

THE WEAKNESS OF THE METHOD

§ I

THE sixth chapter of the *Discourse on Method* is of a different character from the rest. The earlier chapters, as we saw, contain an account of Descartes' philosophical interests and occupations for the years 1619-33. He tells of himself as setting out from the general method of approach to scientific problems and its first-fruit in the *Essays*; proceeding thence to the theoretical philosophy which gives the metaphysical basis without which no science can be really true; and ending with the complete philosophy of nature in which all phenomena find their full and primary explanation. This explanation of all natural phenomena in the light of first principles is thus the expressed goal of the Descartes of the first five chapters of the *Discourse*.

It is generally assumed that after announcing the method in the *Discourse* and offering 'specimens' of it in the *Essays*, Descartes turned to other things, notably to the type of inquiry presented by the *Meditations*. It is as if he had gone as far as he could with logic and science and turned now to the metaphysics in which lay his special interest and real contribution to thought. Hence the apparent problem presented by the *Principles*. If Descartes in 1641 found his real path, the path marked out by the

Meditations, it is difficult to understand why he should leave it in the *Principles* (1644) in order to revert to questions of physics.

It is here that the narrative of the *Discourse* finds its full philosophical importance. Because the *Discourse* was published in 1637 and the *Meditations* in 1641, we think of the *Meditations* as *posterior* to the *Discourse* in the same way as the *Principles*, published in 1644, is posterior to the *Meditations*. But the *Discourse* itself, as we saw, tells another story. The 'true' date of the *Meditations* is 1628–9, the 'true' date of the *Principles*, 1629–33. It follows that the *Discourse*, written in 1636, is far from being a preliminary manifesto worked out (or abandoned) in the later *Meditations* and *Principles*.¹ It is the retrospect of a Descartes who has *been through* the stages of *Meditations* and *Principles* and now looks back on them. The Descartes of the *Discourse* is in full possession of himself. He is not sketching a programme but summing up results. Now it is these results which are set out in the chapter following and completing this survey, i.e. the sixth and last.

The sixth chapter of the *Discourse*, far from being, as it is often thought to be, an otiose appendix to the whole, is thus Descartes' *confessio fidei*. It is, indeed, even more than that, just as the Descartes of the *Discourse* is more than a private individual. It is the cry of a whole generation the achievement

¹ I omit reference to the *Passions de l'âme* (1649), which is in intention a completion of the *Principles*. See below, p. 83.

of which, however vast, fell short of its dreams and ambitions, and it definitely inaugurates the next epoch of scientific and philosophic thought, the epoch of observation and experiment. It is not the least disservice to the history of thought effected by the fixing on the *Meditations* as embodying the essence of Cartesianism that it has concealed the real unity in the development of the modern mind.

§ 2

It we take the *Discourse* at its face value as Descartes' own summing up of his achievement, a summing up which is definitely posterior to that achievement and definitely assumes that achievement and in some sense passes judgement on it, it behoves us to look with greater respect at those points in it which Descartes stresses himself. Among them are two of fundamental importance: the one, the development, within the general framework of Descartes' outlook, of the different inquiries he undertook; the other, the estimate he himself offers of his own progress in the carrying out of his fundamental aim. The general problem involved is that of the relationship between 'philosophy' and 'science', and, more important from the point of view of the historical development of Cartesianism, that between the two aspects, or perhaps two separate ideals, of science, to wit, mathematics and physics.

The first mention in the *Discourse* of the connexion between science and philosophy is an incidental one.

It is to be found in Descartes' criticism of the science he learnt at school. Science, he asserts, 'derives its principles from philosophy'; but as the 'philosophy' offered him was 'far from firm', the 'science' was no science. Science to be science must have a sure foundation; but the second chapter ends with the reflection that although the finding of such a foundation was all-important, a young man of twenty-three such as he then was could not hope to find it at once but should endeavour first to rid himself of prejudice, to collect facts, and to perfect himself in the 'method'. The primary 'order' of Descartes' thinking is thus definite: 'method' first and then 'philosophy'; but the 'philosophy' is needed not for its own sake but in order thoroughly to base the 'science' the facts of which had been discovered with the help of the 'method'. We have then, according to Descartes, the following stages: first, method; next, discovery; thirdly, 'philosophy'; and lastly and finally, science in the full sense of the term. Thus the discoveries noted by Descartes in the third chapter as giving him 'so much delight' belong not to science in the full sense of the term but to the preliminary science, or, science as discovery.

