

DISCUSIONES

CRÍTICA, *Revista Hispanoamericana de Filosofía*

Vol. XXXII, No. 94 (abril 2000): 89-125

LEWIS'S CAUSATION: A FATAL EXAMPLE A RESPONSE TO DOROTHY EDGINGTON, HELEN BEEBEE AND HORACIO ABELEDO*

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1. *Introduction*

Several years ago I published a paper¹ in *Crítica* in which I argued against the possibility of an analysis of the notion of *causation* in the domain of the natural sciences. I held there, and hold now, that the notion of *law of nature* is a genuine concept, while the notion of *causation* or *cause-effect relation among events* is just an anthropomorphic projection on nature.

In section 2 of that paper I developed a counterexample and an objection to David Lewis's analysis of causation and

* This paper was done thanks to the grants of Universidad de Buenos Aires, Ciencia y Técnica (UBACYT) and Universidad Nacional de General Sarmiento. I am grateful to Hernán Miguel, Jorge Paruelo and very specially to Horacio Abeledo and the anonymous referee, whose comments were extremely helpful in order to improve my work and eliminate errors. Abeledo helped me too to improve my English.

¹ [Flichman 1989]. A much longer and complete work on this topic is [Flichman 1985], only internally published in SADAF (Sociedad Argentina de Análisis Filosófico), photoduplicated.

his pragmatic analysis of counterfactuals. I shall call them “counterexample” and “objection”, respectively.

I tried to show by using an instance of an example developed by Lewis,² and strictly applying his causation analysis to it, that the analysis fails. So, Lewis’s example shows itself as a counterexample for his own analysis. With the objection, on the other hand, I tried to show that the pragmatics of Lewis’s counterfactual analysis has serious problems. When trying to correct his pragmatics, its projection on his causation analysis comes out invalid. Counterexample and objection, especially the first one, were examined by other authors in three articles, also published in *Crítica*.

Dorothy Edgington³ (University of London) accepts my counterexample and agrees with my idea about the non-analyzability of the notion of causation. However, in her view—which is not mine—it is a concept that we should not abandon because its non-analyzability is due to the fact that it is a primitive notion. Horacio Abeledo⁴ (University of Buenos Aires) devotes all his paper to discuss my counterexample. His conclusion is that my “criticism can be avoided and Lewis’s theory preserved”, but that “there are considerable prices to be paid for it.” Finally, Helen Beebee⁵ (University of London and Australian National University), publishes another exhaustive discussion on this matter, where she intends to “show that the putative counterexample which he presents is not a counterexample after all. Thus, there is no need for the costly alterations which Abeledo proposes on Lewis’s behalf; nor is there any motivation here for Flichman’s and Edgington’s view

² [Lewis 1973b], penultimate paragraph of section “Counterfactual versus Nomic Dependence” and note 10.

³ [Edgington 1990].

⁴ [Abeledo 1995].

⁵ [Beebee 1997].

that the concept of causation cannot be analyzed.” Only Beebe discusses not only my counterexample but also my objection, trying to show its invalidity.

I respond here to those criticisms and expand my ideas about these matters. I start with the presentation of (a rough version of) Lewis’s causation analysis and of my counterexample (sections 2 and 3); Edgington’s criticism and my answer (section 4). After that I present my objection and Beebe’s criticism (sections 5 and 6), my answer (section 7), Beebe’s criticism of my counterexample and my answer (sections 8, 9 and 10), and finally (in section 11), Abeledo’s criticism and my answer.

2. Lewis’s analysis of causation⁶

I shall express *à la Lewis* that two events, a and b occur: “ $O(a)$ ” and “ $O(b)$ ”. According to Lewis, the synonymous expressions “ a causes b ” and “ a is a cause of b ” are true if (but not only if) “ $O(a)$ ” and “ $O(b)$ ” are true statements and the following counterfactual is true: “*If a had not happened then b would not have happened.*” This counterfactual will be formally expressed:⁷

$$(i) \quad \sim O(a) \square \rightarrow \sim O(b)$$

This is (for Lewis) a sufficient condition for causation, but not a necessary one. The necessary and sufficient condition is: a causes b if and only if “ $O(a)$ ” and “ $O(b)$ ” are true and there exists a causal chain from a to b , even if (i) is false. That is to say, all the links of some chain:

$$(ii) \quad \begin{aligned} \sim O(a) \square \rightarrow \sim O(d_1), \sim O(d_1) \square \rightarrow \sim O(d_2), \dots, \\ \sim O(d_n) \square \rightarrow \sim O(b) \end{aligned}$$

are true.

⁶ [Lewis 1973b].

⁷ I shall always use Lewis’s symbolization.

3. My counterexample to Lewis

Events p , r and b are relevant in the base world (contextual situation):

p : The atmospheric pressure being P .

r : The barometer's reading P .

b : The barometer's working well.

I assume that $O(p)$, $O(r)$ and $O(b)$ are true (in the base world, where the statements are uttered). It is implicit, of course, that I am referring to a certain barometer at a certain time and in a certain geographical area where it works well and it reads P . All this belongs to the contextual situation. The counterfactual

$$(iii) \quad \sim O(p) \square \rightarrow \sim O(r)$$

is true under the usual context, in accordance with Lewis's counterfactual analysis,⁸ because in all the closest⁹ worlds (to the base world) where the atmospheric pressure is different from P , the barometer's reading is different from P . That is to say that the most similar (to the base world) $\sim O(p)$ -worlds¹⁰ are $\sim O(r)$ -worlds. This conclusion is in general in perfect agreement with intuition. Therefore, according to Lewis's analysis of causation, p causes r . And this also agrees with intuition. So far the analysis seems to work.

⁸ [Lewis 1973a], [Lewis 1973b] and [Lewis 1979].

⁹ When I say "the closest" it could seem that I do not take into account the case in which the limit assumption could fail. But it is only a verbal simplification, just in order to make the wording simpler. The *failure in the limit assumption*, failure that I neither deny nor affirm (with Lewis), corresponds to the perhaps possible cases where an infinite succession of possible worlds exists, worlds in which the antecedent holds, each of them closer to the base world, but without one or more being the (rigorously) closest (to the base world) in that succession: [Lewis 1973a], chapter 1, section 1.4.

¹⁰ An X -world is a possible world in which the statement X is true.

We should notice that the causation relation is asymmetric. Lewis recognizes that fact, although he does not cancel by fiat the opposite possibility: the case of closed causal loops; but such special situations are far from our case. Lewis bases the asymmetry of causation on counterfactual irreversibility, which fails,¹¹ in his view, only in those special situations in which causation asymmetry also fails, very far from our case.

