



## Causation and the Geometric Method in the Philosophy of Spinoza (II)

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## CAUSATION AND THE GEOMETRIC METHOD IN THE PHILOSOPHY OF SPINOZA (II).\*

TO determine the causes of things, then, the true method will seek the causes of ideas. Its tests are concerned with ideas and their characteristics, and the order of its inquiry is an order of ideas. The inquiry will be satisfied, finally, not by some historical explanation of forces or events, but by a generation of the idea or the essence from a principle which does not in turn require explanation or cause.

The true method is the way in which truth itself or the objective essences of things or ideas (all three have the same significance) are sought for in the proper order. Again the method must necessarily touch on reasoning and understanding; that is, the method is not the reasoning itself to understand the causes of things and far less is it the understanding of the causes of things; but it is the understanding of what a true idea is by distinguishing it from other perceptions and by investigating its nature that we may thence know our power of understanding and that we may thus accustom our mind to understand by that standard all things which are to be understood.<sup>16</sup>

The manner and the locus of the method are, therefore, unambiguously specified. True, its basis is yet to be stated, and one might have reasonable doubts whether, or at least in what sense, the idea is under the same conditions objectively as the ideatum is in reality. Yet the supposition is that an examination of method may bring out the aspect of the understanding or of nature which will justify even that confidence.

The nature of the causation among ideas is not difficult to state. Any relation of ideas is a causal relation. For a thing to have relations or intercourse with other things is for it either to produce them or to be produced by them. The question suggested is concerning ideas and things: how are the connections of an idea with other ideas the same as the relations of a thing with other things? This question Spinoza asked and answered in different terms and in a different context than these. Possibly, if the *Improvement*

\* The first part of this article appeared in the March, 1930, issue of this REVIEW, p. 178.

<sup>16</sup> *Int. Emend.*; II, 15.

of the *Understanding* had been completed, it would have approached the question in the order in which it has turned up here, but in any case developments in the history of thought since the seventeenth century justify asking the question thus in his name, particularly since his treatment of method indicates that he thought it could be disposed of easily and should become, apart from metaphysics, an irrelevant question. It is not an impossible hope, therefore, that an examination of his method may show how the question disappears. To answer the question will, of course, lead back to Spinoza's language and to his order of consideration, for in the inquiry into the nature of the understanding, as in all inquiries, knowledge of effect is nothing other than the more perfect knowledge of cause, and if the cause of the true method is sought, the starting-point must be a more perfect knowledge of the nature of the understanding and eventually of God.

A simple idea, then, one which has no relations with any other ideas, is necessarily true. Aristotle would have said that a simple idea is neither true nor false, but in the context of their systems the consequences of the two statements are the same: a simple idea cannot be investigated; questions of truth or falsity are improper to it. Any definition moreover is necessarily true. In his letters Spinoza states as an axiom which a philosopher should know that *every definition or clear and distinct idea is true*.<sup>17</sup> That this is essentially the aristotelian distinction is clear from another letter in which the meaning of the word definition is broadened to include the description of an existent and real thing outside the mind.<sup>18</sup> If the definition explains a thing as it exists outside the understanding, it is no different from a proposition, and it differs from an axiom only in that it deals with the essence of things or of conditions, whereas the axiom is wider and extends to eternal truths. Like a proposition too such a definition must be shown to be true. On the other hand a definition may explain a thing not as it is outside the mind, but as it is conceived or may be conceived by the mind. In that case it differs

<sup>17</sup> *Epistola IV*; IV, 13. In the *Organon* Aristotle speaks of simple ideas as neither true nor false (*De Int.* 16<sup>a</sup> 10; cf. *Meta.* Book E, 1027<sup>b</sup> 27). Elsewhere they are considered to be necessarily true (*Meta.* Book Θ, 1051<sup>b</sup> 31, 1052<sup>a</sup> 1; *De An.* Book III, 430<sup>b</sup> 28).

<sup>18</sup> *Epistola IX*; IV, 43.

from an axiom or a proposition, since all that is required of it is that it be conceived, whereas an axiom must be conceived as true. Spinoza illustrates this distinction: if one says that each substance has only one attribute, that is a mere assertion and needs demonstration. But if one says that by substance one understands that which consists of only one attribute, that is a good definition, but thereafter one must be careful to call entities consisting of more than one attribute by some other name than substance.

In the second sense of definition it can be said that all definitions (and, what is the same thing, all clear and distinct ideas) are necessarily true. Unless the definition is thrown in a form in which its references carry beyond the understanding (and in that case it is properly a proposition), the very statement of the definition is mark of its truth. Once more this is a distinction between the extrinsic and the intrinsic marks of truth to the end that method may deal exclusively with the latter, for only the intrinsic qualities by which a true idea is known as adequate can be recognized by the method. The distinction to this end is recurrent in the *Improvement of the Understanding*.

