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## THE LOGIC OF *SOKU* IN THE KYOTO SCHOOL

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Assertion prevails not, nor does denial. When neither of them is to the point, what would you say?

Zen paradox

'A is A, and yet A is not A; therefore A is A'.<sup>1</sup> This common inference within the logic of *soku* is based on the dialectical form 'A *soku* not-A', variously translated as 'A *sive* not-A', 'A *qua* not-A', and 'A and yet not-A', and is hereafter referred to as the *soku* dialectic. Nishida Kitarō, Tanabe Hajime, and Nishitani Keiji, the central philosophers of the Kyoto school, grant the legitimacy of this dialectic without question, and invoke it often. For many ('Western') philosophers, however, the conjunction of A and not-A is a contradiction, and the pervasiveness of the *soku* dialectic in their writings is puzzling, if not absurd and meaningless.

Western philosophers insist that 'A and yet not-A' is a contradiction, while the Kyoto philosophers acknowledge the fact and maintain that the combination is legitimate: reflection upon reality inevitably reveals antinomies, they argue, so that any logic adequate to such reflection must allow contradictions. Since anything follows from a contradiction,<sup>2</sup> Western philosophers can dismiss arguments involving the *soku* dialectic as unintelligible or meaningless, thereby eschewing any serious confrontation with or appropriation of the Kyoto philosophies.<sup>3</sup> Yet disciples of the Kyoto school analyze and critique each others' work as though it is intelligible and meaningful. Such a situation prompts the suspicion that 'A *soku* not-A' is not a contradiction, despite the insistence of the Kyoto philosophers to the contrary.

This essay offers an analysis of 'A *soku* not-A' that removes the appearance of contradiction from the logic of *soku* (*soku hi*) through the presentation of a formal system for this logic. Section 1 presents some puzzling features of the *soku* dialectic, along with attempts to explain these features, the shortcomings of such attempts, and an improved explanation. Section 2 expands the new, informal explanation from section 1 with a formalization of the logic, including a semantics, a natural deduction system, and several important theorems. Finally, section 3 considers the benefits of the system presented in section 2, and suggests how this formal system might be used to criticize or defend the logic of *soku*. The overarching goals of this essay are to understand better the rhetoric of the Kyoto philosophers and, in the process, defend their approach to philosophy from the usual criticism of unintelligibility.

### 1. *Mysterious Soku, Mischievous Negation*

#### 1.1

The central philosophers of the Kyoto school accept contradiction and paradox as essential elements in the explanation of (true) reality. In his final essay, Nishida

writes that a “true logic must adequately exhibit the self-expression of the absolute. Therefore it must be paradoxical.” He also writes, of the *soku* dialectic essential to his logic:

If understood in terms of object, or substance, logic, the paradoxical structure of the *soku hi* [i.e., *A soku not-A*] runs afoul of the principle of identity. But for one who has personal experience, the paradox of God is a clear existential fact. The trouble would seem to lie, then, with abstractly logical thinking.<sup>4</sup>

Nishitani echoes such thoughts; for example, he writes:

[T]he selfness of a thing cannot be expressed simply in terms of its “being one thing or another.” It is rather disclosed precisely as something that cannot be so expressed. Selfness is laid bare as something that cannot on the whole be expressed in the ordinary language of reason, nor for that matter in any language containing logical form. Should we be forced to put it into words all the same, we can only express it in terms of a paradox, such as: “It is *not* this thing or that, therefore it *is* this thing or that.”<sup>5</sup>

Both philosophers supplement the principle of identity (*A is A*) with a principle of contradictory identity (*A is not-A*). As a result, both see themselves as abandoning traditional logic, insofar as traditional logic insists on the principle of non-contradiction (*not-(A and not-A)*) while their logic of *soku* apparently contains a principle of contradiction (*A soku not-A*). Tanabe not only embraces this principle of contradiction, but also declares that contradictions, while inconceivable, are essential to philosophical problems: “Anything that can simply be reduced to the principle of identity is not a problem for philosophy. For a problem to belong to philosophy there must be something inconceivable in it.”<sup>6</sup>

The dialectic of affirmation and negation, of *A* and yet not-*A*, is the core of the logic of *soku*. With it, Nishida and Nishitani relate immanence and transcendence, subject and object, self and other, life and death, mortality and immortality, relative and absolute, being and nothingness, Form and emptiness, self-identity and self-negation.<sup>7</sup> Tanabe also relates *ōsō* and *gensō*, *tariki* and *jiriki*, *shin* and *gyō*, Great Nay and Great Compassion, *ri* and *ji*. Curiously, no one uses the dialectic to relate abstract and concrete, atheism and theism, enlightened and unenlightened, dynamic and static, “real” contradiction and “merely formal logical” contradiction.<sup>8</sup> Given that the *soku* dialectic seems not to be applicable universally (since, sometimes, it is apparently not the case that *A* and yet not-*A*), one wonders whether the appeal to the *soku* dialectic is arbitrary or inconsistent, and whether the dialectic is a rhetorical device rather than a genuine logical relation. How can we understand the Kyoto philosophers when they seem constantly and intentionally to contradict themselves?

## 1.2

David Dilworth explains this apparently arbitrary appeal to the *soku* dialectic by characterizing the logic of *soku* as “[i]nternally paradoxical, externally confrontational.”<sup>9</sup> According to Dilworth, the dialectic applies to items internal to a given system—in this case, the system(s) within which the Kyoto philosophers operate. Yet

“[t]he same logic, when turned outwardly to confront divergent positions, proceeds to structure such differences according to a rule of disparity. The differences are reduced to an unresolvable tension.” Apparently, then, one invokes the *soku* dialectic within one’s system, and refrains from invoking the dialectic when relating to systems different from one’s own. As noted, the Kyoto philosophers do not apply the *soku* dialectic to every pair of contradictories within their systems. When they fail to apply the dialectic, is it false to say that their system is “internally paradoxical?” Dilworth might reply that the dialectic can be applied to pairs of contradictories even when it is not so applied, in effect denying that there are any pairs of contradictories within the system(s) of the Kyoto philosophers that the *soku* dialectic could not relate while maintaining that there are pairs of contradictories that the *soku* dialectic does not relate.

Unfortunately, Dilworth’s approach is less than satisfactory from a more critical view of the logic of *soku*. Acceptance of the dialectical form appears to forfeit intelligibility and meaningfulness in discourse. For, given any statement *A*, in the absence of the principle of non-contradiction one can justifiably assert its opposite, not-*A*. Since the *soku* dialectic allows one to assert both *A* and not-*A*, and since any arbitrary *X* follows from a contradiction, the assertion of any thesis allows one thereby to assert not just the antithesis, but anything whatsoever.<sup>10</sup> Consequently, the *soku* dialectic undermines intelligible discourse within any system in which it is accepted. Dilworth’s characterization of the logic of *soku* as “internally paradoxical, externally confrontational” cannot address whether or how the logic of *soku* avoids collapsing all argument into nonsense.<sup>11</sup>

One might argue that the logic of *soku* only appears incoherent from a ‘Western’ perspective, which accepts the principle of non-contradiction. Since the logic of *soku* abandons the principle of non-contradiction in favor of a principle of contradiction, the argument might continue, the demand for consistency is unfounded, due only to ‘Western’ biases. This argument is unsatisfying, in that it fails to explain how those who reason with the logic of *soku* appear, at least to each other, to argue meaningfully and intelligibly. That is, insofar as the principle of non-contradiction is essential to meaningful and intelligible discourse, a reiterated appeal to a principle of contradiction does not explain how the abandonment of the principle of non-contradiction avoids collapsing all argument into nonsense.

