The Logical Problems That Prevented David Hume from Refuting the Argument from Design

Jeffery L. Grove
Loyola University Chicago

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The Logical Problems that Prevented David Hume from Refuting the Argument from Design

by

Jeffery L. Grove

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"A purpose, an intention, or design strikes everywhere the most careless, the most stupid thinker; and no man can be so hardened in absurd systems, as at all times to reject it."

Philo, *Dialogues*
The purpose of this thesis is to explain how David Hume failed to establish in Part II of the Dialogues Concerning Natural Religion that the design argument, as presented by Cleanthes, is not a sound analogical argument. The scope of this thesis does not embrace a validation of the design argument. What we are concerned with is whether Hume is able to invalidate the argument in Part II of the Dialogues via its analogical form.

It is Hume's contention, expressed in Part II of the Dialogues, that the design argument, as presented by one of the leading characters, Cleanthes, is not a sound analogical argument. Hume uses Cleanthes to state and defend the design argument while he employs Philo to express his own philosophical views. Cleanthes' defense of the argument from design is based on the logical mode of analogical reasoning. Philo thinks that he can refute the design argument as advocated by Cleanthes, and he attempts to do just that by attacking the analogical form of the argument.

In Chapter II we will examine the argument from design, as presented in Part II of the Dialogues by Cleanthes, in light of analogical reasoning. This will enable us to determine what the analogical form of the design argument is, and the logical criteria that could be employed for evaluating the argument. In Chapter III we will present Hume's refutation of the design
argument which is based on the contention that the logic of analogy employed in the design argument is faulty. Chapter IV will comprise a critical analysis of Hume's attempt at refuting the design argument as presented by Cleanthes, in light of the criteria presented in Chapter II for evaluating analogical arguments. Our analysis will reveal that Hume's objections to the analogical mode of argumentation in the design argument are not sufficient to support his evaluation of the argument from design as not being a sound analogical argument.

To my knowledge, after a thorough investigation of the subject comprising this thesis, I have only found one philosophical source that resembles this thesis. Alvin Plantinga, in the chapter entitled "The Teleological Argument," from his book *God and Other Minds*, maintains that Hume's philosophical criticisms of the formal logical structure of the design argument are not conclusive enough to dismiss it as having no "logical force."

This thesis can be shown to have both similarities and differences to A. Plantinga's. The similarities consist of refuting Hume's conclusion from his critique of the design argument in Part II of the Dialogues, and employing the technique of logical analysis in our refutation. The dissimilarities are manifested in the nature of our refutation. Unlike Plantinga who attempts to establish that the inference from the design argument, as presented by Cleanthes in Part II of the Dialogues has some "logical force," I am not interested in validating the degree of probability for the inference. The other dissimilarity
is a matter of a formal logical analysis of the analogical mode of the design argument as presented and criticized by David Hume.

At this time I would like to thank my advisory committee, Professor Edward Maziarz and Dr. James Godar, for the unselfish use of their time and knowledge. Also, my wife, Sandy, for her continuously increasing encouragement and good humor in typing and proofreading this manuscript.
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CHAPTER I

BRIEF HISTORY OF THE DESIGN ARGUMENT

The design argument has always been the most popular of theistic arguments, tending to evoke spontaneous assent in simple and sophisticated alike. Man perceives the universe as an orderly system. Events have been recurring in regular sequences. The observation of an orderly pattern in one region of existence is found to be nicely adjusted to that of another, and both to conform to an over-all design. An annihilation of this order would make scientific knowledge impossible and human life even more precarious than it is. In familiar objects near at hand, particles of matter too small to be seen are said to be moving in orbits similar to those traced out by remote planets. It is said that if even one particle of matter were destroyed, the entire universe would be annihilated, so delicate are the adjustments of this infinitely complex universe.

Such considerations have lead naturally to the idea of a designer who must be credited with having planned the cosmos. As early as the fifth century B.C., Anaxagoras attributed the working of the universe to a Mind or Intelligence.¹ In the fourth century B.C. Plato also sought to show that the order and

harmony exhibited in the world sprang from the action of mind. His argument entails the notion that all the activity and change in the world originated from a supreme mind which moves itself and creates subordinate souls or gods, the heavenly bodies. The outermost sphere of the universe is set in motion by the direct action of the changeless, transcendent God.²

Aristotle, in the same era, propounded a more emphatic teleological or purposive view of nature in which the members of the hierarchy of natural classes in the universe seek to realize their perfections according to their stations. Aristotle's views presuppose a rational design, a universal aspiration to fulfillment, and in one passage he describes God as the perfect being whom all things desire.³

The theological perspectives of Greek views of nature passed into the later view of medieval science and were readily translated into Christian thought.⁴ St. Thomas Aquinas, during the thirteenth century, offered a typical statement of what came to be called the argument from design. The central thrust of St. Thomas' argument is that things in nature regularly act in certain ways in order to accomplish some useful purpose: they act for the best, both with respect to their own welfare and to that of other beings who depend upon them. But in most instances, the thing concerned is obviously not aware of the

²Ibid., pp. 234-49. ³David Ross, Aristotle, pp. 179-86.
purpose for which it acts: it is not acting intentionally or intelligently at all. "Therefore some intelligent being exists by whom all natural things are directed to their end; and this being we call God."\(^5\)

Like St. Thomas' other "proofs" of God's existence, the argument from design reappeared in new versions in the writings of the early modern philosophers. A classic statement of the modern argument from design is to be found in Part II of David Hume's *Dialogues Concerning Natural Religion*. The form of the argument from design, as presented in the Dialogues persisted into the nineteenth century in the writings of Paley and so many others, and survives in popular and semi-popular forms to the present day.\(^6\)

The philosophical perspective of nature adopted after the rise of science in the seventeenth century, was reflected in the logic of the modern design argument. The new philosophy of nature abandoned belief in the intrinsic teleology of physical objects.