Now then, how does Lewis impose asymmetry in the causation relation in this case? Let us state the counterfactual inverse of (iii):

$$(1) \quad \sim O(r) \square \rightarrow \sim O(p)^{12}$$

In words:

(1') "If the barometer's reading had not indicated P , then the atmospheric pressure would not have been P ."

Lewis tells us¹³ that (1) is false under the "clear-cut context". He alleges that the atmospheric pressure is, in the most similar (to the base world) $\sim O(r)$ -worlds, the same as that in the base world (P). He tells us that it is easier to blame a broken barometer (and not to blame a different atmospheric pressure) for its divergent reading: he affirms that the barometer's malfunctioning involves a smaller deviation from the base world (where the barometer works well) than the change in the atmospheric pressure. Therefore, Lewis says, the statement

¹¹ [Lewis 1973b] and [Lewis 1979].

¹² I begin here the numbering with (1) in order to match Beebe's numbering, for ease of comparison.

¹³ [Lewis 1973b], penultimate paragraph of section "Counterfactual versus Nomic Dependence" and note 10.

(2') "If the barometer's reading had not indicated P , then the barometer would have been out of order."

is true. That is to say (I add), formalizing (2'), that

(2) $\sim O(r) \square \rightarrow \sim O(b)$

is true under "clear-cut context" (using Lewis's [1973b] terminology). Later on, in [Lewis 1979], he will call it "standard context" (though perhaps with a sense more related to time), and he will call the "less clear-cut context", "special context".

If we use Lewis's analysis of causation, and we also keep in mind the truth of (2')¹⁴ and therefore of (2), r causes b . The barometer's reading P causes its working well. And this contradicts intuition absolutely. If we analyze our understanding of "causation" we cannot accept as correct an analysis from which we obtain that the barometer's reading causes its good operation. That is not an example of what we understand as the *cause-effect relation*. We would be analyzing another notion, not that of *causation*. This is my counterexample.

4. Edgington's criticism and my answer

With regard to Edgington's ideas, we have an important coincidence. Both of us hold that the notion of *causation* is non-analyzable. Our difference, also important, consists in that I allege that this notion should be abandoned in the scientific and philosophic domain of the natural sciences while Edgington thinks that it is a fundamental primitive notion that should be preserved.¹⁵ I must explain why I believe that the notion of *causation* should be abandoned

¹⁴ [Lewis 1973b], penultimate paragraph of section "Counterfactual versus Nomic Dependence".

¹⁵ [Edgington 1990], section 5, pp. 64–66, and especially note 16.

in the scientific and philosophical discourse referred to the natural sciences.

The first reason is, obviously, my conviction about its non-analyzability, explained in [Flichman 1989]. But it is evident that it is not enough because, like Edgington points out, causation could be a fundamental primitive notion. However, if we examine any text of Physics or another natural science, we will not often find the use of “cause” in the purely scientific speech. We will find it more assiduously in the meta-scientific discourse and in both cases it is easily replaceable with advantage by statements that refer exclusively to laws of nature or by the equations representing them. The non-replaceable rest is the one that should be eliminated to avoid anthropomorphism. I have analyzed this matter in [Flichman 1995],¹⁶ so that I will not repeat it here.

As for Edgington’s idea,¹⁷ discussed by Abeledo, about the possibility of avoiding my counterexample by means of a maneuver similar to that proposed by Abeledo, but that departs from Lewis’s analysis, it is not a criticism of my counterexample to Lewis, since this maneuver is developed on a basis that is not Lewis’s analysis, so that I should not discuss it here. At any rate, I coincide with Abeledo in that adopting Edgington’s proposal would probably involve the collapse of Lewis’s counterfactual analysis. I should point out that even though I do not agree with Lewis’s theory of causation, I continue thinking that his theory of counterfactuals (except its pragmatic component, which needs corrections) is a good analysis of their truth conditions (even though I do not accept his modal realism) and, in general, of their logic, and for that reason I do not favor the idea of its collapse, unless a better analysis appears.

¹⁶ [Flichman 1995], section 5.

¹⁷ [Edgington, unpublished].

5. Beebee's First Ideas

Beebee holds¹⁸ that Lewis's motivation to reject (1) is completely independent of the truth or falsehood of (2). So that it is not required for Lewis, "*as it seems to be suggested incorrectly in [Lewis 1973b]*",¹⁹ Beebee says, to accept (2) with the purpose of motivating the rejection of (1). Lewis exactly says:

If the reading had been higher, would the pressure have been higher? Or would the barometer have been malfunctioning? The second sounds better: a higher reading would have been an incorrect reading.

Surely Lewis chooses (1) as false and (2) as true, but it is clear that it is not the acceptance of (2) that forces him to reject (1). His reasons only *combine* the acceptance of (2) with the rejection of (1), as he explains immediately:

To be sure, there are actual laws and circumstances that imply and explain the actual accuracy of the barometer; but these are no more sacred than the actual laws and circumstances that imply and explain the actual pressure. Less sacred, in fact. When something must give way to permit a higher reading, we find it less of a departure from actuality to hold the pressure fixed and sacrifice the accuracy [of the barometer], rather than vice versa. It is not hard to see why. The barometer, being more localized and more delicate than the weather, is more vulnerable to small departures from actuality.

I agree that Lewis does not need to accept (2) in order to deny (1). He just simply tries to show that in the \mathcal{A} -worlds²⁰

¹⁸ [Beebee 1997], first paragraph of section III.

¹⁹ [Lewis 1973b], penultimate paragraph of section "Counterfactual versus Nomic Dependence".

²⁰ Antecedent worlds, that is, worlds in which the antecedent is true.

(those where the barometer's divergent reading holds) most similar to the base world, the atmospheric pressure continues being the same as in the base world (since what is modified is the barometer's functioning: it no longer works well). What Lewis points out in fact is that the negation of (1) and the acceptance of (2) go together, which does not imply influence of the second on the first. The reason why Beebee insists that Lewis denies (1) independently from the acceptance or negation of (2) is clear: if the acceptance of (2) were for Lewis the (necessary) reason for the negation of (1), it would have been fundamental for him —because he needs to reject (1)— to accept the truth of (2) and this will be questioned by Beebee in her second criticism, as we will see in section 9.

