3.10 Conclusion: The Postulate of Knowledge (164–7/204–8)
There is one final postulate of the image of thought, and with it, one final reversal of Platonism. This is the postulate of knowledge. If problems are defined in terms of solutions, then our engagement with problems will be determined by the solutions they engender. That is, we engage in problems in order to develop a better understanding of the world through propositional solutions. The image of thought thus privileges knowledge as itself the solution to problems. Once problems themselves are not simply characterised in terms of propositions, the situation becomes more complex. For Plato, knowledge is a relation to the Ideas. For Deleuze, the relation to Ideas is also important, but these Ideas are no longer to be understood in terms of propositions, but rather in terms of problems. This reversal means that what is important is the engagement with problems, which Deleuze calls learning, rather than the solutions that they engender, as knowledge. As such, the supposed result of learning, knowledge, is simply a by-product of what is primary: a relationship of each faculty to its transcendental ground. As Deleuze puts it:

it is knowledge that is nothing more than an empirical figure, a simple result which continually falls back into experience; whereas learning is the true transcendental structure which unites difference to difference, dissimilarity to dissimilarity, without mediating between them; and introduces time into thought. (DR 166–7/206)

Chapter 4 will give an account of the nature of learning, and with it, an account of the transcendental structure of the Idea that makes learning possible.

Chapter 4. Ideas and the Synthesis of Difference

4.1 Introduction: Kant and Ideas (168–71/214–17)
Chapter 4 of Difference and Repetition opens with two intertwined discussions: of Kant’s theory of Ideas, and of the calculus. In the last chapter, we saw how Deleuze was opposed to Kant’s philosophy since it provided an account of the faculties that merely repeated the structures of common sense at a higher level. We also saw in Deleuze’s discussion of sense that if problems are seen as merely replicating solutions (albeit with the addition of the concept of possibility), then they are unable to provide an account of the genesis of experience, but can at best show
how it is conditioned by the faculties operating on a transcendental level. I want to begin, therefore, by looking at Kant’s notion of the Idea, to see why Deleuze thinks that this notion is a key innovation of the Kantian system, but why ultimately it is unable to provide a genetic account for the structure of representation. As we shall see, Deleuze takes the calculus to offer an alternative to the Kantian model. In the previous chapter, Deleuze hinted at the possibility of a ‘thought without image’ (DR 167/208). Chapter 4 deals with this possibility more explicitly, answering the question, ‘how does it operate in the world?’ (DR 167/208).

In the last chapter (3.7) we saw that, for Kant, knowledge requires a connection between different faculties. While this relationship allows us to make judgements about the world, clearly knowledge involves something more than just particular judgements – it also requires these particular judgements to be organised into a coherent system of knowledge. This is the role of reason (3.9), which ‘does not create concepts (of objects) but only orders them, and gives them that unity which they can have only if they be employed in their widest possible application, that is, with a view to obtaining totality in various series’ (Kant 1929: A643/B671). In order to unify knowledge, reason requires the idea of total unity, as a focal point for its enquiries. Now, this total unity cannot actually be given in experience, and serves merely as a ‘locus imaginarius’ (Kant 1929: A644/B672) that allows reason to perform its function. In this sense, reason is subject to a natural illusion that the end point of all of the understanding’s rules for conceptualising the world is ‘a real object lying outside of the field of empirically possible knowledge’ (Kant 1929: A644/B672). This is what gives rise, according to Kant, to the transcendental illusion that reason is capable of fully determining its objects of knowledge, and Deleuze will put forward an analogous claim that it is this that makes us believe that everything can be captured by representation. As Deleuze notes, these Ideas play a necessary regulative role for Kant that allows reason to carry out the task of unifying knowledge, even if a final unification is not possible. Much of Deleuze’s concern in the previous chapter was with developing a notion of a problem that wasn’t defined in terms of the truth or falsity of its solutions. Since Kant’s notion of an Idea goes beyond experience, and hence specifies an object that simply cannot be given, Kant calls the status of the Idea ‘problematic’. An Idea refers to an object that can be thought but not known, and so ‘it remains a problem to which there is no solution’ (Kant 1929: A328/B384). Kant goes further, and notes that it would be wrong to say that each of these
Ideas is 'only an idea' since our inability to determine these Ideas does not mean that they do not relate to objects. In this sense, the Idea appears to fulfil Deleuze's requirements for a notion of a problem that is real, an 'indispensable condition of all practical employment of reason' (Kant 1929: A328/B385), but is not reliant on the empirical content of experience itself (the field of solutions). While Deleuze will take up many of the features of this account, ultimately he will argue that Kant has failed to properly escape from the image of thought Deleuze presented in Chapter 3. In order to demonstrate this, he introduces three categories: the indeterminate, the determinable and the determined.

First, the Idea itself is undetermined. That is, the object of the Idea cannot be presented in a determinate form in intuition. Taking, for instance, the Idea of God, which Kant considers to be the ground of all appearances, it is clear that we cannot know it, because the grounds of appearance are not themselves appearances: 'Outside of this field, [the categories] are merely titles of concepts, which we may admit, but through which we can understand nothing' (Kant 1929: A696/B794). It is nonetheless a concept that we can determine to some extent by analogy with our own empirical intelligence. In doing so, however, we only determine it 'in respect of the employment of our reason in respect to the world' (Kant 1929: A698/B726). That is, the concept of God is determinable (we can specify what properties inhere in it) by analogy to the empirical world, but on condition that we only use this Idea to allow us to unify our understanding of the world further (by seeing the world as if it were created for an intelligible purpose, for instance). Furthermore, the Idea is also present in empirical objects, in so far as we consider them to be completely determined. If we are going to consider empirical objects as being completely specifiable in terms of intelligible properties, Kant claims that we need the Idea of God. In order to specify something completely in terms of the properties that it has, we need some kind of account of all properties it is possible for an object to possess, so that we can determine which of each pair of properties (the property and its contrary) inhere in the object. 'The Ideal is, therefore, the archetype (prototypos) of all things, which one and all, as imperfect copies (ectypa), derive from it the material of their possibility, while approximating to it in various degrees' (Kant 1929: A578/B606). Now, as Deleuze notes, these three moments of the Idea together could be used to make up a genetic account of actualisation. The Idea as undetermined provides a moment which differs in kind from the actual, and hence falls
outside of its categories. As determinability, it is a moment whereby the object of the Idea becomes capable of sustaining predicates, and hence being determined as an actual object, and as determined, it provides a moment whereby it takes on the actual properties the object has. The three moments of the Idea therefore could provide an account as to how the ground of appearances expresses itself within the world of appearance itself. It would thus provide an account of how a problem finds expression in empirical solutions without having to understand the problem itself in empirical terms, as the Idea remains indeterminate in relation to that in which it is expressed, while nonetheless determining it.

In order for this model to account for the movement from the problem to its empirical solution, all three moments would have to be intrinsic parts of the Idea. As Deleuze notes, however, for Kant, ‘two of the three moments remain as extrinsic characteristics’ (DR 170/216). That is, the way in which we understand the determinability and the determined nature of an Idea such as God is solely in relation to already existing empirical states of affairs. We do this purely in order to allow reason to pursue its interests in systematising our knowledge of the world, and not in order to explore the conditions for the constitution of the world itself. The Idea ‘is not a constitutive principle that enables us to determine anything in respect of its direct object, but only a merely regulative principle and maxim, to further and strengthen in infinitum (indeterminately) the empirical employment of reason’ (Kant 1929: A680/B708). In this sense, while Ideas at first appear to offer us a way to think of problems in a way which is not dependent on solutions, Kant’s account ultimately only allows us to make use of them in so far as they are thought by analogy with and in relation to empirical objects. The problem of the Kantian Idea is still understood in terms of the solutions it gives rise to. What is needed, therefore, is an account that intrinsically relates Ideas to the empirical world, while allowing them to maintain their difference in kind, rather than Kant’s merely extrinsic and regulative account.

4.2 Ideas and the Differential Calculus (170–82/217–30)

Although determinability and determination are extrinsic determinations of Ideas on the Kantian model, Deleuze argues that we can develop a notion that intrinsically incorporates all three moments of the Idea by turning to the differential calculus as a model of thinking: ‘Just as we oppose difference in itself to negativity, so we oppose $dx$, the symbol of difference [$Diffèrenzphilosophie$] to that of contradiction’ (DR 170/217).
In order to see why the calculus is important for Deleuze, it’s necessary to outline in general what the calculus is. A first approximation is that the calculus is a field of mathematics dealing with the properties of points on curves (Boyer 1959: 6). As Boyer notes, this concern with properties of points on curves is similar to a concern with the properties of a body in motion, such as its velocity at a given moment in time. If we wanted to determine the average velocity of a body in motion, we would determine this by finding a ratio between two quantities, the distance that the body has travelled in the time period \(s\), and the time period itself \(t\). We could represent this, for instance, in the following form:

\[
\text{average velocity} = \frac{\Delta s}{\Delta t},
\]

that is, the difference in displacement over the period divided by the difference in time (with \(\Delta\) symbolising difference). This would give us an average velocity in terms of metres per second, or miles per hour. While this might be effective for average velocities, the problem emerges when we want to determine the velocity of the body at a particular moment in time. When we are talking about a particular moment, we are no longer talking about average velocity, but rather now about instantaneous velocity. If a body is moving at constant speed, then the average and instantaneous velocities of the body will coincide, but if a body is accelerating or decelerating, however, then its instantaneous velocity will be constantly changing, and so we cannot determine it based on its average velocity.

