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Truth against Reason, and Reason against Truth

Abstract: The paper explores the general relationship between reason (here: epistemic rationality) and truth. It centers on the question of whether there can be conflicts between reason and truth, and on the forms such conflicts may take. Are there philosophically interesting examples of such conflicts?

Rationality is a normative concept, and the language of obligation is as applicable to it as it is to morality. Consider, in particular, epistemic rationality. The language of obligation applied to epistemic rationality enables us to distinguish the following four pairs of prominent *constituents of epistemic rationality:*

1. being rationally *obligated* (O) to believe *p*;[1] being rationally obligated *not* to believe *p*; *or in other words:* O(B*p*); O(¬B*p*);
2. being rationally obligated to believe non-*p*; being rationally obligated *not* to believe non-*p*; *or in other words:* O(B¬*p*), O(¬B¬*p*);
3. being rationally *permitted* (P) to believe *p*; being rationally permitted *not* to believe *p*; *or in other words:* P(B*p*); P(¬B*p*);
4. being rationally permitted to believe non-*p*; being rationally permitted *not* to believe non-*p*; *or in other words:* P(B¬*p*); P(¬B¬*p*).

There are logical equivalence relations between some of these eight constituents. On the basis of the general schematic principles P(A) ≡ ¬O(¬A) and P(¬A) ≡ ¬O(A), we have:

P(B*p*) ≡ ¬O(¬B*p*) P(¬B*p*) ≡ ¬O(B*p*)

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1 Note that "*p*" is here a variable for propositions (and not a schematic letter that represents a sentence). As a consequence, the expression "that *p*" is nonsensical (in contrast to the expression "that (*p* is true)"): "that", in the relevant function, must be followed by a sentence, a closed sentence or an open one, not by a singular term. An expression that has the form "that A" is – for any true or false (English) sentence that is substituted for "A" – a name of a proposition, and can be substituted for "*p*". In what follows, "O(…)" will be treated as a sentence-operator (forming a sentence from a sentence), "B…", however, as a predicate (forming a sentence from a singular term). For the sake of brevity, the symbol of negation "¬" will be used in a double function: as a sentence-operator (¬A: not-A) and as the negation-functor for propositions (¬*p:* non-*p*). Both uses occur side by side in O(¬B¬*p*), for example.

$P(B\neg p) \equiv \neg O(\neg B\neg p)$ $P(\neg B\neg p) \equiv \neg O(B\neg p)$.

These equivalence relations allow us to reduce the four *permission*-constituents to the negations of the four *obligation*-constituents. Furthermore, on the basis of the general schematic principle P1: $O(A) \supset \neg O(\neg A)$, and its contrapositive $P1^c$: $O(\neg A) \supset \neg O(A)$ (which is logically equivalent to P1), we have:

P1.1	$O(Bp) \supset \neg O(\neg Bp)$	$P1.1^c$	$O(\neg Bp) \supset \neg O(Bp)$
P1.2	$O(B\neg p) \supset \neg O(\neg B\neg p)$	$P1.2^c$	$O(\neg B\neg p) \supset \neg O(B\neg p)$.

In other words:

$O(Bp)$	is contrary to	$O(\neg Bp)$
entails		entails
$\neg O(\neg Bp)$	is subcontrary to	$\neg O(Bp)$

$O(B\neg p)$	is contrary to	$O(\neg B\neg p)$
entails		entails
$\neg O(\neg B\neg p)$	is subcontrary to	$\neg O(B\neg p)$

There are, finally, logical implication relations between some of the eight constituents which, in contrast to the previously considered logical relations, connect “B*p*” with “B¬*p*”, and which are, in contrast to the previously considered logical relations, *specific* to epistemic rationality, that is, to the type of rational obligation and permission that concerns propositional belief:[2]

P2	$O(Bp) \supset O(\neg B\neg p)$	$P2^c$	$\neg O(\neg B\neg p) \supset \neg O(Bp)$
P3	$O(B\neg p) \supset O(\neg Bp)$	$P3^c$	$\neg O(\neg Bp) \supset \neg O(B\neg p)$