I must clarify another point: Beebee affirms²¹ that I say in [Flichman 1989] that Lewis seems to allege that statement (1) is false because (2) is true. No matter how much I have reread my paper I have not found such an assertion. On the contrary, what I say there²² is that even if we accepted (as Lewis would have it) that (iii) is irreversible under the standard context and that, consequently, (1) is false under that context, anyhow his analysis of causation is not safe, because Lewis accepts that (2) is true. So that what I say is that, if (1) were a false statement, then (2) should be true, and not that one begins with the truth of (2) in order to affirm that (1) is false.

6. *My objection to Lewis and Beebee's criticism*

6.1. The role of intuition

Lewis's papers use the notion of intuition with a strictly

²¹ [Beebee 1997], section II.

²² [Flichman 1989], section 2 (“Lewis's Analysis of Causation —A Counterexample”), last paragraph of page 36.

pragmatic sense.²³ Intuition is the judge which decides if the truth value obtained for a certain counterfactual by means of some analysis is correct or not. This is due to the fact that we are analyzing the natural language, and we are seeking the best possible analysis adapted to it. The indication of the formal analysis ought to coincide with the intuitive truth value, with the purpose of ensuring the merit of the analysis. So that the permanent judge is intuition. Precisely, counterexamples are cases in which statements have an intuitively different truth value from that assigned by the analysis.

6.2. My objection to Lewis

In the first place I shall present a brief initial idea about the content and the consequences of my objection; but its justification will be delayed until my answer to Beebee's criticism (in section 7, second argument). In [Flichman 1989] and in [Flichman 1988] I also gave a justification, but I shall reformulate it here (in section 7, second argument), based also on later works,²⁴ trying to show that Beebee's criticism is wrong. I shall also include new ideas that arose from the study of her criticism.

I hold that Lewis's analysis of counterfactuals requires modifications in its pragmatic component to avoid serious flaws. Once corrected, the new pragmatic analysis will introduce a concept of *standard context* different from that

²³ Intuition has in this context an eminently pragmatic sense: it is the capacity of a competent speaker of a natural language to grab the truth value of its statements, from the use of the language and from the acquired knowledge.

²⁴ These are works produced by the research group under my direction in the University of Buenos Aires: [Abeledo and Flichman 1994], [Paruelo and Venier 1995], [Abeledo, Miguel and Paruelo 1995] and [Abeledo, Flichman, Miguel, Paruelo and Venier 1996].

of Lewis. We will see that, contrary to Lewis's view, a context may be standard for certain competent speakers and not for others. There are overlapping intuitions. For certain speakers one intuition may be stronger; but for other speakers the inverse situation may occur. When the great majority of the speakers takes a context as standard for a certain counterfactual, I shall say that it is the *usual* context for that counterfactual. Therefore the standard context is relative to the speaker and to the counterfactual (and of course to the relevant facts of the base world, or contextual situation), while the *usual* context depends only on the counterfactual (and on the contextual situation).

My objection consists basically in that Lewis's pragmatic analysis of counterfactuals, on the one hand, and his ideas about intuition, on the other, as a control of a good analysis (see section 6.1.) lead in many cases —especially in our case— to opposite results. We shall see in section 7, second argument, how that contradiction works. Since it would be disastrous, in my opinion, to consider that Lewis's idea about the role of intuition is incorrect, the only possible solution is to accept that his pragmatic analysis fails and should be modified.

By means of a correct analysis of the counterfactual conditionals (that differs from Lewis's only in the pragmatics) I try to show, against Lewis (and against Beebe) that (1) is true under the usual context or, at least, under the standard context of some competent speakers. My objection shows that the fact that (1) is true under such a situation, brings serious consequences for Lewis's analysis, because we can derive from that fact that counterfactual (iii) is reversible in *usual* context (or at least under the standard context of some competent speakers) and in consequence there is no causal asymmetry for those cases: r causes p . That is to say, the barometer's reading causes the atmospheric pressure. The intuitive absurdity of that statement becomes visible.

This devastating result brings with it more problems: if (1) is true (as I shall try to justify below) in its *usual* context, that is to say, if it is true in its standard context for the great majority of the speakers, we will obtain, using Lewis's causation analysis, that r causes p for the great majority, *but not for the remaining minority* of speakers. More than that: if (1) is true under its standard context for only a minority of competent speakers, (or even for only one competent speaker) it will turn out that r would be cause of p for this minority, but not for the rest. But if the causation relation exists in nature independently of any consciousness, it cannot depend on the speaker. In synthesis:

- a) If we try to analyze what we understand as the *cause-effect relation among events* we cannot accept as correct an analysis of (1) from which we obtain that the barometer's reading causes the atmospheric pressure. Because that is not an example of what we understand as *cause-effect relation*. We would be analyzing another notion, not that of *causation*.
- b) Nor can it be acceptable for somebody who considers that causation is objective, that this relation depends on the (competent) speaker. If that were the case, it would just confirm my allegation that this relation is an anthropomorphic projection on nature.

6.3. Beebee's criticism of my objection to Lewis

We must recall that Lewis considers two aspects (apart from the syntactic one) when he analyzes counterfactuals. The semantic view studies their truth conditions taking the relation of comparative overall similarity between possible worlds as primitive. The pragmatic view fixes the ordering

of worlds according to their similarity to the base world and according to the context.

Beebe dedicates the whole section IV of her paper to develop and to justify her criticism to my objection to Lewis. Her criticism outlines a different way from Lewis's (although seeking to use the semantic and pragmatic analyses of Lewis),²⁵ of defending the falsehood of (1), independently of the truth value of (2).

In order to show that (1) is false, Beebe intends to use correctly the semantic and pragmatic analyses of Lewis and considers that the result will give the correct truth conditions; but at least in certain cases, and this is one of them, she does not apply the test of intuition. I shall study whether Beebe's way of trying to prove the falsehood of (1) follows correctly the semantic and pragmatic analyses of Lewis. Lewis himself follows them in [Lewis 1973b], since he considers, referring to the pragmatic analysis (although this is absolutely debatable) that under a "clear-cut" context, (called later on, in [Lewis 1979], "standard context"), the malfunctioning of a barometer implies a smaller deviation from the base world than a change in the atmospheric pressure (and he gives some, very weak, reasons for it).

Beebe attempts a different reasoning, where she also applies (or rather, tries to apply) Lewis's pragmatic analysis (besides the semantic one), now in a much more sophisticated version.²⁶ She keeps in mind what Lewis denominates "system of weights or priorities" that allows us to compare possible worlds as to their greater or smaller similarity with the base world. This method considers *A*-worlds that are exactly like the base world during the longest possible time and that diverge from the base world in the least legally transgressive way that allows the antecedent to occur.

²⁵ [Lewis 1979].

²⁶ The version developed in [Lewis 1979].