Thus the modern argument from design is not a teleological argument of the Aristotelian type. That is, it does not consist in the thesis that the natural order, with which man is integrally bound up, fulfills an end of absolute and intrinsic worth.\(^7\)


\(^7\)David Hume, *Dialogues Concerning Natural Religion*, ed., with an introduction, by Norman Kemp Smith, p. 28.
"It is an essentially anthropomorphic type of argument," Norman Kemp Smith asserts, "resting upon an alleged analogy between natural existences and the artificial products of human contrivance."\(^8\) It was maintained by the users of this argument that we could gain a sufficient basis for the existence and conception of God as an ordering intelligence in our knowledge of the self and of its relation to the products which it consciously designs.\(^9\)

David Hume's treatment of the design argument in the *Dialogues Concerning Natural Religion* is widely hailed as a masterpiece of philosophical criticism. "Hume's destructive criticism of the argument," says Norman Kemp Smith, in his introduction to Hume's *Dialogues*, "was final and complete."\(^10\)

"And there is much to be said for the estimate," Alvin Plantinga states in his book, *God and Other Minds*, for "Hume's discussion is matchless for clarity, imagination, and grace."\(^11\)

\(^8\)Ibid.  \(^9\)Ibid.  \(^10\)Ibid., p. 30.  
CHAPTER II
CLEANTHES' ARGUMENT
The Logic of the Design Argument

Certain important questions are raised by David Hume at the very beginning of his examination of natural theology in the Dialogues.\(^1\) What can be demonstrable by reason in matters of theology? Are the methods of reasoning in theology different from those of common life and of science? Is there a possibility of utilizing scientific knowledge about nature, and the methods of observation, as basis for inferring the existence and attributes of God? Cleanthes, in direct response argues that theological reasoning does not differ in method and assurance from scientific and practical reasoning; and in support of these contentions, he presents the following argument in Part II of the Dialogues:

Look round the world: Contemplate the whole and every part of it: You will find it to be nothing but one great machine, subdivided into an infinite number of lesser machines, which again admit of subdivisions, to a degree beyond what human senses and faculties can trace and explain. All these various machines, and even their most minute parts, are adjusted to each other with an accuracy, which ravishes into admiration all men, who have ever contemplated them. The curious adapting of means to ends, throughout all nature, resembles exactly, though it much exceeds, the productions of human contrivance; of human design, thought, wisdom, and intelligence: Since therefore the effects resemble each other, we are led to infer, by all the rules of analogy, that the causes also resemble; and that the Author of nature is somewhat similar to the mind of man; though possessed of much larger faculties, proportioned to the grandeur of the work, which he has executed. By

\(^1\)Hume, Dialogues Concerning Natural Religion, pp. 137-38.
this argument a posteriori, and by this argument alone, do we prove at once the existence of a Diety, and his similarity to human mind and intelligence.

The quintessence of the stated argument from design is the contention that design or an adaption of means to end can be explained only in terms of an intelligent being or designer. In order for something to be a machine or manufactured item, so the argument reads, it must have a composition of parts, each performing a special function which contributes to the over-all purpose (telos) of the thing in question. There is another characteristic mentioned above which is equally necessary if a thing is to be called a machine: the means-end relationship (or teleological order) typifies a product of design, thought, wisdom, and intelligence. Since both human artifacts and the universe are characterized by this property their causes must be intelligent as well.

The design argument as stated may be put schematically as follows:

1. The productions of human contrivance are the products of intelligent design.
2. The universe resembles the productions of human contrivance.
3. Therefore probably the universe is a product of intelligent design.
4. Therefore probably the author of the universe is an intelligent being.

\(^2\text{Ibid.}, \ p. \ 143.\)
Analogical Reasoning

In examining the above argument from design it is evident that the key factor in the argument is its form—the analogical form that it employs. Analogical arguments are a species of an inductive argument which involve inferences to unobservable portions of the past or present or to the future based on past experience of similar events. Arguments from analogy have the following general form:

1. Analogue A tested or observed for properties b, c, and d have these properties.
2. Analogue A₁ is similar to Analogue A in having properties b and c.
3. Therefore probably Analogue A₁ as yet untested or observed for property d has this property.

Analogical reasoning is employed in most of our everyday inferences and is also widely used in scientific inferences. Thus we infer that the next course we take from a particular instructor will be interesting from the fact that both of two courses taken from the instructor were interesting. Based on the evidence that we got good wear from shoes previously purchased from a particular store we infer that the next pair of shoes we purchase from the same store will wear well.

Professor Swinburne describes the logical form common in scientific inferences, which essentially entails an analogical structure.

A's are caused by B's. A*s are similar to As. Therefore—given that there is no more satisfactory explanation of the existence of A*s—they are produced by B*s similar to Bs. B*'s are postulated to be similar in all respects to
B's except insofar as shown otherwise, viz. except insofar as the dissimilarities between A's and A*'s force us to postulate a difference....

He furnishes the following scientific example to illustrate the above.

Certain pressures (A's) on the walls of containers are produced by billiard balls (B's) with certain motions. Similar pressures (A*'s) are produced on the walls of containers which contain not billiard balls but gases. Therefore, since we have no better explanation of the existence of the pressures, gases consist of particles (B*'s) similar to billiard balls except in certain respects—e.g. size.

Swinburne is aware that similar arguments used by scientists that have argued for the existence of many unobservables become weaker "...insofar as the properties which we are forced to attribute to the B*'s because of the differences between the A's and the A*'s become different from those of the B's." An example of this type is the nineteenth century physicists postulating the existence of an elastic solid, aether, to account for the propagation of light. The outcome was that the light being propagated resulted in such differences that the physicists had to affirm that if there was an aether it possessed many peculiar properties not possessed by normal liquids or solids. Hence their conclusion was that the probability of the inferred existence of aether was very weak.

All of the evidence compiled in support of analogical inferences cannot guarantee that the arguments are certain, or

3Swinburne, "The Argument from Design," 205. 4Ibid. 5Ibid.
demonstrably valid. None of their conclusions follow with "logical necessity" from their premises. It is even logically possible that one fire may burn but not another. At the same time it must be remembered that no argument by analogy is intended to be mathematically certain. Analogical arguments are not to be classified as either "valid" or "invalid."

Probability is all that is claimed for them.

Cleanthes' Argument Viewed in Light of Analogical Reasoning

Although no argument by analogy is ever "valid," in the sense of having its conclusion follow from its premises with logical necessity, some are more cogent than others. Analogical arguments may be appraised as establishing their conclusions as more or less probable. At this time we shall outline the criteria which are applied to arguments of this type. We will then discuss the criteria in light of the analogical reasoning in the stated argument from design, in order to determine what logical criteria might be used for evaluating the probability of the argument. (This will help us, as we shall see in Chapter IV, to evaluate Hume's objections to the analogical form of the design argument as stated by Cleanthes.)

