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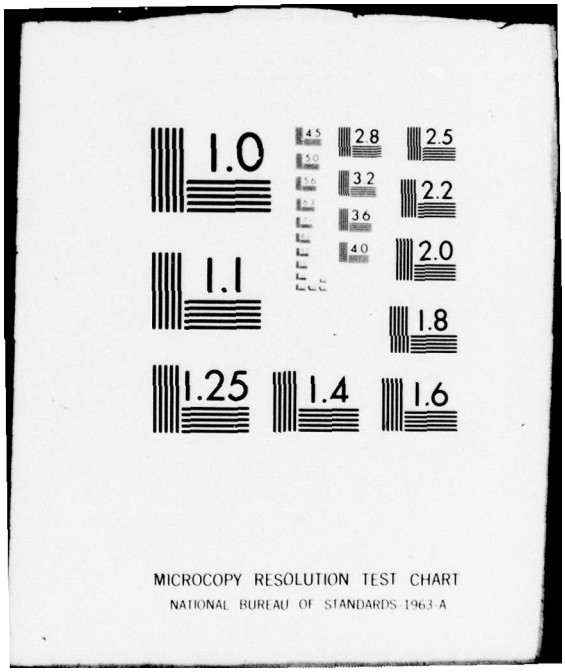
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THE FOURTH LAW OF LOGIC

Thomas E. Bearden

409

Computer Sciences Corp., Hunts

TO: MS. ALICE HEALY
DDC - TOD

CSC

COMPUTER SCIENCES CORPORATION

from the desk of TOM BEARDEN

Dear Ms. Healy,

Enclosed is the paper I spoke about to you on the phone. Again, this is a quite fundamental paper with very extensive ramifications to all our science, logic, and mathematics -- indeed, to our basic concept of fundamental reality itself. I'd very much appreciate your placing this paper in DDC as usual, so that the work may be circulated to other interested theoreticians.

Thank you very much for your courtesy, consideration, and continued assistance.

Sincerely,

Tom Bearden

Thomas E. Bearden
MS, Nuclear Engineering
LTC, U.S. Army (Retired).

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Treating an element of a set as a monocularly perceived entity and accounting for the individual intervals of time used in the perceptions involved in a logic statement, the author demonstrates a simple method for comprehending the identity of opposites, by means of binocular perception in a single monocular frame. He further demonstrates that the present three laws of logic as written are self-contradictory, hence illogical. By writing
Abstract (Continued)

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Key Words (Concluded)

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Abstract (Concluded)

the time-accounted form of the identity of opposites as a fourth law of logic, the author shows that the four-law system is closed, since the fourth law contains the negation of each of the first three laws.

By defining a paradox as something known to be valid but which can be shown to violate one or more of the first three laws of logic, every paradox must therefore be a statement of the fourth law. At least hypothetically, any paradox can thus be "solved" by appropriate application of the fourth law. The author shows two simple methods of applying the fourth law, and solves several long-standing paradoxes such as how lines (lengths) can be made of points (nonlengths), the problem of change, the problem of the definition of probability, and statements such as "It is true that this statement is false."

Aristotle's three laws are shown to implicitly contain the fourth law, and the fourth law to implicitly contain the first three laws. Thus it emerges that either the first three laws apply explicitly and the fourth implicitly, or the fourth applies explicitly and the first three implicitly.

The first three laws are stated to be synthesized from and fitted to the photon interaction, by primitive human observation -- hence they are fitted to monocular perception and apply only away from a boundary. The fourth law is deliberately fitted to binocular perception and thus only applies to the boundary and in the absence of the photon interaction. The two-slit experiment, which contains the heart of quantum mechanics, clearly demonstrates the logical fitting to the presence or absence of the photon interaction.

The fourth law of logic applies to every present rational science, mathematical system, and logical system and subtly changes all of them.

The author refers to his work in applying four-law logic to solve the problem of the nature of mind and its interaction with matter, and paranormal phenomena.

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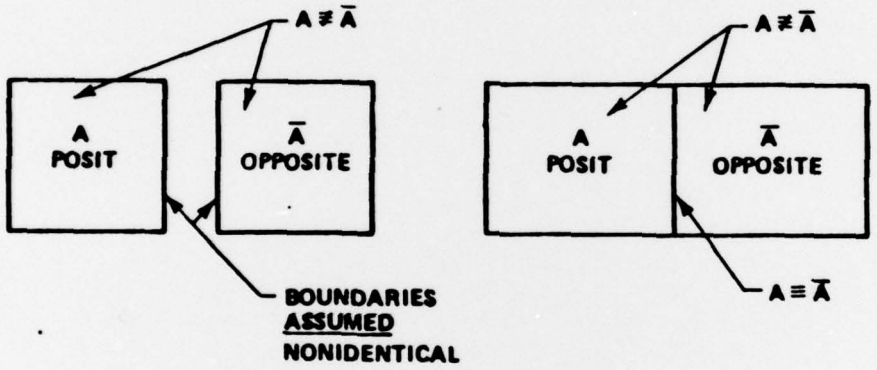
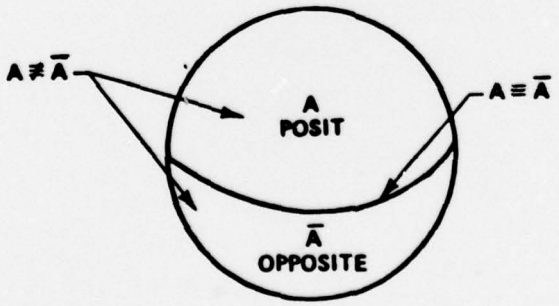
THE FOURTH LAW OF LOGIC