The eight constituents of epistemic rationality

$O(Bp)$	$\neg O(Bp)$	[:= $P(\neg Bp)$]
$O(\neg Bp)$	$\neg O(\neg Bp)$	[:= $P(Bp)$]
$O(B\neg p)$	$\neg O(B\neg p)$	[:= $P(\neg B\neg p)$]

2 It would perhaps have been more appropriate to speak of *doxastic* rationality. On the other hand, the designation “epistemic” emphasizes very appropriately that the rationality in question has something to do with truth.

$O(\neg B\neg p)$ $\neg O(\neg B\neg p)$ $[:=P(B\neg p)]$

can be combined in 16 not obviously self-contradictory ways to form *states of epistemic rationality* with respect to the proposition concerned (that is, with respect to the proposition *p*). The *possible* states of epistemic rationality are those that are marked "*consistent*" in the following listing:

$O(Bp)$	$O(\neg Bp)$	$O(B\neg p)$	$O(\neg B\neg p)$	
Y(es)	Y	Y	Y	inconsistent
Y	Y	Y	N(o)	inconsistent
Y	Y	N	Y	inconsistent
Y	Y	N	N	inconsistent
Y	N	Y	Y	inconsistent
Y	N	Y	N	inconsistent[3]
Y	N	N	Y	*consistent*
Y	N	N	N	inconsistent
N	Y	Y	Y	inconsistent
N	Y	Y	N	*consistent*
N	Y	N	Y	*consistent*
N	Y	N	N	*consistent*
N	N	Y	Y	inconsistent
N	N	Y	N	inconsistent
N	N	N	Y	*consistent*
N	N	N	N	*consistent*

In other words,

R1: $O(Bp) \wedge \neg O(\neg Bp) \wedge \neg O(B\neg p) \wedge O(\neg B\neg p)$ *i.e.*, $O(Bp)$
R2: $\neg O(Bp) \wedge O(\neg Bp) \wedge O(B\neg p) \wedge \neg O(\neg B\neg p)$ *i.e.*, $O(B\neg p)$
R3: $\neg O(Bp) \wedge O(\neg Bp) \wedge \neg O(B\neg p) \wedge O(\neg B\neg p)$ *i.e.*, $O(\neg Bp) \wedge O(\neg B\neg p)$
R4: $\neg O(Bp) \wedge O(\neg Bp) \wedge \neg O(B\neg p) \wedge \neg O(\neg B\neg p)$ *i.e.*, $O(\neg Bp) \wedge \neg O(B\neg p) \wedge \neg O(\neg B\neg p)$
R5: $\neg O(Bp) \wedge \neg O(\neg Bp) \wedge \neg O(B\neg p) \wedge O(\neg B\neg p)$ *i.e.*, $\neg O(Bp) \wedge \neg O(\neg Bp) \wedge O(\neg B\neg p)$
R6: $\neg O(Bp) \wedge \neg O(\neg Bp) \wedge \neg O(B\neg p) \wedge \neg O(\neg B\neg p)$ [not simplifiable]

are the *six possible states of epistemic rationality* (with respect to the proposition *p*, and with respect to a certain – implicit – subject of belief [believer] and a certain – implicit – moment of time).

3 To see the inconsistency in this line, consider that $O(Bp) \supset \neg O(B\neg p)$ is a logical consequence of P2 and P1.2[c].

On the other hand, there are *four possible states of belief* (with respect to the proposition p, and with the respect to the same – the aforementioned – subject of belief and moment of time):

F1: $Bp \wedge B\neg p$
F2: $Bp \wedge \neg B\neg p$
F3: $\neg Bp \wedge B\neg p$
F4: $\neg Bp \wedge \neg B\neg p$

The possible states of epistemic rationality, as listed above, are consecutively numbered: R1 – R6, and the possible states of belief, as listed above, are also consecutively numbered: F1 – F4. In what follows I will refer to those numberings.