One might also argue that it is a mistake to think of the *soku* connective as an external relation between contradictories (*A*, not-*A*). Instead, ‘*soku*’ is meant to express an internal relation between them. For example, ‘life *soku* death’ should be read as expressing an internal relation between life and death, such that one cannot exist without the other. James Heisig appears to advocate this sort of position. According to Heisig, the logic of *soku* retains the principle of non-contradiction but relativizes it “as unsuited to the task of talking about reality.”<sup>12</sup> Heisig translates ‘*soku*’ as a copulative ‘-in-’, thereby rendering ‘*A soku* not-*A*’ as ‘*A-in-not-A* is *A*.’ The copulative ‘-in-’ “connect[s] two items or attributes, the second of which is attached to the first as a matter of course”;<sup>13</sup> it says something like: “*A* is not just *A*, and not-*A* is not just not-*A*; neither are the two simply different aspects of one and

the same thing; *A* is *A* and not-*A* is not-*A*, but neither of them are real unless each belongs to the other just as it is."<sup>14</sup> Heisig thus argues that '*soku*', translated as the copulative '-in-',

by itself does not say *is* in the sense of the opposite of *is not*, and therefore cannot be said to engage the law of non-contradiction as such. There is therefore nothing linguistic to prevent [one] from using it to join elements, like "*A*" and "not-*A*," that in ordinary logical language would be a contradiction.<sup>15</sup>

Rather than have '*A soku not-A*' mean that *A* is not-*A*, Heisig takes it to mean that *A* belongs to not-*A*, where belonging is not the same as being identical. As such, sometimes a thing both belongs to its negation and is identical to itself. Moreover, by reading '*A soku not-A*' as '*A-in-not-A is A*', a thing as belonging to its negation is identical to the thing itself. When '*soku*' connects two items or attributes, then, it indicates that each requires the other.<sup>16</sup>

Heisig's approach avoids the problems that accompany a rejection of the principle of non-contradiction. The position remains vague, however, insofar as what it is for a thing to "belong to" or "require" its contradictory remains unelaborated. How, for instance, can two items or two attributes belong to each other? An attribute can belong to an item as a property of that item, one item can belong to another as a possession or part, and one attribute can be said to belong to another due to an association in someone's mind; but these types of belonging fail to capture the *soku* relation in question. Further, since Heisig's interpretation allows discourse with the *soku* dialectic to retain intelligibility and meaningfulness by retaining the principle of non-contradiction, what is the relation, if any, between the principle of non-contradiction and the so-called principle of contradiction in the logic of *soku*? If what the Kyoto philosophers call a contradiction is not a contradiction in the traditional sense, what is it? Is it a contradiction in any sense of the word? Or some other, misnamed logical relation? Or just an empty expression?

Although Heisig sketches a framework within which the *soku* dialectic and the principle of non-contradiction can coexist, he does not clarify how one is able to work within such a framework.<sup>17</sup> For instance, what is involved in the transition from traditional logic to the logic of *soku*? Does one simply supplement traditional logic with the *soku* dialectic's belonging-to relationship, or must some traditional principles be abandoned for the new logic? Is the *soku* relation, the principle of contradiction, beyond expression in formal language, or might a modification of some traditional principle allow for an adequate formalization? Heisig's approach does not answer such questions. The interpretation of '*soku*' as a copulative '-in-' concerns grammar and does not penetrate into the logical structure of the *soku* dialectic. This logical structure contains two components: '*soku*' and 'not'. An examination of the truth tables for the traditional logical connectives shows that there is no acceptable, unclaimed (so to speak) combination of truth-values to which '*soku*', as a new binary logical operator, can attach.<sup>18</sup> As such, the *soku* connective cannot have a hidden logical structure. So the key to the structure underlying the *soku* dialectic must be in the 'not', if indeed there is an underlying structure.<sup>19</sup> An investigation into this

structure should provide answers to the questions posed for Heisig's interpretation of the *soku* dialectic.

### 1.3

Looking at the standard subject-predicate sentence, there is an important ambiguity involved in what the denial of 'S is P' is. Although often overlooked, this ambiguity is resolved with a distinction between two senses of negation. This distinction between internal and external negation dates back to Aristotle.<sup>20</sup> In *Prior Analytics*, he writes:

It makes a certain difference in establishing and refuting whether one believes 'not to be this' and 'to be not this' signify the same thing or different things (for example, 'not to be white' and 'to be not white'). For these do not signify the same thing, nor is 'to be not white' the denial of 'to be white': instead, 'not to be white' is.<sup>21</sup>

and

'[I]t is a not white log' and 'it is not a white log' do not belong to something at the same time. For if it is a not white log it will be a log; whereas it is not necessary for what is not a white log to be a log.<sup>22</sup>

Aristotle distinguishes between sentences of the form 'it is *not* the case that S is P' and 'it *is* the case that S is not-P'. The former contains an external negation, while the latter contains an internal one. (For convenience, external negation is written as 'not<sub>E</sub>', while internal negation is written as 'not<sub>I</sub>'.)

According to Aristotle, the denial of 'S is P' is given by its external negation, 'not-(S is P)' rather than its internal negation, 'S is not-P'. Moreover, while the external negation of a sentence is true whenever its internal negation is true, the reverse is not always the case: 'not-(S is P)' can be true when the subject referred to is not an S, in which case 'S is not-P' is false. Take the sentence 'The log is white'. This sentence, said of some thing, might be false because the log is, say, brown, in which case its internal negation is true; or the sentence might be false because the thing referred to as white is not a log, in which case only the external negation of the sentence is true. The internal negation of a sentence requires (or presupposes) that the subject of the sentence properly refers to the thing named as subject, while the external negation of a sentence does not.

Aristotle does not offer a clean, absolute distinction between these two senses of negation. For the 'not' involved in an external negation is still ambiguous. An external negation might be true because what is predicated of a subject is not a property of that subject, in which case the external negation is true because the internal negation is true; or an external negation might be true because the subject of a sentence fails to refer properly (as when the subject in 'the log is white' mistakenly refers to a plastic tube as a log). To render the distinction between internal and external negation absolute, it is sufficient to stipulate that (a) the external negation of a sentence is true just in case the subject of the sentence fails to refer properly, and (b) the internal negation of a sentence is true just in case what is predicated of the subject is

not a property of that subject. Given this modified distinction, it is no longer true that the external negation of a sentence is true whenever its internal negation is true. For whenever a sentence is false, either its internal negation is true or else (exclusively) its external negation is true. When the internal negation of 'S is P' is true, the subject of the sentence refers properly but fails to predicate the appropriate property of the subject. When the external negation is true, the subject of the sentence fails to refer properly, so that the question of whether the sentence predicates the appropriate property of the subject is moot.

