

PHILODEMUS

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Part 1: Summary and refutation of the arguments of Dionysius of Cyrene against Epicurean methods of inference (from the teachings of Zeno of Sidon)

The use of analogy (of what is seen) as a stable basis for inference (of what is not seen) can be refuted by examples of invalid analogical inferences

(I^a) ...is it not true that by the method of analogy it is possible to say that since there are pomegranates and figs in our experience, they exist everywhere? Yet both are unperceived, and it is not necessary that because they exist in our experience they exist also in places that are not perceived. And is it necessary to infer about all other plants, in whatever places they may be, that if they do not exist in our experience, they do not exist elsewhere? On the contrary, a method which infers that since something does not exist in our experience it does not exist in unperceived places is not cogent.

Analogical inferences must be based on specific indications, analogical inferences based on general indications can be invalid

We shall question elsewhere the validity of common signs; and indeed a sign is common for no other reason than that it can exist whether the unperceived object exists or not. We say that anyone who thinks that a certain man is good because he is rich is using an unsound and common sign, since some men who are rich prove to be bad and some good. Therefore if the particular and cogent sign cannot exist except along with the unperceived object which, we said,

is by necessity connected with it, and of which it is the sign, it would never be possible to reveal that which is unperceived by means of the analogical method of inference.

Exceptions invalidate the use of analogy

Furthermore, the synthesis of similars seems to conflict with unique cases. For the method of analogy does not seem to be cogent: If there is among the great variety of stones one kind of stone that draws iron, which is called the magnet or the Heracleian stone; and likewise if only amber is capable of attracting chaff; and if the square of four is the only square which has its perimeter equal to its area, how, then, can we say that there is not some exceptional race of men who do not die when the heart has been pierced? **(II)** Therefore, proceeding from the fact that men in our experience die when the heart has been pierced, we cannot conclude by necessity that all men do. There are also in our experience some exceptional things, as for example, the man in Alexandria half a cubit high, with a colossal head that could be beaten with a hammer, who used to be exhibited by the embalmers; the person in Epidaurus who was married as a maiden and then later became a man; and the person in Crete who was forty-eight cubits tall, according to those who examined the bones that were found; and further, the pygmies that they show in Acoris, who are quite analogous to those which Antony recently brought from Syria. If these examples are exceptions to all things with which we are familiar or if they are not similar to things in our experience, we can ask whether any one of the things about which we make our inferences (is not abnormal), because there are some things to which it does not conform.

Inductive inference is not valid unless it assumes what is not seen is like
what is seen

For certainly some things in this world deviate from the normal.
Whenever we judge:

*“Since men in our experience are mortal,
all men are,”*

the method of analogy will hold if we assume that men who are in unperceived places are similar to men in our experience in all respects, so that they will be similar also in respect to mortality; without this assumption it will not be valid. For if they are similar in all respects, we shall be correct in inferring that they are similar in respect to mortality.

The correct form of the argument will be of this kind:

*“Since the men in our experience are mortal.
(III) If there are men in other places who are similar to men in our
experience in all respects, including mortality,
then they are mortal.”*

This method of inference is identical with the method which we ourselves use. If we assume the similarity and say something like this:

*“Since the men in our experience are mortal,
if there are mortal men anywhere,
then they are mortal,” (the inference will be valid).*

But if we do not assume that those about whom we infer are similar also in being mortal, but do assume that those in unperceived places vary in this respect and differ from the men in our experience, the inference will not be necessary. Therefore it will not be necessary that men in unperceived places also be mortal; they may be similar in all other respects to men in our experience but different in respect to mortality, and not in this respect like men in our experience. And generally, if one judges:

*“Since men in our experience are mortal,
if men exist anywhere,
then they are mortal”*

and if this is equivalent to the following:

*“Since the men in our experience,
in so far as and according as they are men, are mortal,
then men everywhere are mortal”*

he will make a valid judgment. But if on the other hand the property of being mortal is an accident of men in our experience, and if one should judge:

(IV) *“Since men in our experience are mortal,
men everywhere are mortal”*

his judgment will be invalid. For, by Zeus, not because men in our experience are short-lived shall we say that the Acrothoites also are short-lived. Therefore one must demonstrate that men, in so far as and according as they are men, are mortal, if we are going to establish the above-mentioned inference as logically necessary.

Analogy is not a stable method of inference

Since we are able to demonstrate this by contraposition, we shall disregard the method of analogy; and if we use the method of analogy in making a synthesis of signs, we shall fall again into the same error...

...and therefore we maintain that the analogical method of inference is not cogent; and on the whole if it is cogent, it must assume that unperceived objects are like those in our experience.

