

A Preliminary Sketch for the Applied Anthropic Arguments —Away from God into Spatial Reincarnation

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Abstract

Bernard Carr claims that while the multiverse theory prevented the fine-tunings from providing unequivocal evidence for God, it does not preclude Him. The fact that one of the leading supporters of the anthropic principle negates the commonly accepted atheistic implication of multiverse deserves a detailed investigation, because from the first there has been a persistent tendency for the anthropic principle to be misunderstood as being anthropocentric, teleological, or theistic. By criticizing Carr's view about a number of loosely interrelated anthropic topics, including the importance of mind, Earth as an example of biological evolution and the reference class of observer, we can re-examine the fundamental logics of anthropic reasoning, especially Nick Bostrom's SSA (Self-Sampling Assumption). The two metaphysical theses are found to be implied by SSA; (1) Everyone's experiential self is based on the same metaphysical self, or follows the same existence condition. (2) Everyone's experiential self is actually the ensemble of identical conscious individuals scattered all over the huge multiverses. We conclude by showing that the second thesis turns out to be a useful framework for unifying the mind-body problem and quantum physics in a promising perspective.

1. Why God at this late stage?

With respect to the possible explanations for the cosmological fine-tunings, Bernard Carr presents "a spectrum of increasingly metaphysical views": (A) no multiverse and no God (for those who regard both God and the multiverse as equally unpalatable); (B) multiverse and no God (for those who regard the multiverse as the natural atheistic explanation of fine-tunings); (C) no multiverse and God (the standard theological view); (D) multiverse and God (an alternative theological view which combines both notions) (Carr, 2013, p.169, Table3)¹. I was puzzled to find Carr had recognized himself as a member of category (D) because there are no clear reasons stated in his paper. I don't understand how it could be rational for a supporter of multiverse and the anthropic reasoning to believe in the designer of reality², and I have slight misgivings about the nature of Carr's pro-anthropie-principle position, typically seen in his accessible and enlightening dialogue with George Ellis (Carr & Ellis, 2008). Can we take the dialogue as a representative, reliable argument over the scientific multiverse or over unobservable metaphysical entities in general, considering that Carr's stance is in favor not only of multiverse but also of god implicitly? If Carr thinks that the values of multiverse

¹ Carr added that each category can be divided according to whether one regards multiverse or God as a subject of science.

² Carr noticed at the end of the paper "the term [god] is not necessarily being used in the western monotheistic sense and it need not imply Intelligent Design" (p.169). But I think any god-believer should presume some essential properties for god, and "being a creator of reality" must be one of them. Considering that a creation without design is impossible, what can 'god' mean other than a "designer of reality"?

and of god as theoretical entities are comparable or even as equals³, I am afraid we will be compelled to re-examine the reliability of his multiverse talks.

Carr writes, “while the fine-tunings certainly do not provide unequivocal evidence for God, nor would the existence of a multiverse preclude Him” (Carr, 2013, p.168). Considering that the anthropic principle, i.e. the acknowledgment of multiverse, is ordinarily regarded as a good reason for giving up the god hypothesis, what ground does he have for daring to keep god along with multiverse?

The only reason Carr presented for admitting god to the field of anthropic arguments seems to be the fact that the observer’s mind is getting more important (or ‘fundamental’) after the advent of the anthropic principle than before. Carr mentions several physicists’ remarks affirmatively to show that contemporary science has elevated the status of mind; “Anthropic arguments have led Andrei Linde (2004) to suggest that consciousness is as fundamental to the cosmos as space-time and mass-energy” (Carr, 2013, p.166). And then, Carr suggests the promotion of mind should retrieve the significance of “G words” (Carr, 2013, p.167).

So, although the anthropic principle, featuring the multiverse hypothesis, has falsified probabilistically the god hypothesis by eliminating the global fine-tuning, the same principle is suggested to have provided a worldview favorable to the god hypothesis through its psychologically-oriented tendency. In short, the anthropic principle looks as if it cancels out its own formal logic against god by its substantial implication in favor of god. That is the only reasonable interpretation of why Carr, being a keen supporter of multiverse, concluded that god had not been precluded. Otherwise, Carr’s vindication of god in his paper’s anthropic context would be almost incomprehensible.

Actually, one might think that the importance of mind does not always have any positive correlation to the possibility of god’s existence, but even if there is such a correlation, is it true that the anthropic principle confirmed mind’s importance at all?

Carr emphasizes that observers are distinctive among all sorts of existence partly because they are at the center of the scales of structure (Carr, 2013, p.149, Figure2, 2007a, p.12, Fig.1.2). Carr says, “simple physics shows that the size of a human is roughly the geometric mean of the Planck length and the size of the observable Universe” (Carr, 2013, p.164). But the impression of human’s centrality must be an illusion. Our middle size is only an appearance due to the selection effect, the same as the one that has made us feel at the central location of our perspective. The old selection effect produced the horizontal egocentric view about position and the new selection effect made Carr adopt a vertical egocentric view about size, but the psychological mechanism of the two are exactly the same; the selection effect of our (extended) sensory devices.