This digression into the distinction between internal and external negation has been necessary in order to understand better the 'not' involved in the *soku* dialectic. A careful study of what it is that the Kyoto philosophers deny within this dialectic reveals an exclusive use of *external* negation.<sup>23</sup> To take but one example, consider the following remark by Nishida:

The logic of the existential self requires us to say that in the self's own depths there must be the fact of the self's own self-negation as constitutive of itself.<sup>24</sup>

No predicates are denied of the subject of this sentence; consequently internal negation is not involved. Instead, the subject is denied its selfness, so that what is referred to by the subject of the sentence both is and is not what it is: the subject term does and does not properly refer. When the Kyoto philosophers say 'A and yet not A', or 'A is A and yet A is not-A', they use an 'is' of identity rather than an 'is' of predication. This indicates that they do not assign contradictory predicates to subjects, nor do they suppose that subjects simultaneously possess contradictory properties. Rather, they take A and not-A to be contradictorily identical. Expanding the *soku* dialectic to reveal a more explicit subject-predicate structure, 'A and yet not A' indicates 'S is P and yet not-(S is P)'. In other words, the dialectic indicates, somewhat mysteriously, that the proper referent of the sentence is both S and not-S, that the subject of the sentence both refers properly and does not refer properly. The Kyoto philosophers call this mystery the principle of contradictory identity.

It might help to clarify the contradictory identity of subjects in the *soku* dialectic, allowed for through emphasis on a distinction between two senses of negation, by examining how Indian logicians use a similar distinction.<sup>25</sup> For the Indian logicians also distinguish two senses of negation. Commenting on Indian logic, Bimal Matilal notes:

An ordinary negation has two different aspects: denial and commitment. [W]hen we say no to a meaningful question we also COMMIT ourselves to say yes to some other question properly formulated. This COMMITMENT may vary in different degrees. When we say 'That flower is not red' we are committed to admit that the flower has some other color. . . . When we say that 'Man is not the creator of the universe' the degree of our commitment is very low. [Denial] is present in every negation, but its intensity may also vary.

Merely to deny that a flower is red is to reject that the flower is red without thereby tacitly accepting that the flower has some other color. Matilal continues:

Indian grammarians and logicians tried to capture these two aspects of negation by their doctrine of [nominally bound negation] and [verbally bound negation]. In [nominally bound negation], the 'commitment' aspect largely predominates over the 'denial' aspect, while in [verbally bound negation], it is the other way around.<sup>26</sup>

Accordingly, one can use verbally bound negation to negate a sentence without committing to the negation or its consequences.<sup>27</sup> One can say 'not A and not not-A' without contradiction, provided one understands at least the outermost 'not' of each conjunct as a verbally bound negation. For example, one might say, without contradiction, both 'not-(S is P)' and 'not-(S is not-P)', so long as the outermost 'not' in each case is a verbally bound negation. In such a case, one might deny the underlying presupposition that S exists, and so deny that S can either have or not have property P.<sup>28</sup>

The distinction between verbally and nominally bound negation is quite similar to the modified distinction between external and internal negation. The significant difference is that the modified distinction between external and internal negation is absolute, so that every negation is meant as either an external negation or else an internal one, while the distinction between verbally and nominally bound negation is a matter of varying degrees of intensity, so that both aspects are present in every negation. More importantly, the Kyoto philosophers add a metaphysical twist to their distinction by affirming the principle of contradictory identity. That is, the Kyoto philosophers commit themselves to saying that the subject 'S' of a sentence both does and does not properly refer. In contrast, (some) Indian logicians prefer a non-committal attitude, and so deny both of these commitments.<sup>29</sup> (Some Indian logicians also deny all predicates of S; the Kyoto philosophers do not appear to go this far.)

#### 1.4

The distinction between external and internal negation along with the principle of contradictory identity permits a distinction between external and internal contradictions, or between absolute and relative contradictions, respectively. An external contradiction occurs when the 'not' in 'A and yet not A' expresses an external negation, while an internal contradiction occurs when the 'not' expresses an internal negation. This distinction between senses of contradiction accords well with Tanabe's distinction between "a *real* contradiction" and "a merely formal logical contradiction,"<sup>30</sup> and with Nishitani's remark that the contradiction involved in man's Existenz "cannot simply be dismissed as logically meaningless."<sup>31</sup> Real contradictions concern the subject itself, while merely formal logical ones concern what is predicated of the subject. Since subjects are contradictorily identical, the world is full of external contradictions, real contradictions. The principle of contradictory identity thus gives rise to the perplexities mentioned in the introductory section, placing the logic of *soku* at odds with traditional logic.



To remove the puzzlement caused by the principle of contradictory identity, section 1.3 introduced a distinction between internal and external negation. That section also contained the claim that the *soku* dialectic uses external negation *exclusively* and that, as such, 'A *soku* not<sub>E</sub>-A' and the resultant principle of contradiction need not conflict with the traditional principle of non-contradiction. A defense of the former claim is postponed until section 3, in order to defend the latter claim and better motivate the appeal of an absolute distinction between internal and external negation.

The traditional principle of non-contradiction forbids both internal and external contradictions. There is every reason to suppose that internal contradictions are, if not impossible, then at least inconceivable or meaningless. Isn't it just common sense that if something has some property, then it doesn't lack that same property? The principle of non-contradiction, at least with regard to internal contradiction, seems to be foundational to all demonstration and proof. Arguments and meaningful discourse seem to be impossible without this principle forbidding internal contradictions; without non-contradictory predication, we cannot really say anything interesting, and rational discourse comes to a halt.

Common sense, however, is not so clear with regard to external negation. When you refer to yourself in any sentence, do you not also refer to what you are not, simultaneously and in precisely the same respects? Isn't it true, on some level, that you have the properties you do because what is not-you also has those properties? Take the following sentence: 'Nishida is Nishida'. Here one identifies Nishida with himself, and one cannot also say that Nishida is not<sub>I</sub>-Nishida, on pain of (internal) contradiction. One also refers to Nishida as the subject who is self-identical; so the sentence properly refers to its subject and is true just because Nishida *is* Nishida. Now comes the metaphysical twist: can we intelligibly say that Nishida is not<sub>E</sub> Nishida?<sup>32</sup> Perhaps we can, if we mean by Nishida not the set of all properties that some person has, but rather the person himself. At least as a living person, Nishida is always changing, and although he never has a property and lacks it at the same time, he is always simultaneously himself and other-than-himself, for he is becoming. Without this sort of contradictory identity, Nishida could not become: "On all sides I escape being *and yet*—I am."<sup>33</sup>

Must we deny this sort of contradictory identity in order to speak intelligibly, when the fact of our becoming is so obvious? Or is our denial of the principle of contradictory identity merely a metaphysical bias, uncritically imbibed through a tradition of logic born from philosophies with static ontologies? Either way, it seems to be perfectly legitimate to separate ontological questions about properties that things can have from ontological questions about the things themselves, insisting on the principle of identity and forbidding internal contradictions with regard to the former, and yet accepting the principle of contradictory identity and allowing external contradictions with regard to the latter. For there is one important difference between things and the properties they can have: things can change, but properties are static. Perhaps it is only a metaphysical bias that prevents (some of) us from acknowledging this difference.

