

A paraconsistent solution to the Sorites paradox

I.M.R.Pinheiro

Po Box 12396 A'Beckett st Vic Au 8006

mrpprofessional@yahoo.com

www.geocities.com/mrpprofessional

Independent Researcher

Abstract: – The purpose of this paper is providing a Paraconsistent solution to the Sorites paradox. It is not a solution in the sense of actually settling the matter so that nobody will worry anymore. It is how a Paraconsistent logician would think about the problem in his/her own head in terms of solving it, considering he/she is forcefully reduced to his/her own beliefs regarding how the World happens, once that is what Logic ended up reduced to after several misinterpretations of both Philosophy and classical logic origins. Whilst the intentions of Frege and Russel were creating an universal language in which any communicator, of any language, could communicate and be well understood by means of propagating it in a World Science which is learned forcefully by everyone, modern logicians seem to get it all wrong and do the opposite: make communication incredibly difficult by adding lots of technical lingo, creating new logics that were not born with an objective that was clearly useful to society, that is, just for the sake of creating something new but not so new, once the reason for it to be new is not original anymore. It is still, however, even inside of this mediocre universe to which the great classical logic thoughts never applied, interesting to play and having some fun with new logical concepts apparently very exotic such as Paraconsistency, a system which seems to justify people who have the so-called double face in the sense that they could be and not be at the same time. However, not only we try to get rid of the confusion made by those people unfortunately attached to their still called scientific work, but we also explain the difference between what is computer lingo and, therefore, has got no human meaning attached to it, and what is human lingo and, therefore, should be always logical if it is to be part of Philosophy and contribute to human improvement in some possible sense, not degeneration. Here comes the moral as well, very well stated in the Bible, that people should definitely present themselves to others with no doubts in terms of their sexuality, professional roles, etc. A World in which everything true is disguised by false logics is a non-reliable World where no good person for society wishes to inhabit, not healthy at all and clearly the opposite of the classical World of Mathematics: with logic, coherence, universal foundations accepted by everyone as such, beauty, made to solve real life problems, not to generate or to support their existence. We aim to inspire researchers from Language (scope we have proved the Sorites belongs to) and from Logic to go further.

*Key-words*¹: Sorites, Paraconsistency, solution, moral, Russel, Classical Logic, Mathematics, society

¹AMS: 26A51

1 Introduction

We here copy our introduction to the problem as stated at [PIN06]. The name ‘Sorites’ derives from the Greek word soros (meaning ‘heap’) and originally referred, not to a paradox, but rather to a puzzle known as The Heap:

Would you describe a single grain of sand as a heap? No.

Would you describe two grains of sand as a heap? No...

You must admit the presence of a heap sooner or later, so where do you draw the line? [HYD97]

The Sorites paradox is generally taken to mean all problems which are variations of the above heap problem. The heap problem starts with a clear heap of sand and one takes one grain of sand at a time until there are no grains left. The problem is telling where one stops having a heap. The heart of the problem is determining where the line (if there is any) that separates heaps from non-heaps is located. The puzzle has been astonishing people for centuries because it is evident that there must be a line between heaps and non-heaps since one has, at the beginning of the puzzle, a clear heap, and, at the end, a clear non-heap. Admitting that there is no line to be drawn, that things are and are not at the same time, as Paraconsistency wants to defend, would mean stating that it is the case that either what you see at the beginning is not what you see, since you clearly see a heap, or what you see at the end is not what you see, since it is clearly a non-heap. It seems completely unnatural to admit that something that one would easily classify as a heap is actually a non-heap as well. Therefore, it must be the case that there is a moment when the heap stops being a heap. We must reassure the reader as to the view that we assume the Sorites was born in a classical logic context and in it should be solved, even because what intrigues people is its similarity to the mathematical induction, which is, clearly, classical.

So far, we only repeated the words written in [PIN06], but we now ask the reader to concentrate on these lines: “Admitting that there is no line to be drawn, that things are and are not at

the same time, as Paraconsistency wants to defend, would mean stating that it is the case that either what you see at the beginning is not what you see, since you clearly see a heap, or what you see at the end is not what you see, since it is clearly a non-heap”.

All we intend with this paper is developing and specifying what we meant in [PIN06] by this paraconsistent solution, yet not mentioned in the literature.

