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II. GENERAL PRINCIPLES of the PHILOSOPHY of LEIBNITZ

Statement of Leibnitz' Problem:- How can that which is continuous consist of indivisible elements?

In the Preface to his Theodicy(1) Leibnitz declares that "there are two famous labyrinths, in which our reason often goes astray: the one relates to the great question of Liberty and Necessity, especially in regard to the production and origin of evil; the other consists in the discussion of Continuity and of the Indivisible Points which appear to be its elements, and this question involves the consideration of the Infinite. The former of these perplexes almost all the human race, the latter claims the attention of philosophers alone." Accordingly, while a right understanding of the principle of Continuity is of the utmost speculative importance, the practical value of a true knowledge of Necessity is equally great. Thus, Leibnitz makes his "Theodicy" an investigation of the meaning of Liberty and Necessity, /

(1) Erdmann, p.470.

Necessity, while in others of his writings he offers a solution of the problem which he describes as the special perplexity of philosophers.

It is this latter problem with which we are here mainly concerned. The philosophical work of Leibnitz was an endeavour to reconcile the notion of substance as continuous with the contrary notion of substance as consisting of indivisible elements. The opposition of these two notions seemed to him to arise from an adequate conception of substance, and the task he set himself was that of deepening the current notion of substance, or, as he himself would have put it, finding a better hypothesis than that which had satisfied his Cartesian predecessors.

Stated in another way the problem is : - How are we to interpret the relation of whole and parts so that the continuity or complete unity of the whole shall not be in conflict with the definiteness or real diversity of the parts? To say that the whole is continuous or really one seems to mean that if it is divisible at all, it is infinitely divisible /

divisible. If it were not infinitely divisible, it would consist of insoluble ultimate elements and would thus be discontinuous. Accordingly, if the whole be really continuous there seem to be no fixed boundaries or lines of division within it, that is to say, no real, but only arbitrary parts. (1)

On the other hand, if the whole consists of real parts and not merely possible subdivisions, these parts must be definite, bounded, separate from one another, and consequently the whole which they constitute must be, not a real continuous unity, but a mere collection or arbitrary unity. Nevertheless, we cannot hold either that the whole is real and the parts unreal or that the parts are real and the whole unreal.

Quantitative or Extensive Notion of Substance held by Descartes and Spinoza, on the one hand, and by the Atomists on the other :

The philosophy of Spinoza, with its cardinal principle that "Determination is Negation", practically amounted /

amounted to an assertion of the unity and continuity of the whole at the expense of the reality of the parts. According to Spinoza, "Substance" is "that which is in itself and is conceived through itself; in other word, that, the conception of which does not need the conception of another thing from which it must be formed."(1) That is to say, Substance is the unconditioned, or that which is not conditioned or determined by anything other than itself. There is ambiguity in the statement. It may mean either that Substance is self-conditioned or that it is absolutely unconditioned, to the exclusion of all determination. In the one case Substance would be a real system of reciprocal determinations, in the other, it would be an unbroken unity, to which every determination is foreign. The latter is the dominant aspect of Substance in the philosophy of Spinoza. It alone is consistent with the principle that "Determination is Negation." Consequently /

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(1) Ethics, Part 1, Def.3 Hale White's Translation.

Consequently his position amounts to saying that Substance can have no real parts. For the very meaning of a part implies that it must be determined or conditioned by other parts.(1)

In contrary opposition to this, there is the theory of atoms and the void, which Leibnitz tells us at one time charmed his imagination.(2) To affirm the real existence of indivisible material atoms is to deny the infinite divisibility of matter. Accordingly, if the atoms constitute the ultimate reality of the world, its unity is destroyed, its continuity becomes an illusion. However numerous the atoms may be they can together constitute no true unity "but only a collection or heaping up of parts ad infinitum."(3) Atomism thus endeavours to establish the reality of the parts at the expense of the reality of the whole.

It is necessary, then, to lay bare the pre-suppositions of these contrary theories in order to find /

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(1) Ethics, Part 1, Prop. 12 and 13.
(2) Systeme nouveau de la Nature, 3.
(3) Loc. Cit.

find the elements of truth in each and to reconcile them in a more comprehensive view. The doctrine of Spinoza is the consistent logical development of the principles involved in the position of Descartes(1 In this connection it is Descartes's special theories that Leibnitz has mostly in view, although his arguments are equally applicable to the more thorough metaphysic of Spinoza. "Spinoza", he tells us "has done nothing but cultivate certain seeds of the philosophy of M. Descartes."(2) Descartes endeavoured to reach absolute metaphysical certainty by a method which Spinoza afterwards more clearly and fully applied and which he defined in his great principle that "Determination is Negation." The essence of Descartes's Method of doubt is the endeavour to attain certainty by stripping from experience ("as it is given in common consciousness") all specific qualities or determinations, on the ground that no contradiction in terms is involved in regarding each of these qualities by itself as non-existent or other than it is. The result of the method /

method is to give, as the residual ultimate certainty, nothing but the instrument by which the process of stripping has been carried out, viz., the thinking Ego, without any specific thought. If we challenge the reality of this instrument, we do so by means of the instrument itself and so involve ourselves in self-contradiction. The thinking Ego cannot be thought non-existent: to think its non-existence would be a contradiction in terms. Spinoza's advance upon this was merely to pass from Descartes's practical method of attaining truth, (namely, the discarding of specific determinations) to the general metaphysical principle which the method implied, the principle, namely, that the essence or reality of a thing is that which remains after the differences in its states and qualities have been thought away or that which is common to all its forms and manifestations, and consequently that the ultimate reality or Substance is that which is free from all specific determinations, that which includes or /

or is common to everything because it is not (specially) anything.

Now when we rigorously apply this principle, that the reality of Substance is that which remains after all specific or differential qualities have been removed, we are left with nothing but quantity— either, as in the case of Spinoza, quantity of Substance in general[1] or, as in the case of Descartes, quantity of a specific substance, that is to say, quantity of one quality. Thus Descartes's position is that in addition to the one true and perfect Substance, God, whose existence is externally unconditioned, there are two created Substances, whose existence is not conditioned by anything finite, but by infinite Substance alone. These are bodily Substance and thinking Substance. They are mutually opposite: the one is what the other is not. Neither is conditioned by the other nor dependent upon it. The essential attribute of bodily Substance is Extension, that of thinking Substance is thought. /

thought. All the specific qualities of created things are reducible to one or other of these as a common quality; and consequently the essence or reality of created Substance comes to be either extension without specific contents or thought without a specific object. In other words, bodily Substance is quantity of one determination, namely extension; while thinking Substance is quantity of one determination, namely thought. Thus the presupposition of the Cartesian systems is a purely quantitative relation of whole and parts.(1)

The same pre-supposition in another form underlies the Atomist philosophy. The atoms are material particles and the whole consists of their aggregation. If the theory is self-consistent, they must be regarded as homogeneous and the specific qualities of things must arise from the variety of their combinations. They could not all really exist and be different from one another without some of them being complex. And in any case the very essence /

essence of the theory is that the whole should be taken as a sum or totality, a quantity of parts.

Leibnitz's non-quantitative or intensive notion of Substance, developed through Criticism of Cartesian and Atomist views regarding Material Substance:

Accordingly, the essence of Leibnitz's argument is that a quantitative conception of the relation of whole and parts affords an inadequate theory of Substance. The common element in the contrary positions of the Cartesians and the Atomists is the explicit or implicit reduction of qualitative to quantitative differences.(1) And it appears to Leibnitz that the solution of the dilemma is to be found in the opposite hypothesis, namely, that the essence of Substance is non-quantitative and that the relation of whole and parts must be conceived as intensive rather than extensive. Thus a "simple substance" has no parts, i.e., no quantitative elements,(2) and yet it must comprehend a manifold in unity.(3) That is to say, it must be real, it must /

must be something, it must be qualitative, specifically determined.