Epicureans apply the method of analogy inconsistently

According to the method of analogy one ought to infer **(V)** that since all bodies in our experience have color, and atoms are bodies, atoms have color; or since all bodies in our experience are destructible, and atoms are bodies, atoms must be admitted to be destructible. From what kind of similarity to what other kind ought we to infer? From men to men, for instance? And why is it better to infer from men to men rather than from the animate to the animate? But ought we to infer from the animate to the animate? And why thus rather than from bodies to bodies? But again ought we to infer from bodies to bodies? And why thus rather than from beings in general to beings? and why thus rather than from being in general to beings? ...Shall we infer from the narrowest to the broadest (classes) of the same genus, or from those men most similar in bodies and souls to those of the same class? We shall not, therefore, use the analogical argument:

*“Since men in our experience are mortal,
then men in Libya are also mortal”*

in preference to the argument

*“since living creatures in our experience are mortal,
if there are any living creatures in Britain,
then they are mortal.”*

*Analogy based on identical objects is unnecessary and analogy based
on similar objects will lead to invalid inferences*

(VI) And when you try to apply these inferences to objects, shall we take identity as the basis of signification, or similarity, or what degree of resemblance? It is ridiculous to say identity. For why will the appearance be the sign of the unperceived rather than the reverse? No longer will the one be apparent and the other unperceived if there is identity. If we base the inference on similarity, how shall we be able to say that the unperceived object does not, by virtue of its distinct nature, differ from the apparent object from which we make the inference?

If we take things completely alike, no longer will the one be unperceived and the other apparent. But if in some cases, on the other hand, relying on a quality that happens to be present we infer some similarity and from that make an inference about the unperceived, even if the nature of a thing as such be grasped in the proper way, our argument is inconclusive. For the nature of a thing as such is established by rational inference. If we proceed by similarity,

(VII) an infinite regress will always result, since we do not perceive the nature of things as such; therefore the inference will be

incomplete. But if we proceed by the method of contraposition we shall establish that it alone has certainty.

Additional arguments of Dionysius

Dionysius tries to refute by sophistry the answers which our school makes, for while we claim that **the method of analogy pervades completely the method of contraposition and contraposition is confirmed by analogy**, he says that we err because of the ambiguity of the word, since we use the word “analogy” first of the common qualities of the apparent and the unperceived, and second, of the process of inference.

Furthermore, he charges, in some cases we infer about objects by our own method of analogy, and sometimes by contraposition, so that we use both principles; and (he charges further) we consider that every appearance and notion is necessarily true and suppose that that which is called analogy in any sense is useful.

Probability is a valid basis for inference

Again, when we Epicureans say that monstrous things are similar to something, Dionysius says, “**Unless the Epicureans conform to things in our experience, we shall deny that the Epicureans exist, and deny it by contraposition.**” But it will be sufficient for us to base our belief on probability in these matters, just as we do in regard to what is learned from trial; for example, that we shall be safe sailing in summer, since we have had experience of favorable winds in that season.

(VIII) Dionysius says **that the qualification is pointless, that whenever nothing conflicts we ought to use the method of analogy. For how will it be possible to establish that no appearance or previously demonstrated fact conflicts? If we make an inference, it is**

clear that we do so either through analogy or through contraposition. If we use analogy, the question will again be asked, how shall we establish that not one of the things previously mentioned conflicts with the inference? But if we infer by contraposition, we must not deny the validity of this method.

Special cases support the general model

Yet if anyone uses the argument from analogy properly, he will not fail, and **we consider that our statement is true even if we find the analogy only in a large number of cases.** We shall continually say in behalf of this theory: **If the method of analogy is not cogent, the method of contraposition is not cogent.** The proposition:

*“If there is motion,
there is void,”*

we do not establish in any other way than by the method of analogy, by proving that it is impossible for motion to take place without void. Establishing by induction all the constant conditions for things that are moved within our experience, apart from which we see nothing moved, we judge by analogy that all objects that are moved are moved in every **(IX)** case under these conditions; and by this method we infer that it is not possible for motion to exist without void. Therefore, if this method (i.e., analogy) does not have the force to prove this inference, neither does the method of contraposition, which is entirely confirmed by and through analogy; hence contraposition is not by itself cogent.

The sun is an example of an exception

Inference according to partial similarity is in some cases just as valid as inference by the sign which is identical with the thing signified. Though objects in our experience indicate that the things in the universe are such as we see them, Dionysius thinks that the sun is much larger than it appears because of its distance from us. Indeed, other things that are seen at a distance appear to be smaller and to move slowly, but the sun has a contrary appearance and movement.' Furthermore, all objects in our experience are observed to have less color when seen at a distance because the coloring appears shadowy or hazy; but the sun has a very bright sphere, and it is not subject to the principle that for the most part distance naturally decreases size, and that distant objects are many times greater than they appear. Thus the sun differs from all the objects in our experience, just as the magnet differs from all other stones in being the only stone which draws iron.

(X) In attacking our argument that the sun is as large as it appears, Dionysius uses an inference of this kind: “All objects in our experience that reappear slowly from behind objects that eclipse them have this character either because they move slowly, or because they are very large. “Since the sun reappears slowly, it must of necessity have one of these two characteristics. “But it does not move slowly, since it completes the path from sunrise to sunset in twelve hours, passing through a very great distance.” Surely he is not using the method of contraposition, nor is the statement that a thing appears changed to the spectator because of distance an argument for our opponent. Indeed his argument, which is itself derived from analogy with things in our experience, will likewise be overturned if the method of analogy is not cogent. For he uses the analogical

inference that things in our experience which are slow to reappear either move slowly or are very large. Why is it necessary that the sun reappear slowly because of these particular causes? Its motion is the result of another cause which is unique and different from things in our experience.