The criteria for evaluating analogical arguments consist essentially of three elements: (1) the number of similar properties that have been observed between objects or analogues, (2) the number of similar instances in which the properties of analogues have been observed, and (3) the relevant ways in which the properties of analogues are said to support the conclusion of analogical arguments.
The analogues of "sheets" and "towels" are employed below to illustrate how the probability of analogical inferences can be affected by the number of similarities that the properties of analogues have in common.

The fact that sheets and towels are alike in being cotton, white, and flat provides a good basis for arguing that they will be alike in further characteristics of being well-laundered. If we could add more characteristics that we know they have in common such as size and weight of material, this would add to the worth of the argument.

If you discover a sufficient degree of differences between the properties of "well-laundered" items the probability of the argument would decrease.

If the towels have fancy lacework and the sheets do not, or if the sheets were silk and the towels cotton, then the probability of the argument would decrease.6

Another example employing the analogues of "shoes" illustrates the importance of determining the strength of analogical arguments by sufficient number of similar characteristics that the properties of the analogues have in common,

That a new pair of shoes was purchased at the same store as an old pair that gave good wear is certainly a premise from which it follows that the new shoes will probably give good wear also. But the same conclusion follows with greater probability if the premises assert not only that the shoes were purchased from the same store, but they were manufactured by the same company, that they sold for the same price, that they are the same style, and that I plan to wear them in the same circumstances and activities.7

The following is an illustration that depicts two instances of analogical inferences admitting of different degrees of

6 Robert Shamy, Logic an Outline, p. 110.
7 Irving M. Copi, Introduction to Logic, p. 344.
probability based on the number of observable instances in which the properties of analogues or events have been said to be observed.

If I advise you not to send your shirts to such and such a laundry because I sent one there once and it came back ruined, you might caution me against "jumping to conclusions," and urge that they ought to perhaps be given another chance. On the other hand, if I give you the same advice and justify it by recounting four different occasions on which unsatisfactory work was done by them on my clothing and report further that our mutual friends Jones and Smith have also patronized them repeatedly with unhappy results, these premises serve to establish the conclusion with a great deal higher probability than did the first argument which cited only a single instance.⁸

It should be noted that the differences between the degrees of certitude is not a simple numerical ratio between the number of instances and the probability of the conclusion. Numerical ratios are employed in the frequency theory of probability and the calculation of probabilities but not with the probability associated with analogical arguments.

An examination of the above analogical arguments reveals that the number of differences or similarities between the properties of the analogues together with the number of instances in which these properties had been observed had a bearing on the probability of the analogical inferences. The examples presented thus far have all been fairly good examples, because the analogies have all been relevant. But it is commonly agreed on that it is difficult to know in general, or even in some particular cases, exactly which things are relevant and which are not.

As Kahane states, "Even the room in which a course is to be

⁸Ibid., pp. 343-44.
taught may be relevant to how interesting it will be. (For example, it would be relevant if the teacher in question disliked large, poorly lit rooms, and the next course he teaches happens to be in such a room.)

Professor Alvin Plantinga, in agreement, asserts that:

For naturally enough the members of any class resemble each other in some respect; the problem is to specify how much and in what respect the members of the sample class must resemble those of the reference class, minus the sample class.

The following illustration depicts how an analogical inference supported on a single relevant analogy connected with a single instance will be more cogent than one which depicts a dozen irrelevant points of resemblance between its conclusion's instance and over a number of instances enumerated in its premises:

Thus a doctor's inference is sound when he reasons that Mr. Black will be helped by a specific drug on the grounds that Mr. White was helped by it when a blood test showed exactly the same type of germs in his system that are now in Mr. Black's. But it would be fantastic for him to draw the same conclusion from premises that assert that Smith, Jones and Robinson were all helped by it, and that they and Black all patronize the same tailor, drive the same make and model car, have the same number of children, had similar educations, and were all born under the same sign of the zodiac.

Although the difficulty is present it is still maintained that in practice we employ the criterion of relevancy in either evaluating or formulating analogical arguments. As Plantinga states:

9Howard Kahane, Logic and Philosophy, pp. 269-70.
10Plantinga, God and Other Minds, p. 105.
11Copi, Introduction to Logic, p. 347.
Still, even if we cannot give the rules for detecting relevant differences or for determining appropriate degrees of similarities we are able to do this in practice; the fact is that we often recognize, as in the case of some of the arguments mentioned, that the sample class does not resemble the reference class minus the sample class in the relevant respects.\(^{12}\)

How could we evaluate Cleanthes' argument from design, which is an analogical argument? We could begin by maintaining as Cleanthes does that the universe is similar to human contrivances in that both exhibit a "curious adapting of means to ends," and that there is a considerable number of instances of design observed in the world to support the probability of an intelligent designer of the universe. For example, Arthur I. Brown, a contemporary writer, refers to the ozone in the atmosphere which filters out enough of the burning ultra-violet rays of the sun to make life as we know it possible on the earth's surface. He states:

The Ozone gas layer is a mighty proof of the Creator's forethought. Could anyone possibly, attribute the device to a chance evolutionary process? A wall which prevents death to every living thing, just the right thickness, and exactly the correct defense, gives every evidence of plan.\(^{13}\)

Another contemporary writer, Richard Taylor, refers to the homeostasis or self-regulation of our bodies, which serves as a safeguard for maintaining the proper balance between internal and external forces acting upon it, as an instance of design.

The homeostasis or self-regulation of our own bodies, for instance, whereby the body manages to maintain the

\(^{12}\) Plantinga, God and Other Minds, p. 105.

most unbelievable internal harmony and to adapt itself to the most diverse and subtle forces acting upon it, represents a wonder which human art cannot really duplicate and our science only dimly comprehends.

Taylor also suggests the same type of teleological order in the embryological development of living things. "The same type of order and seemingly goal-directed change is apparent in the embryological development of living things."\(^{15}\)

Again Albert Einstein refers to ". . . the sublimity and marvelous order which reveals themselves both in nature and in the world of thought."\(^{16}\) Even Philo, later in the Dialogues, concedes that the universe certainly seems initially to resemble things we know to be designed; the impression that the universe has been designed is hard to avoid: "A purpose, an intention, or design strikes everywhere the most careless, the most stupid thinker; and no man can be so hardened in absurd systems, as at all times to reject it."\(^{17}\) Kant thinks the analogy of the known parts of the universe to the products of design is sufficient to support such argument and moreover better than any thing else at hand. "But at any rate we must admit that, if we are to specify a cause at all, we cannot here proceed more securely than by analogy with those purposive productions of which alone the cause and mode of action are fully known to us."\(^{18}\)

\(^{14}\)Richard Taylor, Metaphysics, p. 95.