While the general principle of Leibnitz's argument may be stated in this way, he actually develops it through criticism of Descartes's theory of Material Substance. To regard matter as ultimately pure extension is to make it essentially a substance with nothing more than a shadow of quality. An extended nothing is meaningless. An extended something must have quality. And to call that quality extension itself is merely to cover up the difficulty with a name: an extended extension is much the same as a shaded shadow of nothing. "In my opinion corporeal substance consists in something quite other than being extended and occupying a place: we must, in fact, ask ourselves what it is that occupies the place."(1) "Those who hold that the extended is itself a substance transpose the order of the words as well as of the thoughts. Besides extension there must be a subject which is extended, /

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(1) Dutens, Vol.III. p.353.

extended, that is to say a substance which can be repeated or continued. For extension means nothing but a repetition or a continued multiplicity of that spread out which is diffused; a plurality, continuity and co-existence of parts :and consequently it (extension) is not sufficient to explain the very nature of spread out extended or repeated substance, the notion of which is anterior to that of its repetition."(1)

Again it cannot be said that pure extension has any real parts. There can be no real unit of mere extension.(2) It would be an erroneous conception to regard mathematical surfaces as made up of real lines and these lines as made up of real points. The line is the limit of the surface and the point is the limit of the line. A mathematical point may,then, be regarded as indivisible,but only because there is nothing in it to divide. It cannot be a real unit, for there is nothing to determine its unity. We should have to conceive it /

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(1) Erdmann, p.114.

it as the unit of that whose sole characteristic is to consist of units, to be a quantity. For such is, strictly speaking, the nature of Descartes's "Extension." Thus, as Leibnitz puts it, "mathematical points are exact" (i.e. indivisible) "but they are only modalities,"(1) that is to say, abstractions and not real existences.(2)

Now, while Leibnitz regards the parts of Cartesian Extension as thus indivisible without being real, he maintains on the other hand that the parts to which Atomism reduces Material Substance are real only if they are not indivisible. Their claim to be indivisible rests upon the supposition that they are infinitely hard. But hardness is a relative term. There is no absolute hardness, as there is no absolute motion or rest. And thus infinite hardness is a self-contradictory conception. "By an atom", says Leibnitz, "I understand a corpuscle mentally divisible indeed, but which actually neither is nor has been divided. Not that it cannot be actually divided /

divided; for such atoms do not occur, since they would demand perfect hardness. But it suffices for my definition that there should be corpuscles, whose particles have never been separated, from the foundation of the world to the present day."(1) Every material atom must be at least ideally divisible, if it be real. "The atoms of matter . . . . . are still composed of parts, since the invincible attachment of one part to another (if one could rationally conceive or suppose it) would in no way destroy their diversity."(2)

How the relation of whole and parts is to be conceived. - The real and indivisible unit of Substance (Monad) - "Perception" and "Appetition".

Leibnitz's problem thus takes the form of an attempt to find a unit of Substance which shall avoid the imperfections both of Descartes and Democritus. This unit must be at once real and indivisible. Its reality must be of such a kind that it does not conflict with its indivisibility and it must be indivisible in /

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(1) Comm Epistol. Leibnitii et Bernoullii Epist. 57 (Vol.I.p.312.)

(2) Systeme nouveau, etc., Section 11.

in a sense which is consistent with the continuity of the whole. The basis of its reality cannot be quantity, for no quantity is indivisible. And its indivisibility cannot be exclusive particularity in space or time, for indivisible points in space or time may form an aggregate but cannot become a continuum. The unit of Substance must then be intensive rather than extensive, and the continuity of the whole must be not a mere empty homogeneity but a continuity, though infinite degrees of intension. The word "intension", however, does not help us much. It must be more precisely defined.

The antinomy between whole and parts, which was the issue of the quantitative or extensive view of Substance, had its roots in the conception of whole and parts as inevitably exclusive of one another, the whole being regarded as prior to the parts or the parts as prior to the whole. That is to say, either, as in the view of Spinoza, the parts are to be deduced, in a purely analytic way, from the /

the whole as self-evidently given or, as in the Atomist doctrine, the whole is a secondary construction, of a purely synthetic kind, from the primary parts. In contrast with this the intensive doctrine of Substance, which regards determination as primary or essential, amounts to a declaration that whole and part are inseparable. All specific determinations, states or functions are determinations states or functions of the whole, not in the sense that they are ultimately reducible to one vague determination which is common to everything, but in the sense that the whole is expressed, symbolised and therefore in some way included in each, however specific, individual, limited it may be. Thus the parts are not determined or characterised without reference to the whole, and the whole is not a mere vague aggregate of independent parts. In some sense each part must contain the whole within itself, each unit must include an infinite manifold. The whole stands not merely in a mechanical, but in a dynamic relation to the part. The whole is not merely /

merely external to the part, but in some way passes into it and expresses itself through it. That in general, is the conception of Substance as essentially intensive rather than extensive.

There is here an approach to the modern conception of organism as more adequate to the expression of Substance than are merely mechanical conceptions.(1) But the special angle at which Leibnitz regards his problem prevents him from developing this. His early imaginative liking for "atoms and the void," when first he "freed himself from the yoke of Aristotle,"(2) the love of historical system and of well-grounded hypothesis which set his whole intellectual character in revolt against Spinoza's abstract unity and his purely a priori deductions, /

deductions, probably also the influence of his scholastic training with its suggestions of an infinite multiplicity of "substantial forms," - all resulted in a tendency to emphasise rather the elements of reality than its wholeness. That there can be no real whole without real units, is Leibnitz' guiding thought,(1) and accordingly his question does not primarily take the form :- "What must be the nature of a whole which expresses itself in each of its parts?" It rather is : - "What must be the nature of a part or unit which can in some way contain or express the whole within itself?"

Now /

Now the part cannot contain the whole within itself actually and fully, in all its realized completeness; for thus the distinction between whole and part would vanish. The part must, therefore, contain the whole potentially and ideally, or by means of representation.

The relation of whole and parts is not to be conceived as one of greater and less, of thing containing and things contained, but rather as a relation of Symbolised and Symbols, sign and thing signified. That is to say, the part must be a representation of the whole from some particular point of view, a Symbol or expression of the whole, and the part must contain the whole in such a way that the whole may unfold itself entirely from within it.

Thus the part must have a certain spontaneity or power of acting from within itself, and in virtue of this Leibnitz describes the individual substance as essentially a "Force" rather than a quantity. This intensive Essence or Force in the part (or individual substance) appears in two ways. As representative /

representative or symbolic of the whole, the part, in Leibnitz's terminology, has 'perception', while in so far as in the part the potential whole tends to realize itself, the part is said to have 'Appetition'. Both of these characteristics must belong to it, for if it had Perception alone, the part would merely represent one aspect of the whole like an unchanging picture. It is in virtue of its Appetition that the part is able to realise the life of the whole, to unfold spontaneously from within itself all the variations of that which it represents (1).

This new atom or unit of substance (the 'simple substance', in his own phrase) Leibnitz calls a Monad(2). The word is almost as old as European philosophy and has varied greatly in meaning and application. Shortly before the time of Leibnitz the term was used by Giordano Bruno, whose Monads were ultimate spherical points, regarded as possessing both spiritual and material characteristics. There are some parts of the philosophy of Bruno with /

with which the doctrine of Leibnitz has affinity, as for instance, Bruno's contention that there is nothing, however little or valueless, that does not contain in it life or soul. But Leibnitz repeatedly attacks the doctrine of a World-soul, which is Bruno's Central Conception. Thus in adopting the term 'Monad', Leibnitz may be said to have taken from Bruno little more than the name (1).