And besides, if humans are to overcome their own physical selection effect (that is the very purpose of anthropic arguments) and verify multiverse’s existence somehow, if not observe it directly, the size of humans is likely to be understood as far from the geometric mean, but near the smallest end.

³ Carr does not always seem to think multiverse and god are comparable to each other, for he suggested multiverse concerns the question of how, while god concerns the question of why (Carr, 2013, p.168). But *how* could we distinguish between the questions of how and why?

2. Methodology vs. Ontology

Carr's more serious fallacy is this; when he speaks of mind as 'distinctive' or 'fundamental', his concept of distinctiveness or fundamentality is confused in a way frequently seen in theological misinterpretations of the strong anthropic principle. In the anthropic principle, weak or strong, mind is certainly given a distinctive and fundamental role, but that fundamentality is a methodological one, not an ontological (physical or metaphysical) one. Carr's ways of writing, probably shared with other physicists he quoted, for instance, "mind may be a fundamental rather than incidental feature of the Universe" (Carr, 2013, p.165), "once one accepts that mind is fundamental, that is one step closer to granting that spirit may also be fundamental" (p.167) are wrong, or at least very misleading. It is true that mind is becoming important for the logic of physics, but this does not mean mind has been found important for physical reality.

From a methodological viewpoint, mind is surely fundamental because without taking into account mind's prerequisites, physics cannot rectify distortions of our world picture which are due to observational selection biases and cannot hope to realize correctly what is ontologically typical in the entire physical world. But ontologically, the anthropic principle does not entail mind's fundamentality, but rather seemingly degrades it because in any multiverse proposal the fraction of space-time occupied by mind and all of its products is much smaller than that in any single-universe cosmology.

In the history of science, no thought had depended so deeply as the anthropic principle, upon the recognition that mind is only an incidental subtle ripple on blind reality. It is the most important lesson of the anthropic principle as an extended Darwinism that we should explain the presumed mystery of fine-tuning or superficial design without any resort to basic teleology. We must do as much as possible only with support from a naturalistic assumption of diversity as a result of random processes. Nothing runs counter to the spirit of the anthropic principle as badly as invoking some mystical fine-tuner. The anthropic principle describes the so-called fine-tuning of this universe as only a vision from a local viewpoint within multiverse; an observationally selected result without any real fine-tuning at the global level.

Carr's following comment seems inconsistent with the methodology common to all fields of science; disambiguation. "[W]hile the fine-tunings certainly do not provide unequivocal evidence for God, nor would the existence of a multiverse preclude Him. For if God can create one universe, He can presumably create many." (Carr, 2013, p.168). This remark is beside the point because it ignores what the cosmological God hypothesis was for. What matters is not how many realities *besides ours* were created (how fertile God is), but as what kind of reality *ours* was created (how prudently God tuned reality). If reality is proved to be a multiverse, fine-tuning will be explained away and disappear, so the cause of reality can no longer be regarded as any designer but an indiscriminate purposeless law. Maybe anyone who continues to call it God would have to be criticized for abusing the word "god". I imagine that for the theologians under category (C), the real opponent is not the atheists under category (A) or (B), but the metaphysicians under (D) including Carr.

In any case, I originally imagined that every supporter of the anthropic principle must have felt happy with the naturalistic (godless) explanation proper to the principle.

3. Complexity Principle?

Carr suggests that the anthropic principle should really be interpreted as a ‘Complexity Principle’. His main reason for this interpretation is the recognition that a minimum degree of consciousness or mind which qualifies anything as an ‘observer’ is just an inevitable outcome of a certain complex system; life. But is it true? Carr says, “here on Earth at least, the development of minds seems to have occurred relatively quickly once the first signs of life arose, so it is conceivable that this applies more generally” (Carr 2007b, p.88, 2013, p.11). This statement is obviously false, and doubly at that. First, on Earth, more than three billion years of the early history of life is performed only by single-celled lives that are never candidates of observers. Secondly, generalization from Earth’s case must be severely limited because of the observational selection effect. We will see the second point in the next section.

Minds did not occur in life during the first three billion years and more. Such a long time is comparable to the history of life itself, or even the history of the universe so far. Consciousness required for an observer came into existence very late, even on our observationally selected planet. The path from organic complexity to observers’ awareness, namely, the path from life to intelligent life, is likely to be full of obstacles and far from inevitably determined.