For with respect to that which constitutes the form of the true, it is certain that true thought is distinguished from false not only by extrinsic but principally by intrinsic denomination. For if a workman conceives some construction in proper order, although such construction never existed nor even will ever exist, nevertheless his thought is true and is the same thought whether the construction exists or not; and if on the other hand some one says that Peter, for example, exists, and yet does not know that Peter exists, that thought with respect to him, is false, or if you prefer, is not true, although Peter really exists. Nor is the proposition, Peter exists, true except with respect to him who knows certainly that Peter exists. Whence it follows that there is something real in ideas, by which the true are distinguished from the false.<sup>19</sup>

Save in the case of an idea which has explicit existential references, the truth of the idea of an existent thing is no different from the truth of the same thing nonexistent. The mark of the true idea is that the properties of the thing may be known from it, not that something may be known to correspond in some sense to it in nature.

At the bottom of this notion of truth is the realization that the knowledge of things cannot be equated to particular things. It

<sup>19</sup> *Int. Emend.*; II, 26.

should be possible to recognize the particular thing from a clear idea of it, but the problem of whether there exists some thing to which a given definition fits is the problem of the special scientific techniques, not properly a problem of logic. If the properties which flow from the definition are not the properties recognized in the thing, the definition, although true, is not there applicable. To say therefore that every definition or every clear and distinct idea is true, is not to insist that every assertion of the mind is applicable wherever the mind wishes, but rather that if the mind understands its assertions, it will recognize when they are true or false. Consequently, the principle of choice among the possible definitions of anything is, of course, first to choose definitions from which the properties of the thing in question are known, and then, since there will be an indefinite number of such definitions, to seek that definition from which all the properties of the thing are most readily deducible. From any definition and from axioms (recognized immediately to be true) properties can be deduced (indeed, Spinoza was convinced, despite the objections of one of his correspondents, that more than one property could be deduced from a single definition),<sup>20</sup> and any falsity consequent to wrongly applied definitions must reveal itself in the very process of deduction. There are no dangers in the combinations of ideas; statements and propositions may even be fictitious without being false. It is important of course that the idea be perceived clearly and distinctly; if it is so perceived any false fiction will be detected at once, since its consequences will run counter to the consequences of the clear idea. Fictions can be indulged in only when they are not seen to involve impossibility or necessity; if they involve the one they are seen to be false, if they involve the other they are seen to be true, and in either case they cease to be fictions.

As distinguished from truth, then, fiction is an unwarranted or at least an unexamined association of ideas. If causes are found for any connection of ideas, their connection is seen to be proper in terms of the cause that brings them together. Thus if motion is affirmed of a semicircle the affirmation is false. Yet if a conception of a sphere is formed by feigning a semicircle revolving about its diameter, that is a true idea, and in it motion

<sup>20</sup> *Epistola LXXXVIII*; IV, 335. Cf. *Epistola LX*; IV, 271.

is affirmed properly of a semicircle. The conception of the sphere is then the cause of the conception of the motion of the semicircle. Falsity in all cases consists only in affirming one thing of some other thing which is not contained in the conception which had been formed of the latter thing. Far from avoiding fictions, therefore, the true method indicates that they are proper and may lead to the truth, provided only the conception of the thing be clear and distinct.

It might appear however, since all definitions are equally true, though not equally useful or productive, that there is no distinction possible between fiction and truth. One fiction, it might seem, is limited, not by truth or by the understanding, but only by another and contrary fiction. The mind would then encounter nothing fundamental in either nature or thought, but would be free to construct its own systems with no other limitation than that one fancy might contradict another; and even in such a case it would be free to choose between the contrary fancies. This doctrine Spinoza conceives to be a total denial of understanding; his refutation of it consists in pointing out the difficulties and absurdities of such a denial; these are apparent to *us who know that we know something*. Those who deny it

say that the soul can feel and perceive in many modes, not itself nor things which exist, but only things which are neither in themselves nor anywhere, that is, that the soul can by its own force create sensations or ideas which are not of things, for they regard the soul as God in part. Moreover they say that we or our soul have such liberty that we or our soul constrain our own liberty: for after it has feigned anything and has given its assent to it, it cannot think or feign it in any other way, and it is further constrained by that fiction so that even other things are thought in such a manner that the first fiction is not opposed, just as they are constrained here to admit because of their fiction even the absurdities which I have here enumerated; we shall not be wearied by exploding them with any demonstrations.<sup>21</sup>

Yet this confidence that reason deals with the natures of things and not only with fictions seems to suggest to Spinoza, once it is stated, the danger that to state it thus may seem to give it little foundation, and possibly for that reason he appends a footnote which carries back once more to the nature of the understanding.

Although we may seem to conclude this from experience (and who will say that that is nothing?) because a demonstration is lacking, if any one desires

<sup>21</sup> *Int. Emend.*; II, 23.

it, he may have it as follows. Since there can be nothing in nature which is contrary to its laws, but since all things are made according to certain laws of nature, so that they produce their certain effects by certain laws in irrefragible concatenation, it follows hence that the soul, when it conceives a thing truly, proceeds to form the same effects objectively.<sup>22</sup>

Our inquiry again, therefore, if we would know the distinguishing mark of truth and fiction, is into the nature of the mind by which certain ideas are recognized as its proper consequences and therefore true, and by which the absurdity of others is recognized by deductive analysis. There are some things concerning which false fictions are impossible; what they are may be known, if not ultimately, at least proximately, from the nature of the understanding. The metaphysical foundation of this confidence is easily discovered in the spinozist system: it is the nature of the thinking being to form true and adequate ideas; but as thinking beings we are part of a thinking being, therefore some ideas arise in us which constitute our mind only in part; those ideas are inadequate, the result of the impress of external things upon us, the product of experience; the true method will avoid them and confine itself to ideas which arise from our mind alone and constitute it, not in part, but as wholes. This metaphysical basis, even though it may still seem unacceptable, makes somewhat clearer the mechanism of the method.