When stating this pragmatic system Lewis says that in order to find the A -worlds most similar to the base world, “It is of the first importance to avoid [divergence from the base world by means of] big, widespread and diverse violations of law.” “It is of the second importance to maximize the spatio-temporal region throughout which perfect match of particular facts prevails.” “It is of the third importance to avoid even small, localized, simple violations of law.” and finally “It is of little or no importance to secure approximate similarity of particular facts, even in matters that concern us a greatly.”²⁷

Let t_A be the moment in which the barometer of the example is read. Beebe compares two types of very similar (to the base world) possible A -worlds. In the first ones, the match with the base world finishes shortly before the moment t_A and the atmospheric pressure increases (against some law of the base world) during that time, since it is necessary to give some time, even if very short, for the barometer to react (according to the other laws of nature that do not change) to the increase of pressure and change its reading in order to indicate at t_A , a reading different from P in those worlds, in agreement with the antecedent.

In the second ones, the perfect match with the base world is maintained until t_A . Only in that moment the reading changes abruptly (exactly in that moment, against some law of the base world) without any (either previous or simultaneous) variation of the atmospheric pressure, since some time is required in order to give place for such change, in accordance with the other natural laws that have not changed (since only the most similar worlds to the base world are to be considered).

As the match with the base world is larger in the second case and the transgression to the laws of the base world

²⁷ [Lewis 1979], section “The Future Similarity Objection”.

(“miracle”) is minimum —according to Beebee— in both cases, Beebee concludes that the worlds of the second group are the most similar, with the result that the consequent of (1) is false in those worlds and, therefore, (1) comes out false, according to Lewis’s semantic analysis.

7. *My answer to Beebee’s criticism of my objection to Lewis*

I put forth here three arguments against Beebee’s conclusion.

First argument: Lewis clarifies explicitly in [Lewis 1979] (the paper in which Beebee bases her criticisms) that the change obtained by means of the miracle should not be abrupt. Lewis says:²⁸

We need the transition period, and should resist any temptation to replace (2) by the simpler and stronger

(2*) *w* is exactly like our actual world at all times before t_A .

(2*) makes for abrupt discontinuities. Right up to t , the match was stationary and a foot away from the striking surface. If it had been struck at t , would it have travelled a foot in no time at all? No; we should sacrifice the independence of the immediate past to provide an orderly transition from actual past to counterfactual present and future. That is not to say, however, that the immediate past depends on the present in any very definite way. There may be a variety of ways the transition might go...²⁹

It is clear that an abrupt discontinuity implies for Lewis a bigger miracle: it implies, in our case that the reading

²⁸ [Lewis 1979], section “Two Analyses of Counterfactuals”.

²⁹ “(2)” on this paper should not be confused with “(2)” appearing in Lewis’s quotation, which says: “*w* is exactly like our actual world at all times before a transition period beginning shortly before t_A ”.

of the barometer has infinite values in the same instant (infinite speed of change) or that it jumps abruptly during an infinitesimal time (with the rigorous mathematical sense of “infinitesimal”) to a different value without passing through the intermediate values. So that, following Lewis, one cannot wait until the precise moment t_A to carry out the miracle. It should have a very small transition time. And during that time the atmospheric pressure will also begin to change (thus avoiding also the transgression of the laws that relate atmospheric pressure with the barometer’s reading when it works well),³⁰ so the pressure will not be P in t_A ³¹ and therefore, (1) will be true, against Beebe’s position.

It is true that we have been dealing with Lewis’s “Analysis 1”, subsequently left aside to be replaced by his “Analysis 2”, the one that he accepts definitively, complement-

³⁰ Point (4) of Lewis’s Analysis 1 says: “during t_A and the preceding transition period, w differs no more from our actual world than it must to permit A to hold.” [Lewis 1979], section “Two Analyses of Counterfactuals”. That is to say there should not be any gratuitous changes. The simultaneous change of the atmospheric pressure and the barometer’s reading during that time is a perfect example of non-gratuitous change, because that change really implies that there is no change in the laws which connect the atmospheric pressure with the barometer’s reading and/or other variables.

³¹ The laws do not imply that in every moment the barometer, working well, should indicate the atmospheric pressure of that very moment. The barometer needs a relatively short time in order to change its indication when the atmospheric pressure changes. So it only points out the atmospheric pressure only when pressure and barometer have been stabilized during a short time. But what concerns us here is not that it should point out the pressure at the very moment (when it works well) but only that the indication should begin to vary in the exact moment in which the atmospheric pressure begins to vary, and that once the pressure is stabilized the indication of the barometer should, after a short time, also stabilize indicating the value of the pressure. That is why we say that when the pressure changes during a small time, the indication will also change during that period (even if it does not match the atmospheric pressure during that time).

ed by the pragmatic analysis he calls “system of weights or priorities”. But this last analysis (Analysis 2 plus system of weights or priorities) does not modify the point we have stressed. Moreover, Analysis 1, in those cases where it functions correctly, coincides with Analysis 2.³² The abrupt change without time of transition implies a bigger miracle. It produces a bigger deviation from the base world than the smaller miracle in the other case, even though the time of coincidence between both worlds is somewhat smaller. All this is in perfect agreement with the system of weights or priorities. We see that applying strictly Lewis’s rules, Beebee’s analysis is erroneous. Beebee says, when she introduces her first objection,³³ that she will give only a brief presentation of Lewis’s analysis, sufficient to show the falsehood of (1), and that the finer details will be found in [Lewis 1979]. However, I have shown that these finer details outline an analysis that is not the one used by Beebee.

Something more: Beebee alleges that the miracle consists in an abrupt change in the barometer’s reading without any change either in the atmospheric pressure or in the configuration³⁴ of the barometer’s internal structure in

³² And it coincides in all points, because Analysis 1 becomes included in the more general Analysis 2, which does not contradict it. See [Lewis 1979], section “Two Analyses of Counterfactuals”. There it says: “Our present task is to see what sort [he means the system of weights or priorities] of similarity relation can be combined with Analysis 2 to yield what I have called the standard resolution of vagueness: one that invalidates back-tracking arguments, one that yields an asymmetry of counterfactual dependence except perhaps under special circumstances, *one that agrees with Analysis 1*, our asymmetry-by-fiat analysis, whenever it ought to.” (My italics.) Moreover, in [Parelo and Venier 1995] it is proved that the system of weights or priorities conjoined with the asymmetry of overdetermination, associated by Lewis to the actual world (and consequently to any other base world sufficiently similar) and conjoined with Analysis 2, implies Analysis 1.