Moreover, the level or kind of complexity relevant to any anthropic selection cannot be defined without reference to self-conscious observers. For example, if there are universes where disembodied simple intellectual spirits inhabit, the observational selection effect might pick out not only universes with complex interactions but universes with a purity of some peculiar kind. Disembodied simple spirits are a merely conceptual possibility based on a dubious mind-brain dualism, but at least it shows that a complexity principle cannot be a *theoretical* substitute for the anthropic principle. (Of course actually, any complexity principle cannot even be an *empirical* substitute for the anthropic principle because of the very long distance between mere life and intelligent observer.)⁴

4. Anthropic bias in Biological Evolution

Carr’s motivation favoring complexity in place of mind in the anthropic principle is prompted by the (false) recognition that necessary conditions of life and of mind are almost the same. And that recognition may have been based on the fact that life appeared on Earth as soon as complex materials got to be able to interact with each other in a favorable environment, because Carr mentions Davies’ “Life Principle” sympathetically (Carr, 2007, p.86, Davies, 2007, p.498). It is true that life happened very quickly on Earth, but this fact is not an evidence of the easiness of life formation out of complex materials. Earth is an anthropically biased sample from the class of the histories of planets suitable for life. Almost all of them might have been lifeless from beginning to end. According to neo-Darwinism, the emergence of intelligent life before the death of the sun is not guaranteed by any natural law, therefore on any observationally selected planet, it is necessary for life to have come in

⁴ Brandon Carter proposed what could be regarded as the information-processing version of the complex principle, which he calls ‘entropic principle’ (Carter, 2007, p.313). My criticism of the complex principle must be a little qualified to apply to the entropic principle.

exceptionally quickly by accident and for evolution to have proceeded *exceptionally* rapidly by chance. (This may be one main reason why some distinguished evolutionary events —for example, the rapid increase of human’s brain size—are difficult to explain strictly by adaptationism alone. See Carter, 1983, Dawkins, 2006 pp.168-169).

For a proper understanding of biological evolution in general from the particular instances on Earth, natural selection must be methodologically supplemented by observational selection. Observationally selected planets like Earth must have been full of improbable accidents, including prompt life formation itself. We cannot infer the essential properties and the degree of the inevitability of life or intelligence only from the biased data observed on our atypical planet. This does not mean adaptationism can have only a limited explanatory power. On the contrary, observational selection effect should give adaptationism immunity from responsibility to explain so many trivial counterexamples. The limitation of adaptationism is exposed when it is applied only to explain mechanically an *internally-observed* biological evolution full of incidental anomalies. When it is properly applied to understand biological evolutions *in general*, it may well be as good as almighty.

By recognizing the observational selection effect on Earth, we can understand that we have probably underestimated the credibility of adaptationism as we have been systematically misled by many biased phenomena. The anthropic principle, inspired by the formal logic of Darwinism, will in turn strengthen the persuasiveness of the mechanical essence of Darwinism; adaptationist explanations.

5. Self-Reflection Principle

As for Carr’s ‘Complexity Principle’, I believe an inverse strategy should be taken. I mean the anthropic principle should be interpreted as what may be called ‘Self-Reflection Principle’, which presupposes the necessity of narrowing the reference class of ‘observer’, contrary to the extending strategy of Carr’s. We already saw that the concept ‘complexity’ is not enough to define the observational selection effect, and then we should suspect that even having a mind is not a sufficient condition for being an observer. The strong reason to refrain from welcoming any mind without restriction into the reference class of ‘observer’ is the experienced fact that I am a human being, not any other animal.

Human being is a minority among all beings with a mind, in the entire history of life. If the reference class of ‘observer’ is defined by a mere mind without any qualification, the fact that I am here now not as a member of the reptiles, birds, dogs, monkeys, nor dolphins but as a human with intelligence which enables thought on the anthropic principle or the essence of ‘observer’, seems to be a surprising coincidence. The reasonable explanation is, not suggesting that dogs or monkeys cannot be conscious, but restricting the reference class of ‘observer’ to beings intelligent enough to appreciate the meaning of anthropic arguments; self-reflecting minds. (Generally, qualifying prior probability distribution may be better than restricting the reference class, but the latter way would be sometimes favorable for simplicity). This is a Bayesian hypothesis testing in favor of the self-reflection principle interpretation of the anthropic principle against the broader interpretations, conditioned by the datum “I am an observer thinking about the anthropic principle”, or, in other words, ‘My mind is

at a rare self-referential position while mind would not always reflect on itself”.

It is often noticed in the literature of this field that being *Homo sapiens* is not a necessary condition of the observer, but we can see now it should also be recognized that being *Homo sapiens* is not a sufficient condition of the observer. Even being an *intelligent* *Homo sapiens* (excluding babies, the mentally retarded, and the like) is not sufficient.⁵ Being conscious of anthropic reasoning or being in some similar self-reflecting conscious experience is the necessary and sufficient condition of being an observer.⁶ Space-time points picked out as ‘here, now’ by observational selection are necessarily in self-conscious states, never in any such states as absentminded, dozing, ecstatic, or absorbed. (Strictly speaking, an observationally selected thing is not an observer in its entire duration but always ‘an observer-moment’; the relevant unit according to Nick Bostrom’s SSSA; Strong Self-Sampling Assumption).⁷

The proposition that self-reflection (particularly thinking on anthropic reasoning or similar ideas) is necessary for the qualification of the observer, can be shown to be plausible by the following argument in addition to the above-mentioned Bayesian inference. Observational selection effect picks out some moments of awareness which must belong to a qualified referent of not only the ordinary word ‘observer’ in the third person sense, but also the first person indexes in the contexts of some physicist’s or philosopher’s anthropic argumentation, sometimes pervaded with solipsistic suspicions peculiar to this kind of reasoning. Unlike observers in quantum mechanics or other fields, observers referred to in the anthropic principle are theoretical existences, which have the property of *being referred to in the argument* as an essential property, because their actuality is required by the anthropic argument which depends on a recognition of fine-tuning defined in terms of the existence of the performers of the argument themselves.

