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IS NO HINDERANCE TO SOMETHING

BEING 'TRUE':

RATIONALITY:

OR

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PARADOX IS NOT A NECESSARY AND/OR

SUFFICIENT CONDITION FOR 'TRUTH' :

MATHEMATICS AND SCIENCE EXAMPLES

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COLIN LESLIE DEAN

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EXAMPLES FROM MATHEMATICS AND SCIENCE SHOW THE

DEAN THEOREM

CONTRADICTION, OR INCONSISTENCY WITHIN A VIEW AS WELL

AS MUTUAL CONTRADICTION, OR INCOMMENSURABILITY

BETWEEN VIEWS DOES NOT PRECLUDE THE VIEW OR BOTH

VIEWS FROM BEING 'TRUE'

CONCLUSION

The anthropologist Levy-Bruhl argued that primitive peoples were pre-logical i.e. had a mentality that "... does not bind itself down ... to avoiding contradictions"¹. And Freud said that neurotics did not avoid mutual contradiction.² Now we shall see that contradiction, or inconsistency is no hindrance to a view being 'true' –whether 'truth' is conceived from an instrumental, or coherence, or correspondence (etc) perspective. We shall see that some of the most successful theories in mathematics and science in predicting events are in fact paradoxical or self-contradictory. This being so then it follows that other views containing paradox or self-contradiction such as religion – both primitive and semi-modern- mental illness, magic, the so called pseudo-sciences, superstition, mythology, occultism, non-materialistic etc are not precluded from being 'truth' claims. This is because freedom from contradiction, or absurdity, or meaninglessness is not a necessary and/or sufficient condition for 'truth' as we shall see. Rationality, or the rules of logic are not necessary and sufficient criteria of something being 'true' as has been assumed by anthropologists, philosophers, psychologists etc in our rationality fixated West. Examples from mathematics and science show that somethings can be self-contradictory or paradoxical and still be 'true'. Also examples show that mutually contradictory, or incommensurable explanations can both explain and

¹ Levy-Bruhl, 1926, p.78.

predict the correct results. This indicates that there are other types of comprehension in the world with 'truth' status other than the those based upon the logical principles of a rationality fixated West. The examples from mathematics and science show that rationality as conceived of by the West is a straight jacket upon the mind and both delimits and controls what is possible. The possible is far greater than Western logic or rationality can allow or conceive.

The Prasangika Madhyamika Buddhists demonstrate the absurdity or meaninglessness of all views this would mean that all views are on the same epistemic or logical level nevertheless this does not preclude any of them from being 'true'. If we take Aristotelian logic as an epistemic condition of 'truth' we end up with the notion of the 'two levels of 'truth''. At the first, or logical, level all views collapse into absurdity, or meaninglessness, or paradox or contradiction; at the other, every day level, absurd views can nevertheless give a correct explanation or prediction of the correct results. Thus it is a mystery how our scientific and mathematical theories have the success they do seeing that in terms of Aristotelian logic they are absurd, or meaningless or in other words not 'true'.

² S. Freud, *The Unconscious*, *On Metapsychology*, Penguin, 1984, p.191-192.

This book is a companion book to *The Absurdities or Meaninglessness of Mathematics and Science: Paradoxes and Contradiction in Mathematics and Science which make them Meaningless: Mathematics and Science are examples of Mythical Thought: Case study in the Meaninglessness of all views.*

Aristotle in *The Metaphysics*, makes a distinction between ‘Being’ and ‘being’. ‘Being’ is existence and according to Aristotle, metaphysics studies all the species of ‘Being’.³ On the other hand ‘being’ is a specific species of ‘Being’.⁴ According to Aristotle ‘being’ are substances (essences) and are what are studied by the particular sciences.⁵ Philosophy and science have as many divisions as there are ‘being’ i.e. substances (essences).⁶ The principle of the law of non-contradiction is, according to Aristotle the principle of ‘being’ and is the most certain of principles.⁷ The principle of identity is a principle of ‘being’ by which the law of contradiction is proved.⁸

In regard to ‘being’ Aristotle in *The Metaphysics* laid out the logical principles by which ‘being’ could be investigated (i.e. the law of identity, the law of non-contradiction, the law of the excluded middle). The consequence of the work of Aristotle has been, as Kneale notes, that the successors to Aristotle “often connected logic with the theory of knowledge and the

³ Aristotle, 1947, 1V 1, 2.