Further, we wish to help modern logicians think better. Some of them seem to be very well mistaken in such a way that their argumentation brings fallacies as much as the presentation of the Sorites paradox, able to convince years and years of students groups and induce all of them or the majority of them to get Logic all wrong and keep on perpetuating what is truly inconsistent with the own purpose of Philosophy, Logic, human reasoning development, that is, instead of improving society, it is actually degenerating society as much as Inquisition and the Catholic church which, for ages now, has been putting all the blames on women, precisely the opposite of the book where they claim to base themselves upon [PIN03]. It is absurd to understand that in millenia of Catholic churches, nobody has ever dared reading the own Bible and contradicting the Pope apart from a few priests (there is one in the South of Brazil, for instance) who tried to argue that the Bible never mentioned priests could not marry (it is actually far much worse, the Bible never mentioned priests at all...). Interesting how the Catholic church really got it since Inquisition. Whilst Jesus saved a woman from stoning and said it was not her fault only and it is either the case that the man gets stoned first once he was the married one, or also stoned, or they are both free, that is, Jesus was a top logician, the Catholic church has been telling women to pray for ages and even have babies who were created by means of rape by the own father of the possibly about to be mother, that is, the opposite of it all. How does such a phenomenon happen? How do people create fallacies? How many people in the whole World really get the intentions of Philosophy? How many ever learned anything at all about Philosophy or Logic? This is certainly the subject for another paper. It is a psychological/educational/cultural/psychiatric/political/social/family matter. God, it is an infinite string of whys.

Fully aware that this would never solve the problem once us, ourselves, already found opposition

to this thought and mentioned it in [PIN06], this paper is only further allurements as much as a fuzzy account on the Sorites was, well mentioned in [REA95]. However, we believe the greatest contribution of this paper is not only inspiration to others, but clarification of some basic concepts which should be of fundamental importance to make modern philosophers not to have fallacies and, therefore, not inducing the World population to do the wrong thing thinking that is logical. It is actually a society/World need that someone finally stands up and tell politicians to stop promising that they are going, for instance, to install escalators in the mountain in Brazil, RJ (Brizola, twentieth century, elected because of this promise). And the more popular the article is, the more people are going to learn that is all absurd and has got no logic at all. This way, no hypocrite will ever be elected anymore to do nothing once more for the World besides tricking people who are humble and actually make his life possible and bearable. It is truly outrageous to see that the same person who cleans the room and the spit of that specific leader is the one they are going to use as subject of their jokes, the funniest ones, told to their fellows in politics. The same way we think it is outrageous that a humble person has got no notion of how ridiculous electing that coward is, we think that the students who are going to become new researchers have got absolutely no notion of what they could be propagating by simply supporting such a mistaken statement as: Paraconsistency is ontological. To hell, no! Were it ever ontological, things could actually be and not be, that is, someone could be honest and dishonest, faithful and unfaithful, brave and coward. Please, do not do this to the World, we would say. Butterfly effect is not a dream, is an actual universal truth. You may think that a single word uttered in a classroom to a student has got no World implications, but dare asking the student!

This paper then becomes as important as the article that told the World Catholics were not at all right when Inquisition happened. Did that help? Actually, sadly, not. Nobody could stop Inquisition because of the leaders in power. It was interesting to all of them to literally 'steal' properties and knowledge from women (mainly) in an easy and official way not to be reprimended. However, they did try, as Ghandi tried to teach the World to do the right thing. Nobody could have said it better than when a mother goes to Ghandi and asks him to tell

her kid to stop eating sugar. Ghandi told her to go away for a week and come back. He then finally tells what she wants to the kid. When asked why he told her to go away for a week, Ghandi, the wisest modern man in the World, stated that one week before he, himself, was still eating sugar! Who cares about Ghandi? No one in a World scale. Who will then care about this paper? Probably no one either. However, we are still saying it hoping thta a big shot, someone elected who has got power reads it. There is a chance for that to happen once Duncan proved there are only 6 degrees of accessibility (we also proved this concept in) difficulties, at most, between any two people in this World (we also disagree and think that there is more if the involved are not Americans). Well, all we can state for sure is that there is a weak chance, but still a chance, someone who is in the USA and in power at this very moment, reads this article by means of 6 time steps and still gets it this century so that something relevant occurs in terms of the World. If one plays the lottery with a single card blaming God for all luck, why would we not write the paper, it is still thousands of chances more than the lottery...