If the principle of contradictory identity is true, traditional logic is inadequate to allow for intelligible discourse about contradictory identities. Some alteration is necessary, so that our logic is adequate to its task. One way both to alter traditional logic and to retain logical formality is to distinguish two senses of negation, and thereby distinguish two senses of contradiction, reserving one for the traditional notion and appropriating the other for the *soku* dialectic: whence the distinction between internal and external contradictions. Having informally sketched the logical structure of the *soku* dialectic, section 2 formalizes the distinction between external and internal negation essential to the logic of *soku*. Section 3 presents some remarks of the Kyoto philosophers in light of this formalization, sketches an explanation for the apparent oddity of the *soku* dialectic, and discusses the relation of this distinction to Heisig's grammatical interpretation of the *soku* connective. In what follows, SL (for '*soku* logic') refers to the formal version of the logic of *soku*, and SD (for '*soku* deduction') refers to the natural deduction system for SL.

## 2. The Formal System SL

### 2.1

The object language SL, as a propositional calculus, contains the following symbols: a denumerable infinity of individual propositional variables ( $p, q, x, y_1, \dots$ ); parentheses; binary connectives for conjunction ( $\&$ , 'and'), disjunction ( $\vee$ , 'or'), implication ( $\rightarrow$ , 'only if'), and equivalence ( $\leftrightarrow$ , 'if and only if'); and unary connectives for internal negation ( $\neg$ , 'not<sub>I</sub>') and external negation ( $\sim$ , 'not<sub>E</sub>'). Capital italicized Roman letters ( $A, B_{26}, P, Q, \dots$ ) stand for formulas, with the usual formation rules. Capital Greek letters ( $\Gamma, \Delta, \dots$ ) stand for sets of formulas. SL truth-functionally defines ' $\sim$ ', ' $\neg$ ', and ' $\&$ ' as primitive logical operators. The other connectives, such as ' $\vee$ ' and ' $\rightarrow$ ', are inter-definable in terms of ' $\neg$ ' and ' $\&$ ', as usual.

SL adopts a metalanguage in which the rules of classical logic are valid, since one aim of this formalization is to understand SL from a 'Western' logical perspective. The syntax for the metalanguage includes '=' for equality ('equals'), ' $\neq$ ' for inequality ('does not<sub>I</sub> equal'), ' $\Rightarrow$ ' ('only if'), ' $\Leftrightarrow$ ' ('if and only if'), ' $\vDash$ ' ('it is true that', 'truth-functionally entails'), and ' $\vdash$ ' ('it is derivable that'); ' $\vdash_{SL}$ ' means 'it is derivable in SL that'.

Let  $\mathbf{v}$  be a truth-function which assigns to each proposition  $p$  either **T** (truth) or **F** (falsity).<sup>34</sup> Then:

- (Df1)  $\vDash p \Leftrightarrow \mathbf{v}(p) = \mathbf{T}$   
 (Df2)  $\vDash \sim p \Leftrightarrow \mathbf{v}(p) = \mathbf{T}$   
 (Df3)  $\vDash \neg p \Leftrightarrow \mathbf{v}(p) = \mathbf{F}$   
 (Df4)  $\vDash \neg(\sim p) \Leftrightarrow \mathbf{v}(p) = \mathbf{T}$   
 (Df5)  $\vDash p \& q \Leftrightarrow \vDash p \text{ and } \vDash q \quad (\Leftrightarrow \mathbf{v}(p) = \mathbf{T} \text{ and } \mathbf{v}(q) = \mathbf{T})$

Df2 marks the departure of SL from classical logic,<sup>35</sup> which assumes that external negation is semantically equivalent to internal negation:  $\vDash \sim p \Leftrightarrow \mathbf{v}(p) = \mathbf{F} \Leftrightarrow \vDash \neg p$ .<sup>36</sup> Moreover, the alteration of Df2 demands a corresponding alteration in Df4.

Reverting to subject-predicate mode, SL contains four forms of elementary propositions:

1. 'x is P'  $Px$
2. 'not<sub>E</sub>- (x is P)'  $\sim Px$
3. 'x is not<sub>I</sub> P'  $\neg Px$
4. 'not<sub>E</sub>- (x is not<sub>I</sub> P)'  $\sim \neg Px$

Propositions 3 and 4 are the internal contradictories of 1 and 2, respectively, while 1 and 3 are the external contradictories of 2 and 4, respectively.

## 2.2

SD is a natural deduction system for SL, providing introduction and elimination rules for ' $\sim$ ', ' $\neg$ ', and '&'. The presentation of SD is rather sketchy and informal. The introduction rules will be marked by ' $\neg$ -intro', and the elimination rules by ' $\neg$ -elim'.

1. Rules for External Negation:<sup>37</sup>
  - ( $\sim$ -intro) from  $P$ , infer  $\sim P$
  - ( $\sim$ -elim) from  $\sim P$ , infer  $P$
2. Rules for Internal Negation:<sup>38</sup>
  - ( $\neg$ -intro) from a reduction of  $P$  to absurdity, infer  $\neg P$
  - ( $\neg$ -elim) from a reduction of  $\neg P$  to absurdity, infer  $P$
3. Rules for Conjunction:
  - (&-intro) from  $P$  and  $Q$ , infer  $P \& Q$
  - (&-elim) from  $P \& Q$ , infer  $P$ ; and from  $P \& Q$ , infer  $Q$

## 2.3

Since SL retains ' $\neg$ ' and '&' in their classical senses, it also retains the classical equivalence rules, such as contraposition, distribution, De Morgan's rules, et cetera, as well as the classical rules of inference, such as *modus ponens*. The following theorems primarily concern the new operation ' $\sim$ '.

