories. People might be theists, polytheists, or those disbelieving in supernatural personal beings. With three or four categories and no information about actual belief or which hypoth-esis is true, we might expect on the order of 1/4 to 1/3 of mankind to reject belief in supernatural beings. The probability that any group would form a majority would be very small. If we now take into account that we know H_a is true and prayers are never answered we might think it reasonable to hold that it is quite probable that over the course of centuries at least 1/3 of those who believe in the existence of supernatural personal beings would be converted to rejecting the exis-tence of supernatural beings. This would raise the non-theist, non-poly-theist group from a minority of mankind to the majority belief. If it is true not only that the all-powerful God of theistic religions does not exist, but that no supernatural beings with the power to answer prayers exist either, then people would not have any prayers they uttered answered. They of course might imagine that they had had some prayers answered due to a happy congruence of random events. However, in the face of reality one would expect that over time, the lack of actual answers to prayer would tend to cause belief in deities to die out. People who believe and rely on what is false are likely to have lower chances of survival. Tribes believing in a supreme being might expect that being to aid them in a crisis and be wiped out when no aid is forthcoming. Their religious beliefs therefore probably would have a lower probability of being passed on. The aggressive, hard-nosed real-ists should inherit the earth. They should be more successful in provid-ing for their needs and passing on their beliefs, if anyone should, than the meek theists waiting for salvation from above. Theists would gradu-ally be weeded out losing their land and livelihood to hard working no-nonsense atheists. Thus if there are no supernatural personal beings, there is justification for raising the probability of the statement:

(N) A majority of people believe there are no personal supernatur-al beings.

There is no basis for raising the probability of M, however.[19] The proba-bility of M which is very low on evidence E alone, remains low if we know H_a is true. In summary, when we judge the liklihood of H_a (the probability of M given that H_a is true) *without knowledge of people's beliefs about God, but with knowledge that no supernatural beings exist, it seems rea-sonable to conclude that, the probability that a majority of people are adherents to a theist position should be quite low—less than .1.* After millions of years of

human existence, it seems quite unlikely that a majority of people would hold theistic beliefs or have tendencies to believe what is quite false.

Evaluation of the Liklihood of H_{ct}, H_{nt}, and H_p for the Four Hypothesis Case

When we consider the probability assignment for the liklihood of the classical theism hypothesis H_{ct} (the probability of M given H_{ct}) we can justifiably raise the probability that M is true significantly above the value we would assign if we did not know that H_{ct} is true. If we know H_{ct} to be true and if it is reasonable to believe that a benevolent being would disclose himself and answer prayers in sufficient quantity to affect human opinion or implant natural tendencies to believe the truth about supreme beings, then we might expect that it is probable that over time a considerable number of people would become convinced of the truth of theism.[20] Although a benevolent being might conceivably want to remain totally hidden and undetectable, such behavior should be attributed to an indifferent being. Benevolent beings wish the best for others including knowing the truth. One would expect that an all-powerful and all-know-ing being, if he is benevolent toward human beings, would want people to know the truth and create them with natural tendencies to believe what is true, including what is true about himself. A truly benevolent being who most likely was involved in their creation would want people to come to him for aid when in need. We would expect him frequently to answer prayer. If so, we might expect many people to believe that he had answered their prayers. Only about 1/4 of non-theists would need to be converted to theism over the course of centuries to raise theism from the mean of 1/3 of mankind to the majority belief. It does not seem unreasonable to think that this result is more probable than not, if theism is true. Thus there is a basis for increasing the probability of M from the value we would assign on the background evidence E alone, if we also know that H_{ct} is true. For the special case of theism, the all-powerful being has the power at creation or later to implant and reveal truth about his own existence to human beings in ways that they can grasp. An all-powerful being can communicate with human beings and respond to them. He can answer their prayers. If there is a non-zero probability that he will do these things for many individuals, many may come to believe in his existence until a majority so believe. Consequently the probability of M may be very low on background evidence E alone, but should be raised when we know H_{ct} to be true.

The consequence of raising the probability of M allows us to conclude that M becomes significantly more probable if H_{ct} is true than if H_a is true. Just as for the two hypothesis case, the existence of an all-powerful being with the capacity to influence human belief and to communicate with human beings and a non-zero probability that he would try to com-municate with human beings raises the probability that M will be true—that a majority of human beings will adopt a theist position. Because H_{ct} includes benevolence, it seems justifiable to assign a higher proba-bility for M than for H in the two hypothesis case. While it is possible a benevolent being might remain entirely aloof, it seems reasonable to

assign a relatively high non-zero probability to his acting to provide people with the capacity to know the truth. The liklihood might very well be quite high and it seems reasonable to think that M is more probable than not under these circumstances. Nevertheless, at minimum, we would expect the probability of M if H_{ct} is true to be greater than if H_a is true due to the additional causal factors present.

What can we now infer regarding the liklihood of H_p which presupposes that supernatural beings with but limited power exist? The probability that a majority would believe in an all-powerful and all-knowing deity should not be greater, if a deity with those attributes does not exist than if a deity with those attributes plus benevolence exists. We would expect less reinforcement of belief through answers to prayer when H_p is true than when H_{ct} is true, because there is some non-zero probability that a benevolent, all-powerful, and all-knowing deity would answer many prayers and requests requiring demonstration of more power than limited beings have. Supernatural beings of limited power might answer some or all prayers except those requiring power greater than the power they possess. They might be unable or simply unwilling to answer many prayers. They might not care about beings they did not have the power to create. They might torment people giving them what they do not want or even the opposite of what they asked for. Moreover, if deities have limited rather than unlimited power, it is less probable that people could or would be given special tendencies to believe that an all-powerful being exists. If H_p should be true, the actions of supernatural beings *could* lead to a majority believing an all-powerful being exists, but we would expect that over the course of many millenia of adapting to their environment, human beings would be more likely to align themselves with the truth than what is false. The outcome that a majority of people would come to believe in the existence of supernatural beings with limited power seems more likely than the outcome that they would come to believe in an all-powerful God.