\(^{15}\)Ibid.

\(^{16}\)Albert Einstein, "A Scientist's Cosmology," in Philosophy in the Age of Crisis, ed. by Eleanor Kuykendall, p. 436.

\(^{17}\)Hume, Dialogues Concerning Natural Religion, p. 214.

\(^{18}\)Immanuel Kant, Critique of Pure Reason, cited by Plantinga, God and Other Minds, p. 106.
Mill thinks that the adaptations of means to ends in nature afford a high degree of probability in favor of an intelligent cause or designer for the orderful universe. As he states:

Leaving this remarkable speculation to whatever fate the progress of discovery may have in store for it, I think it must be allowed that, in the present state of our knowledge, the adaptations in Nature afford a large balance of probability in favor of creation by intelligence.19

The difficult problem that we would have in evaluating the argument from design would be to determine whether the property of design was a relevant characteristic or property to support the inference in the argument with any degree of probability at all. In order to assess this problem we might begin by recalling the purpose of the argument from design. The telos of the design or teleological argument is to establish the synergistic relation between design and designer (teleos and techne) in both human contrivances and the universe. As W. P. Alston rightly points out: "This is the heart of the teleological argument--the claim that adaptation can be explained only in terms of a designer."20

In conjunction with the above, John Stuart Mill maintained the design or purpose in the universe was a relevant characteristic in the design argument because there is some connection through causation between design in nature and its causal origin.

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As he states, "...the argument is greatly strengthened by the properly inductive considerations which established that there is some connection through causation between the origin of the arrangements of nature and the ends they fulfill." 21

Of course, it might be argued that the universe does not resemble some man made products. "True enough, the universe does not greatly resemble a spring loom or a golf club." 22 It may even be that the universe resembles an animal or a plant in some respects more than the products of human contrivance, as Hume suggests in his second half of the critique of the design argument. This, however, is not enough to disqualify the design argument, since plants and animals themselves, as well as some of their parts, exhibit the property of design: the curious adaptation of means to ends. As Plantinga states:

This, however, is not to the point, since plants and animals themselves (as well as some of their parts) have the reference property: they too, exhibit the curious adaptation of means to ends. Eyes for example, are often cited as having this property. 23

What has to be kept in mind at this point, as R. G. Swinburne observes is that "All analogies break down somewhere, otherwise they would not be analogies." 24 In saying that the relation of analogue $A$ to property $B$ is analogous to a relation of analogue $A_1$ to a postulated characteristic $B_1$, we do not

22 Plantinga, God and Other Minds, p. 106.
23 Ibid.
claim that \( A_1 \) is in all respects like \( A \), and \( B_1 \) is in all respects like \( B \). The degree of similarities or differences between \( A \) and \( A_1 \), and \( B \) and \( B_1 \) is built into analogical arguments. For the degree of support for analogical arguments, as was pointed out above, is directly related to the similarities or differences between the types of evidence available.

The final outcome of this objection concerning the relevancy of design as being a sufficient characteristic or property to support the probability of the conclusion in the argument from design can be construed as Plantinga suggests as a query: are the admitted differences between the universe and things we know to be designed minus the similarity between the analogues, (which is established on the basis of the "curious adapting of means to ends" exhibited in both cases) sufficient to support the inference in the argument with any strength at all? 25

Since the object of this work precludes the validating of the argument from design, we have only to inquire whether Hume has furnished the necessary answer to this question.

Since it is Hume's evaluation of the design argument that is under consideration we would do well to consider exactly what Hume's job entailed!

To begin with, Cleanthes postulated the similarity between the universe and things we know to be designed on the basis of the "curious adapting of means to ends" exhibited in both analogues. What Hume could have done, since he challenged the

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25 Plantinga, God and Other Minds, p. 206.
validity of Cleanthes's argument, was to account for the differences between the two analogues.

Next he might have observed the actual instances of design said to be exhibited in the world as well as in artificial products of contrivance. If he was able to point out only a limited number of instances of design in the world he would have had substantial support for his conclusion that the argument from design is not a sound analogical argument. This is evident because the degree of support for analogical arguments is proportional to the number of similar instances said to have been observed between the properties of analogues.

Although Hume might have pointed out the differences between the universe and things we know to be designed, this by itself would not have supported his evaluation. He would still have had to consider the characteristic which they have in common, i.e., the "curious adapting of means to ends." If he did consider this similarity he might have explained how the property of design was not a relevant characteristic to support the conclusion in the design argument. In order to accomplish this he would have had to explain how the differences between the universe and things we know to be designed override the force of the similarity between the analogues, via design, to vitiate the argument.
CHAPTER III

HUME'S ATTEMPT AT REFUTATION

The design argument, "...as honest and straightforward as a Norman Rockwell painting,"¹ as Plantinga describes it, was placed precariously on Hume's drawing board for evaluation. The problem that challenged Hume with the design argument, Norman Kemp Smith asserts, is "...the question whether the argument from design, as an argument from analogy, can allow of being formulated in a tenable manner. ..." "This indeed," Mr. Smith continues, "is the thesis with which the Dialogues are primarily concerned, and to which they give what amounts to a definitely negative answer."²

Hume sketched his critique of the design argument in two discernible parts. In the first part of his critique, which appears in Part II of the Dialogues, Hume does not explicitly address himself to the theistic nature of the intelligent designer of the universe. The design argument as stated by Cleanthes in Part II of the Dialogues and rebuked by Philo describes the cause of the teleological order or adaptation of means to ends in the universe as only a very intelligent being or designer. This is because the analogy in the argument is not intended to support additional inferences. As Mr. Smith states

¹ Alvin Plantinga, God and Other Minds, p. 95.
² David Hume, Dialogues Concerning Natural Religion, p. 56.
in his introduction to the Dialogues: "Before this argument could be taken as establishing the existence of the God of religion, it had of course to be supplemented by other types of argument. These, however, are supplementary to the argument from design."\(^3\)

