

# Kant's Epistemology

Part III: The Synthetic *A Priori*  
In Physics

# Overview:

## ■ Kant Epistemology—the details

- Synthetic *A Priori* in Physics
  - Two elements in Judgment
  - *A Priori* concepts
  - The Metaphysical Deduction
  - The Transcendental Deduction
  - The Conditions that Make Experience Possible
  - Deduction of the Categories
    - Categories of Substance and Causality
    - The Phenomenal Object
  - Summary

# Kant's Epistemology—the Details

## ■ The *A Priori* in Physics

- Kant's second question: “How are synthetical *a priori* judgments possible in physics?”
- This was discussed in a section of the *Critique* called the “Transcendental Logic”
- Kant called it “logic” because he was concerned with the kinds of putting together that occur in judgment (in contrast to the immediate, sensuous putting together discussed in the Aesthetic”)—that is in space & time

# Kant's Epistemology—the Details

- He called it “transcendental” because, once again, he was concerned not with the content of experience but with the conditions that make an experience of objects possible
- Kant did not maintain that all judgments in the natural sciences are *a priori* (as he held all mathematical judgments to be)
- But he thought that certain judgments must be synthetic *a priori* in order to provide an underpinning for the inductive procedures of the sciences



# Kant's Epistemology—the Details

- He also hoped to do more than merely show that there are some *a priori* elements in our experience of objects—he wanted to specifically that the concept employed in Newtonian physics (the particular kinds of order it presupposes) are *a priori*
- Therefore there are two questions
  - Can a case be made for the existence of some ordering elements contributed by the mind?
  - Can it be shown that these elements are those presupposed in Newtonian physics?

# Kant's Epistemology—the Details

## – The Two Elements in Judgment

- To think is to judge; knowledge is the end product of judging and judging is a kind of putting together
- According to Kant 2 different components are always involved in judging
  - A direct, sensuous component (blind without structure); concrete filling of sense data, perceptions, and feelings
  - A conceptual, structural component (empty without experience); structure, or a relational element

# Kant's Epistemology—the Details

- Kant said, “thoughts without content are empty, intuitions without concepts are blind”

Thoughts

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structure or relational element

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Intuition

sense data, direct perceptions

The relational element without sense data is empty,  
the sense data (direct perceptions) without structure are blind

# Kant's Epistemology—the Details

- Most rationalists from Plato to Descartes and his successors had taken it for granted that cognitive processes form a continuum; they regarded perception as “confused thought”
- That is, the same sort of activity as reasoning, different only in degree of adequacy



# Kant's Epistemology—the Details

- The Empiricists has not maintained that perception is confused, but they hadn't drawn the Kantian distinction between percepts and concepts
- They tended to treat concepts as fictions, or even (as with extreme nominalists) as merely words
- Hence they too failed to emphasize that there are two indispensable elements in human knowledge

# Kant's Epistemology—the Details

- On the whole, most 19<sup>th</sup> century and 20<sup>th</sup> century philosophers have accepted Kant's distinction between percepts and concepts, with the limitations that this entails regarding direct, immediate knowledge of the self and its world

# Kant's Epistemology—the Details

## – *A priori* concepts

- We're returning to the part of Kant's argument—“Transcendental Logic”
- The question for Kant was whether there are any pure *a priori* concepts, that is forms of thought (of judging) that correspond to space and time as pervasive forms of sensing
- The clue to the discovery of the pure *a priori* concepts lies in recognizing that all judgments whatsoever fall into one or the other of several types

# Kant's Epistemology—the Details

- These several types include judgments like: categorical, hypothetical, affirmative, negative and so forth
- Kant asserted we could not make a judgment of any of these types unless we *understood* the “relationship” being asserted
- Kant didn't mean by “relationship” particular relationships (All crows are black), rather the relationship “All \_\_\_\_\_ are \_\_\_\_\_”
- To grasp the particular connection between “crow” and “black” sense experience is required



# Kant's Epistemology—the Details

- Hence the concept “All \_\_\_\_\_ are \_\_\_\_\_” is a pure *a priori* concept which is antecedent to all experience and a condition of there being any specific judgments of this type
- Kant believe that Aristotelian logic furnished a complete and exhaustive table of all possible types of judgment