The conclusion we reach is that we should expect that fewer people would exhibit belief in supernatural beings with unlimited power when H_{ct} is false than when it is true, because there is less capacity and motivation to communicate with, respond to, and influence human beings, than if an all-powerful and benevolent being exists. The various possibilities suggest a moderately lower to significantly lower probability that M will be true if H_p is true than if H_{ct} is true. On the other hand, the fact that there is some probability that some prayers would be answered which might cause some people to believe in all-powerful supernatural beings indicates assigning a higher probability to the liklihood of H_p than to the liklihood of H_a. Thus I conclude that it seems quite reasonable to hold that people would be more likely to reject theism than to accept it and the probability value for a majority of people believing in theism, if H_p is true, should be less than if H_{ct} is true, but greater than if H_a is true.

Analysis of the liklihoods is completed by considering the fourth liklihood, the liklihood of H_{nt}. If we consider the liklihood simply from the standpoint that we would expect human beings after many millenia of

learning to align themselves with the truth rather than with what is false, then because H_{nt} and H_{ct} each imply theism is true, we would expect the same support for the truth of M for the hypothesis H_{nt} as for H_{ct}. However, if an all-powerful being exists, the probability we should assign to a majority believing an all-powerful being exists depends also on our expectations about the probable interaction with human beings arising from the benevolence, indifference, or malevolence of the supernatural being. If anything, we would expect the probability of M if H_{nt} is true to be less than if H_{ct} is true, because we would expect non-benevolent beings on balance to be less motivated to communicate the truth to people or to provide them the capabilities to discern the truth. Of course, an all-powerful malevolent being might do more to convince people of his existence and power than a possibly benevolent but hidden all-powerful being. In general though we should expect the motives of a benevolent being to cause him to do more to cause people to know the truth than would malevolent or indifferent beings of comparable power. The reasons for thinking that people would come to believe that an all-powerful being exists are weaker, if an existing all-powerful being is not benevolent. There is a lower probability such a being would want people to know the truth and would try to communicate the truth about himself to people. There is also a lower probability that he would want to help people, to communicate with them, and to answer their prayers. A malevolent being might diabolically remain hidden as he torments people. An indifferent being would be less likely than a benevolent being to act in ways which would provide sufficient evidence for a majority of people to come to believe he exists. On the other hand, the fact that there is some non-zero probability that supernatural beings would communicate with human beings or respond to them in some fashion warrants assigning a higher probability to the liklihood of H_{nt} than to the liklihood of H_a. With respect to assigning a probability, about all we can say is that it should probably be a value less than the liklihood of H_{ct}, but greater than the liklihood of H_a.

The conclusion that we can draw is that the liklihood of H_{ct} has the highest probability, the liklihood of H_a has the lowest probability, and the liklihoods of H_p and H_{nt} are intermediate between them.[21] Thus the four hypothesis version of the *consensus gentium* argument is valid if we know that the value for the liklihood of H_{ct} is the greatest of the four liklihoods. At bottom the difference between a supreme personal being existing and not existing is that, if he exists, there are additional causal factors which may cause people to believe that he exists. The potential causes and effects which cannot be present if God does not exist, raise the liklihood of H_{ct} over the other liklihoods. *The existence of this inequality relation is all that really matters for the argument to work.*

There are some additional consequences relevant to the function theory evidence (if it is admitted). If we admit the function theory evidence of the beliefs of primitive and ancient peoples, the evidence may tend to support increasing the probability that people would adopt polytheistic rather than theistic views. Because this tends to decrease the probability of theistic belief, that is, of the probability of M relative to all four

hypotheses, *it decreases the liklihoods for all hypotheses uniformally rather than relative to one another*. So it seems any admissable evidence supporting function theories would justify assigning a high probability for the truth of a proposition other than M, for example, that a majority of people are polytheists, and a low probability for M. Moreover, *a uniform lowering of the probabilities of the four liklihoods has the effect of increasing confirmation for* H_{ct}.[22] In any case, appealing to the functional value of religious belief does not raise the probability of M on the various hypotheses under consideration, and, in particular, not the liklihood of H_a.

The Liklihoods when our Evidence is of the Type Expressed by M'

What can we say about the liklihoods of H and -H if our evidence is M' which includes evidence of a long-term trend of increasing belief in theism? It seems obvious that if we know that -H is true—that God does not exist, we should expect the long-term trend to be decreasing rather than increasing, or at least stable. With people becoming more educated world-wide and with advancements in knowledge in scientific and technical fields, it would be surprising that increasing numbers are adopting false theism rather than truly rejecting theism. We would expect M' to be even more improbable than M. The fact that majority belief in theism is increasing is more unlikely than evidence that a majority believe *per se*. Thus the liklihood of -H with the evidence of M is greater than the corresponding liklihood with the evidence M'. So we should assign a low probability to discovering M' to be true when we are given -H&E.