- (T1)  $\vdash_{SL} P \leftrightarrow \sim P$   
Proof: Suppose  $P$ . Then  $\sim P$  (by  $\sim$ -intro). So  $P \rightarrow \sim P$ . Suppose  $\sim P$ . Then  $P$  (by  $\sim$ -elim). So  $\sim P \rightarrow P$ .<sup>39</sup>
- (T2)  $\mathbf{v}(P) = \mathbf{T} \Rightarrow \mathbf{v}(\sim P) = \mathbf{T}$   
Proof: Let  $Q = \sim P$ .  $\mathbf{v}(P) = \mathbf{T} \Leftrightarrow \vDash P$  (by Df1)  $\Leftrightarrow \vDash \sim P$  (by T1)  $\Leftrightarrow \vDash Q$  (since  $\sim P = Q$ )  $\Leftrightarrow \mathbf{v}(Q) = \mathbf{T}$  (by Df1)  $\Leftrightarrow \mathbf{v}(\sim P) = \mathbf{T}$  (since  $Q = \sim P$ ).
- (T3)  $\vDash \sim P \Rightarrow \mathbf{v}(\sim P) = \mathbf{T}$   
Proof:  $\vDash \sim P \Leftrightarrow \mathbf{v}(P) = \mathbf{T}$  (by Df2)  $\Rightarrow \mathbf{v}(\sim P) = \mathbf{T}$  (by T2).

- (T4)  $\vdash_{\text{SL}} \neg(P \ \& \ \neg P)$   
 Proof: Suppose, for *reductio*,  $(P \ \& \ \neg P)$ . Then  $P$ , and  $\neg P$  (both by  $\&$ -elim). So  $\neg(P \ \& \ \neg P)$  (by  $\neg$ -intro).<sup>40</sup>
- (T5)  $\vdash_{\text{SL}} \neg(\sim P \rightarrow \neg P)$   
 Proof: Suppose, for *reductio*,  $(\sim P \rightarrow \neg P)$ . Also suppose  $\sim P$ . Then  $\neg P$  (by *modus ponens*) and  $P$  (by T1). So  $\neg(\sim P \rightarrow \neg P)$  (by  $\neg$ -intro).
- (T6)  $\vdash_{\text{SL}} \neg(\neg P \rightarrow \sim P)$   
 Proof: Suppose, for *reductio*,  $(\neg P \rightarrow \sim P)$ . Also, suppose  $\neg P$ . Then  $\sim P$  (by *modus ponens*), so that  $P$  (by T1). So  $\neg(\neg P \rightarrow \sim P)$  (by  $\neg$ -intro).
- (T7)  $\vdash_{\text{SL}} \neg(\neg P \leftrightarrow \sim P)$   
 Proof: This follows as an obvious corollary from T5 and T6.
- (T8)  $\vDash \neg(\neg P) \Leftrightarrow \vDash P$   
 Proof:  $\vDash \neg(\neg P) \Leftrightarrow \neg(\mathbf{v}(\neg P) = \mathbf{T})$  (by Df3)  $\Leftrightarrow \neg(\mathbf{v}(P) = \mathbf{F}) \Leftrightarrow \mathbf{v}(P) = \mathbf{T} \Leftrightarrow \vDash P$  (by Df1).<sup>41</sup>
- (T9)  $\vdash_{\text{SL}} (\sim(\sim P) \leftrightarrow P)$   
 Proof:  $P \leftrightarrow \sim P$  (by T1)  $\leftrightarrow \sim(\sim P)$  (by T1).

The theorems above formally express many of the considerations from sections 1.3 and 1.4. T1 and T4 are the most important. T1 is a formalization of Nishida's "identity of absolute contradictions" or "principle of absurdity," also called the principle of contradictory identity, and T4 is the principle of non-contradiction. So SL can express both internal and external contradictions. It is also evident, from T1, that SL does not restrict these external contradictions to a special set of propositions, but applies universally. T6 is unremarkable from a classical standpoint, since Aristotle had held as much. Yet T5 is quite remarkable from an Aristotelian standpoint, since it denies the classical subalternate relation between external and internal negation; that is, it denies that  $\text{not}_E\text{-}P$  entails  $\text{not}_I\text{-}P$ . T5 and T6 are remarkable from a classical standpoint only if  $P$  is non-fictional. A propositional calculus does not adequately capture this nuance. If SL were a predicate calculus, one would say that T5 and T6 are remarkable only if the subject exists, since classical logic accepts T5 and T6 due to considerations of existential import. Finally, T8 and T9 both concern double negation: the former is double internal negation (classical double negation), and the latter is double external negation.<sup>42</sup>

### 3. Informal Interpretation and Commentary

#### 3.1

SL provides a system that preserves the differences between contradictories while also uniting them in an immanent synthesis: both  $A$  and its "negation"  $\sim A$  are true,

if either is true, even though  $A$  and  $\neg A$  are never both true. Insofar as it retains the principle of non-contradiction (T4), SL is an extension of traditional logic. The significant difference is the new relation between contraries (T1) and the denial of the subalternate relation (T5).<sup>43</sup>

The new relation expressed by T1, in allowing the conjunction ' $A \ \& \ \sim A$ ', respects the conception of dialectical logic that the Kyoto philosophers seem to hold.<sup>44</sup> Tanabe, for instance, writes that, in dialectical logic, "any affirmation that takes place . . . is transformed into negation, whereas negation is converted into affirmation without simply being eliminated."<sup>45</sup> Moreover,

opposites are always correlative; one can only exist because its opposite also exists. That is to say, *dynamic* opposition is marked by the fact that even though—or rather, precisely because—opposites are contradictory and incompatible, they require one another.<sup>46</sup>

This is no longer puzzling when negation and contradiction are taken in their external senses. T1 expresses Tanabe's notion of "real contradictions," in that  $A$  is true if and only if  $\sim A$  is true. Similar examples occur in Nishitani's writings. He instantiates T1, for instance, when he claims that "Combustion has its ground in non-combustion. Because of non-combustion, combustion is combustion,"<sup>47</sup> that "Heat and non-heat are self-identically a single fact,"<sup>48</sup> and that

What we usually say. . . , that 'this is fire,' is not yet true. Rather, we speak the truth when we negate that standpoint and say that 'this is not fire,' instead. Only on a field where this sort of utterance is possible does it become truthful to claim that 'this is fire.'<sup>49</sup>

Moreover, to say that  $A$  and  $\text{not}_E\text{-}A$  are "self-identically a single fact" can be understood as an informal expression of the truth-valuation conditions in Df1 and Df2.<sup>50</sup>

Insofar as SL is an accurate formalization of the dialectical logic used by the Kyoto philosophers, it easily explains the logic's apparent oddity. Following Dilworth's model of "internal paradox, external confrontation," paradoxes arise from the conjunction of  $A$  and  $\text{not}_E\text{-}A$  while confrontations arise from the disjunction of  $A$  and  $\text{not}_I\text{-}A$ . Instances of paradox and confrontation are explained by different senses of negation: external in the former case, internal in the latter. Dilworth's so-called "rule of disparity" is nothing more than the assertion of an internal negation of some proposition. The distinction between internal and external negation, along with a modified relation between contraries, allows the logic of *soku* consistency and intelligibility, even if the new relation between contraries (and subalternates) is counterintuitive and untraditional.<sup>51</sup>

SL also supplements Heisig's interpretation of '*soku*' as a copulative 'in-'. Whereas Heisig's interpretation of the *soku* connective does little to clarify formally the relation between internal and external contradictions, SL not only explains this relation but also allows one to identify the alterations to traditional logic that permit their coexistence. By locating the essential formal difference between traditional logic and the logic of *soku* in alternate negation functions, SL allows for a thorough, formal explanation of the logic of *soku* that does not require an analysis of the

belonging-to relation. SL minimizes the formal significance of the *soku* connective; negation is the significant logical operation, while '*soku*', as the copulative '-in-', is a grammatical indicator of a shift to external negation. As such, the belonging-to relation becomes an object for grammatical inquiry, inessential to the formal explanation of the logic of *soku*, although perhaps indispensable for an informal explanation of the logic.