It is only in the second half of his critique of the argument from design, which occupies the latter part of the Dialogues, that Hume addresses himself to the additional inferences to the theistic nature of the intelligent cause of the universe. In so doing he employs his *reductio ad absurdum* arguments in order to explain the following. Even if we grant that the analogy employed in the design argument as stated by Cleanthes is sound, and that is *a posteriori*, one can, by precisely the same methods of analogy and from the same kind of evidence, deduce a number of conclusions about the proposed cause of the world that are remarkably obnoxious to those who accept traditional religious doctrines. The world is disorderly as well as orderly, hence implies a disorderly cause; the world is full of evil as well as beneficent purposive-relationships, and hence implies an evil cause; machines and houses are often made by many artisans, hence the world has multiple causes—many gods. In other words, in the *absurdum* arguments Hume shows that analogical arguments of precisely the same form and of equal validity demonstrate conclusions radically at variance with those accepted by the users of the design argument who want to argue the following:

\(^3\) Ibid., p. 29.
(1) the designer or creator of the universe is omniscient, omnipotent, and perfectly good; and (2) the creator of the universe is an eternal spirit, without body, and in no way dependent upon physical objects.

As I have mentioned earlier the scope of this work embraces only the first part of Hume's critique of the design argument. With this in mind we shall proceed to examine Hume's critique of the argument from design in Part II of the Dialogues.

Before beginning his evaluation of Cleanthes's argument, Philo, Hume's mouthpiece, informs Cleanthes of his understanding of Cleanthes' argument.

By experience we find (according to Cleanthes) that... If we throw several pieces of steel together, without shape or form, they will never arrange themselves so as to compose a watch. Stone and mortar, and wood, without an architect, never erect a house. But the ideas in a human mind, we see, by an unknown, inexplicable economy, arrange themselves so as to form the plan of a watch or house. ... Experience, therefore, proves, that there is an original principle of order in mind, not in matter. From similar effects we infer similar causes. The adjustment of means to end is alike in the universe, as in a machine of human contrivance. The causes, therefore, must be resembling.  

Philo's critique of the design argument begins immediately afterwards. "Now it is clear," Robert Hurlbut correctly points out, "that the key factor in the design argument is its form—the analogical form of inference that it employs—and therefore it is natural that it is the main part of Hume's attack."  

Philo contends that the design argument is not a sound

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4 Ibid., p. 146.

analogical argument. "The dissimilitude," Philo states, between the design argument and a sound analogical argument, "is so striking, that the utmost you can here pretend to is a guess, a conjecture, a presumption concerning a similar cause; and how that pretension [the inference drawn in the design argument to an intelligent designer for the universe] will be received in the world, I leave you to consider." 6

There are three central objections, which will be developed in order, that Philo levels against the design argument in Part II of the Dialogues in support of his evaluation of Cleanthes' argument.

(1) The design attributed to the world as a whole cannot be inferred from particular cases of design found in the world, hence it cannot be employed as an instance to establish the similarity between the universe and things we know to be designed.

(2) Since the world is one particular, not a member of a species a great number of whose members have been observed, it cannot be employed as an analogue or subject in the analogical argument from design. The world being a particular, is unique; it is on the surface not a member of the class of machines.

(3) Since no one has seen the origin of one world, let alone "worlds" we do not have the requisite instances of similarity to support the conclusion to an intelligent being or

6Hume, Dialogues Concerning Natural Religion, p. 144.
designer of the universe.

The first objection that Philo levels against the design argument is based on his contention that no whole can resemble its parts or some set of its parts sufficiently to support an analogical argument. As he states:

But can a conclusion, with any property, be transferred from parts to whole? Does not the great disproportion bar all comparison and inference? From observing the growth of an hair, can we learn anything concerning the generation of a man? Would the manner of a leaf's blowing, even though perfectly known, afford us any instruction concerning the vegetation of a tree?

The above passage viewed in light of Philo's direct criticism of the design argument, can be understood as follows. Philo wants to argue that since the operation or adaptation of means to end in the universe is represented as the design or teleological order of the universe as a whole it cannot be logically employed as an instance to establish the similarity between the universe and things we know to be designed. This is evident, Philo insists, because we would be inferring the design or purpose of the universe as a whole from particular cases of design found in nature, and we cannot do this: "... the operation of one part of nature upon another for the foundation of our judgement concerning the origin of the whole (... can never be admitted)...

Philo follows this objection with one that does take into consideration the nature of the relevant whole.

When two species of objects have always been observed to be conjoined together, I can infer, by custom, the existence of one wherever I see the existence of the

7 Ibid., p. 147. 8 Ibid., p. 148.
other: And this I call an argument from experience. But how this argument can have place, where the objects, as in the present case, are single, individual, without parallel or specific resemblance, may be difficult to explain. And will any man tell me with a serious countenance, that an orderly universe must arise from some thought and art, like the human; because we have experience of it? To ascertain this reasoning, it were requisite, that we had experience of the origin of worlds; and it is not sufficient, surely, that we have seen ships and cities arise from human art and contrivance.9

All cases, Philo is arguing in the above passage, in which we analogically argue from effects to causes must refer to (a) effects of exactly a similar nature, effects which can be shown to belong to members of the same species; and (b) the causes as well as the effects of the analogues must be experienced.

That a stone will fall, that fire will burn, that the earth has solidity, we have observed a thousand and a thousand times; and when any new instance of this nature is presented, we draw without hesitation the accustomed inference.10

But, in the design argument of Cleanthes, which says that the world is a machine, we do not have the requisite experience of similarity. The world is a particular; it does not belong to a species; it is unique; it is on the surface not a member of the class of machines. Further, in machines, houses, etc., the cause is observed, time after time, to be responsible for the effect. But in the design argument this condition does not hold. Since we have no such experience of the origin of worlds, "... will any man tell me with a serious countenance, that an orderly universe must arise from some thought and art, like the human; because we have experience of it?"11

9Ibid., pp. 149-50. 10Ibid., p. 144. 11Ibid., pp. 149-50.
Cleanthes, in the midst of the argument just referred to, insists that if Philo's strictures are accepted, then Galileo's argument concerning the earth's motion is invalid. "...a caviller might raise all the same objections to the Copernican system, which you have urged against my reasonings. Have you other earths, might he say, which you have seen to move? Have..."¹² Philo's response is quick:

Yes! ... Is not the moon another earth, which we see to turn round its centre? Is not Venus another earth, where we observe the same phenomenon? Are not the revolutions of the sun also a confirmation, from analogy, of the same theory? All the planets, are they not earths, which revolve about the sun? Are not the satellites moons, which move around Jupiter and Saturn, and along with these primary planets, round the sun? These analogies and resemblances, with others which I have not mentioned, are the sole proofs of the Copernican system: And to you it belongs to consider, whether you have any analogies of the same kind to support your theory.¹³

Note that according to Philo's point on observing causes and effects, Galileo's argument would offer a hypothesis, rather than a proof—it is the "sole" proof, according to Philo. But the similarities observed between the earth and the moon, etc., are full and complete. Both are members of the species of planets, and there is evidence enough to justify a high degree of probability in the hypothesis that the earth moves. Cleanthes, Philo observes, does not have such evidence at his disposal. The world is not experienced to be the effect of either a machine or a work of art. Both sorts of inference involve an argument to a first cause, and therefore both are subject to Philo's criticism that neither involves the observation of causes.