For the liklihood of H, an increasing percentage of theists is just what we might expect, if we know H to be true. We should expect increasing belief to be more probable than majority belief *per se*. Thus the liklihood of H with the evidence of M is less than the corresponding liklihood with the evidence M'. It follows that *because the disparity between the liklihoods of H and -H with M' as evidence is greater than for evidence M, possession of evidence for M' provides stronger confirmation than does M*. It is evident also that the inequality relations among the liklihoods which held for the four hypotheses case with M as evidence will hold also for M' as well. The disparity between the liklihoods for classical theism and atheism will also be greater for M' than for M by the same reasoning applicable to the two hypotheses case. [23]

As stated earlier, the statement of the common consent evidence could be much more complex. The evidence might be stated as a conjunction of statements reporting the numbers of people belonging to the different categories of belief. For statements indicating the existence of a greater number of theists than other categories of belief, the Bayesian analysis will show confirmation for theism.[24]

Some Examples

At this point I will illustrate some implications of the preceding analysis by offering several examples with probability assignments which make the liklihood of H_{ct} the greatest, and the liklihood of H_a the

least, for the four hypotheses case, and the liklihood of H greater than the liklihood of -H for the two hypotheses case.[25] *The assignments for the examples are intended to be illustrative only.* The examples make the implications of the application of Bayes' Theorem more concrete. They provide a sense of the strength of the support for each alternative hypothesis provided by the *consensus gentium* evidence. Since we are only interested here in the support provided by the common consent evidence, we will suppose that the prior probabilities on the background evidence E for the hypotheses are equal. For the four hypotheses version we assign .25 as a neutral value for the prior probabilities and for the two hypotheses version we assign .5.

For the first example we rely on the arguments above against functionalism and the analysis given in Endnote 12 for assigning a very low probability to widespread theistic belief if H_a is true. Let us assume also that after centuries of potential activity by a benevolent supreme being people would have considerable evidence for his existence and a value for the liklihood of H_{ct} of .5 or more seems reasonable. Although Nietzsche and other atheists would probably want a much higher value, a being that is so far above us in knowledge might have an agenda which does not give top priority to providing human beings with uncontestable evidence of his existence. We assign the values .5, .35, .14, and .01 to the liklihoods H_{ct}, H_{nt}, H_p, and H_a respectively. Then the resulting posterior probabilities for the corresponding hypotheses are .5, .35, .14, and .01. Classical theism represented by H_{ct} undergoes a 100 percent increase in probability, while the probability of H_a falls to 4% of its previous value.[26] With liklihood assignments such as these the *consensus gentium* argument has significant force, providing strong confirmation for classical theism and strong disconfirmation for the belief that there are no supernatural personal beings. Evidence that majorities of people believe classical theism should be taken seriously.

As a second example suppose that we, in response to the urging of Nietzsche and other atheists, assign a very high probability to the liklihood of H_{ct}, namely, .9 and a slightly higher probability of .1 to the liklihood of H_a and that the values .9, .5, .5, and .1 now represent the liklihoods H_{ct}, H_{nt}, H_p, and H_a. The posterior probabilities for H_{ct}, H_{nt}, H_p, and H_a now become: .45, .25, .25, and .05. The probability of theism equals .7 and the probability of -H is .3.[27] Classical theism represented by H_{ct} has undergone an 80 percent increase in probability, while the probability of H_a has sustained an 80% decrease in probability. The probability of theism is up 40 percent from its prior probability and the probability of -H is down 40 percent from its prior probability. This reflects the fact that the *consensus gentium* argument provides stronger confirmation for classical theism than for theism *per se* and greater disconfirmation for atheism and other views rejecting supernatural personal beings than the simple rejection of theism.

Suppose now that someone does not accept the arguments for a low liklihood for H_a. He or she believes that functionalist arguments warrant giving the liklihood of H_a a much higher value, say, .4. We now assign the liklihoods H_{ct}, H_{nt}, H_p, and H_a the values .9, .6, .5, and .4.

The posterior probabilities for H_{ct}, H_{nt}, H_p, and H_a now become: .38, .25, .21, and .17. Classical theism represented by H_{ct} has undergone a 50 percent increase in probability, while the probability of H_a has sustained a 33% decrease in probability. There is still confirmation for classical theism, but it is not as strong when the liklihood values have been unduly inflated in this way.[28]

Is the Valid Consensus Gentium Argument Also Sound?

If the *consensus gentium* argument is to have usefulness, it must not merely be valid, but also sound. It is sound only if we actually possess the evidence M or M'. The question which remains, then, is whether the evidence actually does show that M or M' are true. Because the evidence required to make a definitive judgment has not been collected in a scientific manner either in sufficient quantity or quality, I shall not attempt to make any definitive pronouncements. This must be reserved for some time in the future when much more comprehensive evidence has been collected. Nevertheless I do believe there is sufficient evidence to believe M and M' are true. In the future, if the long-term trends continue and more comprehensive and accurate public opinion and psychological data is available for the world population, it is likely that we will be in a position to make more definitive judgments about the soundness of the *consensus gentium* argument.

Let us consider the available statistics. The data which do exist seem to show that M is true. If we could use the U.S. opinion poll data as our basis, the answer would be a resounding "yes". For example, a Gallup Poll in 1971 indicated 98% of the people in the United States believed in God's existence.[29] More recent surveys show about 95% of the U.S. population believes God exists.[30] Most other countries in which scientific surveys were taken also have large majorities of theists.[31]

It is really the world population as a whole that is at issue, however. The best indication of belief in God for the world population is given by estimates of adherents to the various world religions. For the world as a whole, the 1997 *Encyclopedia Britannica* provides estimates of the number of adherents for the various world religions.[32] Out of a total world population of 5.80 billion, there are an estimated 3.10 billion adherents to the Christian, Muslim, and Jewish faiths which are clearly theistic. Thus at least 53 percent are estimated to be theists. The Sikhs and other people who are theists but are believed to be adherents of religions which are not really theistic may add a couple of percentage points. It is possible also that some people categorized as non-religious may believe theism is true. The non-theist group could comprise as much as about 47 percent of the world population.

