

THERMODYNAMICS, ENERGY, MATTER, AND FORM

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The dichotomy of matter and energy is very common in physical discussions. It is suggested here that both matter and energy are, in a sense, to be considered as the materials of things. An alternate dichotomy, then, is the old one of form and matter. Matter is conserved, forms are replicated; but neither matter nor form arises from nothing. The consideration, that forms arise only from pre-existing forms, is enough to reveal the impossibility of evolution. Thus, the argument about forms may serve as a useful alternate to the common appeal by Creationists to the second law of thermodynamics.

Creationists often make much, in arguments, of the laws of thermodynamics, especially the second. Certainly the points expressed thus: that from nothing comes nothing, and that from disorder order does not come spontaneously, are valid.^{1,2}

There may, however, be difficulties, especially with an appeal to the second law. Because of the way in which that law was established, there may be a tendency to bring in considerations quite foreign to the Creationist's purpose. Also, opponents are likely to quibble about open and closed systems.

One may wonder, then, whether there may be some law or principle, somewhat more general and not presenting these difficulties. It is suggested that indeed there is such a principle, and that it may be very useful. After some preliminary discussion, the proposed principle will be stated.

Conservation and the First Law

The first law of thermodynamics is really a statement of conservation of energy, especially as it applies to mechanical and thermal processes, which are often what are being considered. In physical science there are two principles of conservation which are often mentioned: conservation of energy and of mass (or matter). These quantities are said to be conserved, that is, to remain the same.³

It is better to speak of conservation of mass than of matter. For conservation is a quantitative notion; it is a quantity which is conserved. Both energy and mass are, in this sense, quantities; it is often said, after Newton, that mass is the quantity of matter. Besides, matter, in so far as it is matter and nothing else, must remain unknown; then it would not be known whether or not it was conserved.

It is sometimes said that, according to the theory of relativity, it is mass and energy together which is conserved. That notion will be examined in an appendix; and it will be found that each is conserved independently, but that usually the processes going on involve both.

Matter vs. Energy

In many discussions, matter (now scarcely considered synonymous with mass) and energy are presented as the two contrasting things in physical science. Such a contrast is strange, if it is proposed to go on and argue that they are the same thing, essentially, as is often done. While the more extreme doctrine that they are the same is repudiated here, it will be seen that they do have

something in common. Thus it seems advisable to look for a different antithesis.

Matter and Form

In fact, such an antithesis was known at least from Aristotle's time, and it had great use especially among the Schoolmen. The antithesis meant is that of matter and form.⁴

Matter, in this context, means much the same as material. It is the material element in things.

Form means, in a sense, the way in which the material is used. For a statue, as the ancients used to say, the material is marble, or whatever it may be; the form is the shape of the statue. The matter, or material, of a house is lumber, bricks, etc.; the form is the design. The matter of a machine is steel, for instance; the form is the design and the function of the machine.

Consider the work in a foundry. The matter is the pig iron which is used. The forms are, or are incorporated in, the molds. One great difference between form and matter is apparent here. When the supply of iron is exhausted, nothing more can be made. Matter, it might be said, is that of which there is only so much. The same amount of iron, in finished products and in scrap, leaves the foundry as entered it in pigs. The matter is conserved.

As for the form, the same mold could, in principle at least, be used over and over. (This is true at least in principle. The actual current practices in a working foundry are not to the point here.) And how were the molds made? From patterns, which likewise incorporated the forms of the things to be made.

Is the point not plain, then? Matter is conserved. Once a certain amount of matter is used for something, it is out of circulation, until the thing in which it was used is melted down, or whatever may be necessary to recover the matter done.

Forms, on the other hand, are replicated. The form came from a previously existing form; the mold from the pattern, for instance.

Incidentally, since energy, too, is conserved, it may be convenient, as is suggested in the appendix, to count it in as matter, in a sense.

Three Ways in Which a Form Can Exist

It has been said that forms are replicated; that a form comes from a previously existing form. That is true; but it is necessary to distinguish the different ways in which forms can exist.

First of all, they can exist as the form of some matter. The form of the statue exists as the form of a piece of marble. The form of the casting exists as the form of

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some iron, the form and matter together making up the casting. It also existed, in much the same way, in the mold and in the pattern.

A second way in which a form may exist is in matter, but in pieces. Consider, for instance, an automatic lathe, making some machine part. The form of the part exists in the cams, followers, levers, etc., of the lathe. So it is still material, but in several parts.

This printed page may furnish another example. When it had been set up in type, its form existed in the type. But now consider an earlier stage: the typewritten manuscript. Its form existed, before the typewriting had been done, partly in the typist's soul, as will be explained; but partly in the typewriter, in pieces.