There exists a rather strange paradox in all science, mathematics, philosophy, and logic -- indeed in the entire rational thought of the Western world -- which many scientists themselves are unaware of. It is a fact, unknown to many, that the entire structure of Western knowledge is known to be founded on totally illogical, irrational bases; and "objective science" is founded totally on the nonobjective. Indeed, if one pursues any rational thought to its limit, it turns into irrationality. Regardless of how hard we try to avoid the logical pitfall, if we pursue any logical thought to its boundary, it turns into its own opposite. This "accursed necessity for the identity of opposites" has been the bane of many a philosopher, logician, and foundations mathematician for it has thusfar proven inescapable and incomprehensible.



(a) CLASSICAL LOGIC

(b) BOUNDARY IDENTITY OF OPPOSITES



(c) Boundary identity of opposites, spherical surface.

Figure 1. The boundary identity of opposites -- Venn diagrams.

Yet in this paper we propose a path around the "Great Dilemma" that underlies all our Western rationality, and we propose a methodology to comprehend the identity of opposites. Further, we propose a simple methodology to apply the fourth law to solve present paradoxes. We state at the beginning that this is not just a mental exercise; indeed, it has direct application for the construction of real physical (and nonphysical!) devices that function in ways our present devices do not. Further, we state that the methodology offers at least one way to unite physics and metaphysics on a single, consistent, scientific basis.

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Aristotle instituted the basic precept that every demonstrative science must start from indemonstrable principles(1). Those principles common to all sciences are called axioms(2). "Elsewhere the axioms are characterized as the common opinions from which all demonstration proceeds, and as those things which anyone must hold who is to learn anything at all."(3) Euclid used a division of postulates (indemonstrable principles peculiar to the science of geometry) and common notions (the same as Aristotle's axioms.) While there is still some confusion even today between the terms postulate and axiom, an increasing usage is evidenced to limit the term axiom to the axioms of logic, and the term postulate to those assumptions or first principles beyond the axioms of logic by means of which a particular mathematical or scientific discipline is defined.

However, all our present science, mathematics, logic, and philosophy are known to be open-ended and assumptive. This follows directly from Gödel's famous proof that, within any rigidly logical system there are questions (propositions) that cannot be proved or disproved on the basis of the axioms within that system(4). In other words, none of our present sciences are necessarily free from contradiction. In fact, they are not necessarily even consistent, from recent work on foundations of axiomatic set theory. This follows because, assuming that a particular axiomatic theory T is consistent, and S is a sentence or formula of T that is not an axiom and is also independent, then the theory T remains consistent whether S or not-S is added to it(5).

In brief, these results have proven already that there can and do exist many parts of an axiomatic theory which are subject to leaving the theory consistent even when their negations are also assumed. Or put another way, every theory has "holes" in it where the identity of opposites can apply; where S can be said to be both true and false implicitly, but either true or false explicitly.

Let us turn now to a much simpler discussion of the problem posed by this peculiar S property that has been proven existable in all theories, and resolve the quandary.

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In the sixth century B.C., the philosopher Heraclitus pointed out that everything was in a state of flux and nothing was at rest. He accepted the belief that reason could find an underlying unity or unchanging basis in the world, but asked how this permanence could be reconciled with the fact of change (nonpermanence). For if a thing changes, then it becomes something else; but then how can a thing be something else different from itself? Thus the philosophical problem of change -- as do so many other such

philosophical problems -- confronts the necessity for the identity of oppositive things, and thus accents the vexing problem that has confounded philosophers, logicians, and thinkers through the centuries. For if one pursues any matter to its ultimate, he will meet the necessity for the identity of opposites at the very boundary of the matter being pursued.

Up to the present, a completely satisfactory answer to Heraclitus's question has not been discovered(6). In the sixth century B.C., the prevailing conclusion was that the world is merely the totality of all changes, and stability results from the union of opposites. Even in Heraclitus's day, however, opinion on the problem of change was sharply divided; e.g., Parmenides regarded change as an illusion! He reasoned that whatever is, is; and whatever is not, is not. Thus whatever changes both is and is not at the same time, which is a contradiction since a thing cannot logically be its opposite(7).We should note here that much of reality is known to violate logic even though true; i.e., parts of reality are known to be illogical (paradoxical). Thus if opposites can be identical, this might simply constitute the ultimate paradox).

This led to the argument that change meant creation, the appearance of something new. However, for something that did not exist before to come into existence implied the creation of something out of nothing, which again was an intolerable contradiction (8).

Hegel (9) regarded the "union of opposites" as a conflict which created a new entity or new reality. Thus he reasoned that one thing (thesis) met its opposite thing (antithesis) and from the conflict between them there emerged a third thing (synthesis). This gave birth to dialectics, which even today is the central philosophical theme of dialectical materialism. However, Hegel's dialectics are primarily a restatement of the ancient "union of opposites" or "identity of opposites" idea of the sixth century B.C.