A possible state of belief *F* is *rational with respect to* a possible state of epistemic rationality *R* if, and only if, *F* fulfils all the rational obligations that are intrinsic to *R*.

Thus, F1 – that is, $Bp \wedge B\neg p$ – is not rational with respect to R1, R3, R5, since F1 does not fulfil the obligation $O(\neg B\neg p)$, which is intrinsic to R1, R3, R5. And F1 is also not rational with respect to R2, R3, R4, since F1 does not fulfil the obligation $O(\neg Bp)$, which is intrinsic to R2, R3, R4. It may seem that F1 is rational with respect to R6. Not so; for $O(\neg Bp \vee \neg B\neg p)$ is an obligation that is intrinsic to every state of epistemic rationality, since it is purely a matter of the logic of rational obligation;[4] F1 does not fulfil that obligation.

Now, F2 – that is, $Bp \wedge \neg B\neg p$ – is not rational with respect to R2, R3, R4, since F2 does not fulfil the obligation $O(\neg Bp)$, which is intrinsic to R2, R3, R4. But F2 is rational with respect to R1, R5, R6.

In turn, F3 – that is, $\neg Bp \wedge B\neg p$ – is not rational with respect to R1, R3, R5, since F3 does not fulfil the obligation $O(\neg B\neg p)$, which is intrinsic to R1, R3, R5. But F3 is rational with respect to R2, R4, R6.

Finally, F4 – that is, $\neg Bp \wedge \neg B\neg p$ – is not rational with respect to R1, R2, since F4 does not fulfil the obligation $O(Bp)$, which is intrinsic to R1, and not the obligation $O(B\neg p)$, which is intrinsic to R2. But F4 is rational with respect to R3, R4, R5, R6.

These results can be perspicuously summed up in a diagram:

4 Note that $O(\neg Bp \vee \neg B\neg p)$ is logically equivalent to $O(Bp \supset \neg B\neg p)$. $O(Bp) \supset O(\neg B\neg p)$ – that is, P2 – can be taken to follow logically from $O(Bp \supset \neg B\neg p)$.

	F1	F2	F3	F4
R1	NR	R	NR	NR
R2	NR	NR	R	NR
R3	NR	NR	NR	R
R4	NR	NR	R	R
R5	NR	R	NR	R
R6	NR	R	R	R

The six possible states of epistemic rationality R1 – R6 and the four possible states of belief F1 – F4 can be combined to form *24 possible epistemic-rationality-and-fact situations:* R1 ∧ F1, R1 ∧ F2, …, R6 ∧ F4. Each of these epistemic-rationality-and-fact situations either has the character “rational” or the character “irrational”. Which one of these two characters it has can be read off the above diagram: What, for example, is the rationality-character of R3 ∧ F3? Go to the *row* R3 and the *column* F3, and look were they intersect: There is an “NR” there, and therefore R3 ∧ F3 has the character “irrational”. In the same way it can be determined that R4 ∧ F4 (say) has the character “rational”. It is easily seen from the diagram that ten of the epistemic-rationality-and-fact situations are *rational*, and fourteen *irrational*. Observe also that some possible states of epistemic rationality allow more rational freedom than others (count the “R”s in their rows), and that some possible states of belief are logically more likely to be rational than others (count the “R”s in their columns).

Since R1 – R6 logically exclude each other, and also F1 – F4 logically exclude each other (with respect to the same subject of belief and moment of time, and the same proposition *p*), only one of the 24 possible epistemic-rationality-and-fact situations can be *actual* – with respect to the same subject of belief and moment of time, and the same proposition *p*. *Which one* of the 24 possible epistemic-rationality-and-fact situations will be *the actual one* depends on the proposition *p*, on the subject of belief concerned and the relevant moment of time, and, of course, on the pertinent normative facts of epistemic rationality and non-normative facts of belief. Note that only if it is specified which of the 24 possible epistemic-rationality-and-fact situations is *the actual one*, can one speak *simpliciter* of the epistemic rationality or irrationality of a given subject of belief, at a certain time, with respect to a given proposition.