³³ [Beebee 1997], first paragraph of section IV.

³⁴ It is important to note from here on, that when I refer to the

that instant: if the miracle consists in that the atmospheric pressure also changes in that moment, (1) is true.³⁵ Beebee accepts, in order to obtain that change of reading without any other change, that there should be a violation of some law, since we are dealing with a miracle. She is correct in accepting it for (1),³⁶ because she (as well as Lewis and myself) assumes deterministic worlds.³⁷ In them the value (value determined by the world laws) of a variable cannot change, unless some law is locally violated (miracle).³⁸

configuration of the barometer's internal structure (or just to its internal structure) I am not only referring to the spatial arrangement and articulation of the pieces, but also to any other relevant property or relation.

³⁵ And if the miracle consists in that the internal structure of the barometer changes, (2) results true, which constitutes my counterexample to Lewis.

³⁶ And for (2). She (correctly) accepts it for (1) in the beginning of the fourth paragraph of section IV of [Beebee 1997]. And she (correctly) accepts it for (2) in the penultimate paragraph of section V of the same paper. This matter is important because otherwise it could be thought (incorrectly, because of the reasons given in the text and also in note 38) that we are only dealing with the modification of an initial condition, and therefore that the last item of Lewis's system of weights or priorities could be applied: "It is of little or no importance to secure approximate similarity of particular fact, even in matters that concern us greatly."

³⁷ See the beginning of the third paragraph of section IV, in [Beebee 1997].

³⁸ A more correct (and more intricate) way of saying this is the following. If the possible worlds are deterministic, then two worlds which coincide in all particular facts up to some time t_A must differ in some almost-law (different to the law in a short local period of time) with respect to the law in the base world, if some particular facts are to differ after t_A . As before t_A the particular facts are identical, only almost-laws should differ with respect to the laws in the base world. So it is impossible to obtain different particular facts after t_A if there is no difference between the laws of both worlds.

*Second argument: (justification of my statement that (1) is true under usual context).*³⁹ Beebee tries to apply (incorrectly as I have shown above) Lewis's pragmatic analysis, but she fails to contrast it with intuition. And intuition is, as we have seen, the final judge of the truth or falsehood of the counterfactual. As we shall see, we find exactly the same problem in the arguments presented by Abeledo.

If we ask a competent user of the language the truth value of (1), *uttered in complete isolation*, with the sole special information (contextual situation) that the atmospheric pressure is P , that the barometer indicates the reading P and that it is working well, in most cases we will find that intuition will make him say that (1) is true. In face of the isolated counterfactual, without previous conversational influences (except for the recently mentioned data and other obvious relevant data about the base world, that configure the contextual situation), the speaker will fix the ordering of possible worlds, only when the counterfactual has been completely stated.⁴⁰ Regarding (1), in

³⁹ What follows is a reformulation of my explanation in [Flichman 1988] and [Flichman1989], which uses also many aspects developed in [Abeledo and Flichman 1994], [Abeledo, Miguel and Paruelo 1995], [Paruelo and Venier 1995] and [Abeledo, Flichman, Miguel, Paruelo and Venier 1996] as well as some new ideas.

⁴⁰ Even in the absence of a conversational context, the contextual situation is not the only contributor to the context: the text of the counterfactual is the other. With those contributions (contextual situation and text of the counterfactual) the speaker generates an ordering of possible worlds by their similarity to the base world. If a contribution of conversational context is added, the ordering may be modified. The final context, in absence of a conversational context, is what I call "standard context", which depends on the contextual situation, on the text of the counterfactual *and also on the speaker*: different speakers may generate, from the same contributions of the contextual situation and of the text, different orderings of the possible worlds. The reason is that they have different histories (they elaborate that ordering on the basis of the already mentioned contributions, but also on the basis of the implicit theory of the speakers, theory which has a

most cases, the speaker will keep implicitly in mind (with-
in the context) the fact that the barometer works well.⁴¹
The speaker will read: “If the reading had been different,
then (since the barometer works well) the atmospheric pressure
would have been different.” The same speaker, in face of
(2) also presented in isolation (not after (1), which would
generate a conversational context) will very probably say
that (2) is true. In that case a different ordering of worlds
is generated since, in spite of having the same antecedent,
the consequent of the counterfactual is different and, as
I said before, the ordering is finally fixed only when the
complete counterfactual is stated. In this case, the speaker
will read: “If the reading had been different from P , then
(the atmospheric pressure being P) the barometer would have
been out of order.”

I do not mean that *any* competent speaker would react
that way. Overlapping intuitions may have different weight
in different speakers. The standard context, in my opinion
and against Lewis’s ideas, *depends on the speaker*. What I
suppose is that in the great majority of cases, (1) is true
under the standard context of (1); and (2) is true under
the standard context of (2), which is not the same as that
of (1). Those are the contexts that I have called “*usual*”
above: those that are standard for the great majority of
the competent speakers. This result does not imply that all
counterfactuals are true under their own *usual* contexts.
On the contrary: for example, counterfactual

private particular development for each of them). On the other hand,
Lewis’s standard context depends only on the contextual situation (on
the relevant characteristics of the base world).

⁴¹ Lewis calls such assumptions “factual premises”. It is true in the
base world and it stays true in the most similar (to the base world)
 A -worlds. In Lewis’s analysis the context of the counterfactual usually
includes suppositions of that type. I shall include them parenthetically
from now on, with low case (small type) within the statement of the
counterfactual, when I consider it necessary for the argument.

$$(3) \sim O(r) \square \rightarrow O(p)$$

is false under the *usual* context. *If it is uttered in isolation*, very few speakers would say that it is true. The speaker will usually read it with the same factual premise as when (1) is read: “If the reading of the barometer had been different from P , then (as the barometer works well) the atmospheric pressure would have remained the same.” The speaker will clearly say that (3) is false.

On the other hand, the formulation: “If the reading of the barometer had been different from P , then *still* the atmospheric pressure would have remained the same.” may generate a different intuition which evaluates it as true. But the reason is that the use of the term “still” (or “anyhow”) introduces a typical conversational context of semifactual conditionals, generated by the previous presence of some asseveration stated under the context of (2). In this case, (3) is read: “If the reading of the barometer had been different from P , then (as) still (the atmospheric pressure is P) the atmospheric pressure would have remained the same.” For that reason it is fundamental that the counterfactual is presented in absolute isolation.