We should be cautious with these numbers. The estimates are based on various assumptions. They are not based on survey data for many groups of people. Also, care is in order for the people classified as non-religious. It is difficult to assess how extensive this group is, for many of the people who apparently belong in the category of non-theists live or have lived until recently under totalitarian governments where there has been heavy

indoctrination in atheism and strong penalties for expressing belief in God. Now that the former Soviet Union provides freedom of religion, more of its citizens may be theists than is reflected in the numbers. China still has harsh penalties for adherents of Christianity. Membership in a church is dangerous. There may be more Chinese who do believe in God and would express this belief if they had greater freedom of expression, than are reflected in the numbers. We might consider excluding some people from our estimates because the information is somewhat unreliable or because their beliefs probably have been partially coerced and subject to indoctrination. The population of China is about 1.2 billion. Of this .84 billion were classified in the non-religious and atheist categories. If we excluded only the people in the People's Republic of China from the totals because the data are unreliable and probably skew the results, then of the remaining 4.6 billion people, 67 percent are classified as theists, 6 percent are atheists or non-religious, and the remaining 27 percent believe in supernatural beings, but are not theists.

It is interesting that there are actually relatively few outright atheists. They are estimated to total .22 billion or 3.8 percent of the world population. Moreover, nearly all reside in China or countries in the former Soviet Union where the populations have been subjected to heavy indoctrination. The atheists in other countries are less than 1 percent of world population. The estimated size of the group which would reject the existence of supernatural beings, if one includes atheists and the non-religious, is 1.11 billion or 19 percent. Adding some Buddhists will augment the total by one or two percentage points. The remaining non-theists are Hindus or adherents of a variety of other religions which are mostly polytheistic in nature.

Do we have evidence for M'—-that theistic belief has been increasing over time? It is quite clear that it has been. If we go back in time, the evidence on this point, which is sketchy even now, becomes of course far more sketchy. However, some rough estimates can be made. In the time of Christ, theistic belief was probably limited primarily to the Jews, who probably represented less than 4 percent of the estimated 300 million world population.[33] Even if we also allow for many Hindus and educated pagans effectively being theists, it is doubtful that theists could have accounted for more than 10 percent of the world population.

The year 1800 is a more recent year for which a very rough estimate can be made. Because the areas populated by European and Semitic peoples (plus an appropriate fraction of population in India-Pakistan, Indonesia, and Southeast Asia estimated to be Muslim) cannot have accounted for much more than 35 percent of world population, it is doubtful that theists could have comprised more than about 1/3 of world population in 1800. This is probably an upper bound. The true number could be below 30%. Since theists now apparently comprise a majority, the long-term trend has been increasing. M' therefore appears to be true also.

Conclusion

In conclusion, the *consensus gentium* argument in the form based on M and M' has proven inductively valid from the standpoint of a Bayesian

analysis of inductive reasoning.   Classical theism receives stronger support than a definition of theism which does not incorporate the attribute of benevolence.   Consequently, if there is adequate justification for believing either M or M' is true, there will be support for God's existence, and the argument will be sound. Since, to my knowledge, properly conducted studies of the evidence relevant to M and M' have not been undertaken for the world population as a whole, the best one can do is to make a subjective assessment on the evidence readily available. The evidence available does seem to show that M and M' are probably true. The available statistical data tend to show that the majority of people are classical theists or have a natural tendency to accept classical theism. Indeed, if the long-term trend of increasing theist belief continues and use of opinion polls spreads world-wide, it may not be too long before we will be in a position to pronounce unequivocally that the *consensus gentium* argument is sound. Hence it seems reasonable to think that the *consensus gentium* argument does provide support for God's existence. Yet whether or not M and M' are true and a version of the argument is sound, it is clear that the *consensus gentium* argument is not a fallacious inductive argument, but is inductively valid and as an argument has far greater merit than is usually supposed.

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NOTES

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   1.   Paul Edwards, "Common Consent Arguments for the Existence of God," *The Encyclopedia of Philosophy*, Vol. II, p. 147.
   2.   A thorough discussion and justification for holding that a Bayesian approach is needed to satisfactorily explicate scientific and inductive reasoning is to be found in *Scientific Reasoning: the Bayesian Approach* by Colin Howson and Peter Urbach, (LaSalle, Ill.:Open Court, 1993).
   3.   This approach to reasoning to God's existence is covered thoroughly in *The Existence of God* by Richard Swinburne (Oxford: Oxford University Press, 1991).
   4.   If $Pr(A)$ is the probability that a statement A is true, the conditional probability $Pr(A/B)$ is the probability that A is true when B is given or already known to be true. By definition $Pr(A/B) = Pr(A\&B) /Pr(B)$. If M is our inductive evidence and E is the background evidence, the prior probability of an hypothesis H_i then is $Pr(H_i/E)$. The liklihood is $Pr(M/H_i\&E)$ and the posterior probability is $Pr(H_i/M\&E)$.
   5.   Bayes' Theorem is simply a consequence of the definition of conditional probability. To apply Bayes' theorem, the set of hypotheses H_i (i=1, 2 .. n) relative to which we are examining evidence must form a mutually exclusive and exhaustive set. Let S equal the sum of the products of the liklihood and prior probability, that is, the sum of the n $Pr(M/H_i\&E)Pr(H_i/E)$

terms for the n hypotheses H_i. For a set of two mutually exclusive and exhaustive hypotheses, $H = H_1$ and $-H = H_2$, S becomes:

$S = \Pr(M/H_1 \& E)\Pr(H_1/E) + \Pr(M/H_2 \& E)\Pr(H_2/E)$.