If the problem were simply something that old men with long white beards discussed because heat had soaked their brains, and if it had no further ramifications, then the problem would not be worth discussion. However, the problem of the "accursed necessity of the identity of opposites" is directly applicable to the most fundamental part of all Western logic, rational thought, mathematics, and science. For the basis of all of these is Aristotle's three laws of logic, and these laws can be shown to violate themselves because they involve in the symbol for their logic operations an identity of oppositives. Since all logic, science, and mathematics are founded on these three laws, the fact that the laws themselves are self-contradictory is a matter of the most fundamental importance. We will clarify the violation in each of the three laws of Aristotle shortly, and then give the resolution. But first we mention a few other basic fundamentals of Western science that are presently founded on illogical bases.

First is the matter of geometry. Geometry is actually the modeling of thing and extension in terms of nonthing and nothingness. For example, foundations mathematicians and logicians abandoned the attempt to define lines, points, etc after almost a hundred year struggle. First they attempted to define a line as length, or that which has length, or the presence of length. They then defined a point as nonlength, or that which has no length, or the absence of length. But then lines cannot be made of points, for if they were, length and nonlength would be identical, and presence and absence of length would be identical. Today they simply do not attempt definitions; instead they simply state, "There is a class of entities called lines. There is another class of entities called points. Lines are made of points." and go on from there.

(note that the line and one of its points
cannot be simultaneously observed/perceived/thought)

Figure 2. How can a line be composed of points?
Length be comprised of nonlength?
Presence of length be comprised of absence of length?

FUTURE = NOT OCCURRED; PAST = OCCURRED

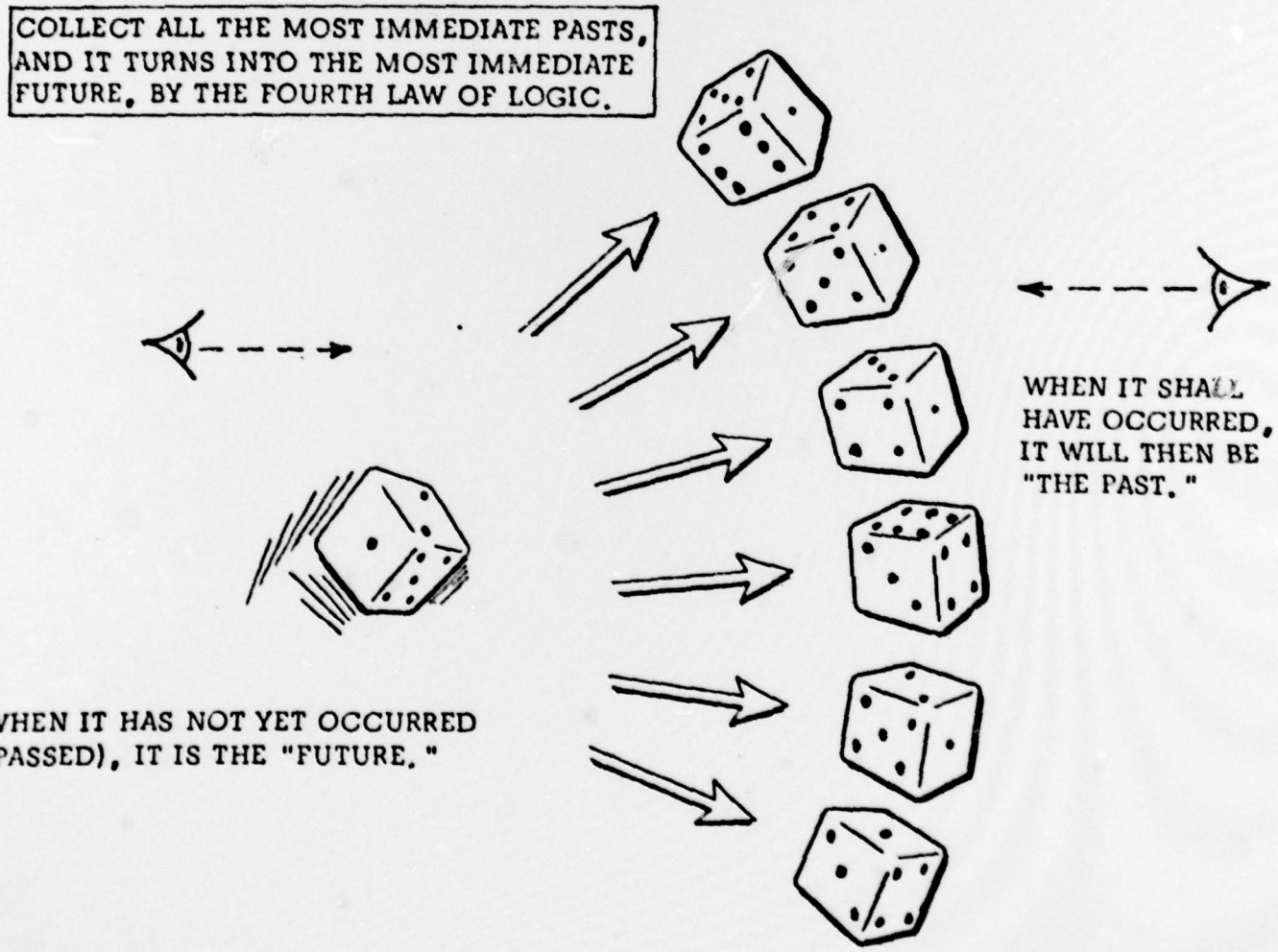
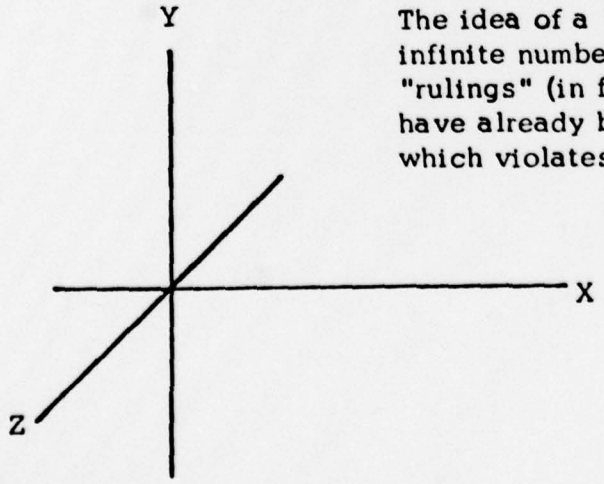