As it can be seen, my conclusion that (1) and (2) are true, each one under its own *usual* context, comes from intuition, sole judge for these cases. I do not deny that there are opposing intuitions, but I believe, and it can be empirically tested, that the strongest intuition is usually the one that I have indicated. It is for that reason that the great majority of competent speakers will confirm what I say, whenever each of those statements are presented in an isolated way, without any influences from one to the other. Otherwise, if (1) is first stated, the result will be that (1) is true and (2) false. And (3) will come out false. The *usual* context of (1) will be the dominant context. If, on the other hand, we state (2) first, then it will come out that (2) and

(3) are true and (1) is false. Here the dominant one will be the *usual* context of (2). Lastly, if we stated (3) first, it will come out that (3) and (2) are false and (1) is true. The *usual* context of (3), the same as that of (1), will be the dominant context.

Beebee has just applied formally Lewis's analysis —mistakenly, as I try to show in the first argument— without making any control against intuition. The strongest intuition in the great majority of speakers shows the truth of (1). So, applying Lewis's analysis of causation, the barometer's reading causes the atmospheric pressure. That is, my objection to Lewis holds.

But even if my empirical estimation were wrong and the great majority of the speakers considered that (1), presented in isolation, is false, it would be enough for my argument that a minority of competent speakers (even that only one competent speaker) obtained by intuition without forcing the context, the truth of (1). Causation would clearly be speaker-dependent, a conclusion absolutely incompatible with Lewis's and Beebee's ideas, as has been explained before. And I am one of the members of that putative minority. And I believe myself to be a competent speaker.

Third argument: I shall develop this argument in section 9. But it is applicable both to the objection to Lewis and to the counterexample to his thesis.

8. Beebee's criticism of my counterexample to Lewis

a. Beebee accepts that the statement

(2') "If the barometer's reading had not indicated *P*, then the barometer would have been out of order."

is true, in accordance with Lewis and in accordance with intuition. But she alleges that the formalization

(2) $\sim O(r) \Box \rightarrow \sim O(b)$

does not correspond to (2'),

or at least, that (2) it is not derived from (2'). Beebee tries to show that (2) is false although (2') is true.

- b.** By this means, Beebee would save Lewis from my counterexample, as well as other defenders of other causation analyses that are attacked by it, since it depends on the truth value of (2). The argument to deny the truth of (2) begins by showing that b (the barometer's working well) is not a genuine event (with Lewis's notion of event in [Lewis 1986]). The only way of being able to use (2) in order to apply it to a causation example is to replace b by a genuine event; but in that case (2) comes out false, according to Beebee.
- c.** Since b is not a genuine event, the statement that affirms $O(b)$ cannot be used as consequent in a statement that says that an *event* counterfactually depends on another.
- d.** The argument continues, pointing out that $O(b)$ states that an object (the barometer) has a dispositional property: to be ready to indicate a reading of such and such a value when the atmospheric pressure has that same value. Lewis accepts that a statement of that type (dispositional) refers to an event. Here a contradiction arises between Lewis and Beebee, since the latter alleges that b is not a genuine event (it is not an event). However, Beebee reduces the confusion when she clarifies that we are dealing, according to Lewis, with an event *accidentally* characterized in terms of a dispositional property, and that no event can be *essentially* characterized in those terms. There will be possible worlds in which b occurs (the barometer works well), but it does not satisfy the dispositional

characterization: the laws of that world are different and therefore the barometer works well according to those laws, which make it indicate a value different from that of the atmospheric pressure. (As I interpret that a barometer is a (well working) barometer only if it has the disposition to indicate correctly the atmospheric pressure, I shall write “barometer”, between quotation marks, from now on.)

- e. Beebe explains, following Lewis, the reason why the dispositional statements do not characterize the corresponding events in an essential way. The reason is that the dispositional properties are eminently extrinsic and disjunctive (with a very special notion of *disjunctive property*), and also that such types of properties cannot be affirmed of objects, in an essential way. I will not repeat this explanation here; it is very well developed by Beebe. Another important point in Lewis’s explanation is that the events referred to by statements of counterfactual dependence, which should hold for Lewis’s analysis of causation should be distinguishable events (with a very special sense of “distinguishable”); but this point does not generate problems to the example in discussion.
- f. Because of all that was said, one should seek an event *b* constructed in such a way that the object had, instead of the dispositional property, a property that coincides with it in the base world, but that characterizes the event *essentially*. The internal structure of the “barometer” in the base world is a property with those characteristics, and it is the basic feature that generates the disposition.
- g. Since the new event *b* is a genuine event (the property of the “barometer” characterizes the event *es-*

entially), we can now accept (2) (with the new b) as a statement of counterfactual dependence between events (that serves to apply Lewis's analysis of causation) and study its truth value.

Here Beebee proceeds as she already did in the case of (1). She studies two types of $\sim O(r)$ -worlds similar to the base world. In the first place, she studies the worlds that match with the base world until $(t_A - \varepsilon)$, just before the time t_A corresponding to the antecedent. $O(r)$ holds in t_A in the base world so a miracle takes place during the transition period $\langle (t_A - \varepsilon), t_A \rangle$, a miracle that violates as little as possible some laws according to which the configuration of the internal structure of the "barometer" is delineated. Because of that violation, the internal structure is modified during that transition period, so the reading of the "barometer" becomes modified, and $\sim O(r)$ obtains in t_A . On the other hand, the consequent will be $\sim O(b)$, since the configuration of the internal structure has been changed. If these were the most similar worlds to the base world, (2) would come out true. Secondly, Beebee studies the worlds that match the base world exactly until t_A . The miracle takes place only in t_A . It consists in the abrupt change of the reading of the "barometer", without any modification of its internal structure in that instant (if the structure were also abruptly modified in t_A , then (2) would come out true). If these were the most similar worlds to the base world, then (2) would come out false.

- h.** Beebee affirms that the worlds of the second type are more similar to the base world than those of the first type, because the time of matching with the base world is larger in the second ones than in the first

ones without any difference —according to Beebee— in the size of the miracles.

- i. *Conclusion:* (2) would come out false and in consequence my counterexample would not be a counterexample. On the other hand, it would become clear that (2) is neither the formalization of (2') nor is it derived from (2'), since (2') is true and (2) would be false.
- j. In the VI (last) section of her paper Beebee adds that she does not see any reason to suspect that another substitution of the dispositional property which could provide us with another event *b* characterized essentially, could give a different result. That assertion completes her argument.

9. *Answer to Beebee's criticism of my counterexample*

I agree with Beebee in what she says in **a.** and **b.** except for her optimism about the possibility of demonstrating afterwards that (2) becomes false when replacing the accidental characterization of *b* by an essential one. On the contrary, I shall try to show now that even in that case, (2) is clearly true.