⁴ *ibid.*, 1V, 11, 6.

⁵ *ibid.*, 1V, 1, 3.

⁶ *ibid.*, 1V, 1, 10.

⁷ *ibid.*, 1V. 1v. 21.

⁸ *ibid.*, 1V. 1v. 26.

psychology of reasoning.”⁹ These laws of logic have up until modern times been the authority upon which arguments were assessed for validity or rationality. If a philosopher’s arguments did not obey these laws then his peers would call his arguments invalid.¹⁰

Now though there have been advances in principles of inference, in syllogistic logic, symbolic logic, and predicative logic, all the arguments used to support these logics cannot violate the laws of Aristotelian logic. There are non-Aristotelian logics but the arguments which support these logics are framed in terms of the laws of Aristotelian logic. In other words Aristotelian logic is the meta-logic for non-Aristotelian logics.

In this regards the laws of logic are seen as being some objective epistemic condition giving access to objective truth and reality. McTaggart takes this position when he claims that a time with which had “... logically inconsistent properties could not possibly exist”¹¹ Swartz goes so far as to claim that “what is currently regarded as being needed, both for metaphysics and for science, is a theory of time which is free of internal inconsistency...”¹²

Thus for philosophers anything that violates the laws of entity and law of non-contradiction; cannot not be true; since they follow Aristotle in noting “the simultaneous predication of contradictories is impossible.”¹³

⁹ W. Kneale & M. Kneale, 1978., p.738.

¹⁰ Look at any introductory book on logic to see this.

¹¹ N. Swartz, 1991, p.178

¹² *ibid*, p.180.

The anthropologist Levy-Bruhl argued that primitive peoples were pre-logical i.e. had a mentality that “... does not bind itself down ... to avoiding contradictions.”¹⁴ And Freud said that neurotics did not avoid mutual contradiction.¹⁵ Now we shall see that self-contradiction is no hindrance to a view being true –whether truth is conceived from an instrumental, or coherence, or correspondence (etc) perspective. We shall see that some of the most successful theories in mathematics and science in predicting events are in fact paradoxical or self-contradictory. This being so then it follows that other views containing paradox or self contradictory such as religion – both primitive and semi modern- mental illness, magic, the so called pseudo-sciences etc are not precluded from being ‘truth’ claims. This is because freedom from contradiction is not a necessary and/or sufficient condition for ‘truth’ as we shall see.

The Prasangika Madhyamika Buddhist demonstrate, that all our concepts, all our categories, all our ideas, all theses, all antitheses, all philosophies, all epistemologies, all ethics, all ontologies, and all metaphysics, in other words all our views are meaningless as they collapse into absurdities i.e. paradox, contradiction, regress, circularity etc. Nevertheless we shall see this omnipresent absurdity of everything does not preclude views from explaining or predicting the correct results; in other words it does not preclude absurd, or meaningless, or irrational views from in fact being ‘true’

¹³ Aristotle, *The Metaphysics*, Penguin, 1998, p.94

¹⁴ Levy-Bruhl, 1926, p.78.

¹⁵ S. Freud, *The Unconscious*, *On Metapsychology*, Penguin, 1984, p.191.

In the so called most rational of endeavors mathematics, absurdity or paradox and self-contradiction goes right to the heart of it. In 1930 the mathematician Hilbert began a program to prove that mathematics was consistent. With the discovery of such mathematical paradoxes as the Burli-Forti paradox, Russell's paradox, Cantor's paradox and Skolem's paradox by early 1930's as Bunch notes, Hilbert's program did not succeed such that "disagreement about how to eliminate contradictions were replaced by discussions of how to live with contradictions in mathematics."¹⁶ Attempts to avoid the paradoxes led to other paradoxical notions but most mathematicians rejected these notions.¹⁷ Thus the present situation is that mathematics cannot be formulated, except in axiomatic theory, without contradictions without the loss of useful results. With regard to axiomatic theory, this cannot be proven to be consistent with the result that paradoxes can occur at any time. As Bunch states:

"None of them [paradoxes] has been resolved by thinking the way mathematicians thought until the end of the nineteenth century. To get around them requires some reformulation of mathematics. Most reformulations except for axiomatic set theory, results in the loss of mathematical ideas and results that have proven to be extremely useful. Axiomatic set theory explicitly eliminates the known paradoxes, but cannot be shown to be consistent. Therefore, other paradoxes can occur at any time [i.e. the Skolem paradox]."¹⁸

¹⁶ B. Bunch, *Mathematical Fallacies and Paradoxes*, Dover, 1982, p.140.