Figure 3. Probability: Modeling the future in terms of the past.

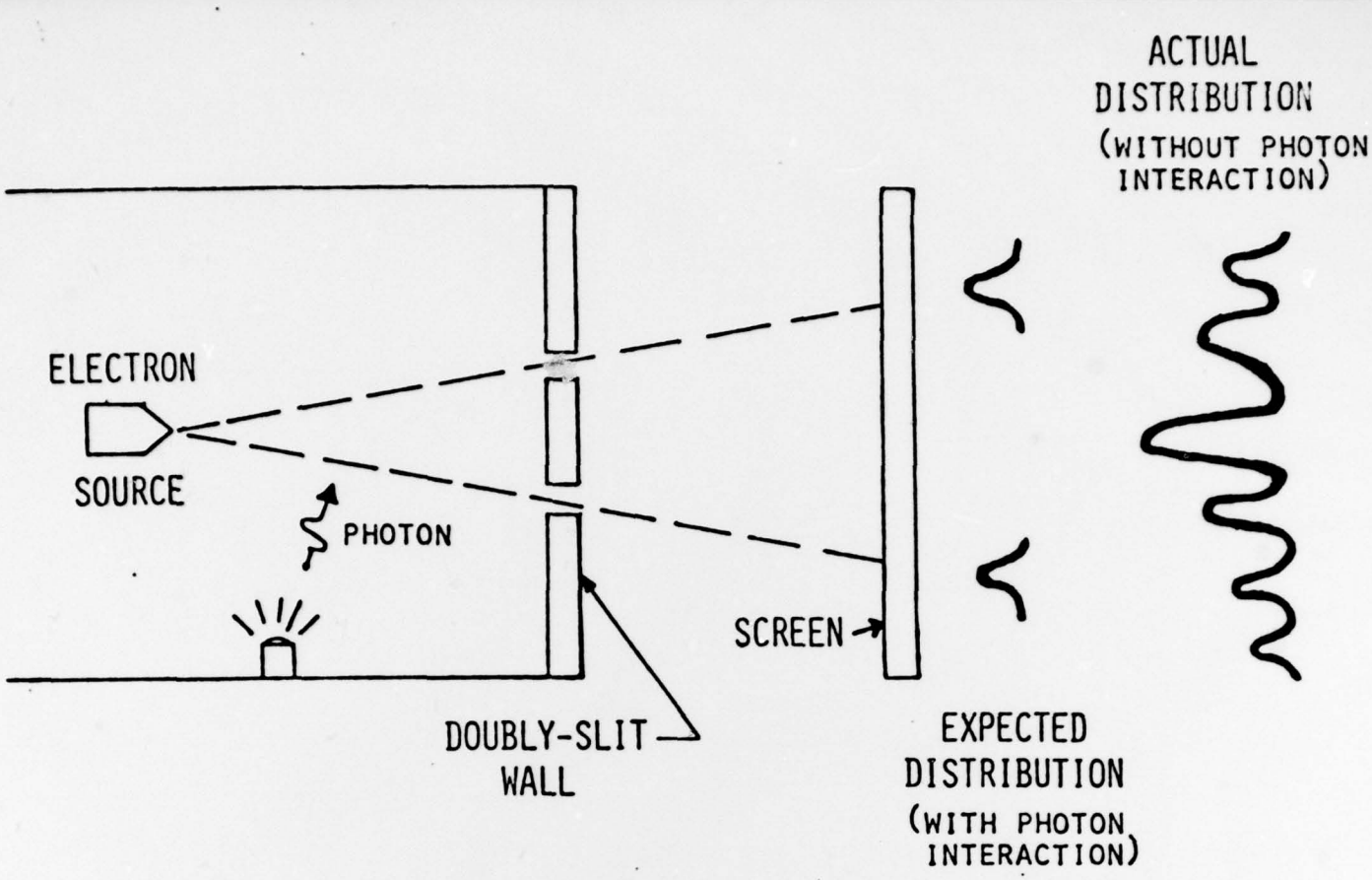
Second is the matter of "probability." In the concept of probability, one is essentially concerned with representing the most immediate future in terms of the most immediate past. I.e., one wishes to speak of an event before it happens. However, the concept of an "event" is of something which has happened, is in the past, and gone. Thus to speak of a "future event" -- one "which has not happened" -- is to speak of the future in terms of the past. Again, there is no accepted logical solution to the dilemma of probability, which today is founded on a totally illogical basis. Most logicians and foundations mathematicians have also abandoned the attempt to resolve the difficulty; today when a definition of probability is attempted, it is done essentially as a tautology. Probability is probability, any fool knows that! -- this is the statement one is likely to get in one form or another.