What is meant by "in pieces" (or parts), is this. The forms of the letters, which are parts of the total form, existed in the typewriter. So did the spaces between letters, for instance; but they existed in the form of the spaces between notches in the control of the carriage. So the form existed in parts; these parts were assembled under the typist's control.

The third way in which a form may exist is in a soul, or mind. The word "soul" is used here in Aristotle's sense; the Christian sense includes and goes beyond that. The order of the letters in the manuscript, for instance, existed at one stage in the typist's soul. And the form of the statue, before the statue had been carved, existed in the sculptor's soul.⁵

There is a special point about the existence of a form in matter, but in parts. The thing in which the form exists will always be considerably more complicated than the form itself. Few would deny that the typewriter is more complicated than the sheet of manuscript. And the automatic lathe is certainly much more complicated than the thing which it is making.

It is easy to see why this must be so. For the thing under discussion, the typewriter, automatic lathe, or whatever it may be, must not only contain all of the parts of the form which it will reproduce, but also it must embody its own form. So naturally it is a more complicated thing.

The Potential Existence of Forms in the Soul

It is necessary to consider a little more of the existence of forms in the soul. For the sculptor did not consciously have the form of the statue in his soul from childhood; he was not always thinking about it.

It must be said, then, that the soul contains all forms, but potentially. Aristotle distinguished two senses of this potentiality. When the sculptor was an infant, then he was potentially a sculptor, in that, being human, he had the ability to learn the art in due time. Later, when he had become a sculptor, it was potentially in his soul in that, when he set himself to thinking about it, he could give the form to the marble to make the statue.⁶

The Impossibility of Evolution

That there are many forms in the world today, none will deny. And many of them, especially the forms of living beings, are most complicated. How did they come about?

It was proposed above that a form comes from a pre-existing form. But the evolutionist would admit that there was a time when the Earth was without form. In this, at least, he would agree with Genesis.

But suppose that there was a time when there was nothing but a cloud of dust, or of nebula, or whatever the current fashion may be. Certainly the forms of planets and stars, let alone living things, did not exist materially in it as stars, planets, and living things.

Neither did these forms exist materially in parts. For how could they have done so? Besides, it has been shown that such an existence demands something even more complicated than the form in question; and how would that be found in a featureless cloud of stuff?

Finally, the evolutionist, if he is of the usual materialistic type, can not claim that the forms then existed in a soul. For he will not admit that there is such a thing as a soul. So he has no way of accounting for the variety of things which now admittedly exist.

All that he can do is argue that forms need not come from pre-existing forms. But then one may appeal to induction, and show that in every case in which one can trace whence the form came, it came from a pre-existing one. So the evolutionist has not a leg to stand on.

Note that the evolutionist in mind here was a materialistic evolutionist. A theistic evolutionist might not be affected so much by this argument; it would be necessary to argue with him on other grounds.⁷

The Creationist's Viewpoint

The Creationist grants—nay, insists—that there was a time when all of the forms did not exist in the world in a material way. But this causes him no trouble. For then they existed in God. For certain aspects of God's being are analogous to the human soul, but infinitely more powerful. So, just as at one time the form of the statue was in the sculptor's soul, so at one time the forms of all of the things which are in the world were in God.

Indeed, it is not too strong a statement to say that the admission that forms can come only from pre-existing forms logically compels one to admit that there is a Creator.

Conclusion

It has been argued, then, that much of the same conclusions as it is often proposed to reach by the second law of thermodynamics can be reached by using the principle that forms come only from pre-existing forms. And such an argument leaves no room for quibbles about open and closed systems.

It is not proposed, of course, that this principle supersede the second law generally. In the first place, the second law, being a more quantitative thing, will continue to be needed for purposes of calculation in engineering and other fields. Also, the term "second law of thermodynamics" has been used so much by Creationists that it will likely continue to be used. But in such cases there may be a possibility of meeting quibbles by an appeal to this principle of forms, as something more general.

The Second Law Again

It is often noted that the second law of thermodynamics implies that in every process some energy becomes unavailable. Is that not true of matter also? A machine shop produces scrap; carpentry, useless ends of boards; and so in other cases. This view may be useful if energy and matter are to be considered together.

Is something the same not true of forms at each replication? If a casting is used to make a mold, the mold to make another casting, and so on, flaws will accumulate, until the result is useless. Likewise if a book is copied many times. One might say that the original form becomes less and less available.

It is hoped, in a subsequent issue, to have an appendix, discussing in more detail certain points about conservation.