For is it not true that while all other bodies in our experience having bright **(XI)** colors admit of change of degree, the sun does not have this characteristic? Is it not also the case that whereas objects which reappear slowly in our experience can do so through the two causes mentioned, the sun will be able to produce this effect through another cause different from the causes in our experience? Nor does the fact that the magnet is the only stone which draws iron prove that our method of inference is not cogent.

There are two types of inferences: formal inference tested by contraposition and analogical inferences tested by inconceivability (response to the first two Stoic arguments not present in the surviving text)

Nor will it be overthrown through the refutation previously brought forward by Dionysius. Not merely because he questions whether the method of analogy is cogent, will analogy be refuted as a method of inference. For to every part of his refutation it could be very fittingly said that the inference that he uses is according to the method of analogy rather than the method of contraposition. The method of inference which seems to be more cogent is not established in this way by those who confirm its cogency?

It happens, indeed, that his arguments are easily dissolved by anyone who examines them closely. The first two have the same force and are refuted in the following way. Granted that the proposition,

“If the first, then the second,”

is true whenever it is true that,

“If not the second, then not the first”

it does not follow from this that only the method of contraposition is cogent. The proposition,

“If not the second, then not the first,”

sometimes is proved true when the second may be denied by hypothesis and from the mere denial of it the first is also denied, as in the proposition,

“If there is motion, there is void.”

For when void is denied by hypothesis, by the mere denial of it, motion will also be denied. Such an example, therefore, belongs to the class of contraposition. But sometimes the proposition is not proved in this way, but rather, when it is not possible to conceive that the first is or is of a certain character, and the second is not or is not of such character. For example,

“Plato is a man, and Socrates is a man”

If this is true, it is true also that,

“If Socrates is not a man, neither is Plato a man,”

not because by the denial of Socrates Plato is denied along with him, but because it is inconceivable for Socrates not to be a man and Plato to be a man. But this inference is derived from the method of analogy. Therefore, neither the first nor the second argument proves that the analogical method of inference is not cogent.

Conclusions about the unseen that are derived from similar things in our experience are valid when there is no evidence to the contrary

Nor does the third argument establish this, since Dionysius **(XIII)** judges wrongly that the specific kinds of analogy are not valid. For the inference ought not to be made from any chance common quality to any other, but from that quality which does not admit a spark to the contrary or exhibit even a breath in opposition to appearances. How is it similar to infer that since all men beheaded in our experience die and do not grow new heads, men decapitated everywhere will have this characteristic, and to infer from the existence of pomegranates or figs in our experience that these exist everywhere? Though men in our experience are necessarily like men in unperceived places, plants even in the same regions do not appear to correspond; but those of the same genus differ in odor, color, form, size, and other characteristics. Therefore, his argument does not prove that the method of analogy is not valid, but is itself weak and refuted by the facts. Nor is his argument based on an inductive inference from the similarity and difference in appearances unless one could say: "Since we see hairs plucked out and others growing back in the same places, we ask if eyes may not have this character, **(XIV)** and since nails removed grow again, if heads might not do so."

Conclusions about the unseen can be made from the formal method of contraposition when a negation of the proposition conflicts with what is seen

The argument based on the distinction between the common and particular sign is also inconclusive. It is not necessary to suppose that since the common sign exists whether the unperceived object exists or not, whereas the particular sign exists only when the unperceived object exists, and does not exist when the unperceived object is non-existent, for this reason every particular sign is an instance of the method of contraposition. Rather, we should say that if by the very negation of the non-apparent the appearance is denied, the inference must be made according to contraposition. But if there is another method according to which it is impossible for the one to exist and the other not to exist — as for example, whenever it is inconceivable that the appearance exists or is such as it is and the unperceived object does not exist — such an argument is not by contraposition, but by analogy. According to analogy it is not possible that the appearance be conceived to exist or to be such as it is and the unperceived object not exist or be such as it is — just as it is impossible to conceive that Epicurus is a man and Metrodorus not a man.

Unique cases

The argument from unique cases is also weak. No one of our school denies such peculiarities, and yet the method of analogy does not become invalid because one class of stones draws iron. There is only one sun and one moon in our world; and there are a number of constant peculiarities in every class of objects; nor does any one class have the same peculiarities as the other classes. **(XV)** If other stones were similar to or identical with the stones that draw iron, and some

drew iron, and some did not, the method of analogy would be destroyed. Since this does not happen, but since among the many different varieties of stones the magnet has a certain peculiarity of a specific kind, and it shows from the outset its particular nature, in no way is the method of analogy shaken.” And the fact that the square of four is the only square having its perimeter equal to its area does not hinder us from inferring by analogy; for all the square numbers tested by trial have shown that this distinction exists among them, so that one who denies it contradicts appearances. It is ridiculous that anything inferred from appearance about the unperceived should contradict appearance. When appearance has once revealed a square number of this kind, one who infers from such numbers in our experience to those in the infinite universes will make a valid inference that every square of four has its perimeter equal to its area, on the ground that it is inconceivable for those in our experience to be of this nature **(XVI)** and those elsewhere not of this nature. Dionysius’ argument in regard to rare cases is also inconclusive, especially if he has invented outright falsehoods. Nor does the argument next in order advance his case. Whenever we infer from the proposition,

“Men in our experience are mortal,”

to the proposition,

“Men everywhere are mortal,”

we do not presuppose that the men about whom we infer are like those in our experience in respect to mortality, nor that they are like them in all other ways but are different in respect to mortality; but from the fact that all men in our experience are similar even in

respect to mortality, we infer that all men universally are liable to death, since nothing opposes the inference or draws us a step toward the view that men do not admit of death. Appealing to this similarity we declare that in respect to mortality the men outside our experience are similar to those within our experience.

