

DISSERTATION ON THE ART OF COMBINATIONS

1666

(Selections)

The Dissertatio de arte combinatoria, which Leibniz published in 1666, was an expansion of the dissertation and theses submitted for disputation the same year to qualify for a position in the philosophical faculty at Leipzig. The work contains the germ of the plan for a universal characteristic and logical calculus, which was to occupy his thinking for the rest of his life. That project is here conceived as a problem in the arithmetical combination of simple into complex concepts, Leibniz deriving basic theorems on permutation and combination and applying them to the classification of cases in logic, law, theology, and other fields of thought. His later judgment on the work was that in spite of its immaturity and its defects, especially in mathematics, its basic purpose was sound.

Three introductory sections which supply the metaphysical and logical foundations of work are given here. They are (I) a demonstration of the existence of God with which he prefaced the work; (II) the 'corollaries' prepared for the disputation; and (III) the definitions introducing the work itself. The solution of the first two problems and several applications are also included.

I. DEMONSTRATION OF THE EXISTENCE OF GOD

[G, IV, 32–33]

Hypotheses [Praecognita]¹:

1. Definition 1. *God* is an incorporeal substance of infinite power [*virtus*].
2. Definition 2. I call *substance* whatever moves or is moved.
3. Definition 3. *Infinite power* is an original capacity [*potentia*] to move the infinite. For power is the same as original capacity; hence we say that secondary causes operate by virtue [*virtus*] of the primary.
4. Postulate. Any number of things whatever may be taken simultaneously and yet be treated as one whole. If anyone makes bold to deny this, I will prove it. The concept of *parts* is this: given a plurality of beings all of which are understood to have something in common; then, since it is inconvenient or impossible to enumerate all of them every time, one name is thought of which takes the place of all the parts in our reasoning, to make the expression shorter. This is called the *whole*. But in any number of given things whatever, even infinite, we can understand what is true of all, since we can enumerate them all individually, at least in an infinite time. It is therefore permissible to use one name in our reasoning in place of all, and this will itself be a *whole*.²
5. Axiom 1. If anything is moved, there is a mover.
6. Axiom 2. Every moving body is being moved.
7. Axiom 3. If all its parts are moved, the whole is moved.

For references see p. 83

8. Axiom 4. Every body whatsoever has an infinite number of parts; or, as is commonly said, the continuum is infinitely divisible.

9. Observation. There is a moving body.

Proof [*Ἐκθεσις*]:

1. Body *A* is in motion, by hypothesis No. 9.
 2. Therefore there is something which moves it, by No. 5,
 3. and this is either incorporeal
 4. because it is of infinite power, by No. 3;
 5. since *A*, which it moves, has infinite parts, by No. 8;
 6. and is a substance, by No. 2.
 7. It is therefore God, by No. 1 Q.E.D.
 8. Or it is a body,
 9. which we may call *B*.
 10. This is also moved, by No. 6,
 11. and what we have demonstrated about body *A* again applies, so that
 12. either we must sometime arrive at an incorporeal power, as we showed in the case of *A*, in steps 1–7 of the proof, and therefore at God;
 13. or in the infinite whole there exist bodies which move each other continuously.
 14. All these taken together as one whole can be called *C*, by No. 4.
 15. And since all the parts of *C* are moved, by step 13,
 16. *C* itself is moved, by No. 7,
 17. and by some other being, by No. 5,
 18. namely, by an incorporeal being, since we have already included all bodies, back to infinity, in *C*, by step 14. But we need something other than *C*, by 17 and 19,
 19. which must have infinite power, by step No. 3, since *C*, which is moved by it, is infinite, by steps 13 and 14;
 20. and which is a substance, by No. 2,
 21. and therefore God, by No. 1.
- Therefore, God exists. Q. E. D.³

II. COROLLARIES FOR DISPUTATION⁴

[G., IV, 41–43]

An Arithmetical Disputation on Complexions, which Mr. Gottfried Wilhelm Leibniz of Leipzig will hold in the famous university of Leipzig, by permission of its distinguished philosophical faculty, on March 7, 1666.

I. *Logic*

1. There are two primary propositions. The first is the principle of all theorems or necessary propositions: *what is (so) either is or is not (so)*, or conversely. The other is the basis of all observations or contingent propositions: *something exists*.

2. Perfect demonstrations are possible in all disciplines.

3. If we regard the disciplines in themselves, they are all *theoretical*; if their application, they are all *practical*. Those, however, from which the application follows more immediately are rightly called practical par excellence.

4. Although every method can be employed in every discipline, as we follow the traces either of our own investigation or of the producing nature in our treatment, it yet