The mind, when it considers a thing which is fictitious and false to its own nature so as to ponder it and understand it and to deduce from it in good order such things as are to be deduced, will easily make manifest falsity; and if the fictitious thing is true to its nature when the mind considers it to understand it, and begins to deduce from it in good order such things as follow from it, it will proceed happily with no interruption, just as we saw that from a false fiction, in the manner stated, the understanding was immediately led to show the absurdity of it and other things deduced from it.<sup>23</sup>

There is nothing mysterious in this power ascribed to the mind; if a thing is understood it makes itself evident, and no other proof is needed, only an example of it. Similarly a contradiction need only be pointed out to appear false.<sup>24</sup> However the mind may be led to a truth or a falsity, there must be that in the ideas or the demonstration which it recognizes as true or false. The founda-

<sup>22</sup> *Int. Emend.*; II, 23, note a.

<sup>23</sup> *Int. Emend.*; II, 23-24.

<sup>24</sup> *Int. Emend.*; II, 20, note s.

tion of the true method, Spinoza is convinced, is in the statement of what there is in ideas by which some are recognized to be true, others false. This does not mean that there is an absolute truth to be determined concerning existent things, nor does it preclude the possibility that a given object be understood in many ways, that a variety of definitions be feigned for it. But it does involve as a consequence that there are implicated in the processes of the mind, and discoverable by it, some eternal truths. We can feign various causes for a given thing, but those feigned causes must involve an uncaused principle, such as motion or thought, or behind them God. The consequences which follow from these uncaused principles are eternal truths; there is for example the first and eternal truth that God is, but it is not an eternal truth that Adam thinks; it is an eternal truth that a chimera is not, but it is not an eternal truth that Adam does not think.<sup>25</sup>

Certainty is founded therefore on the circumstances that the materials of thought, the simple ideas, cannot but be true, and that the mind may know eternal principles according to which the combination of ideas must be true. If an idea is very simple it must be clear and distinct and therefore true; if on the other hand it is made up of a combination of distinct ideas, their composition must be clear and distinct and therefore true, for the elements and the cause of the composite idea are known. Certainty, Spinoza says, is nothing else than the objective essence; it is the way in which the formal essence is perceived. Therefore no other sign of certainty is needed than to have the true idea, since it is not necessary to know that we know.<sup>26</sup> In this sense the mind has the power to know true ideas. To define a thing in a given way is not to penetrate into some hidden recess of nature, but simply to state the characteristics or the properties by which the thing may be recognized; if the definition is clear the nature of the thing and its properties must be clear too. If that is the case it will appear clearly from the analysis of the definition; if they are false the falsity will appear in the same way. There is between thing and knowledge the legitimate distinction of that which a thing is and that which it must be to be just that thing. The first

<sup>25</sup> *Int. Emend.*; II, 20, note w.

<sup>26</sup> *Cf. Int. Emend.*; II, 15.



is difficult, not to say impossible, to express discursively, since it is the infinitely complex, unique nature of the thing; the second is the statement in discourse of the form of that nature, and if the statement is successful the manifold characteristics of the thing may be evolved deductively from it. Medieval philosophers saw this difference in the distinction between the *formalitas* and the *intentio* of the thing. The thing obviously is what it is, dependent on its constitution and the forces and things which environ it; but no less significantly is it derived from and dependent on the truth which is the statement of it. On one analysis the cause of a circle is the compass and the motion of the compass which drew it; on the other its cause is the definition from which its properties may be known. Spinoza's confidence in his method is a confidence simply that these two causes do not refer to different natures. Even more, the reduction of efficient causation to the causation of ideas has the effect of removing from consideration the chain of temporal events which is most usually indicated in efficient causes. The efficient cause of a thing becomes in Spinoza's system that from which the nature of the thing might conceivably have proceeded, not the complex of events immediately antecedent to its production. The latter could never be known exhaustively or adequately, whereas once the nature of the thing is known, however it may come to be known, all possible qualities and all possible effects can be known from it. Therefore even events of time and space, so far as they can be known, are intelligible from the nature of things which the mind can know adequately, not from histories which must be partial and incomplete.