1/S is the constant factor. For a four hypothesis case, S will have four terms. By assumption we know the background evidence to be true. $\Pr(E)$ therefore has a probability of 1 which entails by the definition of conditional probability that the probabilities $\Pr(H_i \& E)$ and $\Pr(H_i/E)$ are equal and can be interchanged in the formulas. Bayes' Theorem for H_i which is derived from the definition of conditional probability is

$\Pr(H_i/M \& E) = \Pr(M/H_i \& E)\Pr(H_i/E)(1/S)$

where S as given above is the sum of the products of the liklihood and prior probability for all the hypotheses H_i.

6.   "Confirmation" here does not imply that the support is adequate to justify holding an hypothesis. It may be adequate. But the term only implies that it provides support by increasing the probability of the hypothesis. Similarly "disconfirmation" here does not imply that the evidence is adequate to justify rejecting an hypothesis. It may be sufficient. Use of the term just means that it decreases the probability of the hypothesis.

7.   This is demonstrated as follows. The prior probabilities in the terms of S must sum to 1 because the probabilities of the hypotheses H_i must sum to 1 (the H_i are mutually exclusive and exhaustive). The prior probabilities therefore act as weights. It is evident that the greatest value S can attain occurs if a prior probability equals 1 and the liklihood for that hypothesis is the liklihood with the greatest probability. S would then equal that liklihood since all other terms are zero. However, the prior probabilities cannot equal one since contrary to assumption the hypothesis would be entailed by the evidence. Thus $S < \Pr(M/H_i \& E)$ where $\Pr(M/H_i \& E)$ is the liklihood with the highest probability. A similar argument shows $S > \Pr(M/H_i \& E)$ where $\Pr(M/H_i \& E)$ is the liklihood with the lowest probability. This has a very straightforward consequence for a two hypothesis case. If we can show or have good grounds to think that one of the two liklihoods is greater than the other, say the liklihood of H is greater than -H, then $\Pr(M/-H \& E) < S < \Pr(M/H \& E)$. Consequently $\Pr(M/H \& E)/S > 1 > \Pr(M/-H \& E)/S$ and from Bayes' Theorem it follows that $\Pr(H/M \& E) > \Pr(H/E)$, or M confirms H. Thus for a two hypothesis case all that is necessary is to determine which liklihood is greater and we can determine immediately from Bayes' theorem that its hypothesis is supported by the evidence M. It also follows that the evidence disconfirms the other hypothesis. If there are more than two hypotheses, matters are a little more complicated, but it still must be the case that of the liklihoods for the the hypotheses, the one with the highest probability must be greater than S and the liklihood with the lowest probability must be less than S. Hence the $\Pr(M/H_i \& E)/S$ factor with the liklihood with the highest probability must exceed 1 and Bayes' Theorem shows that the evidence M provides confirming evidence for that hypothesis H_i Similarly the $\Pr(M/H_i \& E)/S$ factor for the liklihood with the lowest probability must be less than 1 and the evidence M provides disconfirming evidence for that hypothesis H_i. Thus for a four hypothesis case, if we can determine which liklihood is greatest, we can determine from Bayes' theorem that its hypothesis is supported by the evidence M. If we know that a liklihood is greater than the reciprocal of the constant factor then it will provide confirmation. If it is less it will disconfirm it.

8.   The actual evidence will be a statistical estimate based on statistical samples of human opinion polls. Estimates are subject to error. If very thorough polls with representative samples are taken, sampling errors will be

small. Thus we might find, for example that after thorough polling of humankind that 55% are theists and that we have 99% confidence that the correct value exceeds 50%, that is, that M is true. We could devise a more specific statement of M giving estimated values and statistical confidence levels. To do so would introduce an unnecessary amount of complexity. M as stated is sufficient to bring out the essential features of the argument.

9. Some might desire the people polled be limited to those who are educated or to those who specialize in the philosophy of religion. For some subject matters, e.g. theories of quantum mechanics the views of non-specialists are clearly irrelevant. However, it is not evident that for questions related to the existence of an all-powerful God, the views of average people can be judged irrelevant. God might conceivably give them evidence of his existence. Can one be sure he will provide evidence only to the learned? Besides who should determine the criteria for selecting the population whose views are to be sampled? The results might tend to be biased from the method used to select the population.

10. As stated M does not specify the exact level of belief. M may be stated more exactly as, say: 53% of the world population are theists. It is also possible to include the level of disbelief. For example, the evidence M could be: 53% of the world population are theists and 47% do not believe theism is true(to simplify we ignore the undecideds). Or, a more exact statement yet would be:

(M*) Of the world population, 53 percent are classical theists(believe H_{ct}), 28 percent believe H_p, 4 percent are atheists(believe H_a), 0 percent are non-classical theists(believe H_{nt}), and 15 percent are agnostic or non-religious.

The difficulty raised is that we now have to evaluate liklihoods which are very specific values, for example, that on hypothesis H_a there will be exactly 53% theists and 47% non-theists. There is enough subjectivity involved that we are not in a position to assign probabilities to the liklihoods for such specific statements of the evidence very well. One might also differentiate with ranges. For example, consider the statement M**:

(M**) Of the world population, between 50 and 60 percent are classical theists(believe H_{ct}), between 20 and 30 percent believe H_p, less than 10 percent are atheists(believe H_a), 0 percent are non-classical theists(believe H_{nt}), and between 10 and 20 percent are agnostic or non-religious.

Notes 24 and 28 show that evidence statements of this form will also provide confirmation for classical theism.