In this sense, the real coincidental factor of the cosmological fine-tuned coincidence is the actualization of the material or phenomenal embodiment of the argument about fine-tuning itself, not a mere mind’s activity. The existence of mind itself is not always special. A truly surprising specialty, if any, consists in the maximal component of every observationally selected situation, namely, the aggregate of all properties that every observationally selected situation certainly has in common. It is *not certain* that a situation not observed as observationally selected is truly observationally selected, so *consciousness unconscious of itself as observationally selected* should be excluded from “the aggregate of all properties that every observationally selected situation *certainly* has in common”.⁸

⁵ Hirukawa, 2012 suggested that people unrelated to science are never anthropic observers, even though they have the same complex brains as scientists.

⁶ Actually, further restriction is necessary. Self-reflecting-consciousness not only in a functional way but also in a phenomenal way is needed for a subjective selection of a universe. For securing the phenomenal mind, we may be obliged to admit some sort of mind-body dualism (Chalmers, 1996). Even if dualism is true, the dualistic law might be invalid in a large majority of universes in multiverse, but it must be valid in our observed universe. This explains not only the possibility but the necessity of our actual experiences of such immaterial entity as qualia (Miura, 2008). For another way of looking at mind-body dualism, see section 8, SES’s merit 4.

⁷ SSSA is a fine-grained version of his SSA which we will see later. Bostrom, 2002, p.162.

⁸ Are you sure you were conscious not only functionally but phenomenally when you were in the bathroom last night? Your memory is unreliable for its feeling may be just constructed out of the present self-reflection, so you cannot be convinced of the existence of your phenomenal consciousness except in the middle of an

That is why you are *now* thinking of the anthropic argument, even though the time you don't care about the argument is much longer. So, the anthropic principle should be taken as a self-reflection principle, no matter how speculative it may sound. (Conversely, speculativeness is the very reason for being observationally self-selected!) From this principle it follows that a physicist immersed in a "shut up and calculate" approach and indifferent to speculative interpretations, being an observer in the quantum mechanics' sense, is not an observer in the context of anthropic arguments.

Related to it, we can notice the third justification of the self-reflection principle. Observational selection is primarily a self-selection not by mind but by the mind's particular product; physics, in that where physicists describe their environment the contents of the description are necessarily biased *despite its assumed objectivity*. Therefore, the methodological ground of physics had been incomplete until the observational bias got taken into account consciously. We can say the satisfactory meaning of 'observer' in physics has come to be understood only after the anthropic principle had highlighted the concept 'observer'. This means that so-called observers became real observers by grasping the implications of the 'observer' formulated in anthropic reasoning. Even if a universe contains intelligent minds, it does not have any observer in the real sense without the anthropic principle or similar speculations being appreciated there.

Moreover, we cannot find any a priori reason to make light of the possibility of there being some physically fundamental differences between the brain which understands the meaning of the anthropic principle and the one which does not⁹. Then, whether a universe is in the self-reflecting states would make an important physical difference (if not of degree of complexity) that physicists should not ignore and that determines whether it is an observationally selected universe or not.¹⁰

6. Experiential self and Metaphysical self

We have narrowed down the reference class of 'observer' to self-reflections of a special kind, but why not narrow further to get the singleton containing this unique experienced self; only myself? Of course, this particular individual mind, Toshihiko Miura's self-consciousness, is not necessary for material or phenomenal embodiment of self-reflecting anthropic reasoning. So, the "none other than me" is irrelevant to the observational selection necessary for anthropic reasoning. But, it might be suspected that, along a slippery slope, the logic of Bayesian hypothesis test confirming the self-reflection principle could be used also to support a narrower 'Unique-Existence-of-Myself principle' if conditioned by the datum observed by myself that 'Somehow I exist as a conscious subject rather than as an unconscious object'. This curious principle has actually been insisted by some philosophers and called 'SIA (Self-Indication Assumption)' by Bostrom.¹¹ SIA presupposes

explicit self-awareness like "I am here now"; the mental state named "'I-am-me' experience" by Herbert Spiegelberg (Watanabe, 2011). Particularly, while you are under sheer force of habit, you are likely to be a philosophical zombie. For some practical results of self-awareness in ordinary life, see McPhee, 1995.

⁹ This idea came into my mind in the analogy of logic, where self-referential sentences show absolutely different behavior from non-self-referential sentences.