Leibniz’s solution to this dilemma was to suggest that if we take the average velocity of the body over a time, beginning with the point we are trying to determine the instantaneous velocity for, and slowly decrease the slice of time we are using to divide the distance travelled, the average velocity will approach the instantaneous velocity. That is, the smaller the segment of time over which we determine the average velocity, the closer it will be to the instantaneous velocity at a point. If we extend this idea, and determine the average velocity over an infinitesimally small stretch of time, then, because this stretch of time is for all intents and purposes 0, the average velocity will actually equal the instantaneous velocity. Now, what we have been dealing with here is a relation between two quantities, distance and time. One of the main concerns of mathematics is with relations more generally, and the calculus in fact provides a way of accounting for relations between varying quantities in general, that is, for all kinds of continuous curves. We represent curves in terms of mathematical equations, and so the differential calculus is a procedure we can apply to mathematical equations. In this respect, the equation that gen-
erates the curve is known as the primitive function. When we apply the
calculus to the equation of a curve, we get what is known as the deriva-
tive, which is an equation that gives us the gradient of the curve at each
point (in the example of the body in motion, the velocity at each point).
For the average velocity between two points, we used the symbol $\Delta s/\Delta t$,
where $\Delta s$ indicates an arbitrary distance, and $\Delta t$ represents the stretch of
time the body takes to travel that distance, but the calculus is not con-
cerned with average velocities, which rely on finite differences, but with
infinitesimal differences, otherwise known as differentials. In order to
represent infinitesimal differences, Leibniz introduces the symbolism $dy/
dx$. As we saw in Chapter 1, relations for Aristotle were defined in terms
of negation. The differential calculus provides the possibility of develop-
ing a theory of relations that relies on reciprocal determination of the
elements, $dy$ and $dx$. Deleuze claims that 'there is a treasure buried in the
old so-called barbaric or pre-scientific interpretations of the differential
calculus' (DR 170/217). This treasure is covered over by two mistakes:
'it is a mistake to tie the value of the symbol $dx$ to the existence of infini-
tesimals; it is equally a mistake to refuse it any ontological or gnoseologi-
cal value in the name of a refusal of the latter' (DR 170/217). In order
to understand why we might make these two mistakes, we need to look
further at what the term, $dx$, signifies. Now, as we saw, $dx$ represents for
Leibniz an infinitesimal distance between two points. When we want to
use this to determine instantaneous velocity, however, we encounter a
contradiction. To see this, we can turn to the account of the infinitesimal
of L'Hôpital, one of the earliest popularisers of the calculus:

*Postulate I.* Grant that two quantities, whose difference is an infinitely small
quantity, may be taken (or used) indifferently for each other: or (which is the
same thing) that a quantity, which is increased or decreased only by an infinitely
smaller quantity, may be considered as remaining the same. (L'Hôpital 1969:
314)

This postulate is needed because $dx$ must be seen as having a deter-
minate value in order to form a ratio, $dy/dx$, but also has to have no
magnitude ($=0$) in order to capture the gradient at a point, rather than
across a length of the curve. Clearly, this is a fundamental difficulty,
since the consistency of mathematics is threatened by taking a vari-
able simultaneously to have and to lack a magnitude. In this sense, it
appears that Deleuze is right in holding it to be a mistake to give the
differential a sensible magnitude, even if this were infinitely small, and
modern readings of the calculus concur, presenting an interpretation of the calculus in terms of a concept of limits that does away with the need to give anything beyond a formal meaning to the differential. Deleuze, however, holds that this reading is also a mistake. In providing an alternative reading of the calculus, Deleuze returns to the metaphysical readings of the eighteenth and nineteenth centuries. The three figures he presents, Bordas-Demoulin, Maimon and Wronski, all held that the contradiction in the mathematical account of the differential did not entail that the differential itself was contradictory, but rather that a proper understanding of it involved a metaphysical interpretation that brought in resources not available within mathematics itself. I want now to present a brief summary of how Deleuze takes up these different readings in order to present an alternative to the Kantian notion of the Idea. Each of these figures takes up a different moment of the world of appearances. Bordas-Demoulin's account is concerned with quantities. As a follower of Descartes, he takes matter to be continuous, rather than made up of discrete atoms. In this regard, he is interested in the way in which the calculus allows us to provide an account of these continuous magnitudes. Maimon is concerned with qualities, such as the colours of objects. As such, he is interested in how these qualities are reciprocally determined, and how we are to understand the changes in quality of objects. Finally Deleuze's discussion of Wronski develops an account of potentiality in terms of the calculus, that is, the moments in the development of an object where its nature itself changes.

The first figure Deleuze introduces is Bordas-Demoulin, 'a Plato of the calculus' (DR 170–1/217). Bordas-Demoulin asks how we can represent mathematical universals as they are in themselves. He claims that Descartes, for instance, does not represent the concept of circumference in itself, but only this or that particular circumference. Descartes' procedure is, according to Bordas-Demoulin, to present the algebraic equation for a circle, \( x^2 + y^2 - R^2 = 0 \). If we drew the graph of this equation, then for a specific value of \( R \), all of the solutions to the equation would together give us a circle, centred on the point \((0, 0)\) of the Cartesian coordinate system. Why does this Cartesian definition not give us the true definition of a circle? Bordas-Demoulin puts the point as follows: 

In \( x^2 + y^2 - R^2 = 0 \), I can assign an infinity of indifferent values to \( x, y, R \), but nevertheless I am obliged to always attribute to them one, that is, one determinate value, and by consequence to express a particular circumference, and not
circumference in itself. This is true for equations of all curves, and finally for any variable function, so called because they give a continuous quantity and its symbol. It is the individual curve or function which is represented, and not the universal, which, accordingly, remains without a symbol, and has not been considered mathematically by Descartes. (Bordas-Demoulin 1843: 133)

In relation to particular circles, algebra functions like the Russellian notion of sense, or the Kantian notion of a condition, in that the variables, \(x, y, R\) simply stand in for particular values. It gives us an account of what circumference is in general, but this account can only be 'cashed out' by choosing specific values to put into the equation. Ultimately, therefore, we simply define the structure of this or that particular circumference, rather than circumference itself. In order to develop an account of what circumference is in itself, we need to remove these references to the particular terms, and this is achieved by using the differential calculus, 'whose object is to extract the universal in the functions' (Bordas-Demoulin 1843: 54). When we differentiate a function, we receive another function that no longer gives us the precise values of the function, but instead, the variation of the function. Moreover, because this function is constituted in terms of \(dy\) and \(dx\), which cannot be assigned a value (they are strictly 0 in regard to \(y\) and \(x\)), we no longer have a function that can be understood simply in terms of possible values of variables. For Bordas-Demoulin, therefore, \(dx\) does not represent a variable that can be given different particular values, but rather a radical break with understanding structure in actual terms. 'Applied to \(x^2 + y^2 - R^2 = 0\), [the calculus] gives \(ydy + xdx = 0\), an equation that does not express any particular circumference, but circumference in general, \(dx, dy\) being independent of all determinate or finite magnitudes' (Bordas-Demoulin 1843: 134). What Deleuze wants to take from this is the idea that the differential is simply inexpressible in terms of quantity, and so is inexpressible in terms of the primitive function. Nevertheless, if we reverse the operation of differentiation by integrating a function, we get the formulae for particular, actual circumferences. The differential is not simply different from the primitive function, but we can also see that it has an intrinsic relationship with it: 'If in, \(ydy + xdx = 0\), one still encounters the finite magnitudes \(y, x\), this is because in quantity, no more than in substance, can the universal isolate itself completely and form a separate being' (Bordas-Demoulin 1843: 134). We thus have a situation that parallels the account of Plato that Deleuze has given in
the last chapter. An empirical concept, such as that of circumference, carries within it its Idea, the differential, in comparison with which it falls short. Whereas for Plato the Idea was ultimately understood by analogy with empirical objects (the use of analogy in Plato’s theory of memory), the differential allows Bordas-Demoulin to present a difference in kind between the Idea and its instantiations. In emphasising the degree to which the differential is immanent to the primitive function while different in kind from it, Bordas-Demoulin chooses another figure as a model of the metaphysics of the calculus who might be even better suited to Deleuze’s account: ‘According to this metaphysics [of the calculus], one might say, by way of comparison, that the God of Spinoza is the differential of the universe, and the universe, the integral of the God of Spinoza’ (Bordas-Demoulin 1843: 172).

The second figure Deleuze introduces is Salomon Maimon, who Deleuze claims to be the Leibniz of the calculus. Maimon, for Deleuze, uses the calculus to overcome what he takes to be Kant’s ‘reduction of the transcendental instance to a simple conditioning and the renunciation of any genetic requirement’ (DR 173/220). Deleuze’s reading of Maimon derives almost entirely from Guéroult’s *The Transcendental Philosophy of Salomon Maimon*, so I will concentrate on that reading here. We can see Maimon’s basic project as problematising the Kantian account of the *a priori* through the reintroduction of a form of Humean scepticism, whilst simultaneously adding a pre-critical element to the Kantian project through introducing a Leibnizian genetic account of the production of space, time and intensity. Just as Bordas-Demoulin took the differential to provide the universal for particular mathematical figures, Maimon takes the differential to be the source of a construction, this time of the phenomenal world. We can begin by recalling that Kant’s fundamental problem is finding a way to relate faculties that are different in kind. Kant’s concern is to guarantee knowledge, and so he isn’t concerned with the reasons why we possess faculties that differ in kind, but is purely interested in how these faculties can be related to one another in order to produce knowledge. Maimon instead wants to investigate the genetic conditions of phenomena. In his *Philosophical Dictionary*, he makes the following comment on the relationship of reason to the object of intuition:

Reason demands that one must not consider the given in an object as something of a pure unalterable nature, but merely as a consequence of the limitation of
our faculty of thinking. Reason demands of us therefore an infinite progression through which that which is thought is perpetually increased, the given, however being decreased to an infinitesimal. (Maimon 1791: 169)