The Monad then, has Perception, but not necessarily in the sense of consciousness. For consciousness is not the essence of Perception, but merely an additional determination belonging to certain kinds or degrees of Perception. Conscious Perception is called by Leibnitz 'Apperception'. But the essence of Perception in general is that in it we have a unity variously modified or a unity which appears in a multiplicity of relations. "I have many ideas (Vorstellungen), wealth of thoughts is in me; and yet I remain, in spite of this variety, one.(2)" But it is not necessarily because I am conscious of many thoughts or many objects that

I /

I 'perceive' and thus exhibit a multiplicity in unity. All representation is Perception (1). Similarly the Monad has Appetition, but not necessarily in the sense of conscious desire or will. As the essence of Perception is multiplicity in unity, so the essence of Appetition is change within the identity or permanence of a simple substance. Appetition is "the action of the internal principle which produces change or passage from one Perception to another."(2) As the Monads alone are real, every change in nature must be change within a Monad. This change, as we have seen, must be the unfolding of the whole which the Monad potentially contains or represents. That is to say, it must be the passing from one Perception (or state of representation, whether conscious or unconscious) to another. And thus, wherever there is change there is Appetition. It is simply another name for the spontaneity of the Monad, its power of unfolding its whole nature and experience from within itself. The Monad as perceptive is thus a universal /

universal within, rather than exclusive of, the particular, while as Appetition it is dynamic and not static.(1)

As the Monads are purely intensive centres or units, each must be absolutely exclusive of all others. Not being quantitative, they are simple, in the sense of having no parts; (2) and thus no one Monad can include another. Further, no Monad can really influence another or produce any change in it. For that would mean a transference of quality from one to the other. But as the quality of a substance, being its very essence, is inseparable from it, such a transference is impossible.(3) The Monads are also real ultimate elements, because, being entirely non-quantitative, they cannot have been formed out of any combination of simpler elements, nor is it possible in any way to dissolve them, as they are without parts. (4) The point which is at once real and indivisible has thus been found in the Monad, as contrasted, on the one hand, with the Mathematical point of Descartes, which /

which is indivisible only when it ceases to be real, and, on the other hand, with the physical point of the Atomists which, if it is real, must always be divisible.(1)

The Identity of Indiscernibles and the Law of Continuity :

The indivisible having thus been established, there remains the question of continuity and the infinite. As we have seen, a quantitative continuum cannot have indivisible parts. But as the actual indivisible elements of reality are essentially perceptive, real continuity must also be a continuity of Perception. As each Monad is a part or element of the Universe, in the sense that each represents it or reflects it as in a mirror from some particular angle, in some special aspect, the whole must be the infinite totality of Monads, representing the Universe from every possible point of view. And thus, while the Monads are entirely separate from one another, each must represent the Universe /

Universe in a way which differs to the least possible extent from the representation given by some other. No two Monads (and a fortiori no two things, which are all made up of Monads) can be exactly the same : no thing can have a merely numerical difference from another. The Monads are essentially non-quantitative, and number by itself is merely a measure of quantity. The Monads differ from one another in quality or intention alone, so that two Monads not differing in quality are impossible. This is the doctrine of Leibnitz which is usually called the "Identity of Indiscernibles." (1) It is simply his law of Continuity in a negative form. The number of Monads must be infinite : otherwise the Universe would not be represented from every possible point of view and would thus be imperfect. But if the number of Monads is infinite and if every Monad differs in quality from every other, then the Monads must be such that they might be considered as a series, each term or member of which differs from the next by /

by an infinitely small degree of quality, i.e., by a degree of quality less than any which can be assigned.

Leibnitz explains his principle of Continuity in a letter quoted by his biographer, Guhrauer.[1] "I think, then," he says, "that I have good reasons for believing that all the different classes of beings, the totality of which forms the Universe, are, in the ideas of God, who knows distinctly their essential gradations, merely like so many ordinates of one and the same curve, the relations of which do not allow of others being put between any two of them, because that would indicate disorder and imperfection. Accordingly men are linked with animals, these with plants, and these again with fossils, which in their turn are connected with those bodies, which sense and imagination represent to us as completely dead and inorganic (informes). But the law of Continuity requires that, when the essential determinations of any being approximate to those of another, all the properties of the former must gradually approximate to those /

those of the latter. Therefore all the orders of Natural Beings must necessarily form only one chain, in which the different classes, like so many links, are so closely connected with one another that it is impossible for sense or imagination to determine exactly the point where any one of them begins or ends: all the species which border upon or which occupy, so to speak, disputable territory (regions d'inflexion et de rebroussement), being necessarily ambiguous and endowed with characteristics, which may equally be ascribed to neighbouring species. Thus, for instance, the existence of zoophytes, or, as Buddeus calls them, Plant-animals does not imply monstrosity, but it is indeed agreeable to the order of Nature that they should exist. And so strongly do I hold to the principle of Continuity that not only should I not be astonished to learn that there had been found beings which, as regards several properties, for instance those of feeding or multiplying themselves, might pass for vegetables as well as for animals, and which upset the common rules /

rules, founded upon the supposition of a complete and absolute separation of the different orders of beings which together fill the Universe: I say, "I should be so little astonished at it, that I am even convinced that there must be such beings and that natural history will perhaps some day come to know them, when it has further studied that infinity of living beings, whose smallness conceals them from ordinary observation and which lie hid in the bowels of the earth and in the depths of the waters . . . . "

The Pre-established Harmony between Substances:

There is, then, in the system of the **Monads** a perfectly continuous and infinite gradation of Intension, that is to say, of Perception or representation, combined with Appetition or spontaneous change. And thus the whole of reality is at once continuous and not only infinitely divisible, but infinitely divided, consisting of an infinity of real elements(1). But we still have to consider how the principle of continuity, as thus interpreted is /

is consistent with the changes which take place in real things. In the system of Monads the principle of Continuity corresponds to the 'Void' in the older Atomism. Each is the necessary correlative of the indivisible and impenetrable elements. The conception of Continuity, however, by implying a plenum, escapes the contradictions that are involved in the idea of a void. But it has still to be shown how change is possible within a plenum or how change can take place without disturbing the Continuity of the infinite series of Monads. Any change within a plenum affects every part of it. This is the principle involved in the scientific point of view regarding the Universe, which became current with the rise of Modern Philosophy. Everything in the world acts and re-acts upon everything else. However separate things may be, no change can take place in any one without affecting every other. The influence may in some cases be imperceptible, infinitely small; but it exists. If, however, the Universe be a quantitative plenum, it is /

is impossible to understand how any change could originate within it. It must receive its motion from outside and must thus be regarded as finite, which again is inconsistent with its reality as a plenum. Leibnitz overcomes this difficulty by regarding the Universe, not as an infinite mass occupying all that there is to occupy, but as a continuity or infinite gradation of qualitative differences, each containing within itself the principle of its own changes. He substitutes for an extensive plenum of mass an intensive continuum of Force or Life.

But if the Universe consists of an infinity of Monads, each independent of the rest, impenetrable and unaffected by them, and each containing within itself the principle of all its changes, how is it possible for a change to take place in any one of them without destroying the continuity of the series?(1) Each Monad contains within itself a representation of the whole Universe from one particular point of view, which differs to an infinitely /

infinitely small degree from the representations contained in some other Monad. If, then, any change, however slight, takes place in the Perception or representation of one Monad, the continuity of the series will be broken and we shall have two indiscernible Monads. But it is of the very essence of the Monads to be "living mirrors", "forces" (as distinct from masses) centres of Appetition, spontaneously unfolding a sequence of Perceptions. Accordingly, this change within the Monad does take place: it is essential to its nature. The continuous order or system of the Monads must therefore be destroyed, unless we can say that any change within one Monad produces, or is invariably accompanied by, correlative changes in other Monads, of such a kind that the equilibrium of the whole system is maintained. In other words, there must be something of the nature of mutual influence, action and re-action, between the various elements in the system. If the system were a <u>plenum</u> of mass, this interaction would be intelligible without further explanation /

explanation. But as the Monads form a qualitative continuum of such a kind that no part can really act upon another, a further hypothesis is required to complete the theory.