Beebee confuses *not being an event* with *being an event characterized accidentally*. It is not a confusion that brings terrible consequences for her argument, but I must point out the incongruity in Beebee's acceptance (following point by point Lewis's theory of events) that a dispositional property characterizes an event (although with qualifications) and on the other hand her assertion that *b* (characterized by a dispositional property) is not an event. In section 8, I have tried to soften the contradiction calling "genuine events" those that are essentially characterized. But in fact, the *same* event *b* can be accidentally characterized by means of a dispositional property or essentially by means of a

structural property (the internal structure of the “barometer”).

I agree with all that Beebee writes in **c.**, **d.**, **e.**, **f.** and **g.**, except for what I have indicated in the previous paragraph (it is only one event). My main dissidence with Beebee arises in **h.** and **i.** It is similar to the one discussed for the case of Beebee’s criticism of my objection to Lewis.

With respect to **j.**, I am in a better position than Beebee. She needs to justify somehow the claim that any other case must uphold her position. Whereas in my case only one counterexample (or objection, depending on the case) may destroy her position.

The *first* and *second arguments* of section 7 in this paper can be applied word by word to this other case. So that I abide by what is said there, with (2) instead of (1) and referring to the event “the “barometer’s” possessing the internal structure Φ ” (the barometer’s working well (b), but in its essential characterization), instead of the event “the atmospheric pressure being P ”. Continuity is required in the change of the indication of the “barometer”, in order that the miracle be sufficiently small. Here too Beebee makes the wrong choice between the two groups of worlds and she does so for exactly the same reasons discussed in the section 7.

Something new appears when we pay attention to the event b , when it is essentially characterized as having such and such internal structure: we find that the preexisting logical relation among $O(p)$, $O(r)$ and $O(b)$ (with the previous characterization of b) disappears. In that previous case there were only two logical possibilities in face of the $\sim O(r)$. One of them was $\sim O(p)$ and $\sim O(b)$ was the other one. This logical connection has been destroyed now. Other logically possible alternatives are added. For example, we may suppose in face of $\sim O(r)$ that p and also b occur, that is to say that the atmospheric pressure is P and that

the internal structure of the “barometer” has not changed, but that on the other hand (supposing a classic mercury “barometer”) the specific weight of mercury is different, against the natural law that asserts that —*ceteris paribus*— the specific weight of mercury is constant. Nothing in my arguments is modified by this new situation. But it could create some minimum complication to Abeledo (see formula (iv) in section 11, a formula that would need to be generalized).

As for the *second argument* of section 7, all that was said there may be applied to (2) if we remember that we should understand the consequent of (2) as essentially characterizing *b* as we pointed out previously. Intuition, which is the judge for these cases, indicates us clearly that (2) is true under *usual* context. The correlate of statement (2'), once the event *b* is described according to its essential characterization, is the following:

(2'') “If the reading of the “barometer” had not indicated *P*, then the “barometer” would not have had the internal constitution Φ .”

In this case there is probably no difference between the application of Lewis's concept of standard context and mine. In my case, this context is speaker-dependent. But in this example it is probable that any competent speaker will answer that (2), with the suitable description (2''), is true (presented in isolation). So that, applying Lewis's causation analysis it will come out that the reading of the “barometer” causes it to have the internal constitution that it in fact has. As absurd as the idea that it causes the atmospheric pressure.

Third argument: Lewis affirms in his system of weights or priorities that it is of the first importance to avoid big, widespread, diverse violations of law (miracles), in order

to diverge from the base world, when we are dealing with the A -worlds most similar to the base world. Let us remember that the divergence begins shortly before t_A and that the extension of the transition period ends exactly at t_A . Immediately after t_A ,⁴² the process should continue according to the base world laws. Lewis's reason is that if the miracle continued up to t_A (t_A included), it would become unacceptably widespread.

Beebe studied two cases: one in which, at the beginning of the transition period, the pressure begins to change and so does the reading. The other one, where the transition is abrupt, without any change other than the reading. I believe I have shown that, contrary to Beebe's idea, the first case includes worlds more similar to the base world than those of the second case. But we may think of a third group of worlds where the change of reading is continuous up to t_A , but the transition period is much smaller than that of the first group. Let us also assume that during that period only the reading of the barometer changes. Of course some law or laws have been violated during that short period, because these worlds diverge from the base world. The problem is to see if that violation ceases immediately after t_A , and if the size of the violation corresponds to the first of the items of the system of weights or priorities ("It is of the first importance to avoid big, widespread, diverse violations of law.") or to the third ("It is of the third importance to avoid even small, localized, simple violations of law.") I will try to show that the violation in our example is of the first type. In t_A , the reading has reached the maximum change. But immediately after that moment, all the laws of the base world should be satisfied, following Lewis. Otherwise the miracle would be more widespread than is needed for the

⁴² In fact, Lewis permits t_A to be a very short period of time instead of being an instant. But that fact does not change the argument.

antecedent to hold: violation of the first type. But if the laws are suddenly satisfied, the change in the variables has to be abrupt; and that makes for a big miracle, again a violation of the first type (continuity disappears).

This case is different from that of Lewis's future similarity example. The firing of the neuron (the miracle) happens and finishes before the moment Nixon presses the button (t_A). After the neuron firing the miracle ceases and there is a final period during the transition period in which all the laws are satisfied. In t_A , only the initial conditions are different from those in the base world. On the contrary, in the barometer example the miracle reaches t_A —and even follows t_A —because the violation of laws continue during all the transition period and t_A (and after, if the abrupt case is to be avoided).

So, both in the case of (1) (objection) and—equivalently—of (2) (counterexample), the first group of worlds is the one whose members are the most similar to the base world. The worlds of the second and third group are farther. Consequently, (1) and (2) result true in Lewis's standard context, using Lewis's pragmatics.

10. *Conclusion*

I have developed three different arguments in order to reject Beebe's criticism of my objection and of my counterexample. The first and third use Lewis's analysis alone, so that it can be seen that following such analysis rigorously, Beebe's criticism is wrong: Beebe has failed in her application of Lewis's pragmatic analysis. But even when it is correctly applied, this pragmatic analysis presents insurmountable difficulties pointed out in my objection, as I believe to have shown by means of my second argument.

If we understand the second case as I have called it: "counterexample", we can only use the first and third ar-

guments and also the intuition argument (intuition is the judge), because everything is based on Lewis’s analysis of counterfactuals and of causation, even if his own example becomes a counterexample for his analysis of causation. On the other hand, the second argument holds only as an objection to Lewis’s pragmatic analysis of counterfactuals, because in that case I question the adequacy of that analysis and I propose a correction to it. Once corrected (third argument), the new proposed pragmatic analysis is projected invalidating again Lewis’s analysis of causation.