Rather than seeing what is given as merely the passive matter of the faculty of intuition, Maimon sees it simply as that which the intellect cannot think. If we did not have a limited faculty of thought, but instead had an infinite understanding, the entirety of what is for us given would be thought, and so the given itself would disappear. To this extent, Maimon's account is rather like Leibniz's, with the given empirical object being a confused form of perception of the true nature of things. Whereas for Leibniz, the difference between the thought of a finite being and an infinite being was a difference in degree (a greater intellect would have no need to perceive conceptual relations under the confused form of space), for Maimon there is a difference in kind between the two kinds of thinking. As we have seen, the infinitesimal cannot be given a sensible interpretation without contradiction. Nonetheless, when we relate two infinitesimals to each other in a differential function \((\frac{dy}{dx})\), we derive a formula that does have a sensible interpretation (the formula for the gradient of the points on a curve). The differential is thus like the Kantian noumenon, which can be thought, but cannot be presented in intuition. Maimon takes this mathematical interpretation of the differential, and gives it a transcendental interpretation, so the differential, \(dx\), becomes a symbol of the noumenal grounds for the synthesis of phenomena:

These differentials of objects are the so-called *noumena*; but the objects themselves arising from them are the *phenomena*. With respect to intuition = 0, the differential of any such object is \(dx = 0, dy = 0\) etc.; however, their relations are not = 0, but can rather be given determinately in the intuitions arising from them. (Maimon 2010: 32)

An infinite understanding is able to think these differential relations, and thus to think the object in its totality without intuition. In this sense, as Deleuze notes, for Maimon, 'the particular rule by which an object arises, or its type of differential, makes it into a particular object; and the relations of different objects arise from the relations of the rules by which they arise or of their differentials' (Maimon 2010: 33). Since the differential gives us a rule that governs the infinite relations of the object, however, the finite intellect is unable to think it all at once. In this respect, as opposed to thinking the object *a priori* according to the
rules governing the way it arises, it can only think of it as given, that is, through sensible intuition. Thus, rather than the extrinsic relation between the faculties, Maimon shows how intuition emerges through the finite intellect's inability to think the relations of differentials all at once. Instead of thinking the object as a completed synthesis, it must be thought as a synthesis in process, as an 'arising' or 'flowing'. Now, as Guéroult makes clear, the fact that we cannot simply think the object means that we become subject to a transcendental illusion:

The imagination is thus never conscious of anything other than representations; it therefore has, inevitably, the illusion that all of the objects of consciousness are representations; it is led by this to also consider the original object or the complete synthesis as a representation. (Guéroult 1929: 66)

It is this illusion that leads us to see problems in the same terms as solutions. We can therefore see in Maimon two different modes of thinking. One that operates in terms of intuition, and provides a philosophy of conditioning, and another that provides a genetic model of thought that attempts to trace the genesis of the given back to its differential roots.

We can now present the alternative theory of the Idea. Rather than seeing it as a relation between three moments, two of which are extrinsic, the differential calculus relates the three moments intrinsically. It is undetermined in that the differential, $dx$, cannot be given in intuition. When it is put into a relation, such as $dy/dx$, it becomes determinable, as it specifies the complete range of values the function can take. Finally, it is determined in terms of specific values that the function takes at particular moments (the instantaneous velocity of a particular point in time in our prior example). Whereas the infinite understanding thinks the curve as a whole, we can only think the process of generation of the curve, equivalent to the actual evolution of the object in intuition. As Guéroult puts it, 'the differential is, then, the noumenon (that which is simply thought by the intellect), the source of phenomena (which appear in intuition)' (Guéroult 1929: 60).

The final figure Deleuze introduces is Wronski. The mathematician, Joseph-Louis Lagrange, tried to show that we could give an algebraic interpretation of the calculus, representing it as an infinite series of terms using his notion of functions. In the introduction to his *Théorie des Fonctions Analytiques*, he makes the claim that 'the Analysis which is popularly called transcendental or infinitesimal is at root only the Analysis of primitive and derived functions, and that the differential and integral
Calculi are, speaking properly, only the calculation of these same functions' (Lagrange, quoted in Grattin-Guinness 1980: 100–1). Lagrange’s claim that the calculus can be understood purely in terms of algebra would, if successful, remove the need for the kind of ‘barbaric’ interpretation that Deleuze puts forward, since we would no longer need to give a metaphysical interpretation of the differential. It is to save the possibility of a ‘barbaric’ interpretation that Deleuze introduces Wronski. As with the other thinkers of the calculus discussed in this chapter, Wronski holds that there is a fundamental distinction between the differential and normal quantity:

It is this important transcendental distinction that is the crux of the metaphysics of Calculus. – In effect, the finite quantities and indefinite quantities, that is to say, infinitesimal quantities, belong to two entirely different, even heterogeneous, classes of knowledge: the finite quantities relate to the objects of our cognition, and infinitesimal quantities relate to the generation of this same cognition, so that each of these classes must have knowledge of proper laws, and it is obviously in the distinction of these laws that the crux of the metaphysics of infinitesimal amounts is found. (Höené Wronski 1814: 35)

Now, while Lagrange believes that he has escaped from the need to introduce infinitesimals by resorting to the (algebraic) indefinite, which can be understood purely in algebraic terms, Wronski’s claim is that the indefinite itself cannot be understood without the infinitesimal. To bring the infinitesimal into the domain of cognition, it has to be presented in an intuition, which can be done purely as an indeterminate quantity. The indeterminate quantity that is at the centre of Lagrange’s method is thus, for Wronski, still reliant on the differential.

In claiming that Lagrange’s method still relies on the differential, Wronski does not deny that, precisely because it is derived from it, it is still correct. In fact, Lagrange’s method produces a series of differentials which allow us to distinguish between two kinds of points on the line: singular points and ordinary points. If we remember our initial example of the calculus, relating distance to time gave us the velocity of a body. If we differentiate this equation once more, we will obtain a relationship between velocity and time, which is the acceleration of a body. Points on this curve, such as where it is flat, indicate singular features of the movement of the body, such as in this case the point at which it is travelling at constant motion. In more abstract curves, points where the gradient is 0/0, or is null or infinite, define points where the nature of the curve
changes. Potentiality thus defines the points at which the nature of the relationship between the terms radically changes.

We can tie these three moments together to develop an account of the Idea where its three moments, the indeterminate, the determinable and the determined, are intrinsic to it. As we saw when we looked at Bordas-Demoulin, the differentials themselves, $dy$ and $dx$, are completely undetermined with respect to representation, and hence to the field of solutions. Nonetheless, when brought into relation with each other, they give us an equation that is determinable. This equation gives us the rates of change of a function at each point in time (or more correctly, for any value of $x$). Such an equation, as Wronski shows, contains singular points that determine the points on the curve where its nature radically changes. That is, by specifying a value of $x$, we can determine the rate of change at any point. Specifying a value of $x$, therefore determines the Idea. We therefore have a particular determined value (intuition), a determinable equation that subsumes it (the concept), and a field of differentials themselves which engenders both the determinable and determination. The differential, as problem, therefore contains the solution intrinsically, rather than simply being interpreted in terms of it. While this account may seem abstract for now, as we shall see in the following four sections, we can develop concrete examples of the Idea that operate according to this schema.

The remainder of Deleuze’s discussion of the differential calculus draws the consequences from this understanding of the calculus as Idea. As Deleuze notes, ‘the interpretation of the calculus has indeed taken the form of asking whether infinitesimals are real or fictive’ (DR 176/223). As Wronski’s account makes clear, however, this question has traditionally been interpreted in terms of whether differentials can be an object of (representational) cognition, or are fictions. Once we recognise that they are of a different order to what they engender, ‘the first alternative – real or fictive? – collapses’ (DR 178/225). Likewise, Deleuze notes that the alternative between seeing the calculus as operating in terms of an infinitesimal, or modern finitist interpretations that seek to dispense with the infinitesimal, is equally invalid. Deleuze’s claim is that both of these interpretations are ways of describing magnitudes, but as these magnitudes operate within the domain of representation, neither of these terms is adequate to the differential. Finally, as we have seen, on Deleuze’s reading, the emphasis is not on the primitive function, but on the differential, $dx$, as constitutive of the primitive function.
As such, it is concerned with problems, rather than solutions. In this sense, Deleuze claims that rather than talking of a metaphysics of the calculus, we should talk of a dialectics of the calculus, dialectic meaning 'the problem element in so far as this may be distinguished from the properly mathematical element of solutions' (DR 178/226). The work of the mathematician, Abel, is therefore important to Deleuze, because he developed a method for determining whether a problem has a solution without resorting to actually solving the problem itself.

We have already seen how the three moments of the Idea are intrinsically, rather than extrinsically, connected in the calculus, and Deleuze reiterates and summarises his discussion in the following passage:

Following Lautman’s general theses, a problem has three aspects: its difference in kind from solutions; its transcendence in relation to the solutions that it engenders on the basis of its own determinant conditions; and its immanence in the solutions which cover it, the problem being the better resolved the more it is determined. Thus the ideal connections constitutive of the problematic (dialectical) Idea are incarnated in the real relations which are constituted by mathematical theories and carried over into problems in the form of solutions. (DR 178–9/226)

Each of these three moments is present in the calculus as a method of intrinsically relating two structures that are different in kind from one another. The calculus thus provides a model for an account of the genesis of determinate quantity from something different in kind where each of its moments is intrinsically connected with the others.

4.3 Ideas and the Wider Calculus (178–84/226–32)

Deleuze notes that 'differential calculus obviously belongs to mathematics, it is an entirely mathematical instrument. It would therefore seem difficult to see in it the Platonic evidence of a dialectic superior to mathematics' (DR 179/226). When we looked at Plato's simile of the divided line (3.5), we saw that Plato held mathematics to be the second highest form of knowledge, below knowledge of Ideas themselves. It seems equally clear that Deleuze wants to provide an account of the world, not just of the field of mathematics. In fact, once we recognise that problems are of a different order to solutions, we can note that mathematics is a way of representing solutions – 'what is mathematical (or physical, biological, psychical or sociological) are the solutions' (DR 179/227). These domains do not apply to problems themselves, but only
to problems as expressed in relation to (and within) solutions. The calculus is itself a way of providing symbols of difference, and as such, it is still propositional, and tied to a specific domain. Since what these symbols refer to cannot be represented, however, the calculus points beyond itself to the problem itself. 'That is why the differential calculus belongs entirely to mathematics, even at the very moment when it finds its sense in the revelation of a dialectic which points beyond mathematics' (DR 179/227). What is important about the calculus is that it presents an account of how undetermined elements can become determinate through entering into reciprocal relations. As relations exist in domains outside of mathematics, the differential calculus 'has a wider universal sense in which it designates the composite universal whole that includes Problems or dialectical Ideas, the Scientific expression of problems, and the Establishment of fields of solution' (DR 181/229).