¹²Ibid., p. 150. ¹³Ibid.
Nobody has seen the origin of worlds.

Can you pretend to show any such similarity between the fabric of a house and the generation of a universe? Have you ever seen nature in any such situation as resembles the first arrangement of the elements? Have worlds ever been formed under your eye? And have you had leisure to observe the whole progress of the phenomenon, from the first appearance of order to its final consummation? If you have, then cite your experience, and deliver your theory.14

Now Philo, in the quotations above, clearly proposed one sort of test for analogical arguments—the standard of observation with respect to the relationship of causes and effects. The hypothesis that the world is the product of intelligent design, is caused by a designer-mechanic-purposer is verified by observing that worlds are created by designers. But, we find, no worlds-in-creation have been observed. Since this key aspect of analogical (scientific) reasoning is missing—the experience necessary to correct analogical inferences from effects to causes—we can only proceed a priori; and "For ought we can know a priori, matter may contain the source of spring of order, originally, within itself. . . ."15 "This eventuality," R. H. Hurlbutt observes, "came to pass, almost on the heels of Hume's suggestion, in Darwin's theory of evolution."16

In conclusion, Philo's critique of Cleanthes's argument from design can be viewed in terms of the following three rejections. He begins by (1) rejecting the design or the adaptation of means to ends, which is attributed to the universe as a whole,

14 Ibid., p. 151.  
15 Ibid., p. 146.  
being an instance that can be employed to establish the similarity between the universe and things we know to be design. Next he rejects (2) the use of the universe being used as an analogue or subject in a sound analogical argument. Finally he rejects (3) the inference to the universe being a product of intelligent design because of the lack of instances in which there has been an observation of worlds being created.

Philo's reasons for the above three contentions rest on the following arguments. In regards to (1) Philo argues that no whole can resemble its parts or some set of its parts sufficiently to support an analogical argument. Since the design which is attributed to the world is designated in the design argument as the design of the universe as a whole, it cannot be used to establish the similarity between the universe and things we know to be designed; this is evident because the inference is based on particular cases of design found in nature and this would involve an argument from parts to whole. Philo's reason for (2) is based on his assumption that all cases in which there is an analogical inference from effects to causes they must refer to effects which can be shown to be of exactly a similar nature; this can only be established by showing how the effects belong to members of the identical species. Philo's contention in (3) rests on his contention that in order to draw an analogical inference of a cause for any effect it is necessary to have experienced the cause and effect in conjunction. Since no one has seen the intelligent designer responsible for the design of the universe in the process of designing or creating, Cleanthes cannot draw his inference to
an intelligent designer who would be responsible for the design of the universe. Since the world is unique the user of the design argument cannot maintain that the world is similar to or belongs to the species of machines of human contrivances, thus it cannot be employed as an analogue in the design argument.

In the next and final chapter we will learn that Hume's (Philo's) critique of Cleanthes' argument was not adequate to support his thesis. This will be established by explaining how Hume's three basic assumptions and arguments in support of the same are neither conclusive nor accurate enough to evaluate the argument from design as stated by Cleanthes, as not being a sound analogical argument.
CHAPTER IV

HUME'S FAILURE AT REFUTATION

David Hume sat in the open-air theatre, disguised as a critic by the name of Philo, listening to a monologue by a character named Cleanthes. The content of the speech was similar to what he had heard several times before. It concerned the nature or character of the world and its parts pointing most clearly to the existence of some very intelligent being or "guiding hand," that is, to some purposeful being responsible for the orderful universe. A universe, according to W. B. Yeats, in which man is not afraid that anarchy will be loosed upon it.

They say the same thing, Hume whispered to himself, What we find is not a mere grain of sand, nor a conglomeration of these or similar things nor a chaos. We find an order and harmony to say nothing of the mystery and complexity of things that our profoundest science and learning seem only barely to penetrate. After the monologue was completed Hume went home to write his critique. This chapter will critically analyze that critique, and attempt to prove that it does not establish what it purports.

In order to facilitate this critical analysis of Hume's critique there will be a review of each specific criterion that Hume might have employed in order to support his evaluation of Cleanthes' argument from design in Part II of the Dialogues in conjunction with his objections to the stated argument. This in turn
will be followed by a critical analysis to determine whether or not Hume's objections are (1) conclusive enough to encompass sufficient answers to the key questions for evaluating the design argument, or (2) accurate enough by themselves to invalidate the argument.

The first criterion that Hume might have employed in his critique of Cleanthes' argument was to determine what the dissimilarities were between the universe and human contrivances. Out of the three central objections to the logic of the design argument Hume's second objection seems to be related to the above problem, if only in an indirect way.

He argues that the universe or world cannot be employed as an analogue in the argument from design because there is no way to establish the similarities, nor for the fact, the differences between the properties of the world and human contrivances. Hume's reference to this point was made in conjunction with Philo's comparison of the analogical argument in support of the Copernican system with that of the design argument.

As Philo stated: "Is not the moon another earth, which we see to turn around its center? . . . Are not the revolutions of the sun also a confirmation, from analogy, of the same theory?"¹ The reference to Galileo was specific: "But Galileo, beginning with the moon, proved its similarity in every particular to the earth; its convex figure, its natural darkness when not illuminated, its density, its distinction into solid and liquid, the

¹David Hume, Dialogues Concerning Natural Religion, p. 150.
variation of its phases. . . ."² What are the analogues that we can compare with the universe Philo asked Cleanthes. Without giving Cleanthes time to answer Philo answered his own question—there aren't any! The world is a particular, not a member of a species a great number of whose members have been observed. Therefore, Philo inferred that the world cannot be employed as a subject in the design argument, because there aren't any points of comparison that could be made between the world and human contrivances (or anything else, presumably); the world is unique; it is on the surface not a member of the class of artificial contrivances.