The 'philosophy' comes later (chapter 4), and its progress is enunciated in eleven distinct stages. These are: (i) the rejection of anything doubtful, whether (*a*) the data of the senses, (*b*) commonly accepted arguments, or (*c*) anything occurring to the mind at all, except (ii) that which is implied in

any such occurrence, to wit, the existence of the self. After noting this as the 'first principle of the required philosophy' Descartes set to work (iii) to investigate the essence of the self so revealed. This he found to lie in the activity of thinking, and drew the consequences (iv) that it is (a) distinct from body, (b) easier to understand than body, and (c) independent of body. From these individual truths he passed (v) to a consideration of the general character of truth as such, and (vi) to the deduction, from the fact of the self's imperfection, of the existence of the perfect or God. He then (vii) turned his attention to other truths, in particular those appertaining to the object of geometrical inquiry or body, and noticed that its essence, unlike the essence of God, was not bound up with its existence. In general (viii) whatever assurance we have of existence is derived from thought, not imagination, and hence (ix) the commonly accepted realities of the physical world are of inferior reality to God and the soul. Once assured, however, of the existence of God and the soul we may accept (x) our own clear and distinct ideas; yet, and here we have the final reflection in this chapter on 'philosophy', (xi) we should remember to follow the 'reason' of our waking experience, not the 'imagination' of our dreams.

From this 'philosophy', which in all but one small point of order is an exact epitome (cf. iii. 297, ll. 3-4) of the *Meditations*, we proceed at once (chapter 5) to a general statement of the 'complete chains of truth'

first derived from it. This comprises an account of inanimate nature in the form of a 'demonstration of effects from causes'. The philosophical 'principles' are thus the primary 'causes', and when followed out, we are told in the following chapter (6), they lead us inevitably to that 'practical', as opposed to the old 'speculative', philosophy which is to make us 'masters and possessors of nature'. Since our greatest good is life and health Descartes announces definitely that he proposes devoting his attention from now on to the study of medicine. What Descartes means by 'medicine' is clear from the distinction he makes, from the point of view of our knowledge, between the science of inanimate nature and the science of man. We know sufficient of the facts of the one, apparently, to be able to offer a complete, or philosophical, account of it, but we do not know sufficient of the other; and a similar remark is made in a letter of June 1645 on the subject of the range of phenomena accounted for in the *Principles*. 'Medicine' is therefore the study of the human body in the widest, and, primarily, the physiological, sense, and indeed the *quelque chose de medicine* which the letters describing the contents of the *Discourse* say was actually introduced into it¹ can refer only to the account of the circulation of the blood given in chapter 5. We have here, therefore, explicitly the *raison d'être* of Descartes' continuous and profound interest in anatomy. His object

¹ i. 349, l. 27; 370, l. 27.

from the very first was not the theoretical study of nature but the amelioration, through that study, of the lot of mankind, and this object now crystallized itself, as it were, in the scientific study of the human organism.

§ 3

If chapters four and five of the *Discourse* give us thus a survey of Descartes' achievement, an achievement which comprises, at least in conception, an account of the whole world of physical nature in the light of primary principles, chapter 6 offers us before all a declaration of the final aim to which that achievement leads up. But it does more than this. In the light of that final aim it reveals the limits of the method.

The method is essentially deductive. It is modelled on the conventional conception of the process of geometrical reasoning. It sets out from a few self-evident principles, and from those principles educes consequences which are, as it were, the 'propositions' of science. But propositions are by nature general, and general propositions have only a limited value in the field which we now know to be all-important for Descartes, the field of practical application to the concrete problems of the individual. There is a 'gap', definite and unbridgeable, between the general laws deduced by help of the method and the particular facts with which we have to deal.