This hypothesis is Leibnitz's system of the Pre-established Harmony between Substances. Though no true substance can really act upon another, everything in the Universe takes place as if this mutual interaction were real. Substances form a system, not of physical relations, but of harmony or mutual compatibility. In the creation of the world, the inner development of each Monad has been so pre-arranged that all its changes are accompanied by corresponding changes in others. The succession of changes in each Monad is different from that in every other, and yet all are in harmony, the perfections of one being accompanied by counterbalancing imperfections in others. One Monad influences another ideally(1), that is to say, not ab.extra but through an inner pre-established conformity(2).

Relation /

Relation of the System of Pre-established Harmony to Scholastic and Occasionalist Theories :

Like most of the other doctrines of Leibnitz, this system of the Pre-established Harmony is a new hypothesis devised to remedy the imperfections of previous theories. The general problem which it is meant to solve appeared at first for Leibnitz in a particular form, that of the relations between soul and body. The usual Pre-Cartesian solution of this special problem was the theory of an influxus physicus or actual passage of elements from the one substance to the other. Descartes's complete separation of soul from body, of thinking substance from extended substance, was in total opposition to the earlier theory (1). The problem itself is left by him without any satisfactory solution; but his followers made a definite attempt to solve it by the theory of "occasionalism," in which they developed a suggestion that had been made by Descartes when he spoke of thinking and extended substance as alike dependent on nothing but the /

the "ordinary co-operation" (concours ordinaire)or "Assistance" of God. The Occasionalist theories varied to some extent, but in its most consistent form the hypothesis is that God is the sole real cause, that finite substance has no power or activity of its own and consequently that the changes which take place in soul and body are both directly produced by God. Consequently on the occasion of the appearing of a phenomenon in the one substance God produces a corresponding phenomenon in the other. The two phenomena are quite independent, except for the fact of their contemporaneous production by God, the one real Cause.

Leibnitz's Pre-established Harmony has sometimes been regarded as merely another variety of Occasionalism, in spite of his frequent criticisms of the Occasionalist theory. And he has been accused of borrowing (without acknowledgment) from the Occasionalist Geulincx the well-known illustration of the two clocks which he uses in explaining his Pre-established Harmony. But Dr Edmund Pfleiderer has clearly shown (1) that Leibnitz, who never mentions /

mentions Geulincx in his writings, must have been quite unaware of Geulincx's use of the illustration. And in any case there is this essential difference between the Occasionalist theory and that of Pre-established Harmony, that the former regards finite things as empty of all activity except that which is immediately communicated to them by God, while the latter is founded on the conception of finite things as in reality forces, Monads with spontaneous activity.(1) Thus the Occasionalist theory is open to the criticism which Leibnitz repeatedly brings against it, namely, that it involves the supposition of perpetual miracle or in other words, that if it be true, the connection between soul and body must be a purely arbitrary one, there being nothing in the nature of either which can serve as a reason why this phenomenon of soul should accompany that phenomenon of body and not some other. The Monads, on the other hand, have at least this in common that it is of the essence of each to represent the same world from a particular point of view

and /

and that each unfolds the series of its Perceptions or representations in an intelligible order. The whole is potentially present and seeks its realization in each of the parts. Consequently the Pre-established Harmony is not arbitrary, but rational: no Deus ex Machina is invoked. Thus it is impossible to regard Leibnitz's theory as the completion of the Occasional doctrine, unless in the sense that it is an hypothesis which seeks to reconcile the contrary views of Scholastics and Cartesians.(1)

The Scholastic theory of an influxus physicus connected soul and body in a way which ultimately confounded them, making it impossible to draw any clear line between them. The Cartesian or Occasionalist view, on the other hand, separated them so absolutely that nothing but a purely arbitrary connection could be supposed - a connection external to the nature of both. The Scholastics seemed to Leibnitz to be right in holding that the connection is a real one, grounded in the nature of /

of the substances: the Cartesians seemed right in maintaining that the Substances are mutually exclusive. And the antinomy is solved for Leibnitz by the supposition of a mutual "ideal influence," a relationship of Perception or representation, between independent self-acting Monads, the harmony of whose inner developments has been established before their creation.(1)

Leibnitz's illustrations of the Pre-established Harmony - the Clocks and the Choirs:

The simile of the clocks, by means of which Leibnitz illustrates his theory in relation to the Scholastic and Cartesian views, is given in the "Third Elucidation" of his "New System." Two clocks may be made to keep perfect time with one another in three different ways. They may be actually connected together, for instance by a piece of wood, in such a way that there is a mutual transference of vibrations between them resulting in a perfect agreement of the motions of the pendulums.(2) Or in the second place, they may be supposed to be kept /

kept in time with one another from moment to moment by a skilled workman. Or, finally, they may have been so perfectly constructed that they keep time of themselves, without any mutual influence or assistance, If we compare soul and body to the two clocks, the first of these ways of connection corresponds to the doctrine of an influxus physicus, the second to the Occasionalist view, and the third to the Pre-established Harmony.

It is, however, misleading to suppose, as has too often been done, that this is Leibnitz's favourite simile for explaining his system of Pre-established Harmony. He uses the illustration, not so much to explain his own theory as to make clear the relation in which it stands to previous hypotheses. He accepts for the moment the limited problem which these hypotheses endeavour to solve. But his own problem is larger and his /

his own hypothesis is therefore more comprehensive than those of his predecessors. Body, for Leibnitz, is nothing but a collection of Monads, and consequently the question of the connection between soul and body is only a confused and imperfect form of the question as to the relations between any one Monad and another. The larger problem thus deals with the relations of body to body and soul to soul as well as the relations of soul and body, with which alone the earlier theories were concerned.

Leibnitz /

Leibnitz would maintain that, as substances (Monads) are not physical but metaphysical, it is impossible for us to realise the true relations between them by conceptions of sense or imagination. These relations are metaphysical or ideal and are therefore only intellectually apprehended. But he elsewhere uses a simile for the Pre-established Harmony more adequate than that of the two clocks, when he compares the Monads to completely independent bands of musicians playing in perfect harmony. "In short, to use an illustration, I will say that this concomitance, which I maintain, is comparable to several different bands of musicians or choirs, playing their parts separately and so placed that they do not see nor even hear one another, which can nevertheless keep perfectly together by each following their own notes, in such a way that he who hears them all finds in them a harmony that is wonderful and much more surprising that if there had been any connection between them. It would even be possible that someone, being beside one of two /

two such choirs, should by means of the one judge what the other is doing and should even acquire such a habit of doing this (particularly if we suppose that he could hear his own without seeing it and see the other without hearing it) that, with the help of his imagination, he should no longer think of the choir beside which he is, but of the other, or should take his own merely for an echo of the other,"(1) etc. The analogy must not be pressed to an extreme; but the simile is much better than that of the clocks. The clocks are too much alike to represent the Monads, and the harmony of their movement is too empty and almost meaningless. But in the case of the bands there is a real harmony formed out of the complementary movements of several self-acting units, and there is also the spontaneous development from the written notes of the score to the system of sounds which they signify. This development from the written signs to the sounds signified might be said to correspond to the passage from /

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(1) Correspondence between Leibnitz and Arnauld in Janet's "Oeuvres Philosophiques de Leibnitz," Vol. 1. p. 653

from Unconscious to Conscious Perception in the Monad.[1] An unconscious Perception is, for Leibnitz a symbol of the corresponding Conscious Perception.