In relativity, the idea of a frame constitutes a logical contradiction. Relativity establishes that separation (length and time) are variable; further, the only thing which can be observed is an "event." Since length and time are not events, they cannot be observed. If length and time are declared observable, then nonevents are observable and relativity violates itself. Yet the concept of an "event" is one which takes place in space (length cubed) and time, contains length and time, and is length and time. In fact, in general relativity, all that mass (the presence of thing) is, is a "kink" or curvature in spacetime nothingness. Further, all of relativity is based on the idea of the localized event, and events are observed by only a single observer at a time. This observer himself is localized; yet the idea of a frame presupposes that an infinite number of "measurements" has been made already, and a length established to each and every "point" in the frame, so that an infinity of observations have been made by an infinite number of observers. The "frame" is thus a sort of distributed "transcendent superobserver," and this violates relativity. Specifically, the idea that a distant point and the observer's point of location can coexist simultaneously in time violates relativity, because time is convertable to length and vice versa, c -- the speed of light -- being the conversion coefficient for "unaccelerated frames". Thus any two separated points have a priori a time separation between them. Rigorously, in relativity there is no such thing as absolute simultaneity between two separated spatial points, and the concept of a frame directly violates this characteristic.



The idea of a "frame" implies that an infinite number of measurements or "rulings" (in fact, every possible one) have already been made simultaneously, which violates relativity.

Figure 4. A Cartesian frame.



NOTE: IF THE ELECTRON IS HIT BY A PHOTON BEFORE IT REACHES THE TWO-SLIT REGION, IT DOES NOT EXHIBIT THE WAVE INTERFERENCE EFFECT, BUT INSTEAD ACTS AS A CLASSICAL OBJECT AND GOES THROUGH ONLY ONE SLIT, YIELDING THE "EXPECTED DISTRIBUTION" PATTERN.

Figure 5. Young's two-slit experiment contains the heart of quantum mechanics and cannot be explained by any classical means.

In physics, in Young's two-slit experiment one can decide whether the electron shall be observed as a particle (corpuscle) or as a wave. One can get it to become totally a particle or totally a wave, simply by whether or not the electron is hit by a photon before it hits the collecting screen. A lengthy controversy on the "wave versus particle" problem was evaded eventually by shaking hands and agreeing to quit fighting! For the principle of complementarity is merely a statement that the determination of whether an entity is a wave or a particle can yield either result exclusively, but not both at the same time. The question of what the particle is before it is observed is tacitly ignored, and indeed usually considered as an "improper question" these days.

Indeed, the Heisenberg uncertainty principle, sometimes referred to as the indeterminancy principle, is also a statement that perception is totally monocular. If one absolutely determines one of a pair of canonical variables, then the other is absolutely undetermined. This translates to the statement that if one is totally perceived, the other is totally unperceived -- so only one of them at a time can be "totally perceived." Interestingly enough, one can even paraphrase the uncertainty principle as "It is absolutely certain that nothing is absolutely certain," in which form its direct analogy to the "conflict of opposites" involved in the age-old problem of change is revealed.

And in logic, logicians have long since despaired over such statements as "It is true that this statement is false." Indeed, most logicians today become quite heated if such a statement is even broached as a problem, the prevailing conclusion (assumption) having been taken that such statements are not logical statements, and have no relevance. However, it is simply a statement which has infolded both truth and falsity in the same enclosure, and identified the two oppositives.

So indeed the problem of change, and the problem of the "identity of opposites" at the boundary are directly applicable to science and technology. So let us address the problem more fully, by addressing the very basis, the three laws of logic.

1.	$A \equiv A$	A is identical to A
2.	$A \not\equiv \bar{A}$	A is not identical to not-A
3.	$A \vee \bar{A}$	A or not-A

Figure 6. Aristotle's three laws (axioms) of logic.

Let us now make a fundamental correction to Aristotle's three laws of logic. First, there is no independent existence to mental phenomena; there is a perception operation involved when we think. There is no independent existence to physical phenomena; there is a perception operation involved when we observe physical phenomena. Furthermore, it takes a finite time interval (piece of time) for the perception process to occur. The logic symbol for a logic operation also requires a separate time interval; it represents a series of separately perceived operations that together comprise a decision algorithm. So let us impose this criterion upon logic itself so as to constitute "logical perception" or the "logic of perception" or the "perception of logic." We begin with Aristotle's third law of logic, A or not-A, written as the law of the excluded middle, $A \vee \bar{A}$ (figure 7). We insist there is no such thing as A per se, but rather there is a perceived A where A is the output of the perception process. Similarly, there is no such thing as not-A per se, but rather there is a perceived not-A where not-A is the output of the perception process.