In the next four sections we expose, once more, the so-written about, Sorites problem (we prefer problem once we have proved it cannot be a paradox ever for inconsistency of the sentence). Next, we expose Paraconsistency and talk about the two systems we had access to considering one of the greatest philosophers of nowadays (we measured that via number of published papers) which seem to be totally conflicting. Next we get rid of the confusion between computer lingo and philosophical lingo in what regards Paraconsistency. Next we present what would a paraconsistent thinker think of the Sorites paradox with criticism to Priest's published work with his own interpretation, even though he is regarded as one of the greatest World defenders of Paraconsistency. We dare challenging that as we would dare challenging Catholicism were we living at that time (perhaps we did, if one believes in re-incarnation).

2 How the original heap problem model could be stated in mathematical terms:

In mathematical terms, it seems that one can express the Sorites paradox like this:

Consider that \tilde{x} is a specific color², $\tilde{x} \subset C$ and

$$\{\psi, \theta, \Delta, C\dots\} = P(A)$$

where P stands for properties of the object, A stands for the object itself, Δ may stand for shape of the object, and so on so forth.

Now change \tilde{x} of an imperceptible amount δ , let's say one degree of brightness if \tilde{x} means "being of color C ", for instance, where $C^3 = \{\tilde{x}, \tilde{x} + \delta, \dots, \tilde{x} + n\delta\}$.

Understand that We then have $\tilde{x}' = \tilde{x} + \delta \subset C$ and:

$$\{\psi, \theta, \Delta, C\dots\} = P(A_1)$$

Do that for a countable number of steps until you reach an A_n that is clearly not inside of the class of A' s with the property C .

3 The philosophical 'surprise' of the problem stated in mathematical terms

It now seems a little bit surreal to claim that \tilde{x} is so close to \tilde{x}' that one, just using their naked eyes, would utter that $\tilde{x} = \tilde{x}'$ and that the modified A , which was modified by this slight change in one of its properties, would be equal to A' under naked eyes when we know, in reality, that $x' = \tilde{x} + \delta$. Things get then explained by the lack of a precise definition for C (what is the first element in the so-called 'vague' set (READ, S. (1995)) defining the color C , and what is the last?). Such lack of mind support for the step $\tilde{x} = \tilde{x}'$ is explained, by Sorensen and others, for instance, in terms of the vagueness of the property "being of color C ", which we shall translate into:

$$\text{"being of color } C\text{"} = C = \{a_1 = \tilde{x}, (\tilde{x} + \delta) - \lambda, \dots, \tilde{x} + \delta, \dots, a_n\}$$

²this definition should be read in conjunction with the errata to the article in Semiotica, contained at www.geocities.com/mrpprofessional and already submitted

³Observe that colour C is formed of all nuances of C

4 How to generate problems containing the essence of the heap problem

An easy way to create a Sorites is then finding out the right amount to be added to some specificity of the attribute of the first element of the sequence, for instance brightness in the case of colors, and the right attribute, which can actually be chosen from several options: any color, any vaguely defined quality, etc. But we also need to present the Sorites in a particular way so that people are lead to believe that there is no way to tell where the line is. This way of presenting things is as the increasing set goes precisely, that is, if one changes the set ordering, placing, for instance, the final element from the class beside the first one, there is the danger that one identifies at least one sharp cut-off in the sequence immediately, and the problem loses its value. Therefore, a Soritical problem demands:

- An attribute that can be established by means of a progressive sequence (increasing⁴);
- The right amount (increment) to be added to each attribute of each element of the sequence;
- Of course, a first element for the sequence (our a_1);
- A clear opposition between the first and the element a_n , with n allowed to be ∞ , of the sequence regarding the attribute (either the attribute can be given to the first and cannot be given to the last or vice-versa).

5 What should have been grasped so far

In this paper, we intend to explain why the Sorites is a puzzle but should not be regarded as a problem, and to present a way through which it could be solved, as it could happen to any other puzzle. At this stage, though, one would expect the reader to be convinced that there is, indeed, a line to be drawn, what we assume is logically delivered by the argument that if we

⁴we regard the opposite direction, in which the Sorites could go, as being redundant

can immediately say that the first object in the sequence is something, even if that something is ‘not being such’, and we can also immediately tell that the last object in the sequence is not that same something, there has to be a moment where the elements stop belonging to that specific vague set.

We would also expect the reader to be convinced of how a Soritical presentation would represent a puzzle, what we believe is also easily delivered by the clearly distinguishable first and last elements in the sequence and the fact that the others are as close as the size of the increment which is as small as to put the next element inside of the same ‘vague’ set, what makes it easy to utter that adding δ to the attribute makes no difference as to the object still be inside of the vague class of objects with that same attribute.