New Par.

We have now considered the three chief conceptions of the Metaphysic of Leibnitz, and we have seen how they arise as the solution of his problem in the form which is given to it by its historical setting. In the first place, Intension, Force or Life, in the form of Perception and Appetition, is the essence of real individual substance. In the second place, the principle of Continuity or the identity of indiscernibles is the hypothesis which explains the system or interrelation of strictly individual substances. And in the third place, the doctrine of the Pre-established Harmony accounts for the possibility of change in elementary substances without prejudice to the whole.

Clear and Confused Perception and Degrees of Appetition :

We must now consider more fully the varieties of/

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(1) Cf. loc. cit. Janet Vol. I. p. 629.

of Perception and Appetition which constitutes the differences amongst Monads. In regard to Perception Leibnitz adopts the Cartesian distinction among ideas, with considerable modifications. Descartes divided ideas into those which are confused, those which are clear, and those which are distinct as well as clear. "I call that clear," he says, "which is present and manifest to the attentive mind, as we say we see an object clearly when it is present to the eye looking on, and when it makes on the sense of sight an impression sufficiently strong and definite; but I call that distinct which is clear and at the same time so definitely distinguished from everything else that its essence is evident to him who properly considers it." And "all the things which we clearly and distinctly conceive are true." Leibnitz follows Descartes in regarding clearness and distinctness as the marks of perfection in ideas or Perceptions;[1] but he does not limit the distinction between clear and confused ideas to the ideas which we consciously possess nor does /

does he draw a sharp line between ideas which are perfectly clear and all others, which are confused. Confused Perceptions are not for Leibnitz, as for Descartes, mere mistakes and illusions; but they belong to the real order of things, which without them could not be what it is. And there is no question, as in Descartes, regarding the correspondence of Perceptions to reality, clear ideas representing reality truly, while confused ideas do not. All Perceptions are representations of reality; but they vary infinitely in their degrees of clearness or confusedness. Confusedness is simply a low degree of clearness; the more perfect any Perception or representation is, the clearer is it, while the less perfect it is, the more is it confused. Thus the differences among the Monads consist entirely in the various degrees of perfection or clearness with which they perceive or represent the Universe. But as each Monad actually represents the whole Universe, however confusedly or imperfectly, and as each is essentially a force or living principle, proceeding /

proceeding, by its own spontaneous activity, from one Perception to another, the clear and the confused are not essentially separate from one another, but it is possible for the confused Perception to unfold into clearness. Each Monad contains the whole more or less confusedly within itself and by its Appetition may rise to a more perfect state. Each Monad contains as it were enfolded within itself all that it is to be. It is "big with the future." It is like an exceedingly condensed algebraical statement which can be indefinitely expounded: somewhat like the symbol π in the problem of determining the relation between the lengths of the diameter and circumference of a circle, with this very important difference that the Monad "reads itself off." An omniscient Being could see the reality and history of the whole Universe within the lowest Monad.

Three Classes of Created Monads, - (1) Unconscious (2) Conscious (3) Self-conscious :

While /

While there is thus a perfect Continuity in the degrees of Perfection with which the Monads represent the Universe, Leibnitz has roughly distinguished created Monads into three main classes, (1) Unconscious or bare Monads (monades nues), (2) Conscious Monads and (3) Rational or Self-conscious Monads. As we have seen, every Monad or simple substance has a certain degree of perfection or completeness, inasmuch as it ideally or potentially contains the whole within itself. Thus the Aristotelian name of Entelechies might be given to all Monads, since they have each "a certain perfection (ἔχουσι τὸ ἐντελές) ", and "a certain self-sufficency (αὐτάρκεια) which makes them the sources of their internal actions, and, so to speak, incorporeal automata." (1) That is to say, each is, in its own way, complete in itself as representing the Universe and complete in itself as an active living being or force. On the other hand, every Monad might be called a "soul", inasmuch as it has both Perception /

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(1) Monadology, Section 18.

Perception and Appetition, in the general sense of these words which has been already explained. Nevertheless, in spite of this essential unity of nature in the Monads, it is possible to draw broad lines of division among them. Conscious sensation or feeling, accompanied by the simpler forms of memory, clearly marks off certain Monads from those which have merely unconscious or confused Perception. To the former class the name "souls" may be specially applied, while for the latter the general name of Entelechies or Monads will suffice. And as there are still higher Monads which have self-consciousness and reason or thought proper, in addition to unconscious and conscious Perception and Memory, we may call these "rational souls" or "spirits" (intelligences, esprits.)(1) The class of rational souls or spirits includes men and higher intelligences. The intermediate "soul"-class is that of animals, and the class of Entelechies or bare Monads includes all real beings that have not reached the stage of consciousness.

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The differences of Appetition in the three classes of created Monads, (corresponding to the three grades of Perception which characterise them), may be expressed as mere impulse, animal instinct or blind desire, governed by mere feeling, and self-conscious desire or will.

Each of the two higher classes possesses, in addition to its own specific qualities, the characteristics of the inferior Monads. Thus both animal and men have unconscious as well as conscious Perceptions, for example, when they fall into a faint or have a profound and dreamless sleep.(1) In such a case, they are not entirely destitute of Perceptions, for the Monad is indestructible (being indivisible) and it cannot exist without Perception of some kind. The changes of the Monad are entirely from within, so that, when the man or animal awakes out of a sleep or trance his conscious Perceptions must have unfolded themselves out of immediately preceding Perceptions of an /

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(1) Monadology Section 20.

an unconscious kind.(1) Again, men share with the animals both sense-Perception and the empirical sequence of memory and imagination, which bears a resemblance to the concatenation of rational thought, but may be sufficiently distinguished from it.(2) Indeed, in most of our actions and beliefs we are empirical, as, for instance, when we expect the dawn, not because we know the cause of it, but because it has happened regularly in the past.(3)

Self-Consciousness in the Philosophy of Leibniz and in that of Descartes :

The significance of this may be brought out by a reference to the position of Descartes, which Leibniz probably had in view. According to Descartes, the rational soul is the mind and its reality comes only from its conscious certainty of itself. Thus without self-consciousness there is no mind or soul. Animals have no self-consciousness and /

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(1) Monadology 22 and 23.
(2) Monadology 26 et seq. cf. Nouveaux Essais, Bk II Ch.11 and Fraser's Edition of Locke's Essay, Vol.I. p. 208.
(3) Monadology, 28.

and therefore they have no souls: they are mere machines. But animals have sensations and impulses, and, consequently, sensation and impulse are not functions of self-consciousness, acts of the soul, but are purely physical and mechanical processes, whether they occur in man or in the lower animals. It is in self-consciousness alone that we have immediate self-certainty, from which we may proceed outward to the certainty of other things. Thus for Descartes the line between consciousness and unconsciousness on the one side and self-consciousness on the other must be very sharply drawn: the complete independence of self-consciousness is the root of the Cartesian dualism.

Now, Leibniz desires to preserve the independence of self-consciousness or the self-certainty and self-sufficiency of the mind. The validity of thinking must not be made to depend on reference to a reality external to it. But, on the other hand, the mechanical dualism of Descartes must be avoided. The independence of self-consciousness is preserved through /

through the conception of the Monads as a plurality of real, independent substances. Mind is not merely a modification of substance, an attribute (as Spinoza made it) : it is an independent substance, in its various forms one or other of the infinite number. But, on the other hand, mind must not be regarded as identical with self-consciousness alone : self-consciousness must not be taken as entirely exclusive of mere consciousness or of unconsciousness. Otherwise we have returned to the Cartesian dualism. There must somehow be an unconscious activity of mind, and the opposition between mind and body becomes a difference, not of kind, but of degree.