We use a square box symbol as an abbreviation for the fact that a perception has occurred, and anything written inside the box represents the output of that perception operation/interval. We can speak of the box either as mental perception -- a description of thought -- or we can speak of it as physical detection -- a description of an instrumentation system that detects and measures. (This is because the box refers to the time interval during which the process occurs, and both mentation and physical detection require a time interval in which to occur). Since each box represents a process which requires a finite time to occur, we must carefully keep up with and account for the individual little pieces of time, the delta t's.

Applying this to Aristotle's third law, we have A perceived or outputted in time one, and not-A outputted in time two. Note that to ascertain that A_1 and not-A_2 actually differ requires a series of operations in a separate time interval, in time three, and this is assumed by the exclusive or symbol. Looked at in this way, Aristotle's third law actually is the law of monocularity; it states that only one thing at a time is perceived. (Actually we had assumed this when we assumed that perception was a

A FUNDAMENTAL CORRECTION TO CLASSICAL LOGIC

1. $A \vee \bar{A}$ ARISTOTLE'S LAW OF THE EXCLUDED MIDDLE

2. DEFINE $\boxed{\ }$ AS "IS PERCEIVED"

3. $\boxed{A} \vee \boxed{\bar{A}}$ LAW OF THE EXCLUDED MIDDLE

4. EACH PERCEPTION IS A FINITE OPERATION AND REQUIRES A FINITE TIME TO OCCUR.
   THE LOGIC SYMBOL ALSO REPRESENTS A DECISION ALGORITHM: A SERIES OF OPERATIONS PERFORMED IN A SEPARATE TIME INTERVAL.
   EACH FINITE TIME INTERVAL MUST BE ACCOUNTED FOR.

5. $\boxed{A}_1 \vee_3 \boxed{\bar{A}}_2$

6. THE LAW STATES THAT PERCEPTION IS A MONOCULAR PROCESS IN TIME 3.
   ONLY ONE-THING-AT-A-TIME IS PERCEIVED.

7. NOW NOTE THAT SEPARATION OF A AND $\bar{A}$ DOES NOT OCCUR IN

   $$\boxed{(A_1 \, , \, \bar{A}_2)}_3 \quad \equiv_5 \quad \boxed{B}_4$$

8. SO $A_1 \equiv_3 \bar{A}_2 \Big|_{4,5}$ BOUNDARY IDENTITY OF EXACT OPPOSITES

9. AND EQUATION 8 CONSTITUTES A FOURTH LAW OF LOGICAL THOUGHT.
   IT SIMPLY STATES THAT PERCEPTION THREE IS BINOCULAR, AND EXCLUSIVE SEPARATION OF EITHER A OR $\bar{A}$ IS NOT PERMITTED.

Figure 7. A fundamental change to classical logic.

finite process, so it is nice to find that Aristotle's third law justifies our assumption, once we understand the third law. The exclusive or symbol assumes a third operation in time three, whereby it is determined that perception output one and output two actually differ. But such an operation -- a decision algorithm --itself requires multiocular perception (i.e., collecting two outputs at once), and that in itself is a violation of Aristotle's third law. The third law thus contains its own contradiction, and indeed

each of the other two laws also contradicts the third law when one examines them meticulously, for each of them in its logic operation symbol implies a binocular perception. Thus each of Aristotle's laws can only be established as true by invoking or involving an operation which negates the third law, and violates it.

Now let us perform a gedanken experiment (thought experiment) to see if we can find a way to comprehend the identity of A and not-A. Here again we start as before, and we have perceived A_1 in time interval one, and not-A_2 in time interval two. We assume we are able to figuratively "pick up" A_1 and not-A_2, so to speak, much like picking up two playing cards that have previously been chosen. We also assume we can forcibly (or perhaps just slyly) input both of the cards to the perception process simultaneously, and force the process to process them both at once, without any additional operations being allowed to separate them or to process either one separately.

In time three we gathered up what had been perception output in time one, A_1, and what had been perception output in time two, $\overline{A_2}$, which in time two we do not yet know is different from A_1, and input them both into the perception process, getting only one output -- let us call it B -- in time four. By the nature of B in time four, we thus say in time five that the outputs in times one and two differ or not. In either time one or time two alone, there is no indication whatsoever of difference or sameness existing between output one and output two. Likewise, in time three there is no separate output one and output two, hence no indication of the sameness of, or difference between, outputs one and two.

So here we have arrived at the identity of opposites. There is no perception of difference between A_1 and not-A_2 in time three if they are both "shoved through" the perception process's monocular operation simultaneously. This actually constitutes a fourth law of logic: the law of the boundary, or the boundary identity of exact opposites. All that is necessary to identify opposites perceptually is to lose all perceptual distinction between them. And that is accomplished by multiocular perception, by perceiving the presence of "both-at-once-completely-unseparated," hence the absence of either exclusively present. Each is nonexclusively present, but neither is exclusively present. If A_1 and A_2 are exact opposites, then $B_4 \Rightarrow 0$, and $\left[\overline{A_1}, A_2\right]_3 \Rightarrow 0$. We thus have the solution to the problem of nothing: Nothing (absence of any presented exclusive thing) admits of the simultaneous presence of two or more nonexclusive things, where none can be singly (exclusively) perceived or detected. Empty nothingness thus is a plenum, not a void -- and as the zen master refers to it, this is the "void that is devoid of void."