This analysis of human thought is at once sound and suggestive. It is even questionable only at one point, and at that point of course the characteristics peculiar to the spinozist method are developed. That point has already appeared in various forms in this statement of the method: it is the confidence that the objective essence conceived in the mind corresponds to the formal essence of the thing; this may be derived as the consequence of eternal truths which are known certainly; and these truths in turn may be recognized because of the fixed nature and definite laws of the understanding. It is not, in any case, the bland assumption of a parallelism or a correspondence of idea and thing. The difficulty is rather in

showing that an infinite regress in ideas is impossible and that fictions are limited by the understanding, not by other fictions. But the demonstration of this or any of the fundamental properties of the understanding seems to forfeit the position, since it would bring out the nature of the understanding by means of something else, whereas the nature of the understanding should be at the bottom of our acceptance of the demonstration. That this is the case is of course no refutation of the method, but rather the reiteration that, if the method is the true method, it is impossible properly to prove it. Spinoza recognizes the difficulty in almost these terms. He remarks the incongruity that he should have demonstrated the method by reasoning, for this would indicate that it is not self-evident, and questions might be raised therefore concerning the correctness of the reasoning.

If we reason well we must begin from a given idea, and since to begin with a given idea requires demonstration, we ought again to prove our reasoning, and then again prove that reasoning, and so to infinity. But to this I reply that if some one had by some chance proceeded in investigating nature as follows, that is, by acquiring other ideas according to the standard of a given true idea in due order, he would never have doubted of its truth, inasmuch as truth, as we have shown, makes itself evident, and all things would have flowed freely from it.<sup>27</sup>

The aim and problem of the method may therefore suffer a final translation. The aim is primarily to have clear and distinct ideas, and these in their metaphysical status are ideas which arise from the mind alone and not from the fortuitous movements of the body.

The form of true thought must be placed in that same thought itself without relation to any others, nor does it recognize the object as cause, but must depend on the power and the nature of the understanding. . . . Wherefore that which constitutes the form of true thought must be sought in the form of that same thought itself and must be deduced from the nature of the understanding.<sup>28</sup>

A good method is one which will show how the mind must be directed according to the standard of a true idea. Obviously there may be more than one system deduced according to the good method. There is therefore a step beyond that good method; there is a perfect method, which shows how the mind must be directed not according to the standard of a given true idea but according to the standard of the given idea of the most perfect

<sup>27</sup> *Int. Emend.*; II, 17.

<sup>28</sup> *Int. Emend.*; II, 26-27.

being.<sup>29</sup> This perfect method advances from the statement that the mind has a true idea to the further statement that the mind may arrange and connect ideas to reflect objectively the formality of nature, not only as parts but as a whole. When it does that it reduces all ideas to one idea. The demonstration of the nature of God follows from the examination of the understanding much as the characteristics of the understanding emerge from an examination of ideas. Ultimately, by this approach, God must be because the mind is able to derive conclusions from particular affirmative essences by forming true and legitimate definitions.

This sequence which leads to the perfect method is more surprising to modern ears perhaps by the terms it uses than by the consequences it entails. Possibly, therefore, since the method leads to God as cause, or to the idea of God, the paradox of the result will be dulled if, as we learned the nature of the understanding by considering its properties, we examine the properties of this most perfect being to discover his nature. To begin with, his definition must be stated in terms of his cause. Our best conclusions, we found, are arrived at from the definition of a particular affirmative essence, and the best definition is one which states the cause of the thing. This is true in the case of the definition of God.

So also when I define God to be the supremely perfect being, since this definition does not express the efficient cause (for I conceive an efficient cause as internal as well as external), I shall not be able to deduce all the properties of God from it; but when I define God to be the Being, etc. see Definition VI, Part I of the *Ethics*.<sup>30</sup>

The definition of the *Ethics* therefore, *By God I understand a being absolutely infinite, that is, a substance consisting of infinite attributes, each of which expresses eternal and infinite essence*, is the statement of the efficient cause of God. All the truths of the universe and of the mind follow, in a sense, from this definition; but it is equally important that existence is involved in it. Once the nature of God is known I cannot feign that he exists or does not exist, any more than, once I know I exist, I can feign that I exist or not, or any more than I can feign that an elephant can go through the eye of a needle.

<sup>29</sup> *Int. Emend.*; II, 16.

<sup>30</sup> *Epistola LX*; IV, 270-271.

The existence of God is a consequence involved in the unusual doctrine of deduction and causation which Spinoza develops. The notion, with which the analysis began, that definitions cannot be erroneous, had been possible only by separating definitions from descriptions of actual specific existent things. A definition expresses no one nor any given number of things, but only the essence of the thing as it is in itself. The definition might be recognized to apply to a given individual, but all the multitude of existing things are produced by external causes and not by the forces of their own natures, and therefore the existence of a particular thing is not concluded from its nature. On the other hand, its nature is not independent of other natures which might exist. This is a reflection of the metaphysical truth that

besides substances and accidents there is nothing really, or outside the understanding. For whatever is, is conceived either through itself or through some other thing, and the concept of it either involves the concept of some other thing or does not involve it.<sup>31</sup>

The idea of substance is at the back of any existence or any idea, to be revealed by analysis; indeed the *Ethics*, working with the consequences of the concept of substance and its modifications, finds,

we can have true ideas of modifications which do not exist, since although they do not exist actually outside the understanding, still their essence is so comprehended in something else that through it they can be conceived. But the truth of substances is not outside the understanding except in the substances themselves, because they are conceived through themselves. If any one should say, therefore, that he has a clear and distinct, that is, a true idea of substance, and nevertheless doubts whether such substance exists, it would be precisely the same as if he were to say that he has a true idea and nevertheless doubts whether it is false (as is clear enough to one who considers it carefully); or if any one asserts that substance is created, he asserts at the same time that a false idea is made true, than which obviously nothing could be conceived more absurd; and therefore it must necessarily be acknowledged that the existence of substance like its essence is an eternal truth.<sup>32</sup>

The investigation of concepts is pushed back among concepts until one is reached which involves no other; that is the idea of a substance which is cause of itself. The idea of God is central in the method which is according to the standard of a given true idea;

<sup>31</sup> *Epistola IV*; II, 14.