Thus the method can, and does, suggest possibili-

ties, possibilities which are infinite in number; but abstract possibility will not create a practical science, particularly a practical science of man. Since the point at issue is that of 'medicine' one may recall Aristotle's remark that the physician does not cure 'man' (in the abstract) but 'Callias or Socrates' (specific human beings); and the reference to the empirical philosopher of antiquity may be justified by the remarkable fact that the whole of this sixth chapter is strongly reminiscent of Bacon.¹ Time and time again we seem to hear the voice not of Descartes but of Bacon himself, but it is of a Bacon who has elaborated a non-Baconian method and sees the necessity of its Baconian supplementation.

The point of special interest is not only the reiterated expression of the need for *expériences*, a word which in its general use may be translated 'facts'. It is the further remark that with the progress of science we shall need *expériences* or 'facts' in even greater measure. The more advanced our science, the greater the need for more, and more delicate, empirical inquiry. For a beginner, common experience may suffice. The real scientist requires much more, and that because the development of abstract theory can reveal to us so many things that the 'will of God' *might* have put in this world that without particular

¹ This was noted already by Kuno Fischer in his translation of the *Discourse* (Mannheim, 1863). One may compare the numerous references to Bacon made in his commentary to this chapter by M. Gilson.

expériences we shall never be able to know what he actually did put into it. The natural tendency of the mathematical bias of Cartesianism¹ was to lead Descartes further and further into the realm of the possible. Now Descartes himself sees that if ever he is to achieve a philosophy of nature which is to yield the required fruit, the possible must yield to the actual.

The passage is so important as to merit detailed quotation.

‘I remarked also respecting experiments that they become so much the more necessary the more one is advanced in knowledge. . . . In this the order I have followed is this: I have first tried to discover generally the principles or first causes of everything that is or that can be in the world, without considering anything that might accomplish this end but God himself who has created the world, or deriving them from any source excepting from certain germs of truths which are naturally existent in our souls. After that I considered which were the primary and most ordinary effects which might be deduced from these causes, and it seems to me that in this way I discovered the heavens, the stars, an earth, and even, on the earth, water, air, fire, the minerals and other such things, which are the most common and simple of any that exist and consequently the easiest to know. Then, when I wished to descend to those which were more particular, so many objects of various kinds presented themselves to me,

¹ ‘*Per principia et causas Gallus*’, remarked Golius to Huyghens (1 Nov. 1632), on the difference between Descartes and Snell, ‘*per effectus et observata Batavus*.’

that I did not think it was possible for the human mind to distinguish the forms or species of bodies which are on the earth from an infinitude of others which might have been so if it had been the will of God to place them there, or consequently to apply them to our use, if it were not that we arrive at the causes by the effects and avail ourselves of many particular experiments. . . .’

In this passage we may note the order (general principles; the simplest things; the detail of phenomena to be checked by experiment) which is followed in the gradual reduction of abstract and general possibility to particular and concrete fact. We may note, too, that it is the urgency of practical application (‘or consequently to apply them to our use’) which forced upon Descartes the necessity to turn to the empirical particularities of the individual. All this is in the direct line of Cartesian thought as it can be traced from his very school-days. But in this passage we have a new and significant note. It is the note of disappointment. The method has broken down, and that in the especial field in which it was needed most and in which its fertility was to be most triumphantly demonstrated.

This adverse judgement on the method from the point of view of its concrete application is not unique in Descartes. On the contrary, it is a common note both in his letters and his books, and it is expressed strikingly in the other famous résumé given by him of the aims and achievements of his philosophy, that contained in the Letter of the Author serving

as an introduction to the French version of the *Principles*, a letter dated 1647.

§ 4

The *Author's Letter*, after some remarks on the need for 'first causes' or 'principles' if we wish to acquire knowledge which is to be of any use, both defines the theoretical character of such principles and enumerates those actually used by Descartes, the movement of thought being laid down clearly as being from the self to God and from God to the physical world. It then passes to a consideration of the proper 'order' of self-instruction, and recommends us, after adopting a code of morals, to study logic, not the logic of the schools but the logic of discovery which is evidently akin to 'the rules used in mathematics' since it may be practised in them. We may then approach philosophy proper, the first part of which is metaphysics, the second physics, and the third 'the other sciences' based on 'individual enquiries into the nature of plants, animals and above all of man' which are 'medicine, mechanics and morals'.