¹⁷ *ibid.*, p.136.

With all these paradoxes and inconsistencies Bunch notes that it is "... amazing that mathematics works so well."¹⁹ Since the mathematical way of looking at the world generates contradictory results from that of science,²⁰ such as the mathematical notion of the continuum, and quantum mechanical concept of quanta. As Bunch notes "... the discoveries of quantum theory or the special theory of relativity were all made through extensive use of mathematics that was built on the concept of the continuum...that mathematical way of looking at the world and the scientific way of looking at the world produced contradictory results."²¹

"Newton and Leibniz developed the calculus.... Their ideas were attacked for being full of paradoxes."²² Newton's formulation of calculus was self-contradictory yet it worked. Newton worked with small increments going of to a zero limit. Berkeley showed that this leads to logical inconsistency.²³ The main problem Bunch notes was "that a quantity was very close to zero, but not zero, during the first part of the operation then it became zero at the end."²⁴ These paradoxes were resolved by the time old expediency of mathematics by defining them away in the nineteenth century by Cauchy and Weierstrass.²⁵ Up until then calculus was used pragmatically such that "instead of having demonstrations justify results, results were used to justify demonstrations."²⁶ Now it must be pointed out that a paradoxical theory of calculus gave the same results as the reformulated non-paradoxical model of

¹⁸ *ibid.*, p.139.

¹⁹ *ibid.*, p.209.

²⁰ *ibid.*, p.210.

²¹ *ibid.*, pp.209-10.

²² *Ibid.*, p.192.

²³ I. Grattan-Guinness, *From the Calculus to set theory 1630-1910*, Duckworth, 1980, pp.88-89..

²⁴ B, Bunch , *Mathematical Fallacies and Paradoxes* Dover, 1982, p.192.

²⁵ *ibid.*, p.192.

²⁶ I. Grattan-Guinness, *From the Calculus to set theory 1630-1910*, Duckworth, 1980, p.296.

Cauchy and Weierstrass; Thus Newtonian or classical mechanics up until the redefinition of calculus in the nineteenth century, was built upon a paradoxical model which generated contradictions in the mathematical model nevertheless it worked i.e. it predicted the correct results..

The anthropologist Levy-Bruhl argued that primitive peoples were pre-logical i.e. had a mentality that "... does not bind itself down ... to avoiding contradictions." ²⁷ And Freud said that neurotics did not avoid mutual contradiction.²⁸ Now we shall see that self-contradiction is no hindrance to a view being 'true' –whether 'truth' is conceived from an instrumental, or coherence, or correspondence (etc) perspective. We shall see that some of the most successful theories in science in predicting events are in fact paradoxical or self-contradictory. This being so then it follows that other views containing paradox or self contradictory such as religion – both primitive and semi modern- mental illness, magic, the so called pseudo-sciences etc are not precluded from being 'truth' claims. This is because freedom from contradiction is not a necessary and/or sufficient condition for truth as we shall see.

Similarly there is ample evidence of theories giving the predicted results even though they collapse into absurdity i.e. are self-contradictory or paradoxical such as those in quantum mechanics- just as there is in mathematics. Heisenberg notes that " the strangest experience of those years was that the paradoxes of quantum theory did not disappear during this

²⁷ Levy-Bruhl, 1926, p.78.