¹⁰ If this speculation has some truth, not only a methodological but an ontological importance of mind (mentioned in section 2) is to be admitted in favor of Carr.

¹¹ Bostrom, 2002 formulated SIA to reject it. Bostrom's first formulation of SIA is this (p.66); "Given the fact

that what cries out for explanation is not the existence of an observer in general, but the particular observer who stems from an unsubstitutable origin (among whose recent stages is the particular space-time region occupied by a particular ovum and sperm). In other words, SIA's presumption is that what must be explained is not a fine-tuning of at least one universe, but the fine-tuning of *this* universe including the unique me. SIA is supposed to nullify the multiverse explanation of the fine-tuning, because the conditional probability that 'this universe' denoted rigidly was fine-tuned is the same whether there are other universes or not, i.e. whether the whole reality is multiverse or a single universe.¹²

Various objections are available against SIA, but almost all of them can be classified into two kinds. The objections of the first kind are along with the orthodox premise of the anthropic principle that denies any particular individual or species the status of a necessary condition of the observational selection. These objections alone can be effective enough, but I am afraid that they could not persuade the SIA believers of a solipsistic temperament. Therefore, the objections of the second kind will be more practical, which involves a reinterpretation of the identity of 'myself'; the distinction between an ordinary experiential self and a metaphysical self who may or may not live a life of a certain experiential self.¹³

According to the folk concept of human identity, prior probability of the birth of any individual person (understood not only experientially in the third person, but also metaphysically in the first person) must be infinitely small. But perhaps everyone understands tacitly that before he or she was born, there had been no predestined correspondence between the metaphysical oneself (in the first person) and some possible experiential person with determinate characteristics (in the third person) in the manner that if history had run without that person's birth the metaphysical oneself would not have lived at all. Indeed, there is not any particular person in history upon whose birth the fulfillment of myself depends. If my parents, Toshihiko Miura's mother and father, had not met each other or even had not been born, I would still have been born as some other experiential person. I cannot have missed a chance to be born, and as an anthropic observer at that, as long as there had been an observer born somewhere. The same thing applies to each 'I', everyone's metaphysical self. This view explains naturally why I was able to be born, disregarding infinitely small probability supposed in the old naïve view.

The contrast between the two views about personal identity in the first person metaphysics, our new view and the old naïve view, can be expressed by some variations of Nick Bostrom's SSA (Self-Sampling Assumption). Bostrom's first preliminary version of SSA formulation is this;

One should reason as if one were a random sample from the set of all observers in one's reference class. (Bostrom, 2002, p.57)

that you exist, you should (other things equal) favor hypotheses according to which many observers exist over hypotheses on which few observers exist". For a typical SIA-based argument, see White, 2000.

¹² Strictly speaking, even in the framework of SIA, multiverse hypothesis is still confirmed over single universe hypothesis, if we can regard existence as an attribute each universe can have or miss independently. See Holder, 2004, p.182, Miura, 2005.

¹³ This distinction corresponds to Carter's distinction between a material observer and an abstract preceptor. Carter, 2007, p.286.

“One” refers to a metaphysical self, and “observers” refers to experiential selves. By adding minimal adjectives to this formulation, we get the parallel formulations of SSA and SIA.

SSA: One should reason as if one were a random sample from the set of all *actual* observers in one’s reference class.

SIA: One should reason as if one were a random sample from the set of all *possible* observers in one’s reference class.

Under the SIA worldview, it is miraculous that I am a member of observers rather than non-observers (or, a member of actual rather than merely possible observers, say, an unfertilized egg or some life’s potential component).

If we take “one’s reference class” as a universal set (the restriction to self-reflecting beings is already involved in the meaning of the term “observer”, as seen in the previous section), with some details to be discussed set aside¹⁴, we can reformulate the two statements further as follows;

SSA: One should think one’s reference class is the set of all actual observers.

SIA: One should think one’s reference class is the set of all actual things.

Previously we saw that SIA presupposes the ultimate narrowing of the observer’s reference class, namely, narrowing down to the unique experiential individual. But the SIA formulation given above involves the broadest reference class; everything. This is an example of the saying “extremes meet”. (To be precise, ultimately extremes would be these; Presentist SIA: One should think one’s reference class is the singleton of the unique experiential individual-moments. Meinongian SIA: One should think one’s reference class is the set of all possible things. As the two pairs follow almost the same logics, let us take the former moderate extremes for now). The broadest is the a priori reference class while the narrowest is the a posteriori reference class. Before I know which possible world this whole reality is actualized as, namely, before I know who I am or even whether I became conscious, the reference class of me contains everything. But once I knew I am here as this observer Toshihiko Miura, the reference class of me shrank into the singleton containing only Toshihiko Miura. Considering that Toshihiko Miura’s origin could admittedly have been formed as anything other than him, the metaphysical “I” rigidly connected to Toshihiko Miura can still be said to be a member of the reference class of everything even in a posteriori sense.