# Kant's Table of Types of Judgments

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## I. QUANTITY OF JUDGMENTS

Universal  
Particular  
Singular

## II. QUALITY

Affirmative  
Negative  
Infinite

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## III Relation

Categorical  
Hypothetical  
Disjunctive

## IV. Modality

Problematic  
Assertoric  
Apodeictic

# Kant's Corresponding Table of "Category"

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## I. OF QUANTITY

Unity  
Plurality  
Totality

## II. OF QUALITY

Reality  
Negation  
Limitation

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## III Of Relation

Of Inherence and Subsistence  
Of Causality & Dependence  
Of Community (reciprocity  
between agent and patient)

## IV. Of Modality

Possibility--Impossibility  
Existence--Nonexistence  
Necessity—Contingency

# Kant's Epistemology—the Details

## – The Metaphysical Deduction

- Every judgment the mind makes (“Roses are red,” “Crows are black” presupposes one or the other of twelve different synthetical operations (“putting together”), or categories
- The categories are transcendental concepts or rules that underlie and make possible the actual empirical syntheses that occur every time we judge
  - They are not empirically observable, but they make possible the judgments “Roses are red”
  - We can be sure that they occur because if they did not the actual judgments we make could not occur



# Kant's Epistemology—the Details

## – The Transcendental Deduction

- The metaphysical deduction has merely shown that pure *a priori* concepts or categories underlie all our acts of judging
- The function of the transcendental deduction was to show that these same categories make possible the kind of world we live in, **namely, a world in which self knows objects**

# Kant's Epistemology—the Details

- Talk about “acts of judging” is to deal in abstractions—it is a self that judges and what it judges about are objects
- Note: the self is not the “inner sense”; the “inner sense” is implied by the intuitive form: time; refer back to the diagram of the “inner and outer senses”

The awareness of ourselves and our own inner state

The material of the senses which have this character of externality

Casual Relation

Casual Relation

Inner Sense

Outer Sense

Noumena

Phenomena

Noumena

Phenomena

*Time*

*Space*

Intuitive Forms

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# Kant's Epistemology—the Details

- The argument for this (transcendental deduction):
  - All experience whatever else it involves is of the succession of a variety of contents
  - To be experience at all, these successive data have to be combined or held together in unity for a consciousness
  - Unity of experience therefore implies **unity of self**
  - This unity of self is as much an object of experience as anything else is
  - It follows that experience of *both the self and its objects* rests on prior acts of synthesis, which **because they are the conditions of any experience** at all are not themselves experienced
  - These prior syntheses are made possible by the categories



# Kant's Epistemology—the Details

- The Conditions that Make Experience Possible
  - Human experience is an experience of objects (unified representations); human experience does not consist merely in a subjective flow of sense data in a mind that claims all these data as its own
  - What is implied by the existence such “objects of representation?”
    - “Appearances are themselves nothing but sensible representations, which as such and in themselves, must not be taken as objects capable of existing outside our power of representation”
    - What this looks like so far:

Intuitive forms of space and time

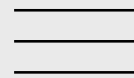
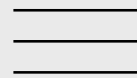
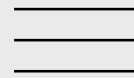
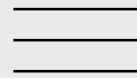
Categories of the Understanding

To be explained

Sensations directly shaped by:

S

T



Noumena

Ding an sich  
Things in Themselves  
Unknown X

Phenomena

**The Synthesizing Activities of the Mind**

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Intuitive forms of space and time

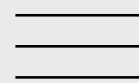
Categories of the Understanding (constitutive)

To Be Explained

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# Kant's Epistemology—the Details

## The Conditions That Make Experience Possible

My interpretation thus far: our knowledge of an object carries with it an element of necessity and this prevents our way of knowing things from being haphazard or arbitrary

And this means that we have some *a priori* categories that “collect” *relata* and, in effect, make them intelligible



# Kant's Epistemology—the Details

- This is because, according to Kant, “all necessity, without exception, is grounded in a transcendental condition—there must be transcendental ground of the unity of consciousness in the syntheses of the manifold of all our intuitions”
- Consequently, also, of the concepts of objects in general. . . .so of all objects of experience a ground without which it would be impossible to think any object for our intuitions

# Kant's Epistemology—the Details

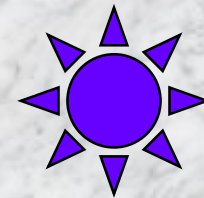
- In Kant's view, self and object are not independent entities but are reciprocal elements in experience
- If we start from object we are led to self; if we begin with self, we are led to object
- The experience of either ones involves the experience of the other, and the experience of both depends on prior occurrence of certain synthetic acts
- Kant called these acts “transcendental” because though never themselves experienced they have to be presupposed to account for the existence of those empirical unities that are experienced, namely, “self” and “object”