²⁸ S. Freud, *The Unconscious*, *On Metapsychology*, Penguin, 1984, p.191.-192

process of clarification; on the contrary they have become even more marked and exciting.”²⁹

In regard to the paradoxes and contradictions of quantum theory Wick state the orthodox view when he says “here my opinion of the orthodox quantum mechanics, like Bohr, comes down to the meaning of words. “Classical” and “complementarity”, insult and commendation, are euphemisms; the belief concealed is that Nature has been found in a contradiction. But quantum physicists are not simpletons. In their hearts they know such a claim is philosophically unacceptable and would be rejected in other sciences.”³⁰

Wick notes “ I believe orthodox quantum theorists [slates] reason, consciously or unconsciously, something like this. The microscopic world exhibits paradoxes or contradictions and this fact is reflected in the best theory describing it.”³¹

Now even though quantum mechanics is paradoxical no experiment has contradicted quantum theory predictions and quantum theory is the most successful that has ever existed in science. Thus it is a mystery how our scientific and mathematical theories have the success they do seeing that in terms of Aristotelian logic they are absurd , or meaningless or in other words not ‘true’.

In the above examples we see how views which are internally self-contradictory, or paradoxical, or meaningless, or irrational can be ‘true’. This means that other views which are absurd can nevertheless be ‘true’ in

²⁹ F. Selleri, *Quantum Paradoxes and Physical Reality*, Kluwer Academic Publishers, 1990, p.v111.

³⁰ A. Wick, *The Infamous Boundary*, Birkhauser, Berlin, 1995, p.184

giving a correct explanation or prediction of results. In regard to the Prasangika Madhyamika Buddhist demonstrations of the absurdity or meaninglessness of all views this would mean that all views are on the same epistemic or logical level nevertheless this does not preclude any of them from being ‘true’.

Now just as mathematics and science show us that absurd or meaningless views can be ‘true’ it also shows us that views which are mutually contradictory can each explain or predict the correct results and thus be both ‘true’ at the same time.

“Bohm has claimed he was doing nothing more than demonstrating, by a counter example, the falsity of von Neumann’s theorem on the impossibility of hidden variables. Here, the same results as standard indeterministic quantum mechanics are obtained in a deterministic - looking theory akin to classical Newtonian mechanics. But if the results are the same, how can any meaningful difference between the two approaches exist.”³² In other words two contradictory models explain the data exactly - just like the self-contradictory model of calculus and the reformulated model of calculus predicted the same results.

Similarly there are other mutually contradictory models in quantum mechanics which can account for the predicted results “..It has come to be recognized very slowly that the success [of quantum theory] was not to be regarded as a demonstration of the validity of the attempts that have been

³¹ A. Wick, *The Infamous Boundary*, Birkhauser, Berlin, 1995, p.183.

³² V. Stenger, *The Unconscious Quantum*, Prometheus Books, 1995, . p.109.

made to put words [models] behind the mathematics, to provide what is called an ontological interpretation. Several interpretations [models] are equally capable of yielding the same empirical results. Since none provides its own unique predictions, this can only mean that all the interpretations of quantum mechanics are equivalent at least until someone shows us how to improve on, or falsify the others.”³³

Some of these models, interpretations to explain the experimental results are:³⁴ the Copenhagen, the world is created in the act of observation, the world is an undivided wholeness, the many world interpretation, quantum logic, neo-realism, consciousness creates reality, the duplex universe. These models are in contradiction with each other but nevertheless they all explain the same results and thus can both be regarded as being ‘true’

We have the fact that while the mathematical way of looking at the world is in mutual contradiction with the quantum mechanical way they both give the correct results. “Most mathematicians proceed about their business as if the real world were infinitely divisible and they obtain the correct results that apply to the real world from this assumption. Physicists, however operate on the notion that the real world is made out of chunks called quanta ... and they obtain the correct results that apply to the real world from that assumption.”³⁵ Thus it is a mystery how our scientific and mathematical theories have the success they do seeing that in

³³ V. Stenger, *The Unconscious Quantum*, Prometheus Books,, 1995, p.10

³⁴ N, Herbert, *Quantum Reality*, Rider, 1985, pp.240-246.

³⁵ B, Bunch , *Mathematical Fallacies and Paradoxes* Dover, 1982, p.192.

terms of Aristotelian logic they are absurd , or meaningless or in other words not ‘true’.