Almost all the philosophers who have struggled with the problems of being, mind, and matter have faced the necessity for the identity of opposites, but none of them could understand how opposites could be identified. By careful accounting of the separate time intervals required for finite monocular perceptions, the mechanism for identifying opposites is immediately clarified and revealed. The laws of logic are simply laws of the operation of perception -- nothing more, nothing less.

The new system of logic is closed. All present paradoxes -- things which are true but which contradict one or more of the first three laws -- are resolved by the fourth law, which contains the negation of each of the first three laws. The fourth law is in fact the law of the paradox. Note also that the hidden time-three operation, which has actually been the application of the fourth law all along, is implied in each of the first three laws. Identity or nonidentity between time-one and time-two outputs can only be established in a time-three operation. The fact that either A or not-A exclusively exists can only be established by a separate operation which establishes that nothing else is there. If separation of A_1 and not-A_2 is absolutely prohibited in time three, then A_1 and not-A_2 cannot be distinguished in time three.

THREE LAWS	FOURTH LAW
1. $A_1 \equiv_3 A_2$ (exclusive)	$A_1 \equiv_3 A_2 \bigwedge A_1 \equiv_3 \bar{A}_2$
2. $A_1 \not\equiv_3 \bar{A}_2$	$A_1 \equiv_3 \bar{A}_2$
3. $A_1 \bigvee_3 \bar{A}_2$	$A_1 \bigwedge_3 \bar{A}_2$

Figure 8. The fourth law of logic contains the negation of each of the first three laws.

Since these laws refer to perceptual operations, one can think of them operationally, or "vectorially". To close the vectorial system prescribed by the first three laws, the opposite or negation of each of the three vectorial statements must be present; i.e., this follows simply from the definition of what constitutes a "closed system," vectorially speaking. Since the fourth law contains the negation of each of the first three laws, then the four-law system is indeed closed, and the logician's dream of a closed metalogic is realized. Furthermore, anything which contradicts any combination of the first three laws automatically is covered by the fourth law, which is the law of the paradox and the boundary. Indeed the fourth law is the law of all logical contradictions.*

The new logic works as follows: either the first three laws explicitly apply (separation of A and not-A is accomplished), or the fourth law explicitly applies (separation of A and not-A is not permitted and not accomplished). The fourth law applies only to -- and in fact creates -- a boundary. The first three laws apply only away from a boundary, and the fourth law applies only to a boundary.

We may also say that all four laws are always used: When the first three laws are explicit, the fourth law is implicit; and when the fourth law is explicit, the first three are implicit.

An example of "identifying opposites" is provided by the absolute value operator. Viewed as an operation, the absolute value process cannot distinguish between a positive and a negative number, since the input of either of them to the process yields the same result.

Another simple example is provided by two marbles, one red and one black, of identical size, texture, weight, and material, which are contained in an opaque bag. If one is allowed to peek at the marbles, the difference can be told immediately. If, however, one is only allowed to blindly feel the marbles in the closed bag, they cannot be distinguished. Whether or not two oppositives can be differentiated or distinguished is a characteristic which depends upon the entire observational/perceptual process, not just on an "innate difference" assumed to exist between them. As we have pointed out previously(10), detection itself is a differentiating process, and derivatives/differentials only are what are perceived. If no derivative or differential is outputted, then perceptual difference is lost, and identity results.

*The necessity for such a law seems obvious. To use negations of the first three laws in logical proofs, one must have a logic law to admit such proof, else it is illogical and not to be permitted. Proof by showing contradiction is widely used in mathematics.

To note how universal this is, we note that change itself violates all three of Aristotle's laws of thought -- and change is all that can be thought, observed, measured, or perceived, for any of these requires "outputting a change" from a pertinent process. We argue as follows: If a thing changes, it has become something else. A has become not-A, negating both laws 1 and 2. And whatever it is that is changing from A to not-A, still is itself though it has changed. Thus it is both A (before the change) and not-A (after the change), negating the third law. This of course is the full statement of Heraclitus's question, and with the fourth law we have now answered the paradox. Without the fourth law, change is illogical, which caused the conclusion by Parmenides that change itself could not exist.

The process of applying the fourth law is quite simple: if <u>all</u> of a percept/thing (say, A) is collected, then the boundary limit (of A) is reached, whereupon the original percept/thing (A) is now identical to (turned into) its oppositive (not-A) (11).

Also, as we briefly mentioned for geometry, ultimately everything/anything is capable of being modeled in terms of its own opposite. One can model not-A in terms of A (the absence of A, which is what the "not-" prefix stands for) and A in terms of not-A (i.e., not-not-A, in a two-value system). And one can easily model the mind in terms of the physical, and the physical in terms of the mind (12).