# Kant's Epistemology—the Details

- Discussion of Kant's View of Experience
  - Kant found that various concepts he was discussing—experience, self, and object—all involved one another and hence could not be discussed separately
  - We tend to think, according to Kant's defender's, in the traditional (Cartesian and Lockian) analysis of experience (e.g. hearing a clock strike three)
    - Realist view of “clock” and “self” as independent objects
    - The clock and I exists and it does strike, I heard it and then judged, “That is a clock striking three

# Kant's Epistemology—the Details

- Kant's analysis of same thing:
  - No metaphysical assumptions about independently existing minds and objects
  - What conditions make this experience possible?
  - What must be the case for me to be able to have the particular experience of a clock striking three?





# Kant's Epistemology—the Details

## – Deduction of the Categories

- Kant has shown (if his argument works) that an order of some sort has to be presupposed as the condition of any experience, however rudimentary
- Next he undertook to show that the world as we actually experience it reflects precisely those patterns that he called categories and that he had derived them from Aristotle's twelve types of judgment
- Jones looks at two most important categories, substance and causality because length considerations won't allow him to explore all 12 categories



# Kant's Epistemology—the Details

## – The Categories of Substance and Causality

- According to Hume (and Kant) we never experience substances and we never experience necessary connections; we experience only succession
- How do we then get the “idea” of stable, enduring entities, objects related causally to other objects?
  - Hume thought we “feign” them
  - Kant concluded that they must be attributed to *a priori* concepts, named the relational structures or patterns in terms of which our minds organize our experience
  - What we bring to experiences are the notions of permanence (substance) and regular sequence (causality)

# Kant's Epistemology—the Details

- Kant replaced the metaphysical relation of “inherence,” which the rationalists venerated and the empiricists ridiculed, with an empirical and temporal relation—endurance through time
  - A substance (in Kant's view) is a complex pattern of sensory materials that are experience as permanent; of course it is the pattern that is permanent, not the individual materials—these are constantly changing
  - He held there were not transcendental supersensible substances; the only substances are those stable, relatively permanent complexes that we encounter in experience
  - What is necessary is that our mind order experience substantively



# Kant's Epistemology—the Details

- When we look at particular segments or aspects of experiences to decide which of these particular segments are substantival and which are not it is purely an empirical inquiry—but **we always organize our experience substantivally**



# Kant's Epistemology—the Details

- This is a good example of the Kantian compromise
  - He agreed with the empiricists in denying any purely rational concepts
  - He agreed with the rationalists that “substance—attribute” must be an observable relation
  - He disagreed with Hume—he held incorrectly that the concept of substance had no objective validity at all
    - Kant held that “substance—attribute” is an empirically observable relation precisely because it is the product of a necessary function performed by the human mind in its task of regulating and ordering the world
  - Kant agreed with the rationalists by maintaining that the necessity attributed to substance is real (not illusory)
  - But Kant agreed with empiricists that it is a mode of human experience (not an obscure force residing in allegedly independent substances-in-themselves as rationalists claimed)

# Kant's Epistemology—the Details

- Kant's treatment of the problem of causality parallels his treatment of the problem of substance
  - Not only do we attribute permanence to objects; we also attribute causality to them
  - We believe objects to be related to one another systematically according to a rule of succession
  - This relating rule relates sensory materials to one another so that they are experienced as a complex of sensory material enduring together through time to form one object

# Kant's Epistemology—the Details

- The Phenomenal Object
  - There is a major dispute in Kantian exegesis at this point
    - What did Kant mean in the transcendental deduction, by describing the object of representation as “something in general = x”?
    - There is general agreement about what Kant did not mean
    - He meant neither the metaphysical substratum of the Scholastics and the rationalists
    - Nor the mere lively-expectation-based-on association of the empiricists
      - Probably the case because Kant criticized both positions
    - There is general agreement that the x in the equation involves a succession according to a rule



# Kant's Epistemology—the Details

- What distinguishes an object (or a “thing”) from a “mere blind play of representations, even less than a dream,” is, as we have seen, the fact that when we experience an object, our representations succeed one another according to a rule, not according to a private fantasy in our own mind
- The exegesis problem comes with the question, **“What exactly are the elements, thus ordered, that succeed one another according to a rule?”**
  - The simplest interpretation is that by “representations” Kant meant the raw data of sense experience