Self-consciousness in the philosophy of Leibniz is, however, a very different thing from self-consciousness in the philosophy of Descartes. The latter arrives at the self-conscious Ego as the result of a rigorous analysis, whose instrument is doubt.(1) It is an ultimate fact, the fact of a subject thinking, without regard to any specific object /

object of its thought. Self-consciousness is the bare witness of consciousness to itself, its empty self-consistency. In the certainty of self-consciousness Descartes (justifiably or not) finds involved the certainty of God, the Perfect Being, and from this he proceeds to the certainty of the external world and to the principle that clear and distinct ideas are characteristic of self-consciousness and are a sufficient warrant for the reality of their objects. For Leibniz, on the other hand, the Ego is not a pure subject, whose essence is immediate self-consciousness. No Monad can be a pure subject. "Not only is it immediately clear to me that I think; but it is quite as clear to me that I have different thoughts; that now I think of A, now of B" etc. (1) An Ego is one of an infinite number of substances, and its self-consciousness is thus not the ground of its existence, but a difference in degree of quality between it and others. (2) The self-conscious Monad is merely one which has developed its representative or Perceptive nature /

nature more fully than those which we describe as animal souls or bare Monads. In other words we are "Egos" before we think of ourselves, realise ourselves or reflect upon ourselves as Egos. We are "raised to the knowledge of ourselves and of God."(1)

The difference between the self-conscious Monad and others consists in the greater clearness and distinctness of its perceptions and ideas. But as clearness and distinctness are relative terms, (every Monad having Perceptions in some degree clear and distinct), the specific Perceptions of a self-conscious being must be further defined. Leibniz, as we have seen, cannot accept the Cartesian view which totally rejects confused and obscure ideas and makes clearness and distinctness the sole criteria of truth.(2) In addition to being clear and distinct, the ideas which are characteristic of a rational being must be analysed, so that their grounds or premises may be as fully exhibited as possible. And thus the specific quality of a rational /

rational soul or self-conscious Monad is "the knowledge of necessary and eternal truths," that is to say, of the ultimate grounds or premises of all knowledge. The self-conscious Monad represents or perceives the Universe in an articulate way. It has carried the internal evolution or realisation of the Universe so far that its underlying principles have clearly revealed themselves. "It is by the knowledge of necessary truths and by their abstract expression (leurs abstractions) that we are raised to acts of reflection which make us think of what is called "I", and observe that this or that is within us: and thus, in thinking of ourselves, we think of Being, of Substance, of the simple and the compound, of the immaterial and of God Himself, conceiving that what is limited in us is in Him without limits. And these acts of reflection furnish the chief objects of our reasonings."(1)

This at once suggests Descartes, but Descartes with a difference. For Leibniz, as for Descartes, the idea of God or the most Perfect Being, is involved /

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(1) Monadology, 30.

involved in that of an imperfect self-conscious being. Yet Leibniz regards the idea of God as contained, not in the self-conscious being alone, but, in one way or another, in every real being. Thus it is of less consequence for Leibniz than for Descartes that the idea of God is pre-supposed in the consciousness of self. That which is of most importance to Leibniz is that self-consciousness pre-supposes a knowledge of necessary truths in general. Thus for Leibniz, God is not merely the eternally necessary Being whose very idea (or essence) involves existence and who is in that way the ground of existence to all other things: He is also the greatest of Beings, the highest of Monads, (Monas monadum)(1) whose own existence is one among many necessary and eternal truths. "We must not imagine, as some do, that eternal truths, being dependent on God, are arbitrary and depend on His Will, as Descartes, and afterwards Monsieur Poiret, appear to /

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(1) Giordano Bruno, as well as Leibniz, speaks of God as monas monadum.

to have held."(1) There are truths or facts which are dependent on the Will of God, but these are not necessary and eternal.

The Kinds of Truth according to Leibniz. Necessary and Eternal Truths and Contingent Truths :

Accordingly as, on Leibniz's view, the self-conscious being has not a primary and independent reality, based on a complete difference in kind between itself and other beings, so the special kind of knowledge (that of eternal and necessary truths) which belongs to a self-conscious being is not to be regarded as the only absolutely certain truth, to the form of which all other real knowledge must be reduced. "There are two kinds of truths, those of Reasoning and those of Fact."(2) The former are the eternal and necessary truths, the latter are contingent. And the difference between them is that the truths of Reasoning are either ultimate self-evident principles or truths which are reducible to /

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(1) Monadology, 46.
(2) Monadology, 33.

to such first principles by a process of strict logical analysis, while any attempt to analyse truths of Fact into their ultimate grounds leads to an infinite process, and they must finally be referred to God as their ground eminenter.(1)

Logical Principles of the Philosophy of Leibniz. (a) Principle of Identity or Contradiction :

With this division of human knowledge into two great kinds, we come in sight of the guiding principles of Leibniz's philosophy, its logical presuppositions as distinct from its specific metaphysical doctrines. The logic underlying the philosophies of Descartes and Spinoza was a logic of abstract self-consistency.(2) In their view all real knowledge must be ultimately of one kind. All apparent knowledge that is not of that kind must be regarded as entirely unreal and illusory. This was necessarily involved in the position that there is no appeal beyond the witness of consciousness to itself. "The order and connection of ideas is /

is the same as the order and connection of things." (1) And as all things must be regarded as ultimately referable to one ground or cause, so all ideas must ultimately be referable to one standard; that is, must be linked together by one principle. The standard must be that of self-evidence or absence of self-contradiction in the ideas, which is simply another way of describing the immediate witness of consciousness to itself. True ideas must be clear and distinct, in order that it may be manifest that they are free from self-contradiction. All real knowledge must either be immediately recognisable as eternal and necessary truth or must be deducible from such truth by a formally or mathematically conclusive process. Thus the philosophies of Descartes and Spinoza were ruled by the principle of contradiction, that A cannot both be A and not A, or that necessary truths are "Identical propositions, whose opposite involves an express contradiction." (2) In other words they held that self-consciousness is self-consistent, that it never absolutely contradicts itself.

Now /

Now this is, so far as it goes, a perfectly sound doctrine. Its fault is that it does not go far enough. Self-consciousness is much more than merely self-consistent. Its self-consistency is no immediate and on the surface. It is not a mere negative self-identity of parts, without regard to their specific content. To be self-consistent, according to the principle of contradiction, is for a thing to be itself, that is, to be "not anything else." But a thing whose ultimate essence is to be "not anything else" is nothing. "Nothing" is immediately self-consistent quite as much as "something."(1) In other words, all real (not merely formal) self-consistency must be mediate, it must have grounds. It must spring from the specific nature of the self-consistent thing.(2) And thus, as Leibniz contended, even axioms may require proof.(3) Their self-evidence requires elucidation: the basis of it must be made manifest.(4) Self-consciousness, then, is really self-consistent only in virtue of its being a definite system, a /

a self-revealing process or development, which contains within itself the ground or reason of existence. Accordingly, to treat it in philosophical investigation as if it were merely superficially self-consistent, as if the law which expresses its whole nature were the law of Contradiction, would be to arrive at an empty and abstract result.