Generalizations are necessary for any discussion

Moreover, Dionysius misunderstood the next argument also. When a person infers from men in our experience and concludes about men everywhere, that they are mortal—from the fact that men who lived in the past according to history and men that have fallen under our observation are all mortal, **(XVII)** with no case drawing us to the contrary—he makes his inference according to analogy. And the argument that men in our experience as men are mortal, which is equivalent to the statement that men with this characteristic are men, is confirmed by this same analogical method. No philosopher who uses the method and procedure of contraposition provides such a confirmation. And we shall not say that the Acrothoites are short-lived because men in our experience are short-lived. Perhaps those who dwell there do not all appear to be similar in respect to old age, for men in our experience are observed to differ much in longevity and brevity of life according to countries and places. Therefore it is not inadmissible that there are some people surpassing others in length of life. Furthermore, the length of life among us varies even more than among the Acrothoites.

Analogies must be used carefully

Nor is the next argument a sound one. He does not know in what cases the analogical method is not appropriate, when we search out

similarities by inductive inference in the proper way; for one ought not infer from any chance common qualities about any chance objects. The simple truth is that bodies in **(XVIII)** our experience are destructible not as bodies, but in so far as they partake of a nature opposed to the corporeal and nonresistant. Similarly, bodies in our experience have color, but not as bodies; for tangible objects in so far as they resist the touch are bodies, but in so far as they are tangible they reveal no color. Indeed, bodies in the dark have no color, yet still are bodies.“ Therefore, from these qualities we do not infer concerning all bodies; but from other similarities, such as lightness and heaviness, we shall not be prevented from making inferences, provided that we use the method of analogy properly. Inferences should be made from objects that are most closely related and from those that are as similar as possible; and one should not use broad similarities, disregarding those qualities which correspond more closely. For example, the inference is best made from particular men to those especially similar to them, and from the class of men to the class of things which follows the whole class of men, nothing inclining us the slightest bit to the contrary; from animals of a certain species to those especially like them, and from a class to the classes close to it; and from a body of a certain kind to another of the same kind, and from the generic body to the generic; from an entity of a certain nature to those especially like it, **(XIX)** and from the generic entity, that which is a constant attribute of the greatest number of things, apart from which we are not able to conceive a common existence, to the generic. Zeno, in his discussions with us, used to set forth the arguments of our opponents, and he made use of the answers that have been given.

*Part 2: Summary and refutation of **the arguments against Epicurean methods of inference (from Bromius' notes of Zeno of Sidon teachings)***

A limit to variation cannot be established, particularly regarding unperceived objects

Bromius, however, used to say that Zeno expounded the beliefs of our opponents and the answers to them in the following way: **How will one infer from appearances to the non-apparent? Is it by including all appearances or only some of them? If the former, the task is impossible; if the latter, no one could make a synthesis of signs when only a limited number of cases concur. If there are variations of atmosphere, food, and natural constitutions, why might there not be, besides, variations not related to our experience, which add other such differences? “Will one make an inference from objects that exhibit an identical nature and power, or from those that are not identical, but have only similar powers and natures? The view that a sign-relation is based on identical things is untenable, for they will differ only in number; inference from objects not identical will not be trustworthy because of the differences present. Again, either assuming the point about which you are inquiring, you will say: **(XX)****

“Since all men are similar to men in our experience even in respect to mortality,

All men must be mortal”

or omitting this assumption, you will not proceed according to the rules of the syllogism. And if the unperceived itself has certain peculiarities as compared with the apparent object, how can you

rightly make an inference by associating similar accidental qualities with those which differ in some respect?”

Special cases

Next Bromius presented the argument from unique cases and the argument that variations and differences weaken inferences by analogy. For example, from the fact that some people digest goats' flesh more easily than other food which seems to be more digestible, our opponent says that objects have no fixed or consistent nature for us, and that there are differences even among similar objects. Is not the unperceived different from the apparent, and cannot the Stoics violently attack us on the ground that although we observe living beings in our experience to be destructible, we say that the gods are indestructible; and although all things are created and destructible, we judge that the elements of all things are uncreated and indestructible? To the first of these arguments our answer (according to Bromius) is that it is not necessary to include all appearances in our experience, and we should not rely merely on chance appearances. We must consider many homogeneous and varied ones, so that from our experience of them and from the **(XXI)** accounts of history concerning them we may take the inseparable constituent of each of them individually, and from these we may infer to all the others. For example, if men are found to differ in all other respects, but in one respect they have been observed to have no difference, why shall we not say confidently on the basis of the men that we have ourselves met with and those of whom we have historical knowledge, that all men are liable to old age and disease? When this has been established and there is no conflicting evidence, we shall say that they state a falsehood who say: "Men were formerly invulnerable." To the second argument we shall say that the inference would not be shaken

by differences of constitutions, but that by using them for the investigation of the unperceived we confirm the apparent variations which first called our attention to this problem. And we shall ask, if need be, on what ground and from what starting-point a person raises an objection to anything whatsoever, or considers an investigation futile, if not from the principle that an object deprived of all similarity with appearance is inconceivable.