As we have seen, Ideas are formed from the differential relations of their elements. In this sense, Deleuze claims that 'Ideas are multiplicities' (DR 182/230). They are the reciprocal relationships of elements that in themselves are indeterminate. Now, when we are dealing with a spatial multiplicity, we talk about multiplicity in terms of a structure possessing many elements. In this sense, we can call it an adjectival notion of multiplicity. The 'many' in this case is a way of describing elements that can be in a sense indifferent to being given the classification, 'many'. They are determinate before they form a group. On the contrary, with differentials, they become determinate precisely by being reciprocally determined. Rather than multiplicity being an adjective that describes a group of substances, Deleuze claims that "Multiplicity", which replaces the one no less than the multiple, is the true substantive, substance itself (DR 182/230). As we have just seen, in order to conceive of the multiplicity in this way, we can't see it in terms of self-standing elements. Now, at least on a first reading of Kant, experience for him was experience of objects, which are self-standing elements. Thus the notion of a multiplicity in Deleuze's terms cannot be found within Kantian experience. In fact, Deleuze gives three criteria for the emergence of Ideas. First, 'the elements of the multiplicity must have neither sensible form nor conceptual signification, nor, therefore, any assignable function' (DR 183/231). That is, they must be determined through their relationships with one another, rather than prior to it. Second, 'the elements must in effect be determined, but reciprocally, by reciprocal relations which allow no independence to subsist' (DR 183/231). As Deleuze notes,
'spatio-temporal relations no doubt retain multiplicity, but lose interiority'. That is, the elements are not intrinsically related to one another, but are simply related by occupying a certain space together. On the other hand, 'concepts of the understanding retain interiority, but lose multiplicity' (DR 183/231). When we determine a concept (man is a rational animal, for instance), we do so by subsuming it under another. As such, while they are intrinsically connected, they form a unity, rather than a multiplicity. Finally, 'a differential relation, must be actualised in diverse spatio-temporal relationships, at the same time as its elements are actually incarnated in a variety of terms and forms' (DR 183/231). That is, if the Idea is to provide some kind of explanation of the structure of the world, it must be applicable to more than one situation; it must capture relations in more than one domain. All of these features can be found in the differential calculus, but to explain how this account functions more generally, Deleuze provides three examples of Ideas in non-mathematical fields: atomism as a physical Idea, the organism as a biological Idea, and social Ideas.

4.4 First Example: Atomism as a Physical Idea (184/232–3)

The first example Deleuze gives of an attempt to develop a wider calculus is that presented by the atomists, notably Epicurus in his *Letter to Herodotus* and Lucretius in his *De Rerum Natura*. What Deleuze presents in this section is essentially a synopsis of his longer treatment in his essay, 'The Simulacrum and Ancient Philosophy', published as an appendix to *The Logic of Sense* (LS 253–79/291–320). Epicurus claims that the universe is composed of two kinds of entities: atoms and void. While the atoms vary in size, they are all below the threshold of perception. Since resistance slows bodies down, and there is no resistance within the void, the atom's 'passage through the void, when it takes place without meeting any bodies which might collide, accomplishes every comprehensible distance in an inconceivably short time'. They move 'quick as thought' (Epicurus 1926: 37). These atoms have shapes, and the structure of the visible world is explained by their combination into compound structures. Atoms in these compound structures appear to move at a perceptible rate, but this is simply due to the fact that as their directions differ, the atoms 'vibrate', leading to a perceptible average motion. Given that it is 'essential that atoms be related to other atoms at the heart of structures which are actualised in sensible composites', we need to ask what allows this relation to take place. Lucretius gives
the following account of how atoms enter into relations with one another:

In this connection, I am anxious that you should grasp a further point: when the atoms are being drawn downward through the void by their property of weight, at absolutely unpredictable times and places they deflect slightly from their straight course, to a degree that could be described as no more than a shift of movement. If they were not apt to swerve, all would fall downward through the unfathomable void like drops of rain; no collisions between primary elements would occur, and no blows would be effected, with the result that nature would never have created anything. (Lucretius 2001: 40–1)

It is through this swerve (clīnamen) that atoms come into contact with one another. Deleuze’s analysis of this situation begins with the claim that since the void provides no resistance, it is not the case that the atoms simply have an undefined location. Rather, moving at the speed of thought, they are strictly speaking ‘non-localisable’. In this sense, they operate much like the differential, \( dx \), in that they are undetermined, lacking one of the key characteristics of ‘sensible form’. Second, they can only be given in sensibility though a reciprocal relation formed between them, just as it is only through the differential relation \( dy/dx \) that differentials become determinate. In the case of atomism, this reciprocal relation is provided by the clīnamen, which allows a collection of atoms to take on sensible significance. Finally, as the atoms are capable of forming diverse relationships amongst themselves, they can be ‘actualised in diverse spatio-temporal relationships’ (DR 183/231). Atomism therefore appears to meet Deleuze’s criteria for the Idea. In fact, however, Deleuze claims it fails to exemplify the Idea fully, because the atom is still too tied to sensible determinations. Epicurus’ account of its nature is based on an analogy with sensible bodies: ‘We must suppose that the atoms do not possess any of the qualities belonging to perceptible things, except shape, weight and size, and all that necessarily goes with shape’ (Epicurus 1926: 31).

4.5 Second Example: The Organism as Biological Idea (184–5/233–4)

Deleuze’s second example of the Idea is derived from a nineteenth-century debate over the nature of the organism. This was the debate as to whether comparative anatomy should understand the structure of organisms in terms of what are known as analogies or in terms of homol-
ologies. For traditional (and pre-evolutionary) comparative anatomy, the names of the parts of animals are, to a certain extent, derived analogically from other animals, archetypally with man. On a model dating back to Aristotle, we define what an organ is by looking at the functional role it plays in allowing the organism to perpetuate itself. Parts are thus defined by their relationship to the whole. The importance of this relationship is made clear by one of the most important comparative anatomists of the nineteenth century, Georges Cuvier, who claims that ‘it is in this dependence of the functions and the aid which they reciprocally lend one another that are founded the laws which determine the relations of their organs and which possess a necessity equal to that of metaphysical or mathematical laws’ (Cuvier, quoted in Coleman 1964: 67). When the function or form of the parts differ, however, a different term must be assigned to the part in question. Thus, although there is a similarity between the fins of a fish and the arm of man, on a teleological account, the functional and structural differences mean that different terms must be applied to each. This teleological account proves itself to be problematic in terms of evolutionary theory, since evolution often involves the change of function of the same structure between different creatures.

Now, one of the key conceptual developments that made the theory of evolution possible was Geoffroy St. Hilaire’s positing of homologies between different parts of organisms. Rather than seeing an organism as defined by the form or function of parts, Geoffroy, a contemporary of Cuvier, saw it as defined by the relations between parts. By focusing on relations rather than functions, Geoffroy was able to provide an account that explains one of the key results of evolutionary theory – that the same structure can change its function in different organisms (fins becoming arms, for instance). Geoffroy didn’t relate organisms to one another directly to generate his account of homologies, but rather posited a transcendental structure of an ideal organism that other organisms were instantiations of (he called his approach ‘transcendental anatomy’).

Deleuze’s interpretation of Geoffroy’s work rests on what he calls Geoffroy’s dream, ‘to be the Newton of the infinitely small, to discover “the world of details” or “very short distance” ideal connections beneath the cruder play of sensible and conceptual differences and resemblances’ (DR 185/233). He claims that what Geoffroy is aiming at with his emphasis on connections is a field of differential elements (the ideal correlates of the bones) forming specific types of relations (the connections
which are central to Geoffroy’s account). On this basis, Deleuze claims that Geoffroy’s transcendental anatomy functions like an Idea, with its three characteristics. The elements of the Idea ‘must have neither sensible form nor conceptual signification’, and transcendental anatomy fulfils this requirement due to the fact that what is important is not the sensible properties of the bones, which vary in different creatures, but their relations. Second, ‘these elements must be determined reciprocally’, which means that what is central is not the bones themselves, but the connections they hold with other bones, what Geoffroy calls the ‘unity of composition’. Third, ‘a multiple ideal connection, a differential relation, must be actualised in diverse spatio-temporal relationships, at the same time as its elements are actually incarnated in a variety of terms and forms’. Deleuze emphasises that homologies do not exist directly between actual terms, ‘but are understood as the actualisation of an essence, in accordance with reasons and at speeds determined by the environment, with accelerations and interruptions’ (DR 184/233). That is, we discover a homology between two creatures by recognising that the actual parts of both organisms are actualisations of the same transcendental essence, the unity of composition, rather than by an analogical correlation of actual terms, as in comparative anatomy. As Deleuze notes, this approach finds its parallels in genetic theory, where genes gain their significance from their relations to one another. In fact, genetics represents an advance over Geoffroy’s account in that for him the transcendental correlates of bones, according to Deleuze, ‘still enjoy an actual, or too actual, existence’ (DR 185/233–4). The Idea in this case therefore allows us to determine in what way diverse phenomena (different organisms) are related to one another.