These examples of mutually contradictory models, in quantum mechanics and mathematics, explaining and predicting results, indicates that mutually contradictory models may be both ‘true’; Just because a model is in contradiction with a model that is regarded as ‘true this dose not mean that the former contradictory model can not be equally ‘true’. What this means is that models from different paradigms, though in mutual contradiction may be both ‘true’ in regard to the same events or data. Namely a religious, or occult, or pseudo-scientific, or etc model may explain the same data as a scientific model in which it is in contradiction with. For example in the hands of a primitive Einstein the notion of anima, or disembodied souls, may turn out equally to explain electricity as does the notion of electrons. Similarly a mythical explanation of the universe may equally explain the data as our so called scientific. Tibetan, or Chinese, or Indian or Aztec, or Nuer, or Ajunta etc views in regard to medicine, the universe, etc may be equally correct in predicting and explaining the data as our so called sciences.

The anthropologist Levy-Bruhl argued that primitive peoples were pre-logical i.e. had a mentality that “... does not bind itself down ... to avoiding contradictions. And Freud said that neurotics did not avoid mutual contradiction.³⁶ Now we shall see that self-contradiction is no hindrance to a view being true –whether truth is conceived from an instrumental, or

³⁶ S. Freud, *The Unconscious*, *On Metapsychology*, Penguin, 1984, p.191-192.

coherence, or correspondence (etc) perspective. This being so then it follows that other views containing paradox or self contradictory such as religion – both primitive and semi modern- mental illness, magic, the so called pseudo-sciences etc are not precluded from being ‘truth’ claims. This is because freedom from contradiction is not a necessary and/or sufficient condition for truth. The absurdity, meaninglessness or irrationality of something is no necessary or sufficient condition of it not being ‘true’. Just as the rationality or freedom from contradiction or paradox is no necessary or sufficient condition of something being ‘true’

FOOD FOR THOUGHT 1

Some argue that the presence of paradoxes, or contradictions in psychoanalysis make it untenable and thus not a science. But based upon the above this would appear to be an untenable claim; as we have seen contradictions and paradox as well the presence of mutually contradictory models or theories are no hindrance to something being ‘true’. The absurdity, meaninglessness or irrationality of something is no necessary or sufficient condition of it not being ‘true’.

In regard to Freud’s notion of psychic-determinism Rycroft notes that it “... [places] psychoanalysis in a contradiction, viz. that of maintaining both that conscious processes are determined by unconscious ones and that making unconscious processes conscious increased the individual’s freedom of choice and action.”³⁷ This contradiction Rycroft claims make the notion of an agent, or ego initiating defenses, or introjection impossible.³⁸ This can

³⁷ C. Rycroft, *A critical Dictionary of Psychoanalysis* 2 ed. , Penguin, 1995, p.101.

³⁸ *ibid.*, pp.4-5.

be put another way. Psychic determinism places psychoanalysis in a contradiction namely that psychoanalytic therapy and analysis, by bringing to consciousness the etiology of behavior, is meant to mitigate and alleviate this behavior but by psychoanalytic theory consciousness and behavior are themselves strictly determined by unconscious forces i.e. psychic determinism. Thus psychic determinism would make psychoanalytic therapy or analysis pointless and useless as consciousness can have no function to play in behavior formation at all. Psychic determinism thus makes all belief in conscious deciding and acting an illusion.

Freud was aware of these epistemological problems; as he states philosophers “ could not conceive of such an absurdity as the “unconscious mental” this idiosyncrasy of the philosophers could only be discarded with a shrug.”³⁹ Similarly “ A person of an epistemological bent might find it tempting to follow the paths –the sophists – by which the anarchists succeed in enticing such conclusions from science [i.e. its self-abrogation]. All I can say is the anarchist theory sounds wonderfully superior so long as it relates to opinions about abstract things: but it breaks down with its first step into practical life”⁴⁰ Nevertheless Freud states “Indeed it seems to us so much a matter of course to equate them in this way that any contradiction of the idea [the unconscious] strikes us as obvious non-sense. Yet psychoanalysis cannot avoid raising this contradiction; it cannot accept the identity of the conscious and the mental.”⁴¹

³⁹ S. Freud, *An Autobiographical Study*, SE, Vol. 20, 1925, p.31

⁴⁰ S. Freud, “A Weltanschauung”, in *New Introductory Lectures on Psychoanalysis*, Penguin, 1991, pp.212-213.

⁴¹ S. Freud, “Introduction”, in *Introductory Lectures on Psychoanalysis*, Penguin, 1982, p.46.