If one scrutinizes the three 'parts' of 'philosophy' mentioned one finds the usual Cartesian pattern. The first, metaphysics, comprises the most general principles of all, and these principles are given explicitly as the existence of the thinking self and that of God as the guarantor of our clear and distinct perceptions. The second comprises the general principles of the structure of natural things, e.g. the

laws of figure and motion. The third is not concerned with general principles at all but is the irruption into the particular which is the aim of the whole. The three parts into which this last is in turn divided, medicine, mechanics, and morals, are clear enough. 'Medicine', as we have seen, means physiology based on anatomy, and Descartes tells Mersenne in 1646 (iv. 566) that he had 'described all the functions of the human body' some 'twelve or thirteen years before' (i.e. 1632-3) and had lent the manuscript to a friend some 'four or five years before' (i.e. 1641-2). 'Mechanics' presents no difficulty. In the same letter to Mersenne Descartes objects to the way Regius explained the movements of the muscles, as 'being opposed to the rules of mechanics' (l. 24), and one remembers the 'union of medicine with mathematics' remarked on by Baillet¹ as being Descartes' principal aim even in his early years in Holland, an aim which would be adequately fulfilled in a mechanical physiology. 'Morals' ('I mean the highest and most perfect moral science which, presupposing a complete knowledge of the other sciences, is the last degree of wisdom') is at least not only what we call by that name but, in addition, what we now call psychology. The late treatise (1649), the *Passions of the Soul*, which is Descartes' contribution to this subject, is first mentioned in connexion with the 'particular questions of morals' the 'certain foundations' of which he had

¹ Above, p. 8, n. 3.

already found in 'physics' (iv. 442, ll. 12-14; 441, l. 27), and one of its principal inquiries is that of the 'union' of body and soul in the 'pineal gland' which Descartes tells us he searched for in vain in the course of his anatomical studies. This whole 'third part' of philosophy, which comes after metaphysics and physics, is thus the study of the machinery of the human organism considered as one whole of mind and body, and in view of Descartes' expressed aim it is not surprising that he considers this part the most important of all. It is indeed that to which the first two parts definitely lead up and are subordinate: 'just as it is not from the roots or the trunk of the trees that one culls the fruit but only from the extremities of their branches, so the main use of philosophy is dependent on those of its parts that we cannot learn till the end.'

The *Author's Letter*, like all the other writings of Descartes, is so full of phrases to the effect that his principles will lead to the highest degree of wisdom of which we are capable, that the confession immediately following the famous passage quoted comes as a surprise. Descartes goes on to say that he has *not* progressed in these last sciences, in other words, that he has *not* achieved his object, and the reason is the reason given ten years before in the sixth chapter of the *Discourse*. His 'principles' fail him as soon as he has to deal with the world of fact, and he has to depend on 'expériences' which, unaided, he cannot carry out.

‘ . . . the main use of philosophy is dependent on those of its parts that we cannot learn till the end. Although however I am *ignorant of almost all of these*, the zeal which I have always shown in trying to render service to the public is the reason of my causing to be printed ten or twelve years ago certain essays on things which I appeared to have learned. The first part of these essays was a *Discourse on the Method of rightly conducting one’s Reason and seeking truth in the Sciences*. . . . The other parts were three treatises: the first, *Of the Dioptric* . . . in [which] I intended it to be shown that we could make sufficient progress in philosophy to attain by its means a knowledge of those arts which are useful to life. . . . From this time forward, foreseeing the difficulty which would be felt by many in understanding the foundations of metaphysics, I tried to explain the principal points in a book of *Meditations*. . . . Then finally, when it appeared to me that these preceding treatises had sufficiently prepared the mind of readers to accept the *Principles of Philosophy*, I likewise published them, and I divided the book containing them into four parts, the first of which contains the principles of knowledge, which is what may be called the First Philosophy or Metaphysics. That is why it is better to read beforehand the *Meditations* which I have written on the same subject, in order that it may be properly understood. The other three parts contain all that is *most general in physics*, i.e. an explanation of the first laws or principles of nature . . . then the nature of this earth . . . By this means I believe myself to have commenced to expound the whole of philosophy in its order without having omitted anything which ought to precede the last of which I have written.