6 Paraconsistent solution

Paraconsistency, also well mentioned by Priest in [PRI00a], is a very well known logical system, defended by Priest as being an ontological property and by Da Costa, according to Priest, as not being ontological [PRI00b].

The major difference would be that if it were ever ontological, things would be allowed to basically ‘be and not be’, just like our most famous author would like it, Shakespeare. This way Hamlet would be rid of his major enquiry once he would be allowed to both at the same time with no conflict.

In being ontological, it would also support one of the most famous Brazilian pop singers, Pepeu Gomes, in his song stating⁵ “Ser um homem feminino, nao fere o meu lado masculino” [GOM80]. The way we see Paraconsistency being ontological is something artistic, apart from reality, a sort of voyage in good terms, something unattainable in real life but possible to be dreamed of, once things either are or are not and if it looks as if they could be and not be at the same time, it is simply for superficial reasoning, not going far enough to see that things look way X from a certain referential and way Y , conflicting with X , from another, and it all depends on

⁵In English-please check on www.geocities.com/trmsorfiap for our credentials as translators, the famous song sentence would mean: ‘Being a feminine male, does not injure the masculine share of my being’

the image in our heads, our 'little voices'.

As the best example/evidence of ontological Paraconsistency, Dr Priest mentions the paintings by a famous painter, which, for instance, bring stairs that could be going either down or up. Our major problem with this is that it is obviously the case that when we see them going up we are seeing it with a different position of eyes or a different paradigm, something like the Parallaxis mistake, so mentioned in the Chemistry classes. Our interpretation is that there is no way of admitting any sort of Paraconsistency that is ontological. In the song by Pepeu, it is obviously the case that he is thinking of a picture in his own head of a masculine man and of a feminine one when he utters that, when all that there is a confused man about his own sexuality, trying to express that confusion to someone else when he himself does not understand it. It is obviously the case that there is no masculine or feminine man, there are either men or women. And we may say some behave like females sometimes, that is because of our own picture of females, but someone raised in a homosexual environment would obviously hold different paradigms and here, once more, we would like to emphasize the obvious difference between what may be attributed logical values and what is just human, as we did in [PIN06] and, therefore, not suitable to truth tableaux systems. There is no absolute truth, there is the truth of each individual and, therefore, nobody can simplify human race so much as to contain it in a logical system. The ones who try it are called reductionists [c704], a view that is obviously not very healthy and entitles lot of machine deductions when there is actually human actions and things need to be asked.

Another thing that is annoying with this view is that it seems that it allows people to not have things well defined in their personality and, therefore, would turn unreliable people into acceptable human beings in society. We are Christians and do not think this is healthy for society.

It is very healthy that people define their intentions to others, play a fair game, which allows people to have the same powers when relating to themselves, that is, an equal relationship, healthy, giving, as God wanted, freedom of choice of action to everyone involved.

With this, we think we have convinced or did our best to, the reader that we actually then

believe in Da Costa and if Paraconsistency is ever possible, it should not be ontological. The paraconsistent logical system, however, is that that differs from the others for one specific reason: it allows contradictions to not bring the law of explosion in an implication, that is, uttering ‘ p ’ and ‘ $\neg p$ ’ at the same time, does not make the whole set of possible assertions in the system true, only a few chosen ones. In principle, that is what makes Paraconsistency special. With all this, the only possible way of devising a paraconsistent solution to the Sorites problem is if all steps in the system are considered true and false at the same time and both the initial and the last implication would actually be one on the top of the other, as if the paradox steps had been folded in the middle and end plus beginning had been glued together so that they are both ends despite being beginning and end in the original shape of it, that is, a paraconsistent solution is only possible if we rearrange the steps of the problem physically, or our objects, or our function assignments. That would mean the creation of a ‘communication’ function between the originally posed problem and the solution so that it all fits nicely. It is all a bit complicated when written, but very easily seen graphically if one considers the paradox sequence to be a line with clear ends. Just fold the line and there we go, our paraconsistent solution. In other terms, by establishing a bijection between the original interval, which might be discrete or continuous, and the solution interval, one gets the only possible way of explaining how all the Sorites sequence may return both ‘heap’ and ‘non-heap’.

The obvious opposition to this solution is that it is unnatural, once this ‘folding’ of the problem just was not there when it all started, falling inside of the category of other solutions that are said to ‘change the original problem’ [HYD97].

7 In more mathematical terms, the paraconsistent solution

Consider that \tilde{x} is a specific color, $\tilde{x} \subset C$ and

$$\{\psi, \theta, \Delta, C\dots\} = P(A)$$

where P stands for properties of the object, A stands for the object itself, Δ may stand for shape of the object, and so on so forth.