11. Friedrich Nietzsche, *Daybreak*, trans. R.J. Hollingdale (Cambridge: Cambridge University Press, 1982), p. 53.

12. There are various methods we could use to estimate the probability that M is true if we have very limited information to go on—little more than the fact that beliefs are highly dependent on the beliefs of the community in which one grows up. If we begin with the question of the probability of M versus the probability that the majority of people are not theists, then we might assign a 50% probability to each. However, it does not seem natural to lump polytheists and atheists in the same category. We should use at least 3 categories of belief. This results in much lower probabilities for majority belief. We might take account of the fact that the 75 most populous countries comprise about 94% of mankind and the 75 major linguistic groups about 87%. (Based on the World Data section of the *Encyclopedia Britannica*, 1997 Yearbook, pp. 762-767, 776-780.) This suggests that we can distinguish about 75 to 90 major ethnic groups that comprise over 90% of mankind. Although the groups vary in population size, we might make a simple model based on

75 major ethnic groups and assume them to be equal and their beliefs about ultimate things to be homogeneous. If we consider at least three categories of religious belief: theism, polytheism, and denial of supernatural personal beings, and assign all individuals in each of the 75 groups distinguished by the model to one of the three categories, randomly, with a 1/3 probability for each, the mean for each should be (25 groups) or 1/3 of mankind. The probability that a majority (38 groups) holds any one of the three options would have to be at least 3 standard deviations above the mean. For each category, the probability is consequently less than 1 percent that the adherents form a majority of world population. Hence, the probability that none of the three views are held by a majority should be greater than 97%. Thus on the background evidence E alone, prior to knowing which hypothesis is true, we would expect to assign a very low probability to M being true. If we then add H_a, H_p, H_{nt}, or H_{ct} to E and estimate from the standpoint of knowing which of the hypotheses H_a, H_p, H_{nt}, or H_{ct} is true, the probability of M can be raised from .01 and assigned a higher value if the hypothesis gives us reason to think that more evidence should be available to enable people to come to a knowledge of the truth.

13. Sigmund Freud, *The Future of an Illusion*, trans. James Strachey (New York: W.W. Norton, 1961), p. 69.

14. Sigmund Freud, *The Future of an Illusion*, trans. James Strachey (New York: W.W. Norton, 1961), especially pp. 7-10, 20-24, 29, 30, 47.

15. David Hume, *The Natural History of Religion* in *Dialogues and The Natural History of Religion*, (Oxford: Oxford University Press, 1993), p. 135.

16. Ibid., pp. 177-83.

17. Ibid. Hume presents his theory about the origin of polytheism pp. 138-41 and his theory of how theism originated from polytheism pp. 154-55. Although the theory has some plausibility and is a possible explanation of the origin of theism, the transition from polytheism to theism does not appear to be necessary or perhaps even likely.

18. Appealing to functionalist theories to estimate the liklihood is tantamount to determining the probability to assign to $Pr(M/M\&H_a\&E)$ which equals 1 rather than to estimating $Pr(M/H_a\&E)$.

19. The analysis in Note 12 indicates a probability of .01 for the liklihood of H_a to be warranted.

20. If H_a happens to be true—that supernatural personal beings do not exist, we can assign the probability c to the majority of people believing theism even though it is false. The probability value assigned to c depends on the various causal factors that may come into play that we think would affect people's beliefs about God *when we do not know what people's beliefs about God happen to be.* If c is the probability value for the liklihood of H_a, what probability should then be assigned to the liklihood of H_{ct}? If H_{ct} is true, there are two cases: a) an all-powerful benevolent being exists and does not act in ways which human beings are capable of detecting, and b) an all-powerful benevolent being exists and does act in ways which human beings are capable of detecting. For the first case God does not act in ways which change the human epistemic situation from the H_a case. It is not obvious that any of the factors which tend to cause people to become theists and make c a good assignment if God did not exist, would cease to be present if God existed. The probability should be the same as for the H_a case, namely c. If the second case holds and God does act in ways which provide evidence for his existence which would not be present if he did not exist, then we should assign a probability value b to the majority of people being theists where b > c. There is an additional factor present in the H_{ct} case which increases the

probability that the majority of people will believe God exists above the probability for the H_a case. We can combine the two cases to estimate the liklihood of H_{ct} if we consider that there is a non-zero probability that an all-powerful benevolent being, if he existed, would provide people with sufficient evidence to attain true beliefs about his existence. If this probability is d, then an appropriate estimate of the liklihood of H_{ct} might be found by the sum of the probabilities for the two cases weighted by the probability that it occurs: $Pr(M/H_{ct}\&E) = db + (1-d)c$. If d is not equal to 0 and $b > c$, multiplying both sides of $b > c$ by d and adding $(1-d)c$ to both sides yields $db + (1-d)c > c$. But this is just $Pr(M/H_{ct}\&E) > Pr(M/H_a \&E)$. The liklihood of H_{ct} is greater than the liklihood of H_a.