‘But *in order to carry out this plan to a conclusion*, I should afterwards in the same way explain in further detail the nature of *each of the other bodies* which are on the earth, i.e. minerals, plants, animals, and *above all man*; then finally treat exactly of medicine, morals and mechanics. *All this I should have to do in order to give to mankind a body of philosophy which is complete*; and I do not feel myself to be so old, I do not so much despair of my strength, I do not find myself so far removed from a knowledge of what remains, that I should not venture to endeavour to achieve this design, *were I possessed of the means of making all the experiments necessary to me in order to support and justify my reasoning.*’

The most illuminating commentary on this passage from the introduction to the *Principles* is that provided by a section of the book itself.

The *Principles of Philosophy*, although the work to which all other writings of Descartes are only the introduction, is by its own confession incomplete. It was to have contained, in addition to the existing four parts, two more, a ‘fifth and a sixth, the fifth treating of living things, that is, of animals and plants, and the sixth of man’. These parts were not written ‘because *I am not yet quite clear* about all of the matters of which I should like to treat in these two last parts, and do not know whether I am likely to have *sufficient leisure* to complete them’ (4, clxxxviii). Thus the original Latin (1644). The French version (1647) makes the significant addition *par faute d’expériences*. There was wanting not only leisure but the essential empirical knowledge.

§ 5

Descartes' constant return to this point is remarkable.¹ He has been considered the apostle of apriorism, and indeed such a tendency is apparent in his philosophy as a whole. The immediate consequence of his generalizing the method of mathematics, a consequence adumbrated already in the *Discourse* but enunciated clearly only in the *Meditations* (5, end), was the rejection from the interpretation of nature of everything *non-mathematical*. Mathematics and physics, as Descartes is reported to have explained some years later in the course of conversation,² deal alike with 'objects which are true and real and have a true and real nature'. The difference is that 'whereas physics considers its object not only as true and real being but as existing actually and as such, mathematics considers its object only as possible and as that which, while not actually existing in space, nevertheless can so exist'. Physical existence thus ceases to be relevant; what matters is conformity to mathematical type. Actuality yields to possibility, fact to formula, and we are embarked on the fatal sea of the *a priori*.³

¹ In addition to the passages referred to here and below, cf. *Corresp.* ii. 525, l. 27 f. (Feb. 1639); iv. 260, l. 12 f. (Aug. 1645); v. 112, l. 22 f. (Jan. 1648); and the letter prefaced to the *Treatise on the Passions*, an excerpt from which is given above, p. 11.

² To Burman (1648) *ap. Corresp.* v. 160; cf. already *Reg.* 14 (x. 448, ll. 18-22), *Disc.* 4 (vi. 36, ll. 16-18), and *Obj.* 4 (vii. 212, ll. 22-3).

³ Cf. *Corresp.* i. 250, l. 21 f., on the natural 'order' (quoted above, p. 71).

Yet, although such is the clear tendency of Cartesian thought, it by no means represents the practice of Descartes himself. His realization of the need of *expériences* (both 'experiments' and 'experiences') was almost Baconian in its emphasis, and we know he held Bacon in high esteem just because of Bacon's demand for facts. He will have nothing to do with those philosophers who neglecting *experimenta*, 'think that truth will spring from their brain like Minerva from the head of Jupiter' (*Reg.* 5, end), and he definitely asserts, in 1638 at least (*Corresp.* ii. 142, l. 5 f.), that geometrical demonstration in matters of physics is an impossibility. Idealism was not yet to try to demonstrate *a priori* that we can have no more than five senses, and Descartes' was still the wiser path of studying anatomy from practical dissection.¹ But whatever the 'union of mathematics' with physics (in the narrow sense) may have revealed to Descartes, its 'union with medicine' effected little. Descartes' investigations 'on animals', according to his own statement about this time (1645), date back to the first years of his retreat in Holland (*il y a quinze ans*), but their indispensable pre-conditions were *plusieurs expériences* which in all those fifteen years he had not found possible to carry out. Yet