A limit to variation can be discovered

Concerning atmosphere and differences of nature we shall make the same argument, not rejecting all difference. Let no one oppose us or be so stubborn as to question whether there are, beyond such **(XXII)** differences, men with a nature of iron, who go through walls as we go through air.

Inferences can beneficially be made from both identical objects and nonidentical objects

To the third argument Bromius answers that sometimes we shall infer from identical objects, whenever there is a distinction in accompanying circumstances. When one object is apprehended from appearance and another is not apparent, we shall use the sign which is confirmed by the apparent. And sometimes we shall infer from nonidentical objects, in so far as they share the same community of similar attributes, as for example, that some attributes are peculiar to men alone, and some are common also to the gods. Thus we shall use successfully the inference from living beings, when we consider that nothing prevents god from being similar in body to man since man alone of living beings in our experience is capable of thought. For god cannot be conceived apart from thought; and even though god was

not born, yet he is composed of soul and body and with this nature he is necessarily a living creature.

Inferences cannot be made by reason alone

To the fourth argument we answer that we do not need to presuppose the conclusion in our premise, so as to say:

*“Since men,
in whatever places they are,
are similar to men in our experience even in being mortal
All men must be mortal.”*

Nor shall I anticipate the opposite of this statement; but by inductive inference from appearances I shall arrive at the **(XXIII)** view that similarity must exist in respect to mortality. For since this attribute is common to all men in our experience, I shall judge in every case that it is an attribute of all men everywhere, and confirm by induction that in this respect also there must be similarity.

Inferences based on features of objects that are seen can be used to determine features of objects that are unseen

To the next argument we answer that in so far as the things which are not apparent to the senses are different, he who infers well will attribute this difference to them, and in so far as they have qualities in common with appearances, he will not deprive them of these. According to this method I would be able, inferring from fires in our experience to fire in any other place whatever, to establish with certainty the universal nature of fire. For example, it is a property of fire, in so far as it is fire, that combustible materials are kindled by

drought or friction or lightning; and this peculiarity, which is confirmed by objects and by the appearance of this variation, prevents fuels from admitting of other forms of combustion. Moreover, on the basis of appearances in our experience one would say that the fuels of fires have different powers in respect to the length of time they burn, for some are of long and some of short duration. And the same fuels do not burn all in the same way in particular cases. Some fires are easily quenched, while others are not. Fires also exhibit differences **(XXIV)** in change of brightness and duration, according to the different fuels. Therefore, on the one hand, one who makes a correct induction will dismiss the differences of appearances in so far as they are peculiarities; and on the other hand he will retain the common qualities of appearances, without which it is not possible to conceive that anything has the nature of fire. The same argument holds in the case of other things. In answer to the argument about unique cases we say that one who infers well has noted rightly both the common qualities and the peculiarities, and he will use substances, powers, qualities, attributes, dispositions, quantities, and numbers as the inference requires. In some cases he will dismiss many differences in things homogeneous, when the differences correspond to the differences within our experience, and in some cases he will dismiss very few. Inferring in this way he will judge that men everywhere are vulnerable and have this peculiarity along with other differences analogous to the variations in our experience.“ “There will not, however, be a peculiarity of such a kind, that it will appear possible in any way that a man be invulnerable or that we see any finite object not bounded by another object. For from the very fact that in all cases the same qualities are joined to these objects, the study of appearances has given confirmation to our argument. Likewise, no beast could be wise, since beasts are without **(XXV)** reason.

Further, man is called man with the quality of being destructible, just as number is number with the quality of being composed of units. In general the soul is a peculiar thing different from every other object, and time also is like nothing else. Will anyone then make use of these unique objects in order to argue that when we infer about unperceived objects we should not base our inference on similarities, even though the unperceived objects possess an analogy with objects in our experience? Indeed someone seeing the manifold variety of our experience will judge that this exists also among unperceived objects, both in regard to common qualities and also in regard to peculiarities, e.g., that eyes do not grow again, but hair always grows again. Taking the identical, then, or the similar we make the appropriate inferences from similar and analogous cases by means of peculiar and common qualities. We shall dispose of the next argument by saying that those who infer badly are corrected by the facts in individual cases, with the qualification that those who make declarations about anything whatsoever sometimes affirm confidently a universal proposition, and sometimes use probability. Certainty and probability are both derived from the observation of appearances. For appearances have established that relativity is important in some cases, and yet in other cases there are constant similarities, as in the case of certain deadly poisons, **(XXVI)** purgatives, and drugs with other powers. It is not at all surprising that, although there is great and manifold variation in foods and in the beings nourished by them, there can be a determinate limit to what men can eat. For this reason we shall not admit that there are men who eat hay, easily digest it, and are nourished. Some things (mentioned by our opponents) are fabricated according to opinion, and are taken from false records of the past; and, besides, nothing is accomplished by such inventions. For anyone who misrepresents any

common features of appearances will destroy the whole method of inference.