4.6 Third Example: Are there Social Ideas, in a Marxist Sense? (186/234–5)

The third domain Deleuze considers is the social domain, where he takes up a structuralist reading of Marx. Marx is traditionally understood as a historicist philosopher, and a disciple of Hegel. Just as in the Phenomenology of Spirit Hegel tries to show that new relations between subjects and objects would arise from the contradictions in their predecessors, the Marxist project, on this reading, would be to show how different social structures emerged from the internal contradictions of their predecessors. Since what generates a new set of social and economic relations is a prior set of such relations (the inherent contradictions in
Feudalism immanently determining the transition to capitalist economic relations, for instance), Marx’s philosophy is essentially a philosophy of history. Deleuze here takes up Althusser’s claim that, at least for the later Marx, there is a radical break with Hegel, meaning

that basic structures of the Hegelian dialectic such as negation, the negation of the negation, the identity of opposites, ‘supersession’, the transformation of quantity into quality, contradiction, etc., have for Marx (in so far as he takes them over, and he takes over by no means all of them) a structure different from the structure they have for Hegel. (Althusser 2005: 93–4)

In fact, the division of history into periods, for Althusser, is secondary to Marx’s analysis of productivity in terms of modes and relations of production.

What is central to Marx’s analysis, according to Althusser, is the mode of production, conceived of as a certain combination between the means of production (land, for instance), and the agents of production (itself divided into direct agents, such as workers, and indirect agents, such as managers). Althusser’s claim is that what is fundamental to Marx’s analysis is not man himself (or even man alone, as this would be to exclude the means of production), but rather the relations between these terms themselves:

The true ‘subjects’ (in the sense of constitutive subjects of the process) are therefore not these occupants or functionaries, are not, despite all appearances, the ‘obviousnesses’ of the ‘given’ of naïve anthropology, ‘concrete individuals’, ‘real men’ – but the definition and distribution of these places and functions. The true ‘subjects’ are these definers and distributors: the relations of production (and political and ideological social relations). But since these are ‘relations’, they cannot be thought within the category subject. (Althusser and Balibar 2009: 180)

What are these relations? Althusser argues that it would be a mistake to see them as ones of domination and servitude, for instance, although such structures may result from these relations. Rather than dealing with visible relations, such as exploitation, he is concerned with the structural relations that underlie these surface phenomena:

The relations of production are structures – and the ordinary economist may scrutinize economic ‘facts’: prices, exchanges, wages, profits, rents, etc., all those ‘measurable’ facts, as much as he likes; he will no more ‘see’ any structure at
that level than the pre-Newtonian ‘physicist’ could ‘see’ the law of attraction in falling bodies, or the pre-Lavoisierian chemist could ‘see’ oxygen in ‘dephlogisticated’ air. Naturally, just as bodies were ‘seen’ to fall before Newton, the ‘exploitation’ of the majority of men by a minority was ‘seen’ before Marx. (Althusser and Balibar 2009: 181)

Althusser’s account, therefore, is that surface phenomena, such as ‘juridical, political, ideological’ (DR 186/234) structures emerge in order to support the underlying structures of relation between roles of workers and means of production. In what sense does Althusser’s reading of Marx relate to Deleuze’s conception of the Idea? First, we can note that the elements of his analysis have no conceptual significance outside of their relations. What Althusser is discussing is the way in which roles relate to the means of production. If we separate these from one another, they cease to have any significance: ‘Whatever the social form of production, labourers and means of production always remain factors of it. But in a state of separation from each other either of these factors can be such only potentially’ (Marx, quoted in Althusser and Balibar 2009: 175). Second, these potential elements become significant by being related to one another. Land only becomes a means of production by being related to a worker, who becomes determined as a worker precisely through this relation. Finally, this structure can be actualised in diverse spatio-temporal relations. Depending on how the elements are related, different actual structures and relations, and hence different forms of society, will of necessity come into existence to sustain the underlying mode of production. Thus, to obtain the different modes of production these different elements do have to be combined, but by using specific modes of combination or ‘Verbindungen’ which are only meaningful in the peculiar nature of the result of the combinatory (this result being real production) – and which are: property, possession, disposition, enjoyment, community, etc. (Althusser and Balibar 2009: 176)

The Idea, in the Marxist sense, thus allows us to get away from the anthropomorphic and historicist study of surface structures, and hence to develop a science of society.

4.7 The Relations of Ideas (186–7/235–6)

How then do Ideas relate to one another? Deleuze claims that ‘Ideas are varieties that include within themselves sub-varieties’ (DR 187/235).
This claim emerges from two previous observations. First, as we have already seen, a differential function can itself be differentiated. As one of the key features of Ideas is that they are differentiated, they too can be further differentiated to give Ideas of Ideas. Second, as we have seen, Ideas are related to the domain in which they are solved. This implies that the same Idea can be expressed in different actual situations, depending on what kind of solution we are looking for. In fact, there are three ‘dimensions of variety’, the first of which is the ‘vertical dimension’ (DR 187/235). This depends on what the elements and relations we are concerned with are. Depending on whether we conceive of the elements as atoms, bones or relations of production, the solution we arrive at will be expressed in the fields of physics, biology or social theory respectively. While we have here different ‘orders’, these orders are still interrelated, in that Ideas of physics can be ‘dissolved’ in higher order problems such as those of biology, and likewise social theory will find itself ‘reflected’ in the structure of the individuals that compose it. The second, ‘horizontal’ dimension deals with ‘degrees of a differential relation within a given order’ (DR 187/235). As we saw in 4.2, by repeatedly differentiating an equation, we can find ‘singular’ points along a curve where the nature of the curve changes. Now, the same Idea can give rise to Ideas with different singular points. Deleuze gives the example of conic sections to explain this concept. In geometry, we can generate a curve by cutting a cone with a plane, just as if we cut a cylinder in half, we would find, on the surface of the cut (the section), a circle. Now, if we take a section of a cone, depending on the angle to the cone at which we take the section, we will have a different type of curve:

![Figure 2: Conic sections](image-url)
Each of these curves has different singular points (points where the gradient is 0, null or infinite), despite the fact that all of the curves are created from the same fundamental shape. In a non-mathematical field, we can note that Geoffroy's comparative anatomy relies on the fact that the same structure is to be found in the relations between the bones of all animals. Nevertheless, the singular points will vary within species, so the same bones that attach the jaw to the skull in fish are found in the inner ear in mammals. Deleuze explains the final dimension of variety, that of depth, with an example from the mathematical theory of groups. He gives the example of 'the addition of real numbers and the composition of displacements' in this context (DR 187/236). As the structuralist mathematical collective, Bourbaki, noted, the addition of real numbers and the composition of displacements traditionally belong to two very different fields of mathematics, since one involves discrete units, and one continuous measurement:

quite apart from applied mathematics, there has always existed a dualism between the origins of geometry and of arithmetic (certainly in their elementary aspects), since the latter was at the start a science of discrete magnitude, while the former has always been a science of continuous extent; these two aspects have brought about two points of view which have been in opposition to each other since the discovery of irrationals. (Bourbaki 1950: 221–2)

Bourbaki note, however, that underneath the surface structures of the specific axioms of these different branches of mathematics, we can discern structures that occur in both branches, provided the elements of each branch are understood in a sufficiently undefined manner. Thus, certain relations may hold between elements that are obscured by further specifying their nature. Underneath the structures of geometry and arithmetic are deeper structures which they both share.

4.8 Essence, Possibility and Virtuality (186–8/235–7, 208–14/260–6)

Given the claim that Ideas find their expression in actual entities, we might be tempted to consider an Idea to be a kind of essence of a thing. Deleuze, however, is adamant that ‘Ideas are by no means essences’ (DR 187/236), or, perhaps more precisely, that we can call an Idea an essence ‘only on condition of saying that the essence is precisely the accident, the event, the sense’ (DR 191/241). This claim is inseparable from his claim that Ideas ‘perplicate’ or interpenetrate one another (DR
187/236). At several points in his analysis, Deleuze likens the Idea of colour to white light (DR 182/230, 206/258), and the Idea of sound to white noise (DR 206/258). This is a reference to a discussion by Bergson of essence in his essay, 'The Life and Work of Ravaisson'. In this text, Bergson considers the question of determining what different colours have in common, and hence, how we are to think, philosophically, the notion of colour. In effect, we are therefore asking the question 'what is X?' for colour, the question Deleuze takes to be 'the question of essences' (DR 188/236). Now, according to Bergson, there are two ways of answering this question. The first is the traditional answer to the question of essences provided by Aristotle. In order to determine the essence of something, we abstract from it those properties that are inessential (or accidental), to arrive at purely those properties that every individual in the class has. Thus, 'we obtain this general idea of colour only by removing from the red that which makes it red, from the blue what makes it blue, from the green what makes it green' (Bergson 1992: 225). If we try to answer the question 'what is colour?' by this means, we end up with a concept that is abstract and empty, as we have proceeded 'by gradual extinction of the light which brought out the differences between the colours' (Bergson 1992: 225).

The alternative is what Deleuze takes up with his concept of perplication. Bergson suggests that rather than proceeding by abstraction, we proceed by taking the thousand and one different shades of blue, violet, green, yellow and red, and passing them through a converging lens, bringing them to a single point. Then appears in all its radiance the pure white light which, perceived here below in the shades which disperse it, enclosed above, in its undivided unity, the indefinite variety of multicoloured rays. (Bergson 1992: 225)

Such an account can only be an analogy, as light is still seen in this case too much along the lines of actual phenomena, but it clarifies the interpenetrative notion of the Idea. Just as the conjunction of the two terms of the differential relation allow us to specify all of the points on a curve, the differentials of the Idea together specify all of the possible states of affairs that a given system can exhibit. Rather than achieving this by excluding what is non-essential, it does so by positively specifying the genetic conditions for each of these states. In this sense, for Deleuze, the Idea does not so much contain the essence of a state of affairs, as the grounds for the totality of possible accidents a system can
exhibit. Depending on how the elements are related to one another, dif-
f erent states of affairs will be generated.