Leibniz, however, while recognising the inadequacy of the principle of Contradiction as thus interpreted, did not clearly enough perceive the reason for this inadequacy. He regarded the principle of contradiction, not as an imperfect interpretation of the one principle of all truth, to be made perfect by further definition, but as an independent principle, adequate to a certain kind of truth, yet requiring to be supplemented by another co-ordinate principle, which should be the standard of another kind of truth. If the principle of Contradiction be the sole principle of Knowledge, whatever is not self-contradictory is true; and nothing is true unless it can be shown that it is not /

not self-contradictory. But how are we to determine what is or is not self-contradictory? According to the Cartesians this is to be done by analytically reducing the doubtful statement to one or more self-evident propositions, or, in other words, by showing that the statement is ultimately involved in one or more propositions, of such a kind that their predicate is manifestly contained in their subject.(1) But Leibniz maintains that there are many statements to which it is impossible satisfactorily to apply this test. Their very nature is such that the process of analysis cannot in their case be brought to an end, and consequently we remain unable to say whether they are really self-contradictory or not. At any rate, their self-contradiction or the absence of it, cannot be made self-evident. For instance, the statement that "I took a long walk yesterday" may be perfectly true; but by no amount of analysis is it possible for us to test its truth by reducing it to self-evident propositions. It is not necessarily, but contingently true /

true. Its truth is not directly grounded in the eternal nature of things, but is determined by a multitude of other truths, which may each in their turn demand an infinite analysis. (1) These contingent truths, however, (if they are to be truths at all, and not merely false or doubtful statements) must have some ground or reason. (2) If the truth is such that it is impossible to find for it an absolute and eternal reason in the first principles of things, there must at least be some satisfactory or sufficient reason why it should be so and not otherwise.

Logical /

Logical Principles of the Philosophy of Leibniz. (b) Principle of Sufficient Reason :

Thus Leibniz supplements the principle of Contradiction by the addition of the Principle of Sufficient Reason. The name has a makeshift sound - as if one should say, "We must be content with a sufficient reason in cases where a perfect reason is not to be found." But in the philosophy of Leibniz, it is much more than a makeshift. This principle is essential to his system and, indeed, gives it the greater part of its value. In the Monadology, Leibniz defines this principle as that "in virtue of which we hold that no fact can be found real or existing, no statement true, unless there be a Sufficient Reason, why it should be so and not otherwise, although these reasons very often cannot be known by us." (1) As thus defined, the Principle of Sufficient Reason might almost be regarded as including the Principle of Contradiction, inasmuch as the self-consistency of necessary truths is their Sufficient Reason. Self-consistency /

self-consistency or absence of self-contradiction is one test of the Suffieiency of the Reason. But, on the other hand, the Principle of Contradiction has an independent and, in some sense, superior position, for in the case of necessary truths the reason can always be given, that is, can be made explicit, while in the case of contingent truths we often can only say that there must be a Sufficient Reason, without knowing fully what the Reason is.

The Possible and the Compossible. The best of all possible Worlds :

The value and importance of the Principle of Sufficient Reason become more manifest when we inquire further :- "In what does the Sufficiency of the Reason consist?" We have seen that the grounds of any contingent truth or fact are to be sought in other contingent truths or facts and that an attempt to analyse a contingent truth or fact into its grounds thus leads to an infinite process. Accordingly, it seems to Leibniz that the /

the final reason of contingent truths must be sought in something outside of the system of contingent things, viz., in an eternal and necessary Substance or God, Who is their Source. But this requires some further explanation. In the case of the Principle of Contradiction, what may be called the Sufficiency of the Reason consisted in the absence of Self-Contradiction in the thing or proposition. But to say that a thing is in itself free from Contradiction is the same as to say that, by itself and without reference to other things, it is possible.(1) Accordingly to say that everything which is not self-contradictory is true or real is to say that everything possible is true or real. "I call possible everything which is perfectly conceivable and which has consequently an essence, an idea, without considering whether the remainder of things allows it to become existent."(2) But the opposite of every particular event or contingent truth is possible in this sense: it does not necessarily imply a self-contradiction. The opposite of the axiom, "Things that are equal to the same thing /

"thing are equal to one another," is not possible,for it involves an immediate self-contradiction. The opposite of the truth,"I am sitting here at this moment," is possible, for it does not involve a direct self-contradiction. Accordingly the truth of contingent things is not grounded in their possibility.(1) It is not in virtue of their very essence or idea that they, and not their opposites, are true or real. Their Sufficient Reason lies beyond themselves, in their relation to other things. In themselves, the contingent truths and their opposites are alike possible: considered in relation to other things, the truths alone are possible. For instance, if we consider the truth that "I am sitting here at this moment," not in itself alone, but in relation to an indefinite number of other truths regarding (say) my habits, character, work, the hour of the day, etc., we shall see that the truth alone is possible, that in this connection its opposite is impossible. The opposites of contingent truths,though not self-contradictory, are in contradiction with the /

the general system. Each is possible, but they are not jointly possible, mutually compatible, or, in Leibniz's phrase, "compossible". According, "compossibility" or conformity with the actual system of things, is the true test of reality, the Sufficient Reason. Everything which is possible has an essence or meaning; but only that which is also compossible has existence.(1)

But while the ground of the individual things reality is its compossibility with the actual system of things, Leibniz does not admit that mere compossibility with any system whatever implies the existence of the compossible essences. The Principle of Sufficient Reason is not interpreted by him as a general reference to system or as reference to a system which is held to be the only one possible—to an all-inclusive system.(2) There are several possible systems or Universes, each of which consists of a collection of compossible elements. Indeed it must be supposed that there is an endless series of such possible Universes, of which one only has /

has existence as well as essence. But the Principle of Sufficient Reason still requires that a cause or reason be assigned for the existence of the Actual Universe rather than any other among those which are possible. The existence of the Actual Universe is its creation by God, that is to say, its being not merely in the region of ideas or essences or possibilities, which is the pure Understanding of God, but also in the sphere of final causes, in which the Will of God operates.(1) In other words, the Actual Universe is the result of a free choice of God amongst all possible Universes. While the choice of God is free, being unlimited in its application, it is not an arbitrary choice, but a choice according to reason. God chooses as the Actual Universe that whose compossible elements admit of the greatest amount of perfection or reality, that is to say, the fullest and most complete essence. Thus the Actual Universe is "the best of all possible worlds" - of all worlds which are really worlds or systems, that is, in Leibniz's language, of all worlds /

worlds whose elements are compossible. God makes this choice because, being omnipotent, His choice is unlimited, He may create any possible world; being omniscient, He contains all possible worlds in His understanding and perceives that which is best; and being perfect in Goodness of Will, He chooses the best. Thus the Divine Nature is ultimately the Sufficient Reason of all particular things, since it is the ground both of the essence and of the existence of the Actual Universe,(1) which, in its turn, as a system of compossibles, is the immediate ground of its individual elements.

Accordingly, the Principle of Contradiction and the Principle of Sufficient Reason remain side by side in the philosophy of Leibniz, each having its specific function, but neither reducible to the other, while no attempt is made to find a more comprehensive principle, which may include both. There are certain eternal and necessary truths which are independent /

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(1) cf. Theodicy, Sect. 7. "His understanding is the source of Essences and His Will is the origin of existences."

independent of the will of God, existing in His understanding alone, and these are subject to the Principle of Contradiction; but the reality of all individual substances and their changes is dependent on the Will as well as the Understanding of God, and they are all subject to the Principle of Sufficient Reason. Each Principle expresses a certain necessity; but the necessity of the Principle of Contradiction differs in kind from that of the Principle of Sufficient Reason, the former being an absolute, compelling, or metaphysical necessity, whose opposite is impossible, involving self-contradiction, while the latter is a relative, inclining, or moral necessity, whose opposite is not impossible, but incompossible, inconsistent not with itself but with the system of which it is a part, inconsistent not so much with the eternally true as with the best possible.