Similar to quantum mechanics psychoanalysis has a number of mutually contradictory models explaining the same data. Based upon empirical evidence all these models have similar success rates with the same types of patients. Also just as there maybe alternative explanations to Western materialistic science, which can be discovered by exploring other cultures metaphysics, epistemologies, ontologies and mythologies, which may have equal ‘truth’ status in explaining the data, there are other psychological models available other than those from the Western tradition. Such alternative, and possibly equally valid models are the meta-psychological models of Nyaya, Vaisesika, Samkhya-Yoga of the Hindu tradition and the meta-psychological models of Abhidharma, and Cittamatra of the Buddhist tradition.

FOOD FOR THOUGHT 2

The paradox of reason is that reason negates reason

Logic and language reduce all views to absurdity, or meaninglessness, or contradiction, including logic and language themselves

To some Buddhists “... logic and meaning, with its inherent duality, is a property of thought and language but not the actual world”⁴²

“... all our knowledge is what a Taoist would call conventional knowledge, because we do not feel that we know anything unless we represent it to

⁴² A, Watts, The Way of Zen, Arkana Penguin Books, 1990, p.93.

ourselves in words, or in some system of conventional signs as the notation of mathematics...⁴³

“Such knowledge is called conventional because it is a matter of agreement as to the codes of communication. Just as people speaking the same language have tacit agreement as to what words shall stand for what things...”⁴⁴

Bohr commenting on the dual, or paradoxical nature of quantum mechanics laid the blame on the paradoxes on words, or language. As he said “Dual pictures, dual language: linguistic analysis is the key to the understand quantum mechanics Bohr told his protegee Heisenberg, shattering his hard-won vision of the microworld. The very words physicists use to describe reality constrain their knowledge of it and scientists in every field will one day encounter this barrier to human understanding.”⁴⁵

“Zen is extracting people from the tangle in which they find themselves from confusing words and ideas with reality.”⁴⁶

⁴³ *ibid*, p.24

⁴⁴ A. Watts, *The Way of Zen*, Arkana Penguin Books, 1990, pp24-25.

⁴⁵ A. Wick, *The Infamous Boundary*, Birkhauser, Berlin, 1995 p.39.

⁴⁶ A. Watts, *The Way of Zen*, Arkana Penguin Books, 1990, p.187.

BIBLIOGRAHY

- Aristotle.** Aristotle: The Metaphysics Books 1-1X, Tran, H, Tredennick
Harvard University Press, 1947.
- Aristotle** Aristotle: The Metaphysics, trans by H, Lawson-Tancred, Penquin,
1998.
- Bruhl-Levy, I,** How Natives Think, George Allen and Unwin, 1926.
- Bunch, B.** Mathematical Fallacies and Padoxes, Dover, 1982
- Dean, C,** The Absurdities or Meaninglessness of Mathematics and Science: Paradoxes
and Contradiction in Mathematics and Science which make them Meaningless:
Mathematics and Science are examples of Mythical Thought: Case study in the
Meaninglessness of all views. Gamahucher Press West Geelong, 2003.
- Freud, S,** “A Weltanshauung”, in *New Introductory Lectures on Psychoanalysis*,
Penguin, 1991,
- “Introduction”, in *Introductory Lectures on Psychoanalysis*, Penguin, 1982
- The Unconsciuous, *On Metapsychology*, Penguin, 1984
- An Autobiographical Study*, SE, Vol. 20, 1925
- I. **Gratten-Guinness I,** *From the Calculus to set theory 1630-1910*, Duckworth,
1980
- Herbert, N,** *Quantum Reality*, Rider, 1985
- Kneale, W & Kneale, M.** The Development of Logic, Oxford, 1978.
- Rycroft C,** *A critical Dictionary of Psychoanalysis* 2 ed. , Penguin, 1995
- Selleri, F,** *Quantum Paradoxes and Physical Reality*, Kluwer Academic Publishers, 1990.
- Stenger, V,** *The Unconscious Quantum*, Prometheus Books, 1995.

Swartz, N. Beyond Experience, University of Toronto Press, Toronto, 1991.

Watts, A. *The Way of Zen*, Arkana, Penguin Books, 1990.

Wick, A. *The Infamous Boundary*, Birkhauser, Berlin, 1995

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