<sup>32</sup> *Eth.* I, 8, sch. 2; II, 50.

the definition of God alone among definitions must lead to his existence as a deductive consequence.

Since (according to hypothesis) necessary existence pertains to the nature of God, it is necessary that his true definition likewise include necessary existence; and therefore his necessary existence must be concluded from his true definition. But from his true definition (as I have already demonstrated from the second and third hypotheses) the necessary existence of many Gods cannot be concluded. There follows therefore only the existence of one God. Q. E. D.<sup>33</sup>

Without the idea of God, neither the perfect method nor metaphysics would be possible. Clear and distinct ideas are necessarily true in that they show what is implied in being a given thing, what properties, in other words, follow from a given nature. That there are or are not such things as the definition determines would be irrelevant before the consideration that if they were they would be such and such. The definition states a value for a formula, or for a function, which expresses a given nature. The mind might examine the characteristics of any constant in that formula with no inquietude over the fact that in nature no individual thing corresponding to the constant value exists. This would be enough for the true method, but there may be fundamental doubts concerning it, and against these there opens the possibility of a more inclusive method: if we know the nature of a triangle or of any idea we can be deceived concerning it only if there is something basically wrong in our understanding and its relation to nature; but we can know the nature of the whole of which these ideas are parts; the best method enables us to arrange our ideas with reference to each other as things are constituted in nature with reference to each other, not in their temporal series, but in their formal or essential natures.

Whence it follows that we can call true ideas into doubt, because perhaps some deceiving God exists who deceives us in things most certain, only so long as we have no clear and distinct idea of God; that is, if we consider the knowledge we have of the origin of all things and we find nothing which teaches us that he is not a deceiver by that same knowledge by which, when we consider the nature of a triangle, we find its three angles to be equal to two right angles; but if we have such a knowledge of God as we have of the triangle, then all doubt is removed. And in the same manner in which we can arrive at such knowledge of the triangle, although we do not know certainly

<sup>33</sup> *Epistola XXXIV*; IV, 180.

whether some supreme deceiver deceives us, so we can arrive at the knowledge of God, although we do not know certainly whether there is some supreme deceiver; and once we have it, it will suffice to remove, as I have said, all doubt which we can have concerning clear and distinct ideas.<sup>34</sup>

If this is indeed the nature of thought it accounts nicely for the paradox involved in the statement of the method of thought. For if a given idea is to be explained by its cause in the sense that the causes of ideas are formulæ or functions, and the ideas are the field of variables determined by them, obviously the cause cannot be known from the effect alone. Integration is a difficult process if no functions or only a few are known; more than one formula can usually be fitted to a given instance. Obviously then if there is a single nature of all things, related to things in this wise, nothing can be known so long as the cause of all things is unknown. But the paradox works equally well in the other direction. Nothing in nature can be understood without increasing our knowledge of the primary cause or God, for knowledge of the effect is nothing other than to acquire a more perfect knowledge of the cause.

This then is the method: there is something real in ideas by which the true is distinguished from the false; true ideas are not distinguished by the fact that true thought knows through the primary causes of things, but by a quality of the ideas themselves and by properties of the understanding; thought is said to be true when it involves objectively the essence of some principle which has no cause, but which is known in itself and through itself. The mind is a spiritual automaton which operates according to principles common to all men. It is through these principles that the understanding knows the causes of ideas; by virtue of them it is the nature of the understanding to form true ideas. The mind is enabled to go from cause to effect over the series of fixed and eternal things, which are present everywhere and which by their very widespread power are like universals or definitions of individual mutable things, as they are the proximate causes of all things. The understanding however cannot descend from universal axioms to individual things, for the axioms extend to infinity and do not determine the understanding to regard one thing more than another. Knowing God the mind knows no

<sup>34</sup> *Int. Emend.*; II, 30.

things but the determinations of all things. The correct method therefore is to form thoughts according to some given definition. The best conclusions, moreover, are derived from the affirmative essence of a particular thing determined in this manner. The more specialized an idea is the more distinct it is, and therefore the more clear. Knowledge of particular things is most to be sought.