Now change \tilde{x} of an imperceptible amount δ , let's say one degree of brightness if \tilde{x} means "being of color C", for instance, where $C^6 = \{\tilde{x}, \tilde{x} + \delta, \dots, \tilde{x} + n\delta\}$.

Understand that We then have $\tilde{x}' = \tilde{x} + \delta \in C$ and:

$$\{\psi, \theta, \Delta, C\dots\} = P(A_1)$$

Do that for a countable number of steps until you reach an A_n that is clearly not inside of the class of A 's with the property C .

Paraconsistent solution:

Rearrange problem so that we now have objects B_m with m ranging from 1 to $\frac{n}{2}$ in case n is even and if n is not even, add an object A to the sequence with the color of A being equal to the mean between the colors of the antecedent and the consequent of the newly inserted object. Each B_m is equal to a pair A_m, A_{n-m} . Now, assuming Paraconsistency is ontological, and a new being was created, and the only way the account would fit, there is no separation between A_m and A_{n-m} anymore once B_m is a single being. In this sense, we also remind the reader that we previously stated that ontological Paraconsistency would belong only to the human scope of things, not mathematical and if one gets rid of the same confusion mentioned in [PIN06], splitting both concepts, one understands this is possible, that is, in reality, we should not try to express this account mathematically, this way we just sound as silly as when doing the same with the original Sorites and associating it with the mathematical induction. It is beyond Maths if possible at all.

Since all beings B belong to both C and its complementary set, without us being able to put them apart, it is true that the end of the line belongs to the union of C and its complementary set. If one can then imagine doing the same we did in creating B to recover A , we now have one end belonging to C and the other end belonging to the complementary set of C , as we wished for. Well, of course, as we stated before, the same way we do not accept Paraconsistency is

⁶Observe that colour C is formed of all nuances of C

ontological, we could not accept this as Ok. However, once we respect those who do, it is all very possible. In a World where everything is and is not we may as well come and go from the classical to the non-classical as we wish, it is just a matter of changing referentials, accepting Parallaxis is not a mistake, it is an actual reality that the line is both ways.

8 Conclusion

We believe to have fully proved why Paraconsistency could never be an ontological matter and can only belong to the virtual World, outside of reality, that is, the reduced World of the machines, computers. We also believe we have been able to fix a terrible mistake or omission on someone else's work talking about Paraconsistency and the Sorites paradox where it is absurdly claimed there is a line, what obviously does not match paraconsistent thought which admits it is always possible to be and not to be. If it is always possible, so it will be. The problem is obviously coherence. If someone presents us with some fallacy all we have to do is getting hang of the own foundations of it to try to challenge the argumentation. In the case of Paraconsistency this is very clear. If things are allowed to be and not to be and the Sorites paradox is precisely about how a paraconsistent thinker would think in seeing the problem, there is no way it could be any different than all utterances being and not being true once that is always possible in his/her reasoning, that is, there is no absolute concept of truth or falsehood unless it is attached to both being true. Consistency in Paraconsistency is about always admitting both at the same time and there is no other way to go. Mathematics foundations, that is, the room it where Mathematics was born in Philosophy, will tell us that. We believe to have brought several new ideas and thoughts to the problem Sorites, to modern Philosophy, to Logic, etc. We actually think that no one should go without reading us.

References

- [c704] *The American Heritage Dictionary of the English Language*, Houghton Mifflin Company. 2004.
- [GOM80] B.; GOMES D. GOMES, P.; CONSUELO. *Masculino/Feminino*, CBS. 1980.
- [HYD97] D. HYDE. *Sorites Paradox*, *Stanford Encyclopedia of Philosophy*. 1997. plato.stanford.edu/entries/soritesparadox/, Acc Oct 2000.
- [PIN03] M.R. PINHEIRO. *VOCE JA FEZ ALGO DE BOM POR ALGUEM HOJE?*, Editoras EST. 2003. POA.
- [PIN06] M.R. PINHEIRO. *A solution to the Sorites Paradox*, *Semiotica*. 2006. 3/4.
- [PRI00a] G. PRIEST. *Introduction to non-classical logic: moving about in worlds not realized*, Cambridge University Press. 2000. Cambridge.
- [PRI00b] G. PRIEST. *Personal communications*, Cambridge University Press. 2000. UQ.
- [REA95] S. READ. *Thinking about Logic: an introduction to the philosophy of logic*, Oxford University Press. 1995. Oxford.