21. Symbolically $Pr(M/H_{ct}\&E) > Pr(M/H_p\&E) > Pr(M/H_a\&E)$ and $Pr(M/H_{ct}\&E) > Pr(M/H_{nt}\&E) > Pr(M/H_a\&E)$.

22. To see this assign .25 to the four priors and $Pr(M/H_{ct}\& E) = .5$, $Pr(M/H_{nt}\& E) = .3$, $Pr(M/H_p \& E) = .3$, and $Pr(M/H_a \& E) = .1$. Then $Pr(H_{ct}/M\&E) = .42$ and is a 67% increase over the prior and $Pr(H_a/M\&E) = .08$ and is a 67% decrease from the prior. Subtract .05 from the liklihoods. Then $Pr(H_{ct}/M\&E) = .45$ and represents an 80% increase over the prior and $Pr(H_a/M\&E) = .05$ and is an 80% decrease from the prior showing greater confirmation and disconfirmation respectively for H_{ct} and H_a. Raising all four liklihoods an equal amount, for example by .1, can reduce the strength of support for theism, for example, using .6, .4, .4, and .2 for the four liklihoods yields $Pr(H_{ct}/M\&E) = .375$ and $Pr(H_a/M\&E) = .125$ which represent merely a 50% increase and decrease for H_{ct} and H_a respectively. Then even if we did allow the admissable evidence for functionalism to be used to *increase* rather than *decrease* the four liklihoods, we would not alter the fundamental relationship between liklihoods that makes the *consensus gentium* argument a valid argument. Whatever the value of the liklihood of H_a, the liklihood of H_{ct} must be higher yet, and in fact the highest of the four liklihoods. Whether or not an all-powerful, all-knowing, and benevolent personal being exists, if we accept any evidence of the functional benefits of religious belief as part of the background evidence, then the probability of the liklihood for H_{ct} is no lower than for H_a since the same causal forces such as societal cohesiveness and promotion of altruism would be operative in either case. But in addition, the existence of an all-powerful, all-knowing, and benevolent personal being increases the probability that people will believe that he exists, because his existence taken together with a non-zero probability that he would make an effort to communicate the truth about himself to people raises the the probability for the liklihood of H_{ct} over the probability for the liklihood of H_a. The argument still works, although a uniform rise in liklihood probabilities may weaken the force of the evidential support.

23. This means that the liklihood values satisfy the following relation: $Pr(M'/H\&E) > Pr(M/H\&E) > Pr(M/-H\&E) > Pr(M'/-H\&E)$.

24. If the evidence is stated so that the number of persons belonging to each category of belief are distinguished (as in M** of Note 10), then arguments similar to those given in the text will show confirmation for theism. If H_a were true, we would expect that after millions of years of the struggle for survival, the vast majority of surviving persons would either be atheists or non-religious since realists would be more likely to survive than those who put their trust in the aid of supernatural beings. One should expect the percentages of people who believe H_{ct}, H_{nt}, or H_p to be low and the atheists and agnostics to be high. By analysis corresponding to that presented in the text, the difference between the observed percentages and the expected percentages will cause the posterior probability of H_a to come out less than its prior probability.

In the case of H_{ct}(or H), the likelihood of M** on H_{ct}(or H) and E will be higher than its likelihood on H_a and E or on H_p and E, because M** reports that there are twice as many people who believe H_{ct}(or H) than believe either H_p or H_a. This conforms much more closely with what we would expect if H_{ct}^p(or H) were true. This fact will cause the posterior probability of H_{ct}(or H) after learning of M** to be greater than its prior probability. Of course, the degree of support would be yet greater if 90 percent of the world population were classical theist. Nevertheless, M** provides support for H_{ct} and H and makes the *consensus gentium* argument valid.

25. That is, $Pr(M/H_{ct}\&E) > Pr(M/H_p\&E) > Pr(M/H_a\&E)$ and $Pr(M/H_{ct}\&E) > Pr(M/H_{nt}\&E) > Pr(M/H_a\&E)$ for the four hypotheses case and $Pr(M/H\&E) > Pr(M/-H\&E)$ for the two hypotheses case.

26. If we assign a significantly lower probability to the likelihood of H_{ct}, the degree of confirmation can still be quite strong. For example, let us assign the values .1, .06, .03, and .01 to the likelihoods H_{ct}, H_{nt}, H_p, and H_a respectively. Then the resulting posterior probabilities for the corresponding hypotheses are .5, .3, .15, and .05. Classical theism represented by H_{ct} undergoes a 100 percent increase in probability, while the probability of H_a falls to 20% of its previous value.

27. To provide additional insight into the relation between the two hypotheses version and the four hypotheses versions we use probability assignments for the two hypotheses case which agree with the assignments offered for the four hypotheses case. $Pr(H/E) = Pr(H_{ct}/E) + Pr(H_{nt}/E) = .5$ and $Pr(-H/E) = Pr(H_a/E) + Pr(H_p/E) = .5$. If $Pr(M/H_{ct}\&E) = .9$, $Pr(M/H_{nt}\&E) = .5$, $Pr(M/H_p\&E) = .5$, and $Pr(M/H_a\&E) = .1$ and we average $Pr(M/H_{ct}\&E)$ and $Pr(M/H_{nt}\&E)$ to estimate $Pr(M/H\&E)$ and average $Pr(M/H_p\&E)$ and $Pr(M/H_a\&E)$ to estimate $Pr(M/-H\&E)$, we obtain $Pr(M/H\&E) = .7$, and $Pr(M/-H\&E) = .3$. The resulting posterior probabilities for H and -H are .7 and .3.