### 3.2

SL, and especially its definitions of internal and external negation, allows at least two well-formed criticisms of the logic of *soku*. First, there is the problem caused by the property of being self-identical. According to the principles of identity and contradictory identity (T1), each subject is identical to itself and not identical to itself: 'A is A, and yet A is not<sub>E</sub> A'. Taking self-identity as a property, the *soku* dialectic allows one to say that something both is and is not<sub>I</sub> self-identical. This, of course, is an internal contradiction, derived only on the assumption that self-identity is a possible property. The *soku* logician has two alternatives: either accept this internal contradiction and minimize its importance or else deny that self-identity is a possible property. In the former case, one might argue that self-identity is the only property that causes this sort of problem for the logic of *soku*, so that self-identity just turns out to be an odd property. In the latter case, there is at least one significant consequence, namely that the definition of zero as the number of non<sub>I</sub>-self-identical things becomes meaningless.<sup>52</sup> This result might be made more palatable to the number theorist by pointing out that the definition of zero in terms of non-self-identity is quite similar to an attempt to define zero as the number of nonexistent things on the background assumption that all things, properly so-called, are existent. Since, in this second case, there are already reasons, dating back at least to Kant, to suppose that existence is not a predicate, one might argue that, by analogy, self-identity is not a predicate, as there is a background assumption that all things, properly so-called, are self-identical. If that approach is unsuccessful, one might just allow that the logic of *soku* is not an appropriate logic for mathematics, even though it is appropriate for other subject matter.

The second criticism of the logic of *soku* concerns the meaning of 'not<sub>E</sub>'. According to two prominent contemporary meaning theories, logical operators receive their meaning either from their truth-conditions or from their introduction and elimination rules. If a logical connective receives its meaning from its truth conditions, then external and internal negations are different *kinds* of negation, since their truth-functional definitions are different. So while 'not<sub>I</sub>' means what negation ordinarily means, one is left to wonder whether 'not<sub>E</sub>' means anything at all, or whether it captures some overlooked sense of negation. If a logical connective receives its meaning from its rules of inference, then since there are different introduction and elimination rules for internal and external negation, one must conclude that 'not<sub>E</sub>' has a different meaning from 'not<sub>I</sub>'. So, as before, one is left to wonder whether 'not<sub>E</sub>' means anything at all.

Just because 'not<sub>E</sub>' has been given a formal definition that differentiates it from

'not', one cannot automatically assume that there really is a second kind of negation, in some reasonable sense of 'negation'. For it might very well be that external negation is so unlike internal or ordinary negation that it does not make sense to call it negation at all, so that the 'not' in 'A *soku* not-A' is just a rhetorical sound without logical significance. One might resort to a grammatical explanation, as Heisig does (see section 1.2). But then it is hard to understand how a copulative '-in-' adds anything (logically) significant to a statement, especially when what it is for a thing to "belong to" its contradictory remains unelaborated and apparently beyond formalization.

### 3.3

SL has been offered both as a way to help us understand the Kyoto philosophers and as an attempt to remove the appearance of harmful (logical) contradictions from their explanations of reality. One way to judge the appropriateness of SL as a formalization of the logic of *soku* is to investigate the extent to which informal sentences appealing to the *soku* dialectic can be expressed in the formal language. Sections 2.3 and 3.1, with reference to section 1, are meant to exhibit the usefulness of SL in this regard. Another way to judge the appropriateness of SL as a formalization of the logic of *soku* is to determine whether SL accomplishes what formalization is meant to accomplish. One might suppose that a system of formal logic is, or ought to be, "a set of regulative principles for developing more precise and efficient habits for using language than are manifested in everyday discourse."<sup>53</sup> SL certainly allows for more efficient and precise discourse. It not only provides a crucial, well-defined distinction between internal and external negation, and so lessens our puzzlement over the dialectical form 'A *soku* not-A', but also permits clearer criticisms of the logic of *soku* generally, as section 3.2 shows. SL could also be used to formalize and clarify arguments given with the logic of *soku*, although this has not been attempted here; and it could be used to develop further criticisms of the logic generally.

Of course, the criticisms from section 3.2 might make one inclined to reject SL and the logic of *soku* as simply absurd or horribly confused. Such a dismissal, however, would be premature. If the merit of a system of logic is judged in terms of the adequacy of the system as a means of attaining its envisaged ends,<sup>54</sup> one must determine two things before dismissing the logic. First, does the logic allow us to convey our thoughts, and might other, more established logics also suffice for this purpose? Second, are such thoughts worth conveying, or are the envisaged ends desirable? The Kyoto philosophers have all claimed that traditional logic is unsuited for speaking of reality as they understand it; so they resort to the logic of *soku*. They seem to be justified in this regard, since, as Nishida says, the paradoxical structure of the *soku* dialectic "runs afoul of the principle of identity" if understood in terms of traditional logic. If this new understanding of reality is judged to be worthwhile, perhaps one is justified in setting aside the concerns from section 3.2 and others like them as temporary puzzles expected of all new systems, amenable to future resolution.

At the very least, critics can no longer dismiss arguments involving the *soku*

dialectic as unintelligible or meaningless on the ground that such arguments violate the principle of non-contradiction, because they do not. (See T1 and T4.) Such arguments might violate other treasured principles of rational discourse; but it is incumbent on the critic to present those principles and defend their desirability. Perhaps in anticipation of this burden, the Kyoto philosophers grant traditional logic legitimacy in certain areas, such as physical science, but insist on their dialectic in other areas, such as religion and the investigation of self-consciousness. Critics of the *soku* dialectic thus have the following challenge: either reinterpret the insights of the Kyoto school with traditional logic, avoiding the *soku* dialectic, or else show the emptiness or irrationality of such insights. Insofar as the Kyoto philosophers are correct when they say that traditional logic is inadequate for their task, the critic is left to pursue the second option. Given SL as an accurate formalization of the logic of *soku*, the usual objection of unintelligibility will not suffice, since the logic does not violate the principle of non-contradiction. This is not to say that the logic is not unintelligible for some other reason, but it is unfair to dismiss arguments relying on the *soku* dialectic without first providing these other reasons.