This version of SIA, backed by a rigid designation view of oneself (the metaphysical name or concept of ‘I’)¹⁵, can be restated as;

¹⁴ The following reformulation of SIA presupposes S5 systems of modal logic.

¹⁵ If a word or concept designates the same thing in all possible worlds in which that thing exists, it is a rigid designator (Kripke, 1980). If a rigid designator denotes the same thing even in all possible worlds where that thing does not exist, it is called an obstinately rigid designator, while a mere rigid designator denotes nothing there (Salmon, 1981, p.32). The distinction between the two could be logically important for SIA, but the distinction is not relevant in SSA.

SIA: One should think one's reference class is the singleton containing the unique person one actually is identical with.

The prior probability of the proposition "the location occupied by the origin of the unique person you actually turned out to be identical with, is connected to an observer" is almost zero, so SIA creates an unnecessary additional puzzle in anthropic arguments.

On the contrary, SSA is incompatible with the metaphysical concept 'I' as a rigid designator, so if the origin of the person you actually turned out to be identical with had not grown to be any observer, you would have been some other observer.¹⁶ No matter how the history of the world had developed, you would have necessarily turned out to be a conscious subject, just like you always find yourself living in the brain, rather than nose, neck, or any other parts, irrespective of details of cell divisions. The problem of the identity of metaphysical self, such as the choice between SSA and SIA about the reference class of 'I', is a typical matter of an intersection of science and religion.

Carr's anthropically-inclined cosmology is obviously in harmony with SSA and goes against SIA. What about the theologically-inclined aspect of his cosmology? With which does it get along better, SSA or SIA?

7. Beyond 'beyond the horizon'

SSA has an implication that 'I' reincarnate indefinitely many times (without memories of 'my' own previous lives), because if 'I' necessarily appear as an observer sometime, I must have already been born as the first observer in history, in case there should come no other observers in the presumably indeterministic history (Miura, 2007, p.21). And it might imply that all selves really belong to the only One Self, as every metaphysical self must have appeared as the same first observer.

This reincarnation view can be interpreted spatially even better than temporally, that is to say, while the temporal reincarnation is only for metaphysical selves, the spatial reincarnation, or coexistence, is not only for metaphysical selves but also for experiential selves, i.e. daily persons. I will explain what it means as follows.

In SSA, though the reference class of you is the set of all observers, actually you happened to have been born as an experiential person with particular characteristics. Now, if our universe extends beyond the visual cosmic horizon enormously, perhaps infinitely, then each physically possible event will occur repeatedly, and, above all, copies of our visual universe will emerge at indefinitely many places (Level I multiverse of Tegmark, 2003, 2014). Identical copies of you scattered all over the quilted multiverse are, in fact, not *copies* but *constituents* of you. Let me call each indistinguishable constituent of an experiential self "element" of that self, and keep the term "copy" for each experiential self just split from each other.

The aggregate of your elements is the real you, because in SSA the identity of an observer is

¹⁶ SSA is a descriptivist theory of the concept of "I" as the indefinite description, which requires only being an observer as essential property. Alternatively, you can adopt the theory of selves as definite descriptions under SSA, if the reality is large enough to ensure somewhere an observer exactly like each actual person. To this problem, we will return in section 7. For the descriptivist theory's cause, see Russell, 1905.

defined by subjective consciousness (supervening on the particular combinatorial patterns of particles), not by an objective pinpointed location or a trajectory as in SIA. So if an experiential observer can be defined as substantiated out of a metaphysical self by completing a set of subjective properties, every duplicate of certain mental contents is equivalent about the identity of an experiential observer. You experientially exist now not in one universe but in many universes at the same time, or, in other words, here in your perspective not ‘the universe’ but ‘the universes’ open out now.

This view of personal identity as a superposition of subjectively identical histories is popular in quantum mechanics as the Everett many-worlds interpretation,¹⁷ called Level III multiverse by Tegmark, but the view seems often overlooked in the contexts of Level I or Level II multiverse. In the Level I and Level II multiverses, as well as in the Level III multiverse, the environment around you including yourself is the superposition of all the indistinguishable counterparts,¹⁸ so an ordinary phrase like “beyond the visual horizon” “beyond our cosmic horizon” (Carr&Ellis, 2008, pp.2.5, 2.8, Greene, 2011, p.36), strictly speaking, should be paraphrased as “between the visual horizons” “between our cosmic horizons”, for you see many indistinguishable horizons at a time from many viewpoints spread out among the vast stretches of unobservable realms.

As suggested earlier, this spatial and temporal reincarnation model probably implies that all metaphysical selves really belong to the only One Self. There really emerges, for example, a particular experiential person Toshihiko Miura, but the multiverse might not necessarily be huge enough to ensure experiential persons of every variety (or, the logical possibility of persons is much more diverse than the physical possibility¹⁹), so if a given metaphysical ‘I’ had been identified only with the improbable phenomenon Toshihiko Miura, ‘I’ could have been materialized as no experiential observer against SSA’s lesson. Lest ‘I’ end up being unborn, the first observer in history should have, and in fact must have been based on, the same metaphysical ‘I’ as Toshihiko Miura’s. (If you are sceptical about ‘the first’ in the entire multiverse, substitute ‘the most probable’ for ‘the first’). This logic is applicable to each and every ‘I’, and hence the only one real Self that diverges phenomenally. In the Self, the relation between you and Socrates would be exactly like the relation among multiple personalities within one material person with dissociative identity disorder.