# Kant's Epistemology—the Details

- According to this view, the desk we're looking at is not a public object “out there” in a public space
- There are as many desks as there are viewers
- This is relatively subjectivist point of view, even though Kant wanted to insist on more objectivity than this view permits
- Kant wanted to show not merely that there is some order or pattern, in experience (succession according to a rule) but that the rules according to which experience is ordered are those presupposed by Newtonian physics

# Kant's Epistemology—the Details

- Indeed, Kant presents in the deduction, along with this view a much more complicated view in which the  $x$  involves not merely sense-data-according-to-a-rule but what Kant called a “phenomenal object.”
- “Phenomenal objects” are like the sense data in that they are modes of appearance, but at the same time they are also supposed both by common sense and natural science, to be the causes of the ordered sense data
- The difficulty is not that the appearance of “phenomenal objects” complicate the picture and occupies an anomalous place between things-in-themselves and representations
- The real difficulty is that according to Kantian principles, the phenomenal object itself must be a synthesis of representations, but it cannot be both the product and the cause of the representations in questions

# Kant's Epistemology—the Details

## – Summary

- Kant did not show that such and such a type of order (Euclidean for space, Newtonian for things) is *a priori*
- But he did show that some order is necessary for there to be any experience at all
- On this view, Kant **failed** to show an acceptable account of the possibility of a rational knowledge of nature



# Kant's Epistemology—the Details

## – Summary

- But, on the other hand, those who accept the pragmatic point of view of modern science will hold that the full deduction was simply so much wasted motion and that it has only an antiquarian interest
- The prevalent view today is that not merely that the Newtonian concepts are not *a priori*, but no scientific concepts are ever more than provisional and hypothetical in character, and that their function is merely to provide principles for ordering experience.



# Kant's Epistemology—the Details

## – Summary

- But to reject the second stage of Kant's argument in which he tried to deduce the Euclidean and Newtonian categories **does not mean that the first stage of the deduction (in which he formulated the new relation between the self and its objects) was inconsequential**
- It enabled Kant to claim that he had provided:
  - An intelligible basis for inductive inference
  - And shown that only a dogmatic empiricism need end in scepticism

# Kant's Epistemology—the Details

## – Summary

- In this view the root of the trouble was not empiricism; it was the assumption that only what is given in sensation is real
- In Kant's view the starting point of true empiricism must be the empirical fact that men experience connections between matters of fact “objects”
- Since the connections are real the conditions that make them possible must also be real, even though they are not themselves encountered or verified in experience

# Kant's Epistemology—the Details

## – Summary

- Kant thought it was fatal to assume that in the knowledge situation an independently existing self confronts an independently existing object
  - Because it follows from this assumption that the self knows only its own states, but, indeed, it cannot know even these—Kant this is an absurd conclusion that leads us to a different starting point
  - For Kant the starting point must be the fact of experience
  - Self and its objects can be seen to grow out of or to be formed in experience



# Kant's Epistemology—the Details

## – Summary

- In some sense there must be a self for there to be any experience at all; but self is not a content, not a thing—it is a form of unity
- That it is a form of unity is why empiricists couldn't find it
- Empiricists, in Kant's view, asked the wrong questions
- So Kant is thought to have rehabilitated empiricism, but the deduction provides a devastating criticisms of the pretensions of rationalism—concepts without percepts are empty
- Kant thought the real function of the concepts were to organize the manifold of sense into meaningful and stable patterns



# Kant's Epistemology—the Details

## – Summary

- Kant thought that the concepts of substance, causality and the rest are meaningless except as synthetic relationships within the spatiotemporal manifold
- He also thought that the very arguments that validate these concepts for experience limit them to experience
- Applying these concepts beyond experience is “transcendental illusion”
- This leads us to Kant's attempt to show the principle fallacies of rationalistic metaphysics—our next slide presentation

Intuitive forms of space and time

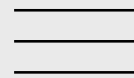
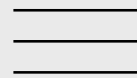
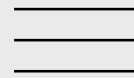
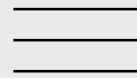
Categories of the Understanding (constitutive)

To Be Explained

Sensations directly formed by:

S

T



Noumena

Ding an sich  
Things in Themselves  
Unknown X

Imagination

Phenomena

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Intuitive forms of space and time

Categories of the Understanding

Regulative Ideas

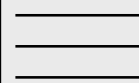
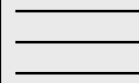
Creates greater unity of reason than just with the categories of the understanding