As we can see Hume did not elaborate on the differences between the world and human artifacts. Instead, he maintained the impossibility of the task. The universe being unique, Hume implies, negates the possibility of it being compared with anything else.

Although Hume does not answer the first critical question necessary to support his evaluation of the design argument, does the fact that the universe or world is unique or single affect the argument? The design argument would seem to be affected by the world being unique only if there was no reference class or property to which both the universe and other things could refer to. As Alvin Plantinga states the problem:

How does the fact that the universe is single affect the argument? It would seem to be relevant only if it implies that there are no classes of which the universe is a

²Ibid., p. 151.
member (or perhaps no classes which contain it and other things), and hence no reference class for the argument... There are reference classes or properties to which the universe and other things can refer to, Plantinga continues, and rightly concludes on this basis, that Hume's objection to the uniqueness of the universe does not invalidate the argument:

But, of course, there are any number of classes to which both the universe and many other things belong: the class of very large things, for example, or things more than fifty years old. The mere fact that a thing is unique does not of course entail that it has no property in common with anything else.

The fact that the universe is single or unique, therefore, does not invalidate the argument.4

Hence Hume's contention that anything unique precludes the possibility of it being compared with anything else is categorically wrong. As R. G. Swinburne states: "Nothing describable is unique under all descriptions (the universe is, but the solar system, a number of material bodies distributed in empty space) and everything describable is unique under some description."5

After all Cleanthes has established the similarity between the universe and things we know to be designed on the basis of an adaptation of means to ends.

Furthermore it might also be noted that Hume's second objection suggests that we are not allowed to draw conclusions about objects which are the only one of its kind. If this is the case, R. G. Swinburne maintains, 'we would have to discredit the results of cosmologists who are reaching scientific conclusions about the

3Alvin Plantinga, God and Other Minds, p. 101.
4Ibid.
universe as a whole, because it is the only one of its kind. We would also have to discredit the arguments by physical anthropologists about the origin of our human race, because there is not supposedly other human races at this time to make comparisons with. As he states the objection:

The other objection which seems to be invalid in the above passage is that we cannot reach conclusions about an object which is the only one of its kind, and, as the Universe is such an object, we cannot reach conclusions about the regularities characteristic of it as a whole. But, cosmologists are reaching very-well tested scientific conclusions about the Universe as a whole, as are physical anthropologists about the origins of our human race, even though it is the only human race of which we have knowledge and perhaps the only human race there is.6

Since Hume was not able to support his evaluation of the design argument by either employing the first criterion for evaluating analogical arguments or by establishing that the universe could not be used as a subject for a sound analogical argument, let us see if he employed the second criterion for evaluating analogical arguments. The second criterion that Hume could have employed to support his evaluation of the design argument was to determine that the number of observable instances established between the property of design in productions of human contrivances and the universe were not sufficient to support the inference stated in the argument.

Hume took a "crack" at this problem with his first objections, while he circumnavigated the problem in his second objection. Philo had argued in his first objection to the design

6Ibid.
argument that the design attributed to the world as a whole cannot be used as an instance by Cleanthes to establish the similarity between the universe and things we know to be designed. This was thought to be evident according to Philo because the teleological order of the universe as a whole would have to be inferred from particular cases of design exhibited in the world, and this would mean that we would be arguing from parts to whole which cannot be done according to him.

There are two points to be discerned in Hume's first objection. First Cleanthes had not only postulated the design of the universe as a whole, but he had also referred to the instances of the "curious adapting of means to ends, throughout all nature." Secondly, Philo's objection rests on his assumption, as Plantinga states, "that no whole can resemble its parts (or some set of its parts) sufficiently to support an analogical inference."7

In regard to the first point, even if we were not able to establish that the design of the universe as a whole was not a relevant instance of design to establish in the argument from design, we would still have the individual instances of design in the world to possibly support the conclusion in the design argument. F. R. Tennant, arguing this point, asserts that the inference in the argument from design would not be limited due to our lack of knowledge of the world as a whole. As he states:

The knowable world, however, is not identical with the universe as to which, as a whole, we have no knowledge. It may be objected, therefore, that to use the phrase "the world" to denote both of these seems to be

7Plantinga, God and Other Minds, p. 98.
a vital question. Of course, if trustworthy evidence
of design in the limited portion of the universe that we
know were forthcoming, a world-designer would be "proved,"
and our ignorance as to other parts would be irrelevant.8

In regard to the second part mentioned above about Hume's
assumption that no whole can resemble its parts, or some set of
its parts sufficiently to support an analogical inference, we
have only to examine an argument of this type to determine the
general validity of this assumption. As Plantinga argues if
we were to infer that the North Cascades Wilderness Area itself
probably contains seven or more Douglas firs to the acre based
on our knowledge that large parts of the North Cascades Wilder-
ness Area contain more than seven Douglas firs to the acre we
would be arguing from parts to whole, and be justified. Hence
Hume's assertion, Plantinga continues, that we are not justified
in arguing from parts to whole is false. What we would have to
consider he maintains in each case is the specific whole at
parts in question. As Plantinga states the objection:

Philo, . . . apparently suggests that no whole can resem-
ble its parts (or some set of its parts) sufficiently to
support an analogical inference. But surely this is not
so. I know large parts of the North Cascade Wilderness
area contain more than seven Douglas firs to the acre
(and have no contrary evidence); I can reasonably con-
clude that the North Cascades Wilderness Area itself pro-
bably contains seven or more Douglas firs to the acre.
On just the information cited, my conclusion certainly
seems to be more probable than not. The general conclu-
sion that one cannot properly argue from parts to whole
is false. Everything depends upon the specific whole
and parts in question.9

8F. R. Tennant, "Cosmic Teleology," in Classical and Contem-
porary Readings in the Philosophy of Religion, ed. by John Hick,
p. 291.

9Plantinga, God and Other Minds, p. 98.
Hence since Hume did not accept the conclusion that we can argue from parts to whole depending upon the specific whole and parts in question, he did not bother to investigate the ways that we could possibly argue in the case from the observable instances of design in the world to the design of the universe or world as a whole. Therefore he cannot conclude to the impossibility of the same, which means that his objection to the design of the universe as a whole, being an instance in which we could compare with human contrivances, is inconclusive.