#### Notes

- 1 – Many commentators identify this inference form: see D. T. Suzuki, *Studies in Zen* (New York: Delta, 1955), pp. 119–120; Ha Tai Kim, “The Logic of the Illogical: Zen and Hegel,” *Philosophy East and West* 5 (1) (April 1955): 22; David A. Dilworth, “Postscript: Nishida’s Logic of the East,” in *Last Writings: Nothingness and the Religious World View* (Honolulu: University of Hawai’i Press, 1987), p. 130; Robert E. Carter, *The Nothingness Beyond God: An Introduction to the Philosophy of Nishida Kitarō* (New York: Paragon House, 1989), pp. 59, 62; Thomas P. Kasulis, “Logic in Japan,” in *Routledge Encyclopedia of Philosophy*, Version 1.0 (New York: Routledge, 1998); James W. Heisig, *Philosophers of Nothingness: An Essay on the Kyoto School* (Honolulu, University of Hawai’i Press, 2001), pp. 65–66; Nishitani Keiji, *Religion and Nothingness*, trans. Jan van Bragt (Berkeley: University of California Press, 1983), pp. 118, 124, 291 n. 19. Note that this is not Hegel’s dialectical form; Hegelian logic infers the synthesis of thesis and antithesis from their conjunction, while the logic of *soku* infers the original thesis. Note also that Heisig prefers the form ‘A-in-not-A is A’ to ‘A is not-A’ (*Philosophers of Nothingness*, p. 65).
- 2 – Some recent formal logicians distinguish the occurrence of a contradiction from an “explosion” resulting from that contradiction, so that in a nonexplosive logic it is not true that anything follows from a contradiction. These logicians have yet to gain widespread acceptance in the ‘Western’ philosophical community, and so what difficulties, if any, they might discern in the *soku* dialectic is left as a separate question.



- 3 – Primarily these ‘Western’ philosophers are those who hold that the principle of non-contradiction is essential in philosophy, and for whom the formal structure of arguments is at least as important as argumentative content; this includes, but is not limited to, most of the so-called analytic philosophers.
- 4 – Nishida Kitarō, “The Logic of the Place of Nothingness and the Religious World View,” in *Last Writings: Nothingness and the Religious World View*, trans. David A. Dilworth (Honolulu: University of Hawai‘i Press, 1987), p. 75.
- 5 – Nishitani, *Religion and Nothingness*, p. 124.
- 6 – Tanabe Hajime, *Philosophy as Metanoetics*, trans. Takeuchi Yoshinori (Berkeley: University of California Press, 1986), p. 13.
- 7 – ‘Form and emptiness’ is from Nishitani, *Religion and Nothingness*, p. 97; the other paradoxical pairs come from Nishida’s “The Logic of the Place of Nothingness and the Religious World View,” although they can be found in Nishitani (and Tanabe) as well. Perhaps as a result of their broad view of logic as inclusive of metaphysics and epistemology, the Kyoto philosophers seem not to distinguish between relations of meanings and relations of referents; this vagueness is reproduced as far as possible throughout the discussion.
- 8 – These last two pairs are from Tanabe, *Philosophy as Metanoetics*, p. 67.
- 9 – Dilworth, “Postscript: Nishida’s Logic of the East,” p. 129. Although he applies this characterization only to Nishida’s logic, it generalizes to Tanabe and Nishitani as well, since all three appeal to the *soku* dialectic.
- 10 – To illustrate the problem, consider the following argument: Suppose *A soku not-A*. That is, suppose *A* and yet not-*A*. From *A*, it follows that either *A* or *X*, for any arbitrary *X*. From not-*A*, it follows that *X* by disjunctive syllogism. Hence, if *A* and yet not-*A* is true, then both *A* and not-*A* are true, and so any arbitrary *X* is also true. Heisig concurs: “To say that there is an affirmation that is *at the same time and just as it is* a negation, or that there is a connection that is *at the same time and just as it is* a disconnection, is to talk nonsense” (*Philosophers of Nothingness*, p. 66). One could attempt to retain intelligibility without the principle of non-contradiction by adopting some criterion for validity (of arguments) other than truth. Insofar as no such criterion is apparent among the Kyoto philosophers, this alternative is not considered.
- 11 – Dilworth diagnoses this obstacle in “Nishida’s Final Essay: The Logic of Place and a Religious World-view,” *Philosophy East and West* 20 (4) (October 1970): 355–367, when he writes: “If we attempt to express [the self-identity of a contradiction] in logical terms, we have to transcend rational, objective logic . . . and speak in dialectical and paradoxical terms. The problem then becomes one of attempting to speak in *meaningful* dialectical terms” (p. 359; emphasis mine). But Dilworth offers no suggestion as to how Nishida proposes to use

dialectical terms meaningfully, nor how in general such a use is possible. This is not meant as a criticism of Dilworth, however, as his effort in diagnosing this obstacle is to explicate rather than criticize Nishida's final essay.

- 12 – Heisig, *Philosophers of Nothingness*, p. 65. Although his discussion on this point centers on the work of Nishida, Heisig's position generalizes to the other Kyoto philosophers. Whence he writes that "[t]he use of the *soku* copulative appears throughout Tanabe's work in much the same sense as it had with Nishida" (p. 313).
- 13 – Ibid.
- 14 – Ibid., p. 66.
- 15 – Ibid., p. 65.
- 16 – Ibid., p. 66.
- 17 – Of course, this is not his purpose in *Philosophers of Nothingness*; these remarks are not meant to diminish Heisig's contributions, but to supplement them.
- 18 – One might reject truth-functional definitions in favor of some other method that can accommodate an additional binary connective. Procedurally, however, this method is to be eschewed. For, in the absence of other reasons, the rejection of a widely accepted method of definition of the logical operators would rest only on the claim that '*soku*' is a legitimate connective, and it is precisely this legitimacy that is in question. So one would reject an established method in the service of a dubious claim, accomplishing nothing since objectors could, in turn, reject the dubious claim in favor of the established method.
- 19 – The insight that negation, rather than '*soku*', is the key to understanding the *soku* dialectic is partially due to Thomas P. Kasulis.
- 20 – For a brief discussion of the distinction between internal and external negation from the perspective of classical logic, see B. H. Slater, "Internal and External Negations," *Mind* 88 (352) (October 1979): 588–591. For an anticipation of the distinction as regards the logic of *soku*, see Th. Stcherbatsky, *Buddhist Logic*, vol. 1 (S-Gravenhage: Mouton, 1958), pp. 394–395, 424 ff.
- 21 – Aristotle, *Prior Analytics*, trans. Robin Smith (Indianapolis: Hackett, 1989), 51b5–9.
- 22 – Ibid., 51b28–30.
- 23 – There is perhaps only one exception to this bold generalization. According to Nishitani, "the relationship we have to religion is a contradictory one: those for whom religion is *not* a necessity are, for that reason, the very ones for whom religion *is* a necessity. There is no other thing of which the same can be said" (*Religion and Nothingness*, p. 1). The 'is' here, of course, is not one of identity. Further, it is doubtful whether Nishitani intends religion to be and not be a

necessity in the same respect. I suspect that his point is rhetorical rather than logical.