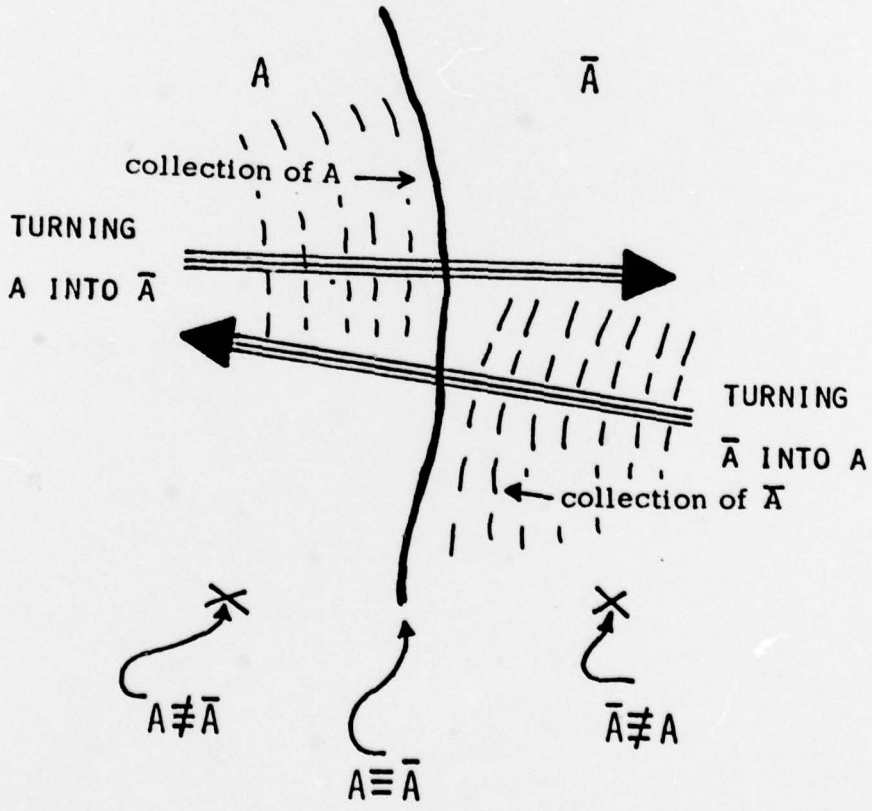


Figure 9. Turning a thing into its opposite (applying the fourth law of logic).

Heraclitus's dilemma can now be solved: A thing can indeed both be and not be at the same time! I.e., a thing -- say A -- can be implicit (unseparated) and not be explicit (not be separated) at one and the same time, by the fourth law of logic (13).

We can also resolve the longstanding wave-particle dilemma: In explicit separation (perception/detection), a thing is monocular and hence either a particle (L^3) or a wave (L^2T) exclusively. Implicitly (nonperceived, not detected), a thing is unseparated as exclusive wave or exclusive particle, and so is inclusively both particle and wave without distinction between the two. Thus the principle of complementarity only addresses the case where detection has occurred; it does not address the case where detection has not occurred. Complementarity in the two-slit experiment applies only to the final result, not to anything preceding. The output of perception applies only after the perceptual operation is completed, not before. And as Wheeler has shown, if we think of the operations preceding the conclusion of the observation as having occurred but not having been observed, then that unobserved past can be changed, even after it has "occurred"! In other words, in the abstract sense observation (completion) finalizes "perceived/observed reality," and until observation (completion) occurs, complementarity does not apply, and whether the particle shall evidence (separate) itself as a corpuscle or wave at the end, remains selectable.

The fourth law of logic applies to every present rational science, mathematics, and logic system, and it changes all of them. We simply state that it is capable of resolving every paradox this author is equipped to examine; hypothetically at least, its application should be capable of resolving every present paradox.

As a primary example the author has applied the fourth law to solve the problem of mind. It has been possible then to model mind and matter and their interaction, and to model a living biosystem. Mechanisms for psychokinesis, UFO's, ESP, psychotronics, radionics, free energy devices, and paranormal phenomena of many types have also been presented, based on the new four-law logic. (14)(12)

NOTES AND REFERENCES

1. "Axiom," Encyclopaedia Britannica, 1968, Vol. 2, p. 921.

2. Ibid.

3. Ibid.

4. Kurt Gödel, "Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme" (On Formally Indeterminable Propositions of the Principia Mathematica and Related Systems), Monatshefte für Mathematik und Physik , vol. 38 (1931).

5. "Set Theory," (specifically, "Present Status of Axiomatic Set Theory), Encyclopaedia Britannica , fifteenth edition, 1976, Micropaedia, Vol. 16, p. 574. See also "Godel, Kurt," Vol. 4, p. 594.

6. Hector Hawton, Philosophy for Pleasure, Fawcett World Library, fifth printing, June 1970, pp. 21-24. This book is highly recommended for the lay reader; while it is out of print, it can usually be obtained from an agency specializing in out-of-print books. It is also a pocket-sized paperback and quite inexpensive.

7. Parmenides, 504 B.C.

8. Hawton, op. cit., p. 24. But note that whether or not the making of something out of nothing is contradictory is itself purely assumptive.

9. Hegel, George Wilhelm Friedrich, German philosopher, 1770-1831.

10. Thomas E. Bearden, Solution of the Fundamental Problem of Quantum Mechanics, January 3, 1977, Defense Documentation Center AD# A034237.

11. A perfect example is Cantor's proof that the set of all sets is not a set.

12. A model of mind and its interaction with matter -- one that is consistent with the present experimental basis of physics -- is contained in Thomas E. Bearden, The Excalibur Briefing, Strawberry Hill Press, distributed by Stackpole Books, 1979, in publication.

13. The idea of "not-being" can be regarded as a statement that "not-being is...," which is its own self-contradiction.

14. It has been possible to model quantized change itself, and derive a hyperspatial (hidden variable) amplification theory which potentially should allow the direct engineering of the virtual state itself. See T.E. Bearden, Virtual State Engineering and Its Implications, 1978, Defense Documentation Center (in publication).