The doctrine of definition and the notion of the cause of ideas give rise, thus, to a novel conception of deduction in the method of Spinoza. It is a method which cannot deal directly with individuals, nor is it on the other hand concerned with universals or classes. It is a deduction among particular affirmative essences. At one extreme Spinoza attacks vehemently the introduction of abstractions and universals into the processes of thought; at the other extreme he maintains that thought cannot be of individual changing things. Deduction is among fixed and eternal things, not among the congeries of mutable individual things. Between those two extremes lies Spinoza's method, to deduce all our ideas from physical things or real entities according to the series of causes from one entity to another. It is important that a definition by generation determines a particular, not a class; the generation of a circle must result in a circle of particular dimensions. Spinoza's criticism of universals was directed against their abstractness; the more generally existence or any quality is conceived the more confusedly it is conceived and the more easily it can be ascribed to anything. Universal or general notions are confused to an extreme degree, and Spinoza's attack upon them involves the substitution for them of definitions of particular things such that the mind may reason by particulars without ever passing over into generalities and abstractions. The true method will proceed least abstractly from the fountain and origin of nature; it has therefore no fear of deception. Its cogency rests on a single substance and on the circumstance that the idea from which it proceeds cannot be conceived abstractly or falsely.

But with respect to the knowledge of the origin of Nature, it is least of all to be feared that we confuse it with abstract ideas: for when something is conceived abstractly, as are all universals, they are always comprehended more broadly in the understanding than their particulars can exist in nature. Moreover since in Nature there are many things of which the difference is so slight that it almost escapes the understanding, it can therefore easily happen (if they

are conceived abstractly) that they are confused. But since the origin of nature . . . cannot be conceived abstractly or universally, for it cannot be extended more broadly in the understanding than it really is, since it has no likeness with mutable things, there is no fear of confusion with respect to its idea, provided we have the standard of truth (as we have already shown); this is a being, unique, infinite, that is, it is all being and beyond which there is no being.<sup>35</sup>

God is in this sense the origin of nature, and all things in this sense are deduced from him. He is the principle of varying things, and in him is expressed, as it were, the changeless principle by which the *natura naturata*, immutable as a whole but changing in its constituent parts, is determined. Yet the distinction between the changing things of experience, measured in time and space, known in imagination, and the fixed and eternal things which order those changing things as laws, must still be sharpened and their relation clarified. When Tschirnhaus asks whether the variety of things can be proved *a priori* from the conception of extension alone, Spinoza's answer is that it is impossible.<sup>36</sup> But though the existence of the individual thing is not known by deduction, and though its nature can be known from definition and from axioms alone, there is a sense in which all natures are deduced from God. A body may be known through its cause, not in the naturalistic sense, but in terms of a metaphysical and logical causation; it may be perceived as generated by the motion of a plane, and the plane in turn as generated by the motion of a line, and the line by the motion of a point. The deduction of line, plane, and body is from motion, and motion is perceived only if quantity is perceived.<sup>37</sup> From quantity, consequently, not body in general nor on the other hand any individual changing body, but a particular body of definite nature and defined proportions may be deduced by supposing a cause. Bodies so defined follow in the series of "physical things and real entities" from which all our ideas are deduced.<sup>38</sup> By them any individual body which fits the specification of that eternal thing is known. It is thus in fact that knowledge of things is possible; things are not known adequately by their experienced particularity, nor by a general

<sup>35</sup> *Int. Emend.*; II, 29.

<sup>36</sup> *Epistola LXXXIII*; IV, 334.

<sup>37</sup> *Int. Emend.*; II, 39.

<sup>38</sup> *Cf. Int. Emend.*; II, 36.



definition which specifies only a type in which they may fit more and more vaguely as the type is made more and more general, but rather by generation from a principle, like quantity, which has no cause.

The spinozist deduction is not by a logic of classes, nor even of relations in a general sense. It attempts to follow the series of entities generated by principles or of ideas dependent on ideas which are known absolutely. The idea of quantity, for example, is known absolutely, since the mind forms the idea of quantity without considering other thoughts; it forms the idea of motion having considered the idea of quantity. Quantity itself therefore can be conceived in two manners: absolutely or as determined by a cause. If it is conceived in terms of a cause, as it is in the above deduction that it might be the cause of body, it is then a determined quantity, and its cause serves only for the determination of quantity. If quantity were not conceived, prior to determination, motion which depends on it could not be conceived. The infinite nature of quantity moreover is indicated by the fact that motion can be conceived prolonged infinitely. So there are principles of things which underly any particular development or system of things, as quantity underlies any particular system of mensuration. To assert that the truth of a measure depends on quantity, is not to say simply that abstractly considered all measures are quantitative, but rather that there is a single and identical foundation of all measured series, and any particular one is only an example of it. It is not, moreover, to erect any series as the undoubted truth, but to indicate that there are properties which must be known if its truth is even to be considered. At best quantity itself will be known as a function which can generate more systems than will ever be exhausted; but if any of the systems is known, it will be in terms of the property which is known in knowing its function. The best knowledge cannot begin with isolated examples, but must seek the generative principle which will account for all examples.