Clearly, if an Idea is to be understood as forming a multiplicity of
interpenetrating elements, then it cannot have the same nature as states
of affairs. Elements in states of affairs are determined in an opposite
manner to the interpenetrative structure of perplication, namely by
determining their limits (what they are not). Furthermore, we can see
that just as problems were immanent to their solutions, the genetic
conditions for states of affairs (Ideas) are simultaneous with states of
affairs themselves. Thus, for Epicurus, atoms co-existed with the sensible
objects that they constituted, and for Althusser, the mode of production
co-existed with the actual relations that it determined. We thus have two
series that differ in kind: actual events that occur within the world, and
the ideal events of ‘sections, ablations, adjunctions’ that engender them
(DR 188/237).

I want to jump ahead somewhat now, to introduce the related dis-
cussion of the Idea and possibility. We have already seen that the Idea
can give rise to different actual situations; so, for instance, Geoffroy’s
unity of composition provides the rules for generating the anatomical
structure of different animals, and Marx’s mode of production gives the
structure underlying different real social organisations. Deleuze defines
the structure of the Idea as being virtual. Now, Deleuze introduces three
claims about the nature of the virtual that need to be explored. It is ‘real
without being actual, differentiated without being differenciated, and
complete without being entire’ (DR 214/266). I want to go through
these different claims, contrasting them with the structure of possibility,
which appears at first glance to be a closely aligned concept. In fact,
Deleuze claims that ‘the only danger in all this is that the virtual could
be confused with the possible’ (DR 211/263).

What does it mean to say that the virtual is real without being actual?
If we return to the notion of possibility, we can ask, what happens when
something which is merely possible is realised? We can begin by fol-
lowing Kant in noting that there is no difference in structure between a
possible object and a real object: ‘A hundred real thalers do not contain
the least coin more than a hundred possible thalers’ (Kant 1929: A599/
B629). Rather, the difference is purely in the existential status of the two
objects. In order to distinguish a hundred real thalers from a hundred
possible thalers, we need to note that the former exist whereas the latter
do not. Possibility is therefore distinguished from actuality in terms of
existence. Now, the virtual is instead ‘Real without being actual, ideal without being abstract’ (DR 208/260). Throughout this chapter, we have seen that Ideas are different in kind from actual states of affairs, just as differentials differ from actual numbers. In this sense, we do not need to distinguish possibility from actuality in terms of reality, as they can be distinguished by this difference in kind itself. More than this, however, the virtual is real to the extent that it provides the structure responsible for the genesis of the qualities we find in actual entities. ‘The reality of the virtual is structure’ (DR 209/260). It provides a complete account of the structure of the actual state of affairs that results from it, and is no less a real part of the object than the actual object itself. In this regard, Deleuze notes that it is ‘complete without being entire’ (DR 214/266). Deleuze’s point is that the virtual does not rely on any reference to the actual, although in fact it is always found to be associated with the object which it engenders. In this sense, it escapes from the limitation of possibility we discussed in the previous chapter. There, we saw that the concept of possibility could not give us the sense of an object, because it merely reduplicated it at a higher transcendental level of analysis. As such, a possible object is not complete, since it is dependent on the notion of a real object to which we add the concept of non-being. The completeness of the virtual is thus what allows us to understand it as giving the sense of a proposition, even though it is not whole, since ‘every object is double’ (DR 209/261).

Finally, the virtual is differentiated without being differenciated. That is, it operates according to an entirely different procedure of determination to that of the possible. As Deleuze puts it, ‘one [the possible] refers to the form of identity in the concept, whereas the other designates a pure multiplicity in the Idea which radically excludes the identical as a prior condition’ (DR 211–12/263). We saw that Chapter 1 of *Difference and Repetition* deals at length with the claim that in order to determine something through the properties it possesses, we need some kind of concept of identity. This is because we describe an object by ascribing predicates to a subject (we differenciate it). The other procedure of determination generates structural properties by bringing into relation with each other elements which are in themselves undetermined (they are differenciated, in the sense of the differentials we looked at in 4.2). Deleuze characterises these two modes of organisation in terms of Leibniz’s distinctions between the clear and confused, and the distinct and obscure. We saw in Chapter 1 that Leibniz’s understanding of the world ultimately traces
it back to the notion of possibility, as God chooses the best of all possible worlds. Nevertheless, in his claim that perception of spatio-temporal objects is a confused perception of conceptual relations, we have an important insight into the relationship between virtuality and actuality. In the *New Essays on Human Understanding*, Leibniz puts forward the claim that perception of objects is based upon microperceptions below the threshold of the senses. In support of this theory, he gives the following analogy:

To give a clearer example of these minute perceptions which we are unable to pick out from the crowd, I like to use the example of the roaring noise of the sea which impresses itself on us when we are standing on the shore. To hear this noise as we do, we must hear the parts which make up this whole, that is the noise of each wave, although each of these little noises makes itself known only when combined confusedly with all the others, and would not be noticed if the wave which made it were by itself. (Leibniz 1997: 54)

Deleuze interprets this passage as presenting ‘two languages which are encoded in the language of philosophy and directed at the divergent exercise of the faculties’ (DR 214/266). On the one hand, we have the language of the roaring noise of the sea. This is the language of the confused. It is clear, in so far as I am able recognise the roar of the sea as a whole and take it up as an object, but it is confused as I only do so in so far as I do not take account of the elements (the waves) which together determine it as an object. On the other hand, we have the language of the waves themselves, which is the language of the virtual, and of the distinct-obscure. If, on the contrary, we focus on the noise of the waves themselves, the waves are perceived distinctly, as we grasp the differential relations that make up the noise as a whole, but also obscurely, since our focus on these particular relations precludes our comprehension of the ‘white noise’ of the sea as a whole. In contrast to Descartes’ notion of clear and distinct ideas, Deleuze’s claim is that ‘the clear is confused by itself, in so far as it is clear’ (DR 254/316). It is this radical divergence between the two languages of philosophy that allows us to give the sense of a proposition, or the conditions of experience, without simply falling into a banal reiteration of the structure of actuality.
4.9 Learning and the Discord of the Faculties (188–97/237–47)

Now that we have an account of Ideas, we can return to two themes Deleuze introduces in Chapter 3 of *Difference and Repetition*: learning (3.10) and the relationship of the faculties (3.6). To explain why we need Ideas in order to learn, we can once again return to Plato and his conception of the hypothesis. When we looked at the simile of the divided line, we saw that Plato suggested two kinds of intelligible knowledge: mathematics and knowledge of the forms. He defines the difference between these two in the following terms:

In one subsection, the soul, using as images the things that were imitated before, is forced to investigate from hypotheses, proceeding not to a first principle but to a conclusion. In the other subsection, however, it makes its way to a first principle that is not a hypothesis, proceeding from a hypothesis but without the images used in the previous subsection, using forms themselves and making its investigation through them. (Plato 1997b: 510b)

The first form of thinking, that uses images, is mathematical thinking, as it is found in fields such as geometry (Euclid’s *Elements* would be the archetypal example). In this case, thinking proceeds deductively to a conclusion. The strength and the limitation of a deductive argument, however, is that its conclusion does not contain anything that is not implicitly assumed in its premises. The most it can do is simply make explicit what we have assumed at the outset. For this reason, it is essential to know that the premises of one’s argument are true, since it is from these that the argument gains its content, and validity. Philosophy traditionally, according to Deleuze, has therefore attempted to show that we can convert hypotheses into categorical statements by arguing from premises that are absolutely certain, either by invoking the Ideas, or by, in Descartes’ case, positing certain concepts that are clear and distinct, and hence indubitable. Now, as we have seen, Plato understands the Ideas by analogy with objects of empirical recollection, and Descartes’ clear and distinct ideas are fully transparent to consciousness. In both cases, therefore, we remain within the domain of consciousness and the proposition.

Deleuze opposes this kind of procedure to ‘vice-diction’, which, instead of moving between two propositions directly, moves from a proposition to an Idea and then to a solution. He sums up the two stages of the process of vice-diction as: ‘the determination of the conditions
of the problem and . . . the correlative genesis of cases of solution’ (DR 190/239). The two examples Deleuze gives of learning in this context, learning to swim and learning a foreign language (DR 192/214), are both favourite examples of Bergson. Bergson’s formulation of the swimming example is as follows:

If we had never seen a man swim, we might say that swimming is an impossible thing, inasmuch as, to learn to swim, we must begin by holding ourselves up in the water and, consequently, already know how to swim. Reasoning, in fact, always nails us down to the solid ground. But if, quite simply, I throw myself into the water without fear, I may keep myself up well enough at first by merely struggling, and gradually adapt myself to the new environment: I shall thus have learnt to swim. So, in theory, there is a kind of absurdity in trying to know otherwise than by intelligence; but if the risk be frankly accepted, action will perhaps cut the knot that reasoning has tied and will not unloose. (Bergson 1998: 192)

Here we see the contrast between the two methods of learning. On a propositional account, learning to swim appears impossible, because thinking operates simply by drawing out what is already implicit in the axioms of thought. If I do not already know how to swim, I can never know. Deleuze’s rather abstract analysis of the process of learning to swim or learning a language is that we do so by ‘composing the singular points of one’s own body or one’s own language with those of another shape or element, which tears us apart but also propels us into a hitherto unknown and unheard-of world of problems’ (DR 192/241). In order to escape the deductive sterility of the proposition, therefore, he claims that thinking needs to raise itself to the level of the Idea. The first stage of vice-diction is therefore that of finding other relevant cases that together specify the problem we are faced with, ‘fragments of ideal future or past events’ (DR 190/239). By ‘discovering the adjuncts’, Deleuze means this procedure of finding equivalent cases that emerge from the problem. As the Idea is an interpenetrative multiplicity, these elements must be combined to generate the Idea corresponding to the problem, just as the shades of light were passed through the convergent lens in Bergson’s example. Once we have the Idea of the problem, we can attempt to find those singular points of the Idea where it engenders solutions that are different from the present state of affairs. Deleuze gives the example of Lenin’s thought, which would involve the extraction from the present state of affairs of the Idea of the economic (abstract modes of production), and then the generation of a solution that involves a different
conjunction of singularities (just as selecting a different plane of a conic section will give us a different curve). Thus, we move from the present society to the problematic genetic principles that give rise to it, and then back to an alternative solution, or form of society. In a similar way, we do not look at the relations between parts of animals directly, as they may have different functional roles, but instead relate each to the others through the transcendental rules for their production. Thinking thus does not go from proposition to proposition. Rather, thinking becomes creative by tracing back propositions to the non-propositional field of problems that engender them.