In respect to differences in digestion we shall say that he who infers by signs makes his inference from appearances, using analogies of both peculiarities and common qualities; and one who establishes by this method that one thing follows from necessity on another makes a correct inference. One who relies on appearances will not question the fact that it is the nature of the moon to wax and to wane, and it is the nature of man to die. Therefore, not in every case should a thing be denied, even when many instances have occurred (that support a denial). Sometimes when you chance on one instance you say that a thing is of such and such a character, and often you use two cases and sometimes more, forming the analogy in accordance with the manifold nature of signs. **(XXVII)** For this reason no one affirms confidently that since a thing is similar to a food in odor, color, and taste, it is nourishing. For many objects that are different in certain hidden powers have been observed to be similar to appearances in color, taste, and other qualities; and in many cases the opposite is true.” When the Stoics accuse us (of inconsistency), we shall remember first that their arguments have no weight against the probability of our doctrine, and secondly, that in stating our views we do not in any way contradict ourselves, if feelings and appearances have confirmed our statements. Indeed, the gods and the first elements of things appear to be indestructible and unborn, since this is a condition of their being such as they are, and since inductive inference from appearances has proved it. Living creatures that are nourished in our experience are living creatures in so far as they have shared in a certain kind of fleshy nature and have been born from those that have possessed similar substances, and with this characteristic they are living creatures.”

These, Bromius said, are the arguments brought forward by those who attack the common view that appearances are the signs of the unperceived, and by those who reject the method of analogy.

Comments regarding the organization of this work

Perhaps the views of our opponents (as Bromius gives them) appear to be different from those previously discussed (by Zeno), and to have received a different refutation. Or perhaps we have set forth only some of the arguments and these not very well arranged for those who wish to **(XXVIII)** make use of them. Zeno presented them more systematically (than Bromius) by putting the Stoic arguments either before or after their refutation. Possibly it would be no better if we expounded repeatedly the Stoic arguments in the way that we have given them above. We shall now follow a systematic order of inquiries by setting forth the common errors which pervade all their arguments, so that we may have the errors clearly marked, even of the arguments that have been overlooked, and of those that may be devised hereafter.

Part 3: Summary of five basic errors of the Stoics (taken from a work by Demetrius of Laconia)

contraposition

In the work of Demetrius the errors are stated very briefly: It is said in this book that it is a pervasive error of the Stoics not to have taken into account the peculiarity of the method of contraposition—when the unperceived is denied, by this very denial the appearance is also denied—as compared with the method of analogy of appearance and

unperceived, according to which it is not possible to conceive that the appearance exists or is such as it is and the unperceived does not exist or is not such as it is. And it is a mistake not to have taken into account the fact that we think one ought not to infer from any chance similarity to any other whatsoever, but only from constant similarities. It is an error not to observe that appearances themselves have shown that there are some kinds of stones and numbers and other such objects which have certain peculiar characteristics, and that these appearances conflict in no way with inference by analogy, but on the contrary strengthen it. It is also an error not to have taken into account the fact that we do not infer indiscriminately from things in our **(XXIX)** experience to the unknown, but from facts tested in every way and not exhibiting the slightest evidence to the contrary.

Further, it is an error not to have discerned that the statement, *“In so far as something is such and such”*—as for example, that man in so far as he is man is destructible, and smooth and round atoms, in so far as they are smooth and round, are creative of pleasure—and statements of this type in general are not all tested by contraposition, but many of them are tested by analogy. For example, *“A man who has been beheaded, in so far as he has been beheaded, does not grow a head again...”*

*Part 4: Discussion of the fundamental errors of the Stoics
taken from a lecture (possibly by Demetrius of Laconia)*

He presented to us nearly the same arguments, but he treated everything in his discussion, from the highest to the lowest and most

fundamental arguments. And first he said that those who use dialectical reasoning do not know that they are shamefully refuting themselves. For the arguments that they devise to refute the method of analogy contribute to its confirmation. For when they attack the statement, for example, that *“If living creatures in our experience are destructible, those in unknown places are also”* and when in the course of their argument they object that animate objects, though similar in kind, differ from each other according to **(XXX)** atmospheric conditions, foods, and many other circumstances, they are using appearances in our experience as the basis for making judgments about similarities among the unperceived. And when they say that, since there are some unique cases in our experience, it would not be at all surprising if among the unperceived there is some nature which differs from things which we have met with, they appear to be making the inference from similars. It is the same in other cases, so that as a result they refute themselves. Moreover, in correcting those who infer badly about the unperceived... they fall into error. If, indeed, anyone says that all men are white, starting from those in our experience, or black, starting from the Ethiopians, or that everywhere the straight indices of the sundial at noon have no shadow at the summer solstice, will not his argument be futile? We shall say that the one who infers thus fails because he has not gone through all appearances well, and indeed that he is corrected by the appearances themselves. Those who reject the method of inference by analogy make all unperceived objects undignified. For there is no other **(XXXI)** correct method of inference besides this. But even if the antecedent signs are sometimes similar and sometimes dissimilar, one who proceeds according to analogy necessarily admits the synthesis of signs, if indeed he is going to construct a proof, as we have established in the previous arguments. Those who say that the method of contraposition depends upon the method of analogy would