Sensations directly shaped by:

S

T

Imagination



World

Self

God

Noumena

Ding an sich  
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Phenomena

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Categories of the Understanding (constitutive)

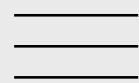
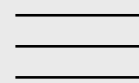
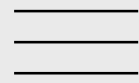
Regulative Ideas

Creates greater unity of reason than just with the categories of the understanding; establish relationships to world, self, God

Sensations directly formed by:

S

T



World

Self

God

Noumena

Ding an sich  
Things in Themselves  
Unknown X

Imagination

Phenomena

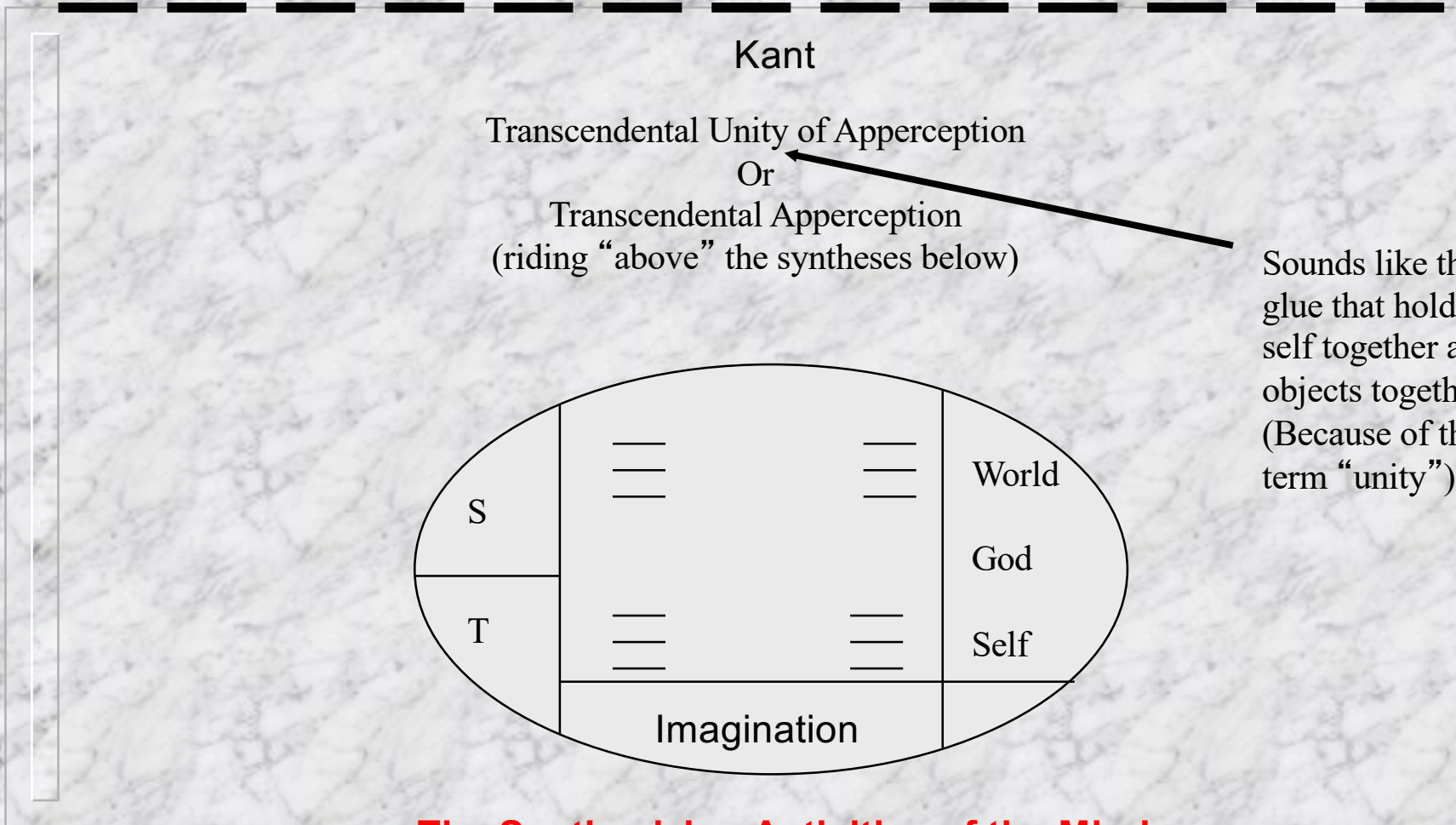
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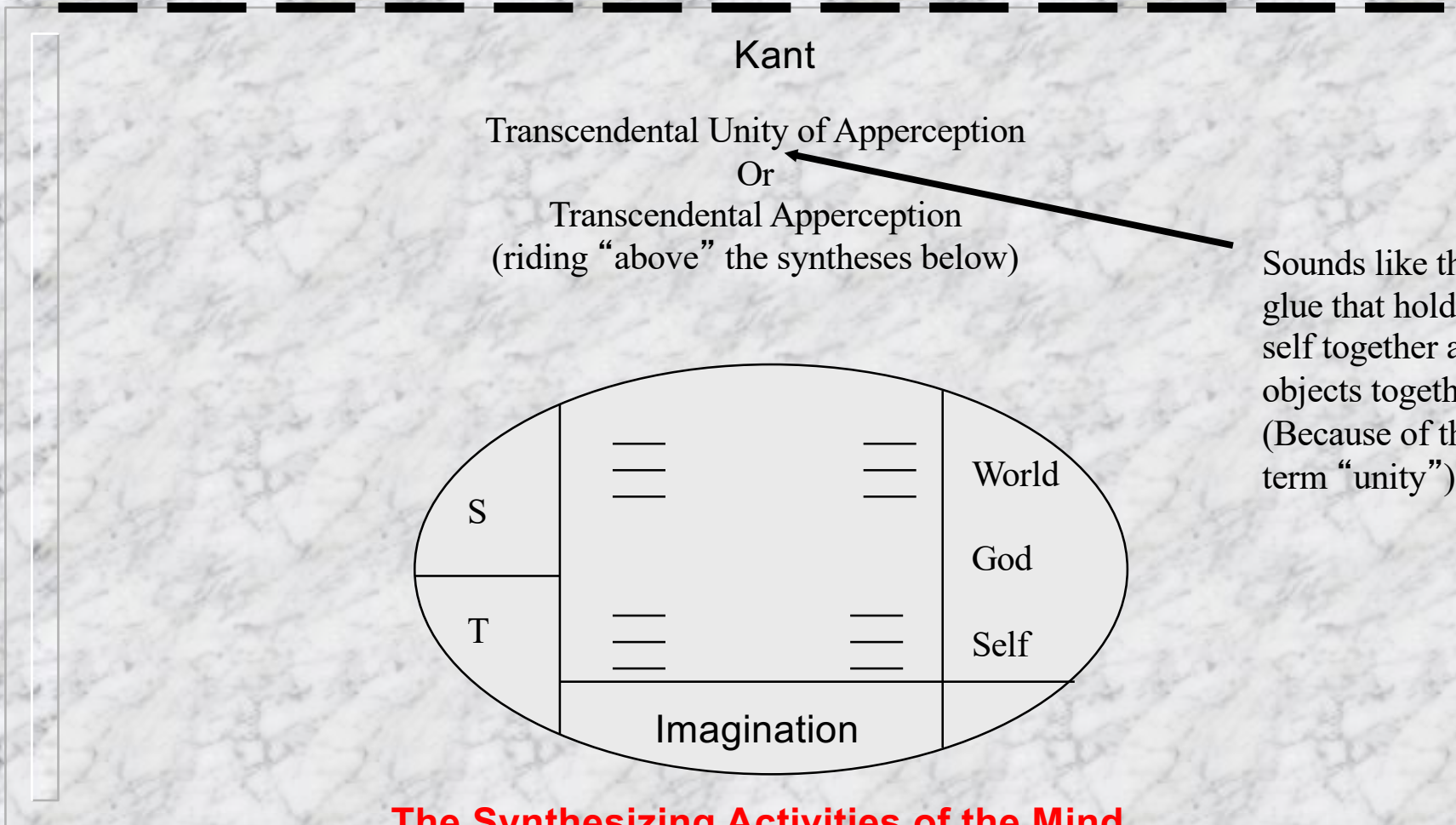


Fichte took Kant's idea a step further by asserting this:  
The I or Ego which is the pure original unchangeable consciousness



### The Synthesizing Activities of the Mind

Fichte took Kant's idea a step further by asserting this:  
The I or Ego which is the pure original unchangeable consciousness



Sounds like the glue that holds self together and objects together (Because of the term "unity")

**The Synthesizing Activities of the Mind**