28. More complex representations of the *consensus gentium* evidence will also show support for classical theism even if there is also substantial disbelief in theism. For example, Nietzsche and other atheists who believe that God has a moral duty to present overwhelming evidence might claim that if God exists he should provide plenty of evidence so that we should expect 90+% to be theists and less than 10% to be non-theists. It might then seem to them that if we obtain evidence that theists are in the 50-60% range and non-theists in the 40-50% range, then the evidence ought not to confirm theism. However, evidence of 50-60% theists would still provide evidence confirming theism. To be sure, if we should assign a higher likelihood to 90+% theists than 50-60% theists, finding evidence that more than 90% are theists would then provide stronger confirmation than evidence of 50-60% theists. To see more clearly how this works, let us define M0 as: 0-10% of the world population are theists and 90-100% are non-theists. We then define M1: 10-20% of the world population are theists and 80-90% are non-theists, and define M2 as: 20-30% of the world population are theists and 70-80% are non-theists, and so on for M3 through M9. Thus M5 would be: 50-60% of the world population are theists and 40-50% are non-theists, and M9: 90-100% of the world population are theists and 0-10% are non-theists. To keep things reasonably simple we ignore agnostics and undecideds. For each of the ten statements of the evidence M0 through M9 there are four likelihoods we can evaluate. For M5 we must evaluate $Pr(M5/H_{ct}\&E)$, $Pr(M5/H_{nt}\&E)$, $Pr(M5/H_p\&E)$, and $Pr(M5/H_a\&E)$. The analysis of the feasible likelihood assignments for the evidence M has shown that $Pr(M/H_{ct}\&E)$ must have the highest probability value and $Pr(M/H_a\&E)$ must have the lowest value. This relation must hold also for the evidence

statements M0 through M9. Thus for n = 0, 1, 2, ... , 9, $Pr(Mn/H_{ct}\&E)$ is greater than $Pr(Mn/H_{nt}\&E)$, $Pr(Mn/H_p\&E)$, and $Pr(Mn/H_a\&E)$. Also, $Pr(Mn/H_a\&E)$ is less than $Pr(Mn/H_{ct}\&E)$, $Pr(Mn/H_{nt}\&E)$, and $Pr(Mn/H_p\&E)$. It is also clear that the M0 to M9 options are mutually exclusive and exhaustive so that the liklihoods relative to each hypothesis should sum to 1. Thus $Pr(M0/H_{ct}\&E)$ + $Pr(M1/H_{ct}\&E)$ + ... + $Pr(M9/H_{ct}\&E)$ = 1 and $Pr(M0/H_{nt}\&E)$ + $Pr(M1/H_{nt}\&E)$ + ... + $Pr(M9/H_{nt}\&E)$ = 1, etc. Let us assign values to some of the liklihoods in a manner which heavily weights the 90+% range giving a higher probability to $Pr(M9/H_{ct}\&E)$ than to $Pr(M5/H_{ct}\&E)$. For example, let $Pr(M5/H_{ct}\&E)$ = .04, $Pr(M6/H_{ct}\&E)$ = .06, $Pr(M7/H_{ct}\&E)$ = .10, $Pr(M8/H_{ct}\&E)$ = .15, and $Pr(M9/H_{ct}\&E)$ = .25. Let also $Pr(M5/H_a\&E)$ = .02, $Pr(M6/H_a\&E)$ = .015, $Pr(M7/H_a\&E)$ = .012, $Pr(M8/H_a\&E)$ = .008, and $Pr(M9/H_a\&E)$ = .005. Several additional probabilities must be assigned in order to calculate posterior probabilities for M5 and M9. Let $Pr(M5/H_{nt}\&E)$ and $Pr(M5/H_p\&E)$ = .03 and let $Pr(M9/H_{nt}\&E)$ = .025 and $Pr(M9/H_p\&E)$ = .02. Using prior probabilities of .25 for the four hypotheses, we can now compute posterior probabilities for M5 and M9. The posterior probabilities for M5 are: $Pr(H_{ct}/M5\&E)$ = .33, $Pr(H_{nt}/M5\&E)$ = .25, $Pr(H_p/M\&E)$ = .25, and $Pr(H_a/M\&E)$ = .17. The posterior probabilities for M9 are: $Pr(H_{ct}/M9\&E)$ = .833, $Pr(H_{nt}/M9\&E)$ = .083, $Pr(H_p/M9\&E)$ = .067, and $Pr(H_a/M9\&E)$ = .017. This shows M5 does provide support for H_{ct}. The posterior probability shows a 33% increase from the prior probability. Of course, M9 does, as would be expected, provide stronger confirmation for H_{ct} than does M5. Although many non-theists like Nietzsche might believe that God has a duty to provide them with all the evidence that they want, it is possible that a being vastly superior to us, while having a moral duty to provide substantial evidence, might have an agenda and motivations which do not give providing human beings with uncontestable evidence of his existence, the priority we might hope or expect. Because we cannot definitively predict the behavior of a supreme being who is far above us in knowledge, we should not overweight the probabilities for the 90+% range. If we assign .5 to the liklihood $Pr(M/H_{ct}\&E)$, then a more balanced and equal allocation of this probability to the liklihoods $Pr(M5/H_{ct}\&E)$ through $Pr(M9/H_{ct}\&E)$ would seem more reasonable.

    29. *Gallup Opinion Index*, April 1971, Report No. 70. 99% of those lacking a college education believed in "a God."

    30. Niemi, Richard, John Mueller, and Tom W. Smith, *Trends in Public Opinion: A Compendium of Survey Data*, (Greenwood Press: Westport, Conn., 1989), p. 253.

    31. *Gallup Opinion Index*, April 1971, Report No. 70. The percentages for European countries are lower than for the U.S., but still a majority believe in "a God," for example, West Germany—81%(9% undecided) and Great Britain—77%(13% undecided). Sweden had significantly fewer theists than other countries—60%(14% undecided).

    32. *Encyclopedia Britannica*, 1997 Yearbook, p.311.

    33. The population figures for the first century and 1800 are based on estimates by John Durand in "The Modern Expansion of World Population", *Proceedings of the American Philosophical Society*, Vol. III, No. 3, June, 1967, pp. 136-159. The author used the Durand estimates for different geographical regions and assumed the Moslem proportion of the population in the countries of Southeast Asia has remained fairly static since 1800. The estimate of the Jewish population at the beginning of the Common Era was based on figures cited in *Encyclopedia Judaica*, (1971), s.v. "Population."