Much that has been urged in criticism of the deduction of the *Ethics* is not relevant if this is its principle. Viewed superficially the subject-matter of the *Ethics* shifts with each part, and there should be no proper inference from the propositions of one to

the demonstrations of the others. The First Part treats of God, the Second of the mind, the Third of the emotions. Indeed, as if to lend confirmation to this objection, new definitions are introduced in all except the Fifth Part, and new axioms in all except the Third; and in the latter two postulates are introduced. However, since God, or rather the attributes of God, are the causes of body and mind, and since they in turn are the causes of adequate and inadequate ideas which are not different from the emotions, the deduction, though unaccustomed, is precise and warranted. It is not the occurrence of an individual body and an individual mind, nor is it the danger and the history of emotions, which is explained, but what body is and how all bodies are determined, and what the essence and the control of each of the emotions may be. It is proper that axioms and definitions be introduced in such a deduction. If quantity is an eternal principle known absolutely, the deduction of body is not from it alone; rather motion and a point are introduced, and by them the world of bodies may be known from the concept of quantity. So if God is an absolutely infinite being, one whose essence involves existence, the differentiations of beings whose essences do not involve existence, but whose existences follow from the first essence, cannot, notwithstanding that dependence, be known from God alone. If God is known, man is not therefore known; but man can be known adequately only if God is known; and if man and God are known, the relation of body and mind, the origin of adequate and inadequate ideas, the control of the passions, and the manner in which they may be made to form the smallest part of the mind, are all perceived in the best manner and by the true science.

The sequence and the manner of the deduction of the *Ethics*, no less than the introduction of axioms and definitions, can be explained by this notion of causation. The propositions of the First Part, concerning the existence of God, his unity, the freedom and necessity of his actions, and the dependence of all things on his absolute nature or infinite power, follow surely enough in deductive sequence from its definitions and axioms, even if the causal relations of ideas be ignored. Part Two, likewise, concerning the nature and origin of the mind, does not depart from the ordinary geometric manner, although without the spinozist

interpretation the relation of its deductions to those of the First Part is not clear. The Third Part, on the origin and nature of the emotions, is further removed from the ordinary conception of linear deduction, until finally in the Fourth and Fifth Parts, the deduction seems to be only the enumeration successively of characteristics of emotions and understanding, and there is little proper use of geometric demonstration; instead there is an expansion of characteristics, an exhaustion of possibilities of combination, a statement of ways in which the understanding can control the passions, and a series of discrete propositions concerning the free man and the emotions. If, however, the method is viewed not simply as geometric, but as a tracing of the causal series of ideas, the early books of the *Ethics* are employed properly in laying down the main characteristics of the causal dependence, for knowledge of effect is nothing other than knowledge of cause. Thereafter the chief end of the knowledge of God's effects, of ideas and bodies, is the exhaustive knowledge of their properties. Their properties are to be known by examination of them among causes, ideas among ideas, and bodies among bodies, for any such relation is a causal relation, and the deduction of properties proceeds best by setting the thing defined and to be investigated successively among varying causes. The identification of efficient and proximate cause, instead of removing efficient causation, as an aristotelian would have conceived it, from the consideration of science, absorbs it in the nature of things and in what Aristotle would have called formal causes; for the history of bodies impinging on bodies and of minds conceiving ideas is handled adequately only in terms of the natures of bodies and ideas. To know truly what a thing is, is to know how it is made. The properties of God are deduced directly from his nature; the properties of other things are deduced according to the standard of the idea of God. The method therefore, despite its apparent shift, is constant throughout the *Ethics*. Even more, since efficient causation is absorbed in the definition of essences and since in each case the essence is considered in terms of its cause, the dynamism so characteristic of Spinoza's metaphysics is proper to his method. The *Ethics* raises the question not only of the absolute nature of God, but of his infinite power, not only of the nature of the mind and the emo-

tions, but of their origin; the essence of a thing and its *conatus* are identified; the strength of the emotions and the power of the understanding are opposed and compared. Yet it is by natures and by definitions that strengths and forces are measured and balanced.

With this subsuming of efficient causes under essences, a reconsidered theory of experimentation becomes necessary. Spinoza's pertinent criticism of the empirical scientist of his day should not be made to obscure the very important place experimentation had in his system. Obviously, from the context of the system, experience can teach us the essences of no things, but it does turn the understanding to reflection on certain essences rather than on others. It is important to science, for example, that the histories of various elements and various fluids be stated, not that thereby their natures may be known, but rather that the general principles of nature may be applied to these instances. Clearly Spinoza intended to work out this theory, which he adumbrates frequently, in the *Improvement of the Understanding*, but unfortunately that part of the treatise was never written. He writes,

Before we undertake the knowledge of particular things, there will be time for us to treat of those aids which all tend to enable us to know how to use our senses and to perform experiments according to certain rules and in order and which suffice for determining the thing which is investigated, so that we may determine from them according to what laws of eternal things the thing was made, and that its inmost nature may be known to us, as I shall show in its place.<sup>39</sup>

Experimentation reveals the characteristics of the thing, which must thereafter be interpreted by such causes as will account for them. The causes will be many, not single, though the determined characteristics indicate a single nature, for an idea of the mind may be determined by numerous causes. Any hypothesis which accounts for the properties discovered in experimentation is true, and among hypotheses that one is to be chosen from which the properties are most readily deducible. Spinoza illustrated the explanation of natural phenomena by the example of the parabola: one curve is discovered, many causes may equally well account for it. Moreover the criticism he directed against the conclusions Boyle derived from his experimentation is determined by this