Philosophical positions arise. Consider *radical skepticism*. For radical skeptics, *epoché* is the rationally obligatory epistemic attitude with respect to any proposition. In other words, radical skeptics hold that, for *any* proposition *p* and *any* (intelligent) human subject of belief[5] and *any* time, it is rationally obligatory not to believe *p*, and also rationally obligatory not to believe non-*p*. In other words again, radical skeptics hold that R3 – i.e., $O(\neg Bp) \wedge O(\neg B\neg p)$ – is the obtaining (or actual) state of epistemic rationality for any proposition *p*, no matter what is the time and who (among us human beings) is the subject of belief.

If R3 is the obtaining state of rationality for all propositions, then most of us cannot escape being irrational with respect to some propositions; for most of us cannot avoid believing some propositions, positive and negative ones. I, for example, cannot avoid believing that I exist, and that 2 is not identical with 1. (You may have your own favorites.) Indeed, the rationality of the radical skeptics themselves is undermined by their very position *if it is true*; for they themselves, qua radical skeptics, certainly believe a certain proposition (namely, the proposition that, for all propositions *p* and all times, one is rationally obligated not to believe *p* and also rationally obligated not to believe non-*p*).[6] This means that radical skeptics, *if they are right* (i.e., if radical skepticism is true), are bound to be epistemically irrational with respect to the very proposition they qua radical skeptics believe (for the truth of that proposition requires that, rationally, they ought not to believe that proposition – but they do). It is important to note that there is no inconsistency here. If a radical skeptic believes that, for all propositions *p* and all times, one is rationally obligated not to believe *p* and also rationally obligated not to believe non-*p*, and if it *is* true that, for all propositions *p* and all times, one is rationally obligated not to believe *p* and also rationally obligated not to believe non-*p* – then there is no inconsistency in this; then the skeptic is simply right. But he is also epistemically irrational.

The case of the radical skeptic who is right in his skepticism is a particulary striking example of how truth and reason may collide: Someone believes what is, in fact, true; but the logical consequence of his believing what is true is that he is being epistemically irrational (in the sense that he is not fulfilling obligations of epistemic rationality which are incurred by the very fact that what he believes is true). Here is another example of a possible conflict between reason and truth, an example which is much more commonplace than the previous one. Suppose it is rationally obligatory, for any (human) subject of belief, to believe that God does not exist. If so, then R2 is the obtaining state of epistemic rationality with respect to the proposition that God does not exist, and there is only one way for a

5 In what follows it is assumed, for the sake of brevity, that all subjects of belief – in particular, all human beings – are always intelligent.

6 If with every proposition *p* also non-*p* is a proposition (as seems right), the radical skeptics' position can also be expressed by "for all propositions *p* and all times, one is obligated not to believe *p*".

subject of belief to be rational about that proposition: this is F3, that is, not to believe that God exists, and to believe that God does not exist. Many people, usually philosophers, have no difficulty at all to comply with the requirements of reason here. But suppose now that God *does* exist – in spite of the (supposed) fact that it is rationally obligatory to believe that God does not exist. This would mean that reason requires one to believe something that is not true. Can true reason counsel, indeed decree, against truth? Can it be rationally obligatory to believe something that is not true?