¹ Cf. *Disc.* 5 *passim* (e.g. p. 47, l. 4 f.); *Dioptric* 5 *ad init.* (p. 115, l. 9 f.). The characteristic letter to Mersenne of 20 Feb. 1639 (ii. 525) speaks of dissection as 'vn exercice où ie me suis souuent occupé depuis vnze ans [i.e. from 1628, the year of his retreat], & ie croy qu'il n'y'a gueres de medecin qui y ait regardé de si prés que moy'.

the treatise 'On Animals' is only a preliminary attack on the fastnesses of medical knowledge, and this medical knowledge, hitherto undiscovered, is only to lead up to the final end of all Descartes' labours, the conservation of health.

'La conservation de la santé a esté de tout temps le principal but de mes études, & ie ne doute point qu'il n'y ait moyen d'acquérir beaucoup de connoissances, touchant la Medecine, qui ont esté ignorées iusqu'à present. Mais le traitté des animaux que ie medite, & que ie n'ay encore sceu acheuer, n'estant qu'une entrée pour paruenir à ces connoissances, ie n'ay garde de me vanter de les auoir . . .'
(iv. 329, l. 16 f.).

'*Je n'ay garde de me vanter de les auoir.*' The phrase is almost pathetic in view of its constant reiteration in so many different contexts and circumstances. Pledged to a method which prolonged experience has shown him cannot bring him to his expressed goal, Descartes is condemned to a confession of failure.

§ 6

Now this failure, far from being accidental, is, as we have seen, inherent. It springs from the very heart of the method. It is in vain that the Platonist Henry More, writing to Descartes (v. 389) on the section of the *Principles* quoted above (p. 86), can tell him not to be disturbed by the want of empirical knowledge. Henry More was wrong, as Descartes knew well. The '*very large interval* between the *general* notion of the Heaven and earth which' he 'attempted

to give in the *Principles*, and the *particular* knowledge of the nature of man which' he had 'not yet treated at all' (iv. 441, l. 20 f. [1646]) cannot be jumped even by the most agile mind, and that because the mind, for all its 'innate power' and 'celestial vigor' (to use the phrases of More), can deduce possibilities only, not actualities:

'The principles we have found are so vast and fruitful that there follow from them *many more things than we see* to be contained in this visible world; indeed *many more things* than lie even in the power of our mind to traverse in thought. Let us set before ourselves a short history [the Baconian phrase is significant] of the principal phenomena of nature (the causes of which are to be investigated here); not however that we should use them as if for reasons to prove anything; for our desire is to deduce the reasons of the effects from causes, not contrariwise those of causes from effects; but only in order that, *out of the innumerable effects which we judge can be produced from the same causes, we may determine our mind to the consideration of certain among them rather than of others*' (*Princ.* 3. iv).

The pronouncement is clear and decisive. As Mr. Whitehead observes (*Adventures of Ideas*, p. 161):
 'There is no valid inference from mere possibility to matter of fact, or, in other words, from mere mathematics to concrete nature.'

We return then to the point to which we were brought in Descartes' own reflections in the sixth chapter of the *Discourse*. The fruitfulness of the science of nature for Descartes' expressed aims

depends upon a winnowing of the infinite deductive possibilities by the empirical fan of the actual. The method offers too much, and as the *sole instrument of discovery* must be pronounced, even by its creator, a failure. ✓

VI

THE ECLIPSE OF THE METHOD

§ I

WE have reached a crux in our inquiry and may therefore review its argument. 7

In order to master nature, Descartes tells us, we must (i) know it; but if our knowledge is to be real it must be (ii) systematic, not casual, that is to say, it must be philosophical or derived from first principles. The first principles are (iii) conceived, on the mathematical model, as a few primary self-guaranteed truths from which demonstration proceeds unilaterally and irreversibly. But (iv) in their application we fall foul of the essential difference between the actualities of 'physics' and the possibilities of mathematics. (v) The method, therefore, while adequate to the discovery of general propositions regarding the structure of nature as a whole, is powerless when it comes to the investigation of particular natural things. Since, however, the aim of science is the dealing with particular natural things