<sup>39</sup> *Int. Emend.*; II, 37.

view of experimentation; there are innumerable elements in even a simple and excellently controlled situation; they are not exhausted in experiment, nor is the essence of the thing uncovered, but properties are enumerated which can be accounted for by assigning causes. A double criticism of empiricism is suggested by this point of view, and Spinoza suggests alternately to Boyle, first, that his general hypotheses could always have been established on common experience as easily as on his careful experiment, and, second, that in any given case the contrary hypothesis too would account for the phenomenon. If Boyle experiments carefully to show that the taste, inflammability, and all the physical and chemical properties of nitre or spirit of nitre can be accounted for by supposing minute parts in motion, Spinoza insists that the hypothesis would have been legitimate even if no experiments had been conducted, for we have sufficient common examples of minute parts which are made to account for properties of wholes: the sound of boiling water, the steam of one's breath on a cold day, and many other instances. Behind this first criticism is, of course, Spinoza's doctrine that a cause may account for the properties of a thing (and therefore the hypothesis may be true) even if it can be shown that the thing was actually produced otherwise. If on the other hand Boyle suggests as hypothesis that nitre and spirit of nitre are composed of heterogeneous elements, Spinoza at once undertakes to show that all the properties which are accounted for by that theory are accounted for as well by the theory that the parts are homogeneous.

Such criticism does not indicate an antagonism toward experimentation and toward theory, but rather an estimation of what is contained in them. Hypotheses supply causes for properties revealed in experimentation; an hypothesis that succeeds in accounting for the properties is true. Hypotheses are illegitimate only when they are supposed to be exclusive descriptions of the nature of the thing described. By that last step they become fictions. Speaking of hypotheses which are formed to explain certain motions which agree with heavenly phenomena, Spinoza remarks <sup>40</sup> that, *if these are applied to celestial movements we conclude from them the nature of the heavens, which can nevertheless be quite*

<sup>40</sup> *Int. Emend.*; II, 22, note y.

*different, especially since many other causes can be conceived to explain such motions.* He refers to the same notion when he says earlier,<sup>41</sup> *See below what we say of hypotheses which are understood clearly by us; but the fiction consists in that we say that they exist in heavenly bodies.* Conceived properly there is no danger in what, if improperly conceived, is fiction. The principle by which an hypothesis operates is guarantee of the truth of the properties deduced from it, and is indication also of what that truth consists in.

Each separate approach to the method must therefore bring out in a different light the universal principles of natural things (as they are expounded in the *Ethics* or in the *Principles of Descartes's Philosophy*) on which as on causes all concepts depend. Each approach leads to principles, such as infinite thought, which follow from the absolute nature of some attribute of God and which must exist always and infinitely.<sup>42</sup> Dependent, however, on those principles are the principles of thought, which Spinoza expounds in his treatment of the mind, and the principles of bodies, which he seeks in Part III of the *Principles of Descartes' Philosophy*. The first expounded a psychology on metaphysical principles. The physical hypotheses of the latter would probably, together with the first most universal principles, have formed his own physics; he sought, he said, principles to explain the phenomena of heaven and earth, not principles which suffice only for the phenomena of heaven, such as astronomers seek at random. When demonstration is complete it starts from uncaused causes and from them proceeds by hypotheses to particular effects; the *Ethics* is an illustration of the true method, which proceeds by the standard of the true idea of God. By this mechanism and in this sense the deduction of the *Ethics* follows the sequence of the causation of ideas from God to the passions. The demonstrations of the *Ethics* either are improper or follow a new method. If there have been confusions in its interpretation, it is because the *Ethics* is in the geometric manner, and the geometric method has been interpreted in other ways than this; if the explanation of the method as a deduction from cause to effect has been overlooked it is because causation is usually interpreted in another, usually naturalistic and

<sup>41</sup> *Int. Emend.*; II, 19, note r.

<sup>42</sup> *Eth.* I, 21; II, 65.

temporal, sense. But in the writings of Spinoza there is sufficient material to reconstruct both the exposition and the illustration of a method which works a subtle and valuable philosophic development in the theory of deduction and experimentation. Doubtless the unfinished state of the *Improvement of the Understanding* is witness of difficulties which he recognized as unsolved, and there is no need therefore to insist that the analysis of method is final or even satisfactory. But the beginnings he made suggest investigations in directions other than those which the centuries since him have undertaken. At very least there are suggestions, in his writings, concerning metaphysical implications of the mathematical method which modern continuators in mathematical logic are little inclined to consider. It is not impossible that contemporary studies of methodology might be turned by such considerations to other problems. Until recently our science and logic engaged in the attempt to reduce all relations to external relations and all causes to efficient causes. Spinoza suggests that efficient causes, taken alone, explain nothing, but are themselves made intelligible by the essences of things. Metaphysical and logical difficulties are involved in that suggestion, and to them Spinoza's philosophy offers solutions. The need for a metaphysics and for a new method, which he felt, persists in contemporary logic and philosophy, and contemporary students might learn, from his approach to problems, well grounded though unwonted philosophic inquietudes.

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