say virtually the same thing as we do, but they leave the suspicion by their teaching that there are two methods of signification opposed to each other. They agree with us that the sign and thing signified are denied along with each other and that when the unperceived is denied the sign is also, but since they seem to use contraposition as well as the method of analogy, they are compactly wrong. Our opponents even by their own method make the unperceived unsignified to themselves. Indeed, when they agree that all men are vulnerable and liable to disease, old age, and death, and that there are no Centaurs or Pans, or anything else of such a nature, they do not confirm these statements in any other way than by the method of analogy. Therefore, if analogy is not a valid method, they will have no ground for these views. They further ignore the fact that we say that not all things **(XXXII)** are inferred by analogy when the antecedent sign is used, but only some things. Indeed, they ask in instances of contra- position what kind of similarity is present, just as if they would not be asked to explain even more in the opposite cases how inferences from similarities can be instances of contraposition. Further, they ignore the fact that we say the method of analogy is only one method of inference, not three. And when we say that there are three kinds of signs, we do not base the distinction on their analogy alone. In addition, they ignore the fact that we collect not only the signs appearing to us or tested by our experience, but also the appearances taken from observation by others. Do those who have never been there doubt that Crete and Sicily are islands? And therefore we say that the method of analogy is a sound method of inference, with this condition, that no other appearance or previously demonstrated fact conflicts with the inference. Bringing forward a few dis- similar cases that conflict with things examined by us, they have set them forth as if they were refuting the whole method.” The Stoics err also in so far as they say bluntly that the so-called

hypothetical proposition is true whenever the first term is denied by contraposition along with the second, and that **(XXXIII)** the particular sign is established whenever the appearance is denied by the denial of the unperceived. But we say that the best test of the hypothetical proposition and the particular sign is established whenever we are not able to conceive that the first exists and the second does not, and conversely. Moreover, our opponents do not confirm by any other method than this the inferences made by contraposition. Again, they do not know that everyone who infers well about the unperceived objects that accompany appearances observes carefully the manifold variety of appearances in order to be sure that there is no conflicting evidence. He considers it impossible that the nature of things and their generation from each other should be inconsistent with appearances. Thus he expounds the origin of the cosmos. And further the Stoics err in so far as they have not taken the trouble to understand the right method of analogical inference. Whenever we say, “Since things in our experience are of such a nature, “Unperceived objects are also of this nature in so far as things in our experience are of this nature,” we judge that there is a necessary connection between an unperceived object and the objects of our experience. For example, “Since men in our experience as men are mortal, “If there are men anywhere, “They are mortal.” There are four things that the words “as such,” “according as,” and “in so far as,” signify: First, that this follows from necessity on that. This statement is equivalent to the statement that that is a condition for **(XXIV)** this, with the implication that this is necessarily a consequence of that. According to this meaning we say, “Men as men are made of flesh and are subject to disease and old age.” Second, there is also the meaning that this is the particular definition of that, i.e., this is the anticipation of that, as in the statement, “Body as body has mass and resistance,” and “Man as man is a rational animal.”

Third, this is a property of that. According to this meaning we may judge rightly that "Man as man dies." Fourth, this results from that taken according to some attribute, as we say that "Men in so far as they are unwise are most miserable," and "A knife cuts in so far as it is sharp," and "Atoms in so far as they are solid are indestructible," and : 'A body according as it has weight falls downward.' Necessary consequence is involved in all these four meanings, but the terminology is assigned according to the particular cases. We infer in each case according to the meaning which the argument requires. But those who attack the inference from analogy do not indicate the distinctions just according as," as mentioned, namely, how we are to take the as in the statement, for example, "Man as man is mortal."

(XXXV) Hence they say that if the "according as" is omitted, the argument will be inconclusive; if it is admitted, the method of % The third meaning probably refers to attributive predication of a property. % In the fourth sense, the term refers to the powers or activities resulting from certain attributes. contraposition is used. But we Epicureans take this to be necessarily connected with that from the fact that this has been observed to be a property of that in all cases that we have come upon, and because we have observed, many varied living creatures of the same genus who have differences in all other respects from each other, but who all share in certain common qualities (e.g., mortality). According to this method we say that man according as and in so far as he is man is mortal, on the ground that we have examined systematically many diverse men, and have found no variation in respect to this characteristic and no evidence to the contrary. Therefore the inference is made according to analogy both in these cases and in all the others in which we use the terms "as such" and "according as," and where the peculiar relation between objects is indicated by the fact that one does not occur without the other, and one follows necessarily on the other. We do not use