This monist view of personal identity is often seen in the oriental religions, especially the Buddhist or Hindu tradition.²⁰ Brandon Carter suggested the comparison between ‘the oriental

¹⁷ But I know a few philosophers who don’t accept that if many-worlds interpretation is true, one committing a quantum suicide always survives subjectively. They said, in the conversations, “The real me must be only in a numerically one world, so how many copies of me survive has nothing to do with the probability of my own survival”. They don’t understand the fact that each and every “copy” of me is not a copy but an element of me until the relevant branching happens. A leading proponent of this mistaken view is David Deutsch, according to Standish, 2006, p.144.

¹⁸ Standish, 2006 expresses this point smartly; “Quantum immortality is thus a consequence of functionalism, even in a classical non-quantum world!” (p.13) But Standish’s usage of “functionalism” throughout his book is misleading. Functionalism is a theory concerning a condition of phenomenal quality, but does not imply anything about the criterion of personal identity.

¹⁹ Level IV multiverse (Tegmark, 2003, 2014) is based on the broadest possibility among his categories, but the logical possibility of modal realism (Lewis, 1986) is much broader. Under SSA, modal realism and even Level IV multiverse seem falsified by the observation that I am not in the world densely overflowing with observers (Miura, 2007, pp.342-346).

²⁰ From the reincarnation perspective, we can understand for example why Buddhism is generally tolerant of

version' (admitting only one self) and 'the occidental version' (admitting a large number of selves) of the anthropic interpretation of the quantum theory.²¹ Whether Carr's God is occidental or oriental, pluralistically productive or monistically creative, I wonder if Carr's God hypothesis, which has not been stated explicitly yet, could find any shape consistent both with some cultural connotations worthy of the term 'god' and with the contemporary development of various applications of anthropic reasoning.

8. Utility of "scattered-ensemble-self assumption"

I have developed so far the bistratal theory of mind to the effect that (1) *Reincarnation Assumption*: your experiential self (daily self) is based on the same metaphysical self as every other experiential person's metaphysical self, or at least follows the same existence conditions as those of every other experiential person's metaphysical self, and (2) *Scattered-Ensemble-Self Assumption*: your experiential self (daily self) is actually the ensemble, union, or set of all elements of the same functional consciousness scattered all over the huge multiverses. Perhaps you may feel that both views of self are even more bizarre and unhelpful than any god hypothesis, including Carr's undefined god. But I have shown that both of them are inevitably derived from a necessary presumption of anthropic reasoning: SSA. The derivation is relatively obvious as for (1), I think. So, in the remaining pages, I will try to demonstrate that (2), let me call it by its acronym SES, turns out to be an extraordinarily useful framework for unifying the mind-body problem and quantum phenomena in a promising perspective.

SES's merit 1: suggestion of Level III's true nature

SES suggests that Level I and II multiverses not only resembles Level III in that your daily self is the superposition of many minds extending over multiverses, but also *exactly the same as* Level III. Max Tegmark's explanation of Level III seems not thoroughgoing on this point, so always inarticulate. His hierarchy of Level I, II, and IV are very clear, but when it comes to commenting on Level III multiverse, his explanation of how it should be inserted into the hierarchy is tantalizingly vague. That is probably because although Tegmark recognizes the formal isomorphism between Level I & II multiverses and Level III multiverse, he is not necessarily happy to admit the strict identification between them. If he dare to support SES, all his noncommittal descriptions of the hierarchy will be made clear. Actually, Aguirre and Tegmark, 2012 first declared that Level III is the same as Level I and II, though owing to the lack of the SES perspective, their remarks ontologically, if not formally, remain a little vague. Level II and III multiverses can be regarded as located in the same spatiotemporal region, so there remains nothing mysterious particularly about Level III multiverse. Especially, the physicists no longer need wonder how split worlds in quantum physics

induced abortion compared to Christianity. And as Miura 2007 ch.12 pointed out, very difficult paradoxes in the framework of the occidental SIA viewpoint such as "the non-identity problem" posed by Parfit, 1984, turn out to be easy to solve in the framework of the oriental SSA viewpoint.

²¹ Carter, 2007 distinguishes between the SSA-like and the SIA-like alternatives within the occidental version (pp.308-9). But it seems that the SSA-like occidental version cannot but be reduced to the oriental version.

can stop interfering with each other so rapidly, because SES assures that the distinct worlds, especially the vicinities of our elements or our splitting copies' elements, are already very distant from each other spatially, whether before or after the measurement.