References

- ¹Williams, Emmett L., 1973. Thermodynamics: a tool for Creationists. *Creation Research Society Quarterly* 10(1):38-44.
- ²Morris, Henry M., 1970. Evolution theory and thermodynamics. *Creation Research Society Quarterly* 6(4):199-200.
- ³Armstrong, H. L., 1975. Use of the second law of thermodynamics in macroscopic form in Creation studies. *Creation Research Society Quarterly* 12(2):103-106.
- ⁴Cardinal Mercier and others. A manual of modern Scholastic philosophy. Third English edition, translated by T. L. Parker and S. A. Parker, 1960. Routledge and Kegan Paul, London. Volume 1, pp. 506-508.
- ⁵Aristotle, *Metaphysics*, Book VII, Chapter 7.
- ⁶Aristotle, *On the Soul*, Book II, Chapter 5.
- ⁷Armstrong, H. L., 1976. An examination of theistic evolution. *Creation Research Society Quarterly* 13(2):108-110.

REPORT OF 1978 BOARD OF DIRECTORS MEETING

The annual meeting of the Board of Directors of the Creation Research Society was held at Concordia College, Ann Arbor, Michigan, beginning at 1830 Friday, 21 April 1978, with a time of silent prayer. Present were: G. Howe, E. Williams, H. Armstrong, W. Frair, R. Korthals, W. Rusch, T. Barnes, D. Boylan, C. Burdick, D. Gish, J. Klotz, W. Lammerts, J. Meyer, J. Moore, G. Mulfinger, H. Slusher, W. Tinkle. Absent: H. Morris. Visitors were welcomed by President Howe. Ladies among the visitors kindly provided refreshments during the break.

The minutes of the meeting of 1977 were read and approved. The secretary reported that 217 ballots had been cast in the election and the six incumbents in the slate of ten were reelected. (See June *Quarterly*.) The Student Chapter constitutional amendment (Article III, Section 3) was passed by a vote of 211 to 6.

Treasurer Korthals disclosed that income for the year was \$37,204.88; total expenses were \$36,302.16; and the balance in accounts as of 31 March 1978 was \$47,323.33.

Rusch, the membership secretary, reported that there are now 595 voting members, 1152 sustaining members, 95 subscribers, 412 student members, 180 library subscriptions, 16 school subscriptions, and 6 church subscriptions, giving a total of 2466. Changes of addresses should be referred to Rusch's office. Notices, and second notices if necessary, are sent about renewal; but members and subscribers need not wait for them.

Rusch reported on the C.R.S. biology books. Sales have been: textbook—56,900; teacher's guide—3,000; student's lab manual—14,000; teacher's manual with answers—2500. Rusch also reported on the Textbook Committee meetings dealing with options regarding revisions.

Armstrong, editor of the *C.R.S. Quarterly*, reported that it has remained and will continue at about 230 pages per year. He always appreciates receiving suggestions from readers.

Meyer reported on new membership brochures, 10,000 of which were printed at a cost of \$772.50. Also he hopes soon to have bulletin board posters available for use primarily in science departments of colleges and universities. Meyer also reported advertising in *The Sword of the Lord*. *Scientific American* had refused to print a C.R.S. advertisement; so one will be placed in *Science* or *Nature*. During the past year 40 news releases were sent out.

Slusher described the El Paso, Texas, student chapter, which is the first student chapter and presently has three to nine members. Meetings are held every two weeks, and student reports are given on creation subjects. Slusher urges development of chapters elsewhere. He may be contacted for help.

Williams, chairman of the Research Committee, introduced Dr. Henry D. Voss who was followed by Professor M. E. Clark and Dr. Sherman Kanagy in describing some of their research on the action of water in a large circular flume. Meyer announced a projected island biogeographical study which could be undertaken at Sheva Temple in the Grand Canyon.

Mulfinger reported progress on preparation of technical monographs. Efforts are being made not only to reprint some old works, but also to produce some contemporary "state-of-the-art" publications.

Barnes discussed participation on "Openness as a Principle in Science". He has about 600 signers and hopes to get more.

The meeting was adjourned at 2320.

Next session was called to order on Saturday, 22 April, at 0905 and began with a period of silent prayer. Consideration was given to encouraging distribution of the article by W. R. Bird published in *The Yale Law Journal* 87(3), January 1978, dealing with legal aspects of teaching religion and science in public schools. Also the book, *The Separation Illusion*, by John W. Whitehead; 1977; published by Mott Media, Box 236, Milford, MI 48042; cost, \$4.25; was discussed. It was