analogy in those cases where inference is made by a sign tested only by contraposition. Yet even in these latter cases the discovery that all instances have the same property confirms the inference. From the fact that all moving objects in our experience have other differences but a **(XXX)** common condition that they move through empty space, we maintain in every case that this condition of motion prevails even in unperceived places. And in order to make the contraposition, "If there is or has been no fire, "There is no smoke," we contend that always in all cases smoke has been observed to be given off by fire. Our opponents also err in so far as they do not observe the fact that we establish through appearances that there is no conflicting evidence. For it is not sufficient to admit the very slight swerves of the atoms because of chance and free will; but we must also prove that this swerve does not in any way conflict with any other appearance. And they should not ignore the difference between antecedent, generic, and specific signs, since the difference is great and varied. For then they would not think that they should use only those signs whose existence is denied if the unperceived object does not exist, They go astray also because of equivocal expressions; for the word "sign" is used of an appearance about which an inference is established, as in the case of motion and the plenum, and "sign" is also used of the inference by which we reason that this unperceived object accompanies this appearance. Attacking the disparity between the antecedent appearances and the unperceived objects concerning which the inferences are made (i.e., "sign" in the first sense), they reject **(XXXVII)** the method of analogy (i.e., "sign" in the second sense), confusing the two meanings with each other." Since all things are the products of elements or of things derived from elements, or are related to elements in some other way, there is a peculiar connection between appearances and the unperceived, so that appearances are judged to be denied by contraposition if the

elements are not posited. By this principle the consequence of the unobserved on appearances is established. But since there is another relation of consequence, as for example, whenever there is a certain similarity or analogy among similar and analogous objects, we shall make use of consequences of this sort. As a consequence of the fact that bodies in our experience rebound, we judge that atoms are heavy and solid, for we cannot conceive that objects in our experience are of this kind and that similar ones (unperceived) do not have this quality.

Sometimes the inference is from perceptible things to perceptible things according to complete likeness, and sometimes to things contemplated by reason, which are analogous to appearance. Although there is this difference in inferences, they disregard the peculiarities of the relation of consequence, as if in both cases the second followed from the first in such a way that the first would be denied by the denial of the second. Therefore, the conversion, "*If there is motion, there is void,*" and **(XXXVIII)** "*If there is no void, there is no motion,*" will be well stated if it is modeled on the following: "If men in our experience are vulnerable and mortal, men everywhere are vulnerable and mortal," and "If men in unperceived places do not have all the differences that we mention, neither do those in our experience." The inconceivability is identical in both cases. Furthermore, the Stoics often invent peculiar and impossible arguments according to the construction of opinion. They seize upon the mythical inventions of some (poets, etc.); while at the same time they disbelieve those (poets) who, they think, have altered some of the myths used by the Stoics, yet who agree (with the Stoics) regarding other myths. In this way they try to strengthen their own belief. But he (Demetrius?) who has established a test of controversies by the method of analogy differs (from the Stoics) in the highest degree! The things said by the members of our school who have spent the most

time in this study are such as we have already considered. What some of the physicians!" have said and have written about the method of analogy we shall now take note of in the last parts of the exposition, if we have the stomach for it and if nothing more important hinders us.

(Frag. 1) The construction of inferences is not established by contra-position of the argument "in so far as this is 'such,'" but by appearances which give the necessary evidence. Indeed, even if one does not know how mental perception will be judged, he thinks that inferences from signs should be constructed if they are verified by observation and do not conflict with present appearances, which are called the criteria of the unperceived: namely, perception, anticipations, mental perceptions, and feelings.

(Frag. 2) One ought not to stop with the apparent, but from the apparent make inferences about the unperceived; nor mistrust the facts proved through apparent objects according to analogy, but trust them just as one trusts the facts from which the inference is made. In the same way, we necessarily differentiate the generic and specific differences of signs in each case. For we are searching for the generic similarities.

(Frag. 3) We ought to reason through inference according to similarity or through analogy; and this being so, we should not depart from the analogy that is furnished by empirical facts. Further, let us posit some things as signs of the existence of unperceived objects, some of a determinate existence, some of non-existence, some of the absence of a determinate existence; and let us not reason from things whose signification varies. We do not infer from the signs tested by contra-position, except in the case of things unperceived by nature about which we make inferences from the apparent.

(Frag. 4) We should use previously demonstrated facts, together with all facts derived from experience, in serious inductive inference, and not apart from inductive inference. And we should use the proper criteria, so that we shall not in any case think that we know objects temporally unperceived by the absence of conflicting evidence, and so that we shall not think that things which are subject to verification are unperceived by nature; and further, so that we may not consider a thing apparent on the ground that it does not seem to be unperceived by nature, or unperceived by nature on the ground that it does not seem to be apparent.

(Frag. 5) (Too fragmentary to translate)

(Frag. 6) He who recalls that mental perceptions occur in this circumstance, namely, apart from perceptions and present objects, and he who says that it is doubtful whether this occurrence comes about through images or is illusory, will not prove that these perceptions are not what they appear. Images can exist either by chance or as products of solid bodies, but they cannot be false.

(Frag. 7) (Too fragmentary to translate)

(Frag. 4) We should refer our notion of the gods to the revelations which take place by mental perception and which guarantee clearly that heavenly and eternal beings exist.