Learning does not have to involve simply moving from one empirical state to another via an Idea. It can also involve investigating Ideas themselves. So how do we relate to Ideas? Well, first, we can note that although we have been applying the terminology of problems and solutions to situations where the solution is understood in terms of knowledge (or learning), Deleuze’s conception of problems and solutions is much broader than this. We will come back to this point later, but for now, we can note that even ‘an organism is nothing if not the solution to a problem, as are each of its differenciated organs, such as the eye which solves the light “problem”’ (DR 211/263). In this sense, as we have already seen, Ideas are not the pure concern of reason, but in fact, each faculty is concerned with them, in so far as it is capable of a transcendent exercise. We can see that each of the faculties themselves is a solution to a problem:

Take, for example, the linguistic multiplicity, regarded as a virtual system of reciprocal connections between ‘phonemes’ which is incarnated in the actual terms and relations of diverse languages: such a multiplicity renders possible speech as a faculty as well as the transcendent object of that speech, that ‘metalinguage’ which cannot be spoken in the empirical usage of a given language, but must be spoken and can be spoken only in the poetic usage of speech coextensive with virtuality. (DR 193/242–3)

In this case, the faculty of speech is rendered possible by the virtual multiplicity, which gives the rules for actual speech production. If we relate the structure of speech to the Idea, we can see that it contains each of its moments. The phonemes are undetermined, but able to enter into determinable relations. These relations describe the expressiveness of the language. In turn, an individual speech act corresponds to the integration
of this field of expressions. There is a reciprocity here, however, since the multiplicity is constituted in terms of the differential relations between phonemes because it is related to the field of a given language (‘each dialectical problem is duplicated by a symbolic field in which it is expressed’ [DR 179/227]). So the constitution of the faculty of speech (the solution) in turn determines the virtual multiplicity (problem) relative to it. ‘The transcendental form of a faculty is indistinguishable from its disjointed, superior, or transcendent exercise’ (DR 143/180). In this sense, each of the faculties is an Idea as well as a relation to an Idea.

We have already seen that each faculty communicates violence to the others, to the extent that they communicate in terms of objects that differ in kind. Thus, the object of sensation differed in kind from the object of memory, but yet was able to enter into a relationship with it. What is it that allows these faculties to communicate? Well, once we recognise that each of the faculties has its own transcendent object, because their objects are ‘express[ed] technically in the domain of solutions to which they give rise’ (DR 179/227), it becomes simple to explain how they can communicate with one another, yet still be distinct. On an empirical level, each faculty is distinct, as each has its own set of objects (both transcendent and empirical). While each of the faculties contains a difference between empirical and transcendent exercises, this is only the first degree of difference. The ‘second degree’ of difference is where each of these faculties is in turn the solution to the problem of pure difference:

This harmonious Discord seemed to us to correspond to that Difference which by itself articulates or draws together. There is thus a point at which thinking, speaking, imagining, feeling, etc., are one and the same thing, but that thing affirms only the divergence of the faculties in their transcendent exercise. (DR 193–4/243)

Each faculty is therefore the expression of an Idea, Difference itself being the Idea of an Idea. In this way, each of the faculties is both the same as, and different from, the others (what Deleuze calls para-sense as opposed to common sense, because it escapes the structure of representation). While all of the faculties relate to Ideas, it is still the case that thought is in some sense superior to the other faculties. If we take speech, then we can see that it is constituted in terms of phonemes. The elements that constitute thought, however, are Ideas themselves. Thought is thus the Idea of Ideas, and relates the other faculties. Thus, ‘while the
opposition between thought and all forms of common sense remains stronger than ever, Ideas must be called “differentials” of thought, or the “Unconscious” of pure thought’ (DR 194/244).

4.10 The Origin of Ideas (195–202/244–52)
We are now in a position to ask what the origin of Ideas themselves is. Deleuze begins by noting that what we have encountered so far is a reorientation of the nature of a problem. Rather than a problem being seen as a purely subjective matter, we have seen that exploring the nature of the problem is a properly ontological or metaphysical matter. Thus, as he has noted, the organism can be seen as a solution to a problem. In fact, the question-problem complex is ‘the only instance to which, properly speaking, Being answers without the question thereby becoming lost or overtaken’ (DR 195/244).

What, therefore, is the relationship between a problem and a question? Deleuze presents his answer in the following manner: ‘Problems or Ideas emanate from imperatives of adventure or from events which appear in the form of questions’ (DR 197/247). Such an imperative would be the kind of encounter that we discussed in the previous chapter, paralleling Socrates’ discovery of the incommensurability of his categories of thought (the large, the small) with the purely relative determinations found within the world of becoming. Rather than operating in terms of contrary properties, however, the encounter for Deleuze is tied to the eruption into the field of representation of a moment of intensity. In the discussion of the fractured I in Chapter 2 (2.6), we saw that representation was subject to a natural illusion that the ‘I’ had a substantive nature. Deleuze’s claim was instead that the ‘I’ could be traced back to a pre-individual field of intensive difference. As we saw in relation to Blanchot however (2.12), this illusion to which representation is prone is perpetually threatened by the disruptive influence of intensity. For this reason, Deleuze makes the claim that ‘Ideas swarm in the fracture, constantly emerging on its edges, ceaselessly coming out and going back, being composed in a thousand different manners’ (DR 169/216). These encounters with intensity raise the faculties to a transcendental operation, and hence allow them to engage with Ideas. Questions map this relationship between the encounter with intensity and the problematic unground responsible for it. As such, ‘questions express the relation between problems and the imperatives from which they proceed’ (DR 197/247). So far, therefore, the account provided by Deleuze parallels
the Platonic account quite closely. Whereas for Plato, Deleuze claims, this process leads to a ground in an apodictic principle, for Deleuze, it instead leads to an unground in the problem. This difference between grounds and ungrounds ultimately simply relates to the fact that apodictic principles have the same structure as the system of propositions they ground (they are amenable to the structure of judgement). On the contrary, the problem differs in kind from the solutions it engenders. As such, it cannot ground solutions by providing a principle that we know to be true, because truth is a function of judgement, and the problem is different in kind to judgements. Thus, rather than a ground, it serves as an ‘unground’, destabilising the vision of the world as amenable to judgement in its entirety. Rather than invoking ‘the moral imperative of predetermined rules’ (DR 198/248), Deleuze instead therefore invokes the notion of the dice throw and decision:

It is rather a question of a throw of the dice, of the whole sky as open space and of throwing as the only rule. The singular points are on the die; the questions are the dice themselves; the imperative is to throw. Ideas are the problematic combinations which result from throws. (DR 198/248)

The imperative is the problematic instance within the state of affairs (the throw), that points beyond itself, through the question (the dice itself), to the problem that engenders the state of affairs and the problematic instance itself (the combination on the die). The Ideas result from this process as the result of our going beyond the state of affairs to find its conditions. The remaining moment of the analogy to explain is the significance of the points on the dice themselves. We can explain this by introducing the moment of decision. As we saw in the first case of learning, we move to the sub-representational level by combining ‘adjunct fields’, or similar cases, to reach the problem (in Bergson’s example, we relate walking to swimming). Now, depending on which cases we combine to form the problem, our understanding of it will differ. How we relate together different encounters, and which encounters we relate, will give a different emphasis to the problem (a different set of singularities), and hence to our Ideas. If the relation of different adjunct fields gives us different Ideas, then how is it that a given throw is able to ‘affirm the whole of chance’ (to provide an objective Idea) (DR 198/248)? When we looked at the example of the conic section (4.7), we saw that depending on how we took a section on the cone, we would derive a different curve, and with it, a different set of singularities. Each of these
curves was, nonetheless, an objective characterisation of the cone. In a similar way, each enquiry gives us an objective problem, but these are not exclusive, since different enquiries will take a different section of the cone, and hence derive different singularities.

This is the reason why in spite of each throw being an objective constitution of the problem, ‘there are nevertheless several throws of the dice: the throw of the dice is repeated’ (DR 200/251). In this sense, there is no ultimate characterisation possible, as there would be with knowledge, but rather a whole series of questions, each of which generates its own field of singularities. Each philosophical enquiry therefore puts forth its own question, on the basis of an imperative, which constitutes its own field of singularities. Remaining true to the encounter does not, therefore, lead us to one apodictic principle, but rather to an objective organisation of a problem. Just as each conic section gives us a different curve, each question gives us a different distribution of singularities. But as each conic section also repeats the structure of the others, each question is also a repetition, albeit a repetition that differs, not just in terms of solutions, but also in terms of its Ideas: ‘Repetition is this emission of singularities, always with an echo or resonance which makes each the double of the other, or each constellation the redistribution of another’ (DR 201/251). At this point, Deleuze notes an affinity with Heidegger’s emphasis on the question, while also cautioning that the emphasis on one single question risks covering over the real structure of the dice throw:

Great authors of our time (Heidegger, Blanchot) have exploited this most profound relation between the question and repetition. Not that it is sufficient, however, to repeat a single question which would remain intact at the end, even if this question is ‘What is being?’ [Qu’en est-il de l’être?]. (DR 200/251)