- 24 – Nishida, “The Logic of the Place of Nothingness and the Religious World View,” p. 83. See also the quotations from section 1.1.
- 25 – I thank an anonymous referee for this suggestion.
- 26 – Bimal Krishna Matilal, *Epistemology, Logic, and Grammar in Indian Philosophical Analysis* (The Hague: Mouton, 1971), p. 163. In the second quote block, I have substituted English translations for the proper Indian words.
- 27 – See *ibid.*, p. 164.
- 28 – See *ibid.*, pp. 164–165.
- 29 – See *ibid.*, p. 164.
- 30 – Tanabe, *Philosophy as Metanoetics*, p. 67.
- 31 – Nishitani, *Religion and Nothingness*, p. 170. Nishitani calls this sort of contradiction a “logical” one. I just take this to indicate that he and Tanabe use that adjective differently. In Tanabe’s terminology, Nishitani is saying that the “real” contradiction involved in our Existenz cannot be dismissed.
- 32 – What follows is an attempt to make sense of the *soku* dialectic independently of the work of the Kyoto philosophers. The purpose here is not to represent accurately views that these philosophers hold, but only to make plausible the claim that the principle of contradictory identity need not conflict with the traditional principle of contradiction.
- 33 – Jean-Paul Sartre, “Self-Deception,” in *Existentialism: From Dostoevsky to Sartre*, revised and expanded, ed. Walter Kaufmann (New York: Meridian, 1989), p. 316; emphasis added.
- 34 – In the metalanguage, the identity of internal negation with external negation is obvious, since falsity is non-truth and truth is non-falsity. That is,  $\mathbf{v}(p) \neq \mathbf{v}(\neg p)$ , because  $\mathbf{T} \neq \mathbf{F}$ .
- 35 – Df2 reads: ‘ $\sim p$  is true if and only if  $p$  is true’; that is, ‘not<sub>E</sub>- $p$  is true if and only if  $p$  is true’.
- 36 – Similarly,  $\vdash_{\text{CL}} (\sim p \rightarrow \neg p)$ , provided that the subject of the proposition  $p$  exists.
- 37 – Formally, these are:  $(\sim\text{-intro}) \Gamma \vdash_{\text{SL}} P \Rightarrow \Gamma \vdash_{\text{SL}} \sim P$ , and  $(\sim\text{-elim}) \Gamma \vdash_{\text{SL}} \sim P \Rightarrow \Gamma \vdash_{\text{SL}} P$ . This formality is foregone in favor of semiformal presentation, to avoid unnecessary technicality.
- 38 – In both cases, absurdity is meant in the classical sense, as internal contradiction.
- 39 – T1 has a semantical counterpart, T1\*:  $\vDash P \Leftrightarrow \vDash \sim P$ . Proof:  $\vDash P \Leftrightarrow \mathbf{v}(P) = \mathbf{T}$  (by Df1)  $\Leftrightarrow \vDash \sim P$  (by Df2).

- 40 – T4 has a semantical counterpart, T4\*:  $\vDash \neg(P \& \neg P)$ . Proof: Suppose, for *reductio*,  $\vDash (P \& \neg P)$ . Then  $\mathbf{v}(P) = \mathbf{T}$  and  $\mathbf{v}(\neg P) = \mathbf{T}$  (by Df5). But  $\mathbf{v}(\neg P) = \mathbf{T} \Leftrightarrow \mathbf{v}(P) = \mathbf{F}$ . So  $\mathbf{v}(P) = \mathbf{T}$  and  $\mathbf{v}(P) = \mathbf{F}$ , which is absurd (since  $\mathbf{T} \neq \mathbf{F}$ ).
- 41 – The result  $\vdash_{\text{SL}} (\neg(\neg P) \leftrightarrow P)$  is quite difficult to prove without appeal to truth-valuations, which is only legitimate given a proof of the soundness and completeness of SL. Since these crucial results are not here proved, a semantical version of the theorem is presented instead.
- 42 – One might wonder whether SL illuminates the purported differences between Nishida's logic of *basho* and Tanabe's logic of species. It does not. Tanabe held that an affirmation of both/and was less radical, and less adequate, than an affirmation of neither/nor. SL, however, allows one to derive neither/nor from both/and, and vice versa. That is, from  $(P \& Q)$  one can infer, in SL,  $(\sim P \& \sim Q)$ , and vice versa. Unless Tanabe intended 'nor' in an internal sense  $(\neg P \& \neg Q)$ , both/and and neither/nor are formally identical in SL. Yet if he intended 'nor' in an internal sense, he forfeits intelligibility. That said, it is not obvious how a formalization of Tanabe's logic of species would depart from SL. This should not be surprising, since rarely does a subtle criticism of a general position rest upon differences among the logics underlying both position and criticism—indeed, the underlying logics are almost always identical.
- 43 – There is also a new relation between subcontraries, namely:  $\vdash_{\text{SL}} \neg P \leftrightarrow \neg(\sim P)$ .
- 44 – SL also seems to be an accurate formalization of Charles Hartshorne's "logic of ultimate contrasts," although SL does not appear to provide for the basic asymmetry among contraries that Hartshorne demands. See Hartshorne, "A Logic of Ultimate Contrasts," in *The Zero Fallacy and Other Essays in Neo-classical Philosophy*, ed. Mohammad Valady (Chicago: Open Court, 1997), pp. 109–132. This is perhaps no coincidence, given the parallels between Hartshorne's and Nishida's philosophy of religion.
- 45 – Tanabe, *Philosophy as Metanoetics*, p. 16.
- 46 – *Ibid.*, pp. 67–68; emphasis added.
- 47 – Nishitani, *Religion and Nothingness*, p. 117.
- 48 – *Ibid.*, p. 126.
- 49 – *Ibid.*, p. 118.
- 50 – For a distinction between logical and dialectical contradictions (here called internal and external contradictions, respectively) in Nishida's work, see G. S. Axtell, "Comparative Dialectic: Nishida Kitarō's Logic of Place and Western Dialectical Thought," *Philosophy East and West* 41 (2) (April 1991): 172 ff. Axtell's discussion seems to agree with SL's formal interpretation of the logic of *soku* and its relation to the principle of non-contradiction. It is also worth noting that, although Nishida states that the "principle of the absurd is not merely

irrational" ("The Logic of the Place of Nothingness and the Religious World View," p. 108), according to SL this "principle of the absurd" is not irrational at all, insofar as rationality is tied to the principle of non-contradiction and SL contains that principle.

- 51 – This explanation of the logic of *soku* through SL also disagrees with Ha Tai Kim's characterization of Nishida as offering a "logic of the illogical" (p. 28). Far from being illogical, SL respects the principle of non-contradiction; the apparent illogicality is due to an unconventional distinction between internal and external negation.
- 52 – See, for example, Neil Tennant, "On the Necessary Existence of Numbers," *Nous* 31 (3) (1997): 316–317.
- 53 – A. S. Kawczak, "The Philosophical Significance of Modern Formal Logic and Its Relation to Aristotelian Logic," *Proceedings of The American Catholic Philosophical Association* 38 (1964): 99.
- 54 – See *ibid.*, p. 99.