One is tempted to say "no" and to postulate the following principles that connect the rational obligation to believe a proposition with the truth of that proposition:

P4 $O(Bp) \supset p$ is true [i.e., $\neg p$ is not true]
P5 $O(B\neg p) \supset \neg p$ is true [i.e., p is not true]. [pair 1][7]

These postulates may even be strengthened:

P6 $O(\neg B\neg p) \supset p$ is true [i.e., $\neg p$ is not true]
P7 $O(\neg Bp) \supset \neg p$ is true [i.e., p is not true]. [pair 2][8]

The first pair of postulates follows from the second pair in view of the uncontroversial principles

P2 $O(Bp) \supset O(\neg B\neg p)$
P3 $O(B\neg p) \supset O(\neg Bp)$

that have already been introduced and made use of. And one can argue for the second pair in the following manner: Can it be rationally obligatory not to believe something even though it is true? Can true reason counsel against truth? It seems not. Thus, if reason says "Thou shalt not believe that *p*" and is right, *p* has to be *not* true, and non-*p*, therefore, true. And if reason says "Thou shalt not believe that non-*p*" and is right, non-*p* has to be *not* true, and *p*, therefore, true.

7 Pair 1 obviously entails $\neg O(Bp) \vee \neg O(B\neg p)$, or in other words: $O(Bp) \supset \neg O(B\neg p)$ – which is an unproblematic principle that is also a consequence of P2 in combination with $P1.2^c$: $O(Bp) \supset O(\neg B\neg p)$ and $O(\neg B\neg p) \supset \neg O(B\neg p)$.

8 Pair 2 obviously entails $\neg O(\neg Bp) \vee \neg O(\neg B\neg p)$, or in other words: $O(\neg Bp) \supset \neg O(\neg B\neg p)$ – which, if true, would for *every* proposition render skepticism (or agnosticism) impossible *as an obligation of epistemic rationality*; for according to $O(\neg Bp) \supset \neg O(\neg B\neg p)$, R3 cannot be an obtaining state of epistemic rationality for any proposition.

Principles P4 – P7, if accepted, have interesting consequences. The moral obligation to do something, or not to do something, does not entail that it is done in fact, or not done in fact. Correspondingly, the rational obligation to believe, or not to believe, a certain proposition does not entail that it is believed in fact, or not believed in fact. But, if P4 is accepted, the rational obligation to believe a certain proposition entails that it is true, and if P7 is a accepted the rational obligation not to believe a certain proposition entails that it is not true. There is no parallel of this on the side of morality; it is peculiar to epistemic rationality.

What are other consequences of accepting P4 – P7? For one thing, it becomes quite impossible to justly accuse people of being irrational because they believe a certain proposition. For example, the atheist or agnostic cannot with justice tell the believer that she is being irrational by believing that God exists. For the believer can legitimately defend herself by answering that there is no rational obligation for her (or anybody) not to believe that God exists, and therefore no rational obligation to believe that God does not exist, either. Why? Because, says the believer, it is just not true that God does not exist.[9]

The dilemma is this: On the one hand, the rational obligation to believe *p* is to be a *good epistemic indicator* of the truth of *p*. For that seems to be the whole point of the rational obligation to believe a certain proposition. On the other hand, the truth of *p* is to be a *conditio sine qua non* of the rational obligation to believe *p*. For it would seem that true reason cannot decree against truth. But if the rational obligation to believe *p* is to be a good epistemic indicator of the truth of *p*, then the truth of *p cannot* also be a *conditio sine qua non* of the rational obligation to believe *p*. For if the truth of *p* were a *conditio sine qua non* of the rational obligation to believe *p*, then the rational obligation to believe *p* would be drawn into in question already by a sincere claim that *p* is not true – and indeed already by a mere uncertainty whether *p* is true. Clearly, under such circumstances the rational obligation to believe *p* cannot be a good epistemic indicator of the truth of *p*.