We have seen that from the beginning of Difference and Repetition, Deleuze has claimed that the existence of the negative is an illusion. Now that we have the theory of Ideas, we can give a fuller account of the origin of negation, which will once again rest on a confusion between seeing transcendental problems and empirical solutions. As Deleuze writes, ‘There is a non-being which is by no means the being of the negative, but rather the being of the problematic. The symbol for this (non)-being or ?-being is 0/0’ (DR 202/253). The problematic is therefore non-being
in the sense that it is not extensive being, in the same way that the differential was not actual (it did not have a magnitude) without on that basis not existing (it was, in Wronski’s terms, an intensive quantity). As we have seen, Deleuze takes problems to be interpenetrative multiplicities which determine all possible actual states of the object. In this sense, the problem does not contain any negation. Learning and solving problems involve a move from the actual state of affairs to the Idea and back again to a different possible solution. They thus involve differentiation to determine the Idea followed by differenciation to reach an alternative solution. Now, as Deleuze notes, ‘the negative appears neither in the process of differenciation nor in the process of differenciation’ (DR 207/258). We can see that differentiation does not lead us to posit the negative, as differentiation involves contracting together actual states of affairs to form an affirmation. Similarly, differenciation is the process whereby we extract a state of affairs from the Idea, and as such is also an affirmation of the Idea. How does negation therefore occur? Once again, Deleuze’s answer is that it is the result of taking the problem to be structured like a proposition. To make this clear, we can turn to another example from Bergson:

If I choose a volume in my library at random, I may put it back on the shelf after glancing at it and say, ‘This is not verse.’ Is this what I have really seen in turning over the leaves of the book? Obviously not. I have not seen, I never shall see, an absence of verse. I have seen prose. But as it is poetry I want, I express what I find as a function of what I am looking for, and instead of saying, ‘This is prose,’ I say, ‘This is not verse.’ In the same way, if the fancy takes me to read prose, and I happen on a volume of verse, I shall say, ‘This is not prose,’ thus expressing the data of my perception, which shows me verse, in the language of my expectation and attention, which are fixed on the idea of prose and will hear of nothing else. (Bergson 1998: 221)

In this case, we have a simple failure of expectations, in so far as our characterisation of the problem fails to conform to the nature of the problem itself. “That is not the case” means that a hypothesis passes over into the negative in so far as it does not represent the currently fulfilled conditions of a problem, to which, on the contrary, another proposition corresponds’ (DR 206/257). Determining the nature of the problem is a part of learning, and so, ‘a problem is always reflected in false problems while it is being solved, so that the solution is generally perverted by an inseparable falsity’ (DR 207–8/259). Once we un-
stand the problem itself in terms of propositions, however, the negation, which really just captures the incomplete grasp of the problem, becomes an ontological feature of the world. If we understand a problem as just a collection of cases that are possible solutions, then, ‘each of these hypotheses [becomes] flanked by a double negative: whether the One is, whether the One is not . . . whether it is fine, whether it is not fine’ (DR 202/253). Because the problem is now understood in the same terms as the solution, we cannot help but give a genuine existence to the negation that appears to subsist in the solution.

Now, if Mons. Jourdain heard me, he would infer, no doubt, from my two exclamations that prose and poetry are two forms of language reserved for books, and that these learned forms have come and overlaid a language which was neither prose nor verse. Speaking of this thing which is neither verse nor prose, he would suppose, moreover, that he was thinking of it: it would be only a pseudoidea, however. (Bergson 1998: 221)

As Deleuze notes, at the heart of the issue is the claim that opposition and limitation are interchangeable (DR 203/253), or in other words, that negation (this is not that) is the way in which something is determined. It should be noted that the issue here is not one of whether negation actually exists, but of the determination of the problematic, regardless of whether this determination is taken to be real or logical. Central to this critique is therefore a different theory of determination that operates through the reciprocal determination of differentials, rather than determining objects (either real or conceptual) through limitation and negation. Negation thus only appears when we understand all determination as determination through opposition: ‘Forms of the negative do indeed appear in actual terms and real relations, but only in so far as these are cut off from the virtuality which they actualise, and from the movement of their actualisation’ (DR 207/258).

### 4.12 Actualisation (214–21/266–74)

If we understand the grounds of actual objects to be some kind of possibility, then clearly we will have no problem explaining why the actual object has the properties that it has, since these would be already mapped out in the structure of the possible. In actual fact, however, this turns out to be a drawback of this kind of account, since, if the only difference between the possible and the actual is the fact of existence, then it becomes difficult to explain the development of the possible into
the actual. ‘We are forced to conceive of existence as a brute eruption, a pure act or leap which always occurs behind our backs and is subject to a law of all or nothing’ (DR 211/263). For Deleuze, there is no problem explaining that development takes place, but he needs to show how the distinct-obscure structure of the virtual becomes actualised in the clear-confused structure of actual relations. This is accomplished by a process called dramatisation, which involves the folding of spaces, and processes operating at differential rates. In Chapter 4, Deleuze sketches out this process from the perspective of the Idea. As we shall see in the next chapter, however, an account in terms of the Idea alone is inadequate, and a full account will require an understanding of the role that intensity plays.

As we have seen, Deleuze is interested in the conditions of production of actual objects and relations. In discussing the process of actualisation, he focuses on the science of embryology, which also deals with the genesis of forms and relations. When we look at an egg, we see that it develops from a completely undifferentiated form into one encompassing the various qualities that characterise its species. As we saw with Geoffroy’s transcendental anatomy, his claim was that only by looking at the unity of composition governing two animals, and the way this is actualised, can we determine how different parts were actualised in different organisms. Deleuze notes that we can equally make this point about the egg itself: ‘Take a division into 24 cellular elements endowed with similar characteristics: nothing yet tells us the dynamic process by which it was obtained – 2 × 12, (2 × 2) + (2 × 10), or (2 × 4) + (2 × 8) . . .?’ (DR 216/268). In fact, Deleuze uses embryology to provide a more general model of actualisation. He delineates the various stages of the process as follows: ‘The world is an egg, but the egg itself is a theatre: a staged theatre in which the roles dominate the actors, the spaces dominate the roles and the Ideas dominate the spaces’ (DR 216/269). ‘Spaces’ here does not refer to actual spaces that we might measure, but rather to what Deleuze calls ‘spatio-temporal dynamisms’ (DR 214/266).

When we look at the development of a cell into an organism, we can note that the cell itself appears to have none of the properties we would associate with the organism it develops into. If we are to understand its development, we cannot see it as a ‘heap’ of atoms and molecules, since this would obscure the nature of the processes that the embryo undergoes. Rather, Deleuze suggests, in line with work in embryology, that we
should see the embryo as developing through a series of transformations of its surfaces that simultaneously constitute the parts of the organism. Thus, we can view the development of the organism as involving 'the augmentation of free surfaces, stretching of cellular layers, invagination by folding, regional displacement of groups' (DR 214/266). This process is governed by a 'kinematics' specified by the Idea. As Deleuze notes, this kinematics differs from the possible movements of the developed organism, as the embryo is capable of transformations that are simply not possible for a developed organism. What Deleuze is suggesting here is that we are confronted with a process that cannot be understood in terms of cause and effect operating on a collection of atoms. Rather, the appropriate model is that of a drama, or in Ruyer's terms, a sociology of development, where we understand the interactions between the elements in terms of the roles that they play, or the relations that they hold with other elements within the embryo:

There is definitely, we shall see, a possible sociology of organic forms and their development, provided we give the word 'society' its true meaning, and don't understand by 'society' a simple juxtaposition of individuals. A society in general always implies that the individuals that compose it follow a series of themes of coordination, and they know how to play their 'roles' in various stimuli-situations; 'roles' that do not arise automatically, like the effect of a cause, the sole spatial situation of the individual in the social whole. We cannot dispel the mystery of differenciation by making it the effect of differences in situation produced by equal divisions. These differences are of stimuli and not of causes. (Ruyer 1958: 91)

These dynamisms are not purely spatial, however, and Deleuze takes up Geoffroy's suggestion that the differences between organisms can be understood by the relative speeds of the different processes that operate within the embryo. As such, the embryo constitutes its own time, which is defined by the differential relations of these processes. In fact, as Deleuze suggests, because we are talking about relationships between distances and time, at the level of the spatio-temporal dynamism, we cannot separate the dimensions of space and time themselves:

Consider the following example, concerning sterility and fecundity (in the case of the female sea-urchin and the male annelid): problem – will certain paternal chromosomes be incorporated into new nuclei, or will they be dispersed into the protoplasm? question – will they arrive soon enough? (DR 217/270)
Thus, the process operates at a level prior to the constitution of the extensive field of space and time. Furthermore, this process operates on two levels simultaneously. We have the generation of the organism as an instance of a species (what Deleuze calls the element of qualitability), and on the level of the parts (the element of quantitability [DR 221/274]). Differenciation is therefore a process that generates both the extensive characteristics of the organism (its size) and the qualities it possesses. The process of cellular development therefore plays the same role in the world as integration of differentials plays in the sphere of mathematics. In both cases, they explain how we are able to move between two states that are different in kind. In the final chapter of *Difference and Repetition*, Deleuze will look at this account from the perspective of intensity, to give an account of how Ideas are ‘dramatised’, or played out in a field of intensity.

**Chapter 5. The Asymmetrical Synthesis of the Sensible**

### 5.1 Introduction
The final chapter of *Difference and Repetition* shares much in common with Chapter 2. There, we saw Deleuze arguing that representation tended to falsify our understanding of time by relating it to the structures of common sense. Deleuze instead presented an account of time that grounded (or rather, ungrounded) it in a field of intensive difference. Chapter 5 turns to the nature of space. Deleuze notes that difference is connected to intensity in the branch of science known as energetics, or thermodynamics. As we shall see, Deleuze’s claim is that because thermodynamics sees the world in terms of systems that are already constituted (good sense and common sense), it is subject to the transcendental illusion that differences in energy or intensity tend to be cancelled out. This is what leads to Boltzmann’s famous hypothesis that the end of the universe will be a form of ‘heat death’, where all of its energy is homogeneously distributed, thus making any kind of order impossible. For this reason, Deleuze focuses in this chapter on the role of intensity in constituting systems and the space that they occupy. Recognising this moment gives us a more positive account of intensity. In the process, Deleuze clarifies how the differential model of Ideas that we looked at in the last chapter can be related to the field of intensive difference that Deleuze introduced in opposition to Aristotelian metaphysics.