While Hume pointed his first objection in the direction of evaluating the instances that have been said to be established between the design in the universe and things we know to be designed, he sailed around the problem with his third objection. Instead of indicating the lack of sufficient instances in which the design in the world could be compared with artificial products of contrivances to sufficiently support the conclusion in the argument from design, Hume maintained in his third objection that there were not enough observable instances of the origin of worlds. This point was brought out when Philo argued that the design argument was not scientific in that it offered no evidence for the cause of the world order. In order to draw an inference of a cause for any effect it is necessary, Philo insisted, to have observed the cause and effect in conjunction—and no one has seen the origin of one world, let alone "worlds." Therefore Philo concluded a priori, since no a posteriori evidence is available concerning the cause of the world, it may have caused itself. The doctrine of evolution provided precisely the filling
for this cavity, arguing that natural selection provides a "law" which explains how the world and the organisms in it took on their form.

Although Hume did not answer the question whether there was not an adequate number of instances in which the design in the world could be compared with human contrivances; let's see whether Hume's third objection invalidates the stated argument from design. Briefly Hume has argued that one can only infer from an observed A to an unobserved B when we have frequently observed A's and B's together. Hence we cannot infer from the adaptation of means to ends in the universe to an unobserved intelligent designer on the analogy of the connection between observed cases of design in human artifacts and human agents, unless we have observed at other times other designers in the process of creating or designing other worlds.

"This argument, . . ." Swinburne points out, "reveals Hume's inadequate appreciation of scientific method."¹⁰ Scientists have been making conclusions about the origin of the universe even if they haven't experienced the origin. They have also been arguing to the existence of many other unobservable things which have not been previously experienced, based on the similarity of the analogues in question. Even Philo's example of Galileo's inference to the rotation of the earth is an example of this type of argumentation. No one had actually seen the rotation of the earth when the inference was made. As Swinburne states: "As we saw in the scientific examples which I cited a more developed

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science than Hume knew has taught us that when observed A's have a relation R to observed B's, it is often perfectly reasonable to postulate that observed A*'s, similar to A's have the same relation to unobserved and unobservable B*'s similar to B's."\textsuperscript{11}

Mr. Plantinga in basic agreement contends that Hume's "... suggestion is too strong; it implies that we could make no sound inductive inference concerning the origin, for example, of the largest crow in the Amazon jungle, since we obviously cannot have had experience of various largest crows in the Amazon."\textsuperscript{12}

Since Hume's contention that we can only infer from an observed effect to an unobserved cause when we have frequently observed identical effects and causes together is a misnomer in the logic of scientific reasoning, and at the same time in the logic of analogical reasoning in general, his second objection does not seem to invalidate the argument from design. A further point can be made at this time. Since Hume's third objection lacks the support to vitiate the design argument, Hume was not able to substantiate his claim that there was no \textit{a posteriori} evidence available concerning the cause of the world. Hence his conclusion that "...aught we can know \textit{a priori}, matter may contain the source or spring of order originally, within itself, ..."\textsuperscript{13} fails to have any impact.

Before moving on to the last area of this thesis, let's

\textsuperscript{11} Ibid.
\textsuperscript{12} Plantinga, \textit{God and Other Minds}, p. 99.
\textsuperscript{13} Hume, \textit{Dialogues Concerning Natural Religion}, p. 146.
briefly speculate on Hume's hypothesis of a self-caused world which Darwin picked up and was thought to have made a convincing case for. Besides the notion that "The survival of the fittest presupposes the arrival of the fit, . . . " there are other considerations that make Darwin's theory less obvious than it seems. Richard Taylor points out that a consideration of any living thing whatever indicates that its power and construction are perfectly adapted to its mode of life. As he states:

A hawk, for example, has sharp talons, rapacious beak, keen eyes, strength, and a digestive system all perfectly suited to a predatory mode of life. A lowly spider has likewise precisely what is needed in order to entrap its prey in artfully contrived snares. So it is with every creature whatever.

Now, as Darwin suggests, Taylor concludes:

One can, of course, insist that it is only because such beings are so equipped that they pursue the goals that they do, and deny that they are so equipped in order to pursue those goals, just as one can insist that it is only because a man is carrying rod and reel that he goes fishing, and deny that he is carrying the equipment in order to fish; but this seems artificial even if one gives the evolutionary theory of origin of such creatures everything that it claims.

Now that our detour has led us back to the main highway of this work, let's see if Hume has followed the last road sign needed to terminate his trip. As we have observed Hume did not as yet follow the directions needed to reach his goal, nor was he able to reach it by his own private roads.

Out of the three criteria necessary for evaluating the design argument, the last criterion, as stated earlier, is the

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15 Richard Taylor, Metaphysics, p. 95.
most difficult to employ. Even after being satisfied that we had established the sufficient similarity between the universe and things we know to be designed, on the basis of an adaptation of means to ends exhibited in both analogues, and the sufficient number of instances in which this characteristic had been observed between the analogues to support the conclusion of the argument from design, we still would have the problem of relevancy to contend with. We would have to explain in what relevant ways the property of design was said to support the conclusions of our argument.

In the case of Hume's evaluation he would have had to explain how the property of design was not relevant to support the conclusion in the argument from design. If he would have given the answer to this problem he could have supported his evaluation (and thus reached his goal) but we can see that in order to have furnished an answer he would have had to indicate the differences between the universe and things we know to be designed. This was important, as was revealed earlier, because in order to determine that the design or "curious adapting of means to ends" was not a relevant characteristic to support the inference in the argument from design, one would have to explain how the differences between the analogues were sufficient to vitiate the argument.

Since we have exhausted Hume's objections to Cleanthes' argument in Part II of the Dialogues, and have discovered that Hume did not point out the differences between the universe and things we know to be designed, we can state categorically, as Plantinga
confirms, that "Hume has given us no answer to the question." Further, we can also conclude that Hume has not given us any answers in Part II of the Dialogues that are sufficient to support his evaluation of Cleanthes' argument from design as not being a sound analogical argument.

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16 Plantinga, God and Other Minds, p. 106.


**SECONDARY SOURCES**


The thesis submitted by Jeffery L. Grove has been read and approved by members of the Department of Philosophy.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Philosophy.

Sept 17, 1971

Date

Signature of Adviser