Consider a similar case, but a case where there is no dilemma. The truth of *p* is a *conditio sine qua non* of *knowing* that *p* is true; one cannot know that *p* is true without the truth of *p*. But this makes it quite impossible for knowledge to be a good epistemic indicator of truth. If one is uncertain whether *p* is true, one cannot reasonably say to oneself: “Person X certainly knows that *p* is true; this indicates that *p* is true.” For the uncertainty whether *p* is true is ipso facto an uncertainty whether anybody *knows* that *p* is true – since the truth of *p* is a *conditio sine qua*

9 She is using the contrapositives of P7 and P3 (i.e., $P3^c$) to arrive at her conclusions: $\neg(\neg p$ is true$) \supset \neg O(\neg Bp)$ and $\neg O(\neg Bp) \supset \neg O(B\neg p)$.

non for knowing that *p* is true. But of course one *can* reasonably say "It is true. I know it to be true" or "It is true. N.N. said that he knows it to be true". The first is merely an emphatic way of saying "I believe it to be true", and the second is merely a compendious way of saying "N.N. believes it to be true, and I share his belief because N.N. is in this matter an authority for me".

In resolving the above-presented dilemma for rational epistemic obligation – which dilemma is a consequence of conflicting conceptual aims – we should, after all, *not* follow the example set by knowledge. The similarity between *rational obligation to believe* and *knowledge* is far from being strong. Saying that it is rationally obligatory (for subject X) to believe *p* is just another way of saying that there cannot be any reasonable doubt (for X) about *p*'s being true.[10] But how can it be the case that there cannot be any reasonable doubt about *p*'s being true if this impossibility of reasonable doubt can only be the case if *p* is true? If the truth of *p* were a *conditio sine qua non* of the rational obligation to believe *p*, then, *except* for the e*pistemically special* propositions (the uncontroversially true propositions in logic and mathematics),[11] it would never be rationally obligatory to believe *p*; for one must always allow (*except* in the case of an epistemically special proposition) that the believed or surmised non-truth of *p* can reasonably be held against the alleged rational obligation to believe *p*.

But if the truth of *p* is not in general a *conditio sine qua non* of the rational obligation to believe *p*, then, indeed, in a considerable number of cases the claim that there is a rational obligation to believe a certain epistemically non-special proposition may be true. We may even come to the point that 99.9% of such claims are true: that in 99.9% of the cases in question there is indeed, as is claimed, a rational obligation to believe a certain epistemically non-special proposition – for example, just for the sake of the argument, that God does not exist, that everything is physical, that there is no incompatibilist freedom of the will, that life has no ultimate meaning, that there are no objective moral obligations. But, note, the claim that it is, e. g., rationally obligatory to believe that God

10 Saying that it is *not* rationally obligatory (for subject X) to believe *p* is just another way of saying that there *can be* reasonable doubt (for X) about *p*'s being true. Saying that it is rationally obligatory (for X) *not* to believe *p* is just another way of saying that there *is* reasonable doubt (for X) about *p*'s being true.

11 The proposition *that I exist* is another epistemically special proposition – a very special one. It is rationally obligatory to believe that I exist – but it is so only *for me:* there is no rational obligation for anyone else (who is human) to believe that I exist. I cannot reasonably doubt (the truth of) the proposition that I exist, but anyone else (who is human) *can* reasonably doubt that proposition. In contrast, it is rationally obligatory for anyone (who is human) to believe the proposition that 1+1=2; no one (who is human) can reasonably doubt that 1+1=2.

does not exist is now in a peculiar sense *fallible*. By this I do not merely mean that the obligation-claim itself may be false (I think that it *is* false, but I have just now proposed, for the sake of the argument, that it is true); I mean that the claim, though true, may be nothing more than an imperative of reason *against truth*.

Consider, finally, a telling parable. By accidental contact with human beings, the idea that there are human beings has touched a population of intelligent *termites*; call the termites in that population "the alpha-termites". Yet, in the course of their history (in which further contact with human beings is for a very, very long period non-occurrent), the alpha-termites ultimately come to the following claim: There cannot be any reasonable doubt that there aren't any human beings. In other words, it is rationally obligatory, for every alpha-termite, to believe that human beings do not exist. And this obligation-claim is even true: It is, indeed, rationally obligatory, for every alpha-termite, to believe that human beings do not exist. How could it be *not* rationally obligatory for an alpha-termite to believe this, given that the truth of a proposition, as was finally determined in this paper, is *not* a *conditio sine qua non* of the rational obligation to believe it?[12] But, as we human beings *know*, the imperative of termite-reason in question is an imperative *against truth*. The alpha-termites, by the way, never learned the truth; they were destroyed by human beings before they had any chance to learn it – which goes to show that there are certainly worse things than being irrational: *being wrong* is one of them.