Moreover, according to SES, it is obvious that the total number of an observer's elements plus its copies' elements is fixed no matter how many branches the observer has passed through. This intuitively intelligible picture is useful to prevent the recurrent misunderstanding about Everett's theory as if the combined measure of a given observer's copies is proportionally increasing every time a branch happens (For typical example of the misunderstanding, see Leslie, 1996, pp.264-266). SES's model, which specifies the decreasing of each experiential self's measure as inversely proportional to the increasing number of its different experiential copies (i.e. the decreasing number of elements per experiential self), is consistent with, and a natural interpretation of, Everett's "additivity requirement" (Everett, 1956, p.73).

SES's merit 2: unification of the interpretations of quantum mechanics

Among several interpretations of quantum mechanics, the opposite poles are found to be actually one and the same interpretation by considering the mechanism of SES. The many-worlds interpretation which is the most realist and materialist of all, can be translated directly into the most idealist, von-Neumannian interpretation that the collapse is caused by the consciousness of the observer. If there were no phenomenal consciousness, there would be no perspective space²² in which any process is received as a collapse, because the reality then merely consists of diversely continuous material events. The discontinuous collapses are just appearances in the observer's inward perspective that develops in proportion as the observer's location is getting sparser and sparser, thinner and thinner along with the determinations of each environmental history of the observer's element's vicinity.

Furthermore, SES could unify the many-worlds interpretation and the many-minds interpretation as one and the same interpretation. The continuous infinity of minds in each experiential self, required for the many-minds interpretation, can hopefully be provided by the combinations of many viewpoints occupied by the observer's elements to be splitting into various copies; into elements of different experiential selves.

SES's merit 3: necessitation of quantum mechanics

The many-worlds interpretation reduces the quantum fluctuation to diverse determinations in the Level III multiverse. SES in turn reduces the Level III multiverse to the Level I and II multiverses. Therefore, SES can be considered to have reduced the quantum fluctuation to the existence of the Level I and II multiverses. Tegmark suggested there may exist universes where laws of quantum mechanics don't work (Tegmark, 2003, p.49), but under SES the multiverse picture itself excludes any non-quantum universe containing observers. Even if you believe in multiverse, or, if only you believe in multiverse, SES tells you not to admit the possibility of any true physics being non-quantum,

²² The term "perspective space" was originally introduced by Bertrand Russell as the logical construct out of the ordered combination of sensibilia, in Russell, 1914. Russell's sensibilia can be understood as components of possible observer moments, and his sense data as components of actual observer moments. Russell's neutral monism is likely to be helpful to formalize the dualistic idea developed in this paper.

because quantum physics is just the physics of observation; just the subjective reflection necessitated by the diverse way of local determinations of reality. According to SES, big reality necessitates quantum physics!

SES's merit 4: reduction of mind-matter dualism to type-token dualism

While a material thing without its own subjective landscape is just occupying its unique position, a conscious being is decreasing regularly its locations set at intervals, and that regularity creates the order of conscious experience. While material things are tokens determined by their spatiotemporal or causal trajectories, conscious subjects are types defined not by material trajectories but by informational contents, so can occur repeatedly anywhere keeping their identities. This view provides a type-token dualistic explanation of the elusive difference between the polar ontological statuses of mind and matter, so the deep-rooted trouble of mind-matter or mind-body problem can be viewed to be reduced to a much less objectionable distinction.

The type-token dualism, or contents-media dualism, is a very natural way of thinking about the conscious mind because our folk psychology has been likely to regard the mind's essence as unified non-local phenomena rather than localized physical functions. This view enables us to make better sense of the distinction between the phenomenal mind and the functional mind. While the functional mind is a sort of unconscious material object localized in a single trajectory, the phenomenal mind is a bundle of functional minds, decreasing its elements every second²³. We can understand now the infamous physical irreducibility of consciousness or qualia as just a representation of the natural fact that any type is not reducible to any particular token.

We can enjoy all of the four merits we saw above if only we get ready to change our conception of mind slightly. Actually, it will not require even a slight change in us to accept SES, because of its compatibility with our folk dualistic psychology. SES keeps all the common images of physical reality intact, which include "substance stability or conservation, continuity of change, causality, and objectivity or mind-independence" (Cannavo, 2009, p.5), at the cost of a slight sophistication of our image of consciousness. This shows the usefulness of SES as at least a working hypothesis in the broad theoretical field connecting the philosophy of mind and quantum mechanics, and I believe SES is worth discussing for not only metaphysicians but also physicists.

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²³ Carter, 2007 pointed out that "perpetual multiplication of the relevant number of branch-channels is, as a general rule, misguided" because "a given finite system cannot continue to acquire information without limit" (pp.298-299). Indeed, due to a possible loss of information, elements of a given self may sometimes be increasing. Such a situation as amnesia or dementia can fuse many experiential selves as with new born babies, so may be an opportunity for an experiential self to undergo reincarnation to another experiential self, as Standish, 2006 suggests (pp.143-144, p.185).

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