11. *Abeledo’s arguments and my answer*

11.1. Abeledo’s arguments

Abeledo has tried to show that it is formally possible to reject simultaneously (1) and (2) using Lewis’s counterfactual theory (but not Stalnaker’s, which would leave Lewis without defense in face of my counterexample), if we deem true the following conjunction of “might” counterfactuals:

$$(iv) \quad [\sim O(r) \square \rightarrow \sim O(p)] \cdot [\sim O(r) \square \rightarrow \sim O(b)]$$

In words: “If the barometer’s reading had not been P , then the atmospheric pressure might not have been P ; and if the barometer’s reading had not been P , then the barometer might have been out of order.” This would be a case of “tie” of worlds: among the most similar (to the base world) $\sim O(r)$ -worlds, there is always at least a $\sim O(p)$ -world and a $\sim O(b)$ -world.

To accept that (1) and (2) are both false and that (iv) is true would solve the problem formally, because the possibility of the truth of (2) with its disastrous consequence for Lewis would be avoided.

But the problem would be solved only formally. Abeledo shows that if we stay in Lewis’s system, which is fun-

damental in order to discuss whether mine is or is not a counterexample for Lewis, several difficulties arise.

The first one relates to the intrinsic vagueness of counterfactuals, which according to Lewis makes it very difficult to say that two worlds are *exactly* equal in similarity to the base world. We should recall that Lewis's pragmatic view works on the ordering of worlds according to their similarity to the base world under each context.

Let us remember Lewis's allegation that the most similar (to the base world) $\sim O(r)$ -worlds are $\sim O(b)$ -worlds, but not $\sim O(p)$ -worlds because, according to him, worlds where the atmospheric pressure changes deviate more from the base world than worlds where the barometer becomes out of order. We can only try to defend Lewis if we allege, against that idea, that $\sim O(r)$ -worlds of both types are "tied" in similarity to the base world. But we have just seen Abeledo's argument that the "tie" view is difficult to state, given the intrinsic vagueness of counterfactuals, one of the most grounded and fundamental positions in Lewis's counterfactual pragmatics.

The second stone on Lewis's road pointed out by Abeledo relates to the possibility of other examples even more difficult to solve and to the fact that his solution has an *ad hoc* character.

Up to this point he has discussed the problem of the intrinsic vagueness of counterfactuals pointed out by Lewis, especially in [1973a]. But also, and this is the third and last "stone on the road" discussed by Abeledo, the vagueness of counterfactuals is related (in agreement with Lewis) with the context. Counterfactuals are context-dependent. Lewis chooses a certain context called "standard" by him since [Lewis 1979], to be used when treating causation, because he realizes that the truth value of a counterfactual may depend on the context. So we should choose one single context for causation, because in the opposite case, it would

result that an event's causing or not another would depend on the context, something that obviously Lewis would not want to admit: in that case causation would not to be an exclusive attribute of the objective reality.

Abeledo says that when a "tie" situation appears, as it would happen with our example if we accepted the truth of (iv), *a minimum change of context* would modify the truth value of (iv), since it would change the ordering of the possible worlds with respect to their similarity to the base world. So one of the two conjuncts would become false.

11.2. My response to Abeledo's arguments

I believe that if my arguments developed in response to Beebe's criticisms about the truth values of (1) and (2) are accepted, the interest in saving Lewis by means of Abeledo's formal resources totally disappears. It becomes useless to affirm that Lewis's causation analysis can be "saved" by means of a formal resource that allows (1) and (2) to be false, when it is visible that they are both true (under their own usual or at least under their own standard contexts for some competent speakers). Of course, there is no reason to deny the truth of (iv) *under its own usual (or standard) context*. On the contrary, (iv) is clearly true⁴³

⁴³ I must add here that I do not agree with Lewis's idea that because of the intrinsic vagueness and context-dependence of counterfactuals, they may have an unstable truth value. I think that once the context is fixed, there is neither "context fluctuation" nor variation because of vagueness capable of producing changes in the truth value as can be inferred from Lewis words, especially in [Lewis 1973a]. I believe that if intuition tells me that there is a "tie", then there is a "tie". The vagueness may occur, for instance, in what respects to the proportion of "tied" worlds, but that will not change the counterfactual's truth value. If a competent speaker considers (iv) true, then he or she takes for granted the "tie" and that is all. (He or she has fixed the ordering of worlds fixing the "tie".)

and that is not against the truth of (1) and (2), each one under its own *usual* (or standard) context. Moreover, the following statement, in isolation, is also true (when b is taken under the essential characterization):⁴⁴

$$(v) [\sim O(r) \Box \rightarrow \sim O(p)] \cdot [\sim O(r) \Box \rightarrow \sim O(b)] \cdot [\sim O(r) \Box \rightarrow \sim O(p_e)]$$

where “ p_e ” symbolizes the specific weight of mercury (in *ceteris paribus* conditions) in the base world.

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Recibido: 20 de enero de 2000

RESUMEN

Algunos años atrás publiqué en *Crítica* un artículo en el que argumentaba contra la posibilidad de un análisis de la causación en las ciencias naturales. Consideraba, y aún considero, que la noción de *ley natural* es genuina, mientras que la de *causación* es una proyección antropomórfica que debe abandonarse. En aquel trabajo desarrollé un contraejemplo del análisis de la causación de David Lewis que es examinado en tres artículos, publicados también en *Crítica*, realizados por Horacio Abeledo (Universidad de Buenos Aires), Dorothy Edgington (Universidad de Londres) y Helen Beebee (Universidad de Londres y Universidad Nacional Australiana). Abeledo discute mi contraejemplo y concluye que mi crítica puede eludirse y que la teoría de Lewis puede preservarse; pero con considerables costos. Edgington acepta mi crítica a Lewis y concuerda con la no analizabilidad del concepto de *causación*. Pero éste, dice, no debería ser abandonado porque su no analizabilidad se debe a que es una noción primitiva. Finalmente, Beebee intenta demostrar que mi pretendido contraejemplo no es, al fin y al cabo, un contraejemplo y que, por lo tanto, las costosas alteraciones propuestas por Abeledo no son necesarias y que no hay motivo para suponer que la noción de *causación* no pueda analizarse. Por último Beebee también critica una objeción que realizo a la pragmática del análisis de contrafácticos de Lewis. En el presente trabajo intento rebatir las críticas de Abeledo, Edgington y Beebee.