Appendix

(I) Principles in full explicitness: With time-index and subject-index added, P2 – $O(Bp) \supset O(\neg B\neg p)$ – (for example) turns into: $O_{s,t}(B_{s,t}p) \supset O_{s,t}(\neg B_{s,t}\neg p)$. If also the quantification involved is made fully explicit, P2 turns into $\forall s \forall t \forall p(O_{s,t}(B_{s,t}p) \supset O_{s,t}(\neg B_{s,t}\neg p))$.

12 Still, readers may wonder *why* there cannot be any reasonable doubt – for the alpha-termites – that there aren't any human beings. The savants of the alpha-termites would tell potential doubters among the alpha-termites (and the savants would tell the truth): (1) There is not a shred of dependable evidence for the assumption that there are human beings; (2) every phenomenon in the (alpha-termite) world can be perfectly explained without assuming that there are human beings – and *entia non sunt multiplicanda praeter necessitatem*; (3) it is even "incoherent" to assume that there are human beings, for human beings "just don't fit in". This may leave one with the impression that it is merely rationally obligatory for every alpha-termite *not to believe* that *there are* human beings – and not that it is rationally obligatory for it *to believe* that *there aren't any* human beings. But the difference which looks big in logic is very small in practice – *given* the truth of (1), (2), and (3).

(II) If radical skepticism is true, then the radical skeptic is irrational:

(1)	$\forall s \forall t \forall p(O_{s,t}(\neg B_{s,t}p) \wedge O_{s,t}(\neg B_{s,t}\neg p))$	[thesis of radical skepticism]
(2)	$q^* :=$ that $\forall s \forall t \forall p(O_{s,t}(\neg B_{s,t}p) \wedge O_{s,t}(\neg B_{s,t}\neg p))$	[definition]
(3)	$B(_{s^*,t^*}q^*) \wedge \neg B(_{s^*,t^*}\neg q^*)$	[s* is a radical skeptic at t*]
(4)	$O_{s^*,t^*}(\neg B_{s^*,t^*}q^*) \wedge O_{s^*,t^*}(\neg B_{s^*,t^*}\neg q^*)$	[instantiation of (1)]
(5)	s* is irrational at t* with respect to q*	[from (3) and (4)]

Here the actual state of epistemic rationality is of the type R3 and the actual state of belief is of the type F2; therefore the actual situation-of-rationality-and-fact is of the type R3 ∧ F2 – which is irrational, since F2 is irrational with respect to R3. Replacing (3) by (3′) – $B(_{s^*,t^*}q^*) \wedge B(_{s^*,t^*}\neg q^*)$ – does not help. The only way to escape irrationality in the face of (1) is replacing (3) by (3″): $\neg B(_{s^*,t^*}q^*) \wedge \neg B(_{s^*,t^*}\neg q^*)$. But if this is the actual state of belief of s* at t*, then s* can hardly be called "a radical skeptic"; otherwise, the famous "man on the street", who never thinks about epistemological matters, would turn out to be a radical skeptic.

(III) Prima facie it may seem that "p is true ⊃ O(Bp)" (the converse of P4) is a valid principle. However, if *p* is true and it is nevertheless impossible to believe *p* (for example, because *p* just cannot be grasped by the subject of belief) then there is no obligation to believe *p*. Likewise, if *p* is true and *p* is totally irrelevant for the subject of belief, then there is no obligation to believe *p*. Thus, "*p* is true ⊃ O(B*p*)" is certainly not a valid principle; but other valid principles are implicit in the considerations that show its invalidity, for example: $O(Bp) \supset \Diamond(Bp)$.