The Leading Characteristics of Leibniz's Philosophy as results of the two great Logical Principles:

We are now in a position to see how the main features /

features of the Metaphysics of Leibniz are determined by these great logical principles which underlie it. (1) The principle of Contradiction, taken by itself, is a principle of exclusion. A is A, (every real thing is identical with itself) at all times, in all circumstances, throughout all changes, in every variety of relations. Strictly speaking, then, A can never become B. A is always A, B is always B; each is for ever exclusive of the other. "Black is black, furieusement black: white is white, furieusement white." The principle of Contradiction, as thus interpreted, is a principle of pure self-identity, which asserts permanence to the exclusion of change or in general, unity to the exclusion of difference. In other words, it insists on the reality of terms, making relations subordinate or fictitious. Consequently a philosophy whose dominant principle is that of Contradiction, in this sense, must (consciously or unconsciously) treat whole /

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(1) What follows is, of course, not an exposition of Leibniz's explicit doctrine, but an analytic investigation of the way in which his logical principles fix the main lines of his philosophy.

whole and parts as exclusive of one another, asserting the reality of the one as against that of the other. For if the whole be real, it must be simple it must exclude as unreal all relations or differences. Otherwise it will not be purely self-identical, but may receive a variety of real predicates. And as it is simple, it can have no real parts. Since A cannot be not-A, and since not-A includes B, C, etc., it cannot be true that some A is B or C. Some A can only be A without further distinction. On the other hand, if the parts be real and purely self-identical, if the reality of each is self-centred, and is determined without regard to its relations to the others, then there is no real whole, but only a numerical collection of individuals which may even be contradictory of one another. The Principle of Contradiction, considered as meaning merely that the real is that which is not self-contradictory, yields either a whole which has no real parts or determinations, because it is equally indifferent to all possible determinations, or a bare collection /

collection of severally possible, but jointly "incompossible" parts.

Now, it is the influence of the Principle of Contradiction, thus abstractly interpreted, that leads Leibniz to the conception of real Substance as simple, i.e., as without parts, indecomposable. And it is the same Principle that accounts for the infinite plurality of simple substances and their complete isolation from one another. For Leibniz, in order to give due value to the differences in the Universe, holds the Principle of Contradiction as ensuring reality to the parts, leaving the whole to be otherwise accounted for. And, on the other hand, the mutual isolation of simple substances is but another name for their abstract self-identity. A can never become B, and as A and B are simple, no part of A can ever become B, or a part of B.

The Principle of Sufficient Reason in combination with the Principle of Contradiction, yields the idea of the Monad as itself the source of all the differences it contains, the whole variety of its existence.(1) /

existence.(1) The Principle of Contradiction requires that real substance must contain its whole nature within itself, in such a way that it may be analytically deduced. The notion of Substance is self-explicative. Every true proposition must be analytic. Thus the Monad must be self-sufficient. But now the Principle of Sufficient Reason is added to explain that the analysis is not necessarily completed in every case, that while substance must be self-sufficient and self-explicative, its self-sufficiency is not necessarily in every case fully realised. Its self-identity is not static but dynamic : it is not immediately self-explaining, but progressively self-revealing. Many true propositions are not actually but potentially analytic. While the predicate of every true proposition must in some way be contained in the subject, it does not follow that in each particular case the relation can be made perfectly and self-evidently clear.(2) The predicate must have a sufficient ground or Reason in the subject, but not necessarily a self-evident one /

one. The Monad must be conceived as sufficiently the Reason of all its changes or varieties, though not self-evidently the Reason of each. In other words, the various Perceptions, which are the variety or change in the Monad, the "multitude" in the simple substance, have reality even though they are not all perfectly clear. Thus Spinoza, under the guidance of the Principle of Contradiction, rejected merely empirical knowledge, the contingent sequence of ideas that comes ab experientia vaga, as confused and therefore unreal and illusory, a work of imagination. On the other hand, Leibniz, (for whom this empirical sequence is the series of Perceptions in Monads that have not reached the self-conscious stage), attributes to this sequence a relative reality, inasmuch as it is potentially, though not actually, clear and distinct.

Further, we see the influence of the Principle of Sufficient Reason in the conception of the Monads as each representative of the whole Universe from its particular point of view. The Monads are indeed "terms" /

"terms" or absolute points, centres exclusive of one another; but they are not terms exclusive of relations. It is a part of their essential reality to contain within themselves a multiplicity of relations. The Monad may be likened to "a centre or point, in which, quite simple though it is, an infinite number of angles exists, formed by the lines which meet in it."(1) The Principle of Contradiction requires nothing but a pure simplicity in the individual substance; any kind of simple substance would satisfy it. But the Principle of Sufficient Reason imposes the further condition that the simple substance must have relations to other simple substances and to the whole, and that only those simple (self-consistent) substances are real which are also consistent with the real unity of the whole. For otherwise every real substance would have its ground or reason wholly in se, and those things for which we must be content with a ground or reason in alio would be entirely illusory. Thus the combination of self-consistency with consistency in relation to /

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(1) "Principles of Nature and of Grace". 2

to the whole is what Leibniz means by the character of the Monad as at once exclusively individual and representative or perceptive of the whole Universe from its particular point of view.

Again, the Appetition of the Monads is due entirely to the Principle of Sufficient Reason. A Substance which is real in virtue of its mere possibility can have no tendency to a change of state. (1) If it were really to change, it would cease to be itself. But the Appetition of the Monads is ruled not by the principle of realising the self-consistent or the abstractly possible, but by the principle of realising the best or the full harmony of a system. The Pre-established Harmony of the Universe as a system of "compossible" substances is the ground or reason of the Appetition in each, the principle of its changes. But this, as we have seen, is a consequence of admitting the Principle of Sufficient Reason.

Lastly, a very slight consideration will show that the law of continuity (with its obverse, the identity /

identity of indiscernibles) is a particular application of the Principle of Sufficient Reason. A breach in the continuity of the Series of Simple Substances would mean a void in nature. Such a void is not inconsistent with the Principle of Contradiction: it is not self-evidently impossible. But it is inconsistent with the principle of the best or most fitting, which governs the actual system of things, that is to say, it is inconsistent with the Principle of Sufficient Reason. That one possible thing is in itself more perfect than another is no sufficient reason for the existence of the former rather than the latter; the former might perhaps be incompatible, while the latter is compatible, with the rest of the world. But it is inconsistent with the Principle of Sufficient Reason that nothing should exist where something is possible; for the Principle of Sufficient Reason requires the existence of a complete world, that is to say, of that entire system of compossible things which contains the fullest reality or the greatest amount

of /

of essence.(1) Consequently the law of Continuity derives its force from the Principle of Sufficient Reason. And thus in general, Leibniz's solution of his main problem is accomplished by the Combination of the Principles of Contradiction and Sufficient Reason, giving, on the one hand, real units of substance, even more thoroughly impenetrable and indivisible than physical atoms, and on the other hand, in consistency with these, a real whole, which is not a mere aggregate of independent and perhaps mutually contradictory elements, but the most perfect system of mutually consistent or compossible substances, in each of which the whole is in some way ideally contained. (2).

NOTE to PAGE 3.

(1) For instance, the spectrum is continuous. There is no limit to the number of varieties of colour that may be discriminated in the rainbow: the usual division into seven colours is an arbitrary arrangement made by observers. It probably originated in a suggested analogy with the musical scale.

NOTE to PAGE 6.

(1) "Cartesianae disciplinae intemperantia Spinozae doctrinam parit; in hoc sententia totum reperire est Leibnitium." (Lemoine, Quid sit materia apud Leibnitium, p.52.)

(2) Letter to the Abbé Nicaise; Erdmann, p.139. Leibnitz, especially in his earlier days, recognised that his philosophy had much in common with that of Spinoza, although, as time went on, it became more and more evident to him that they were fundamentally at variance. Thus in an early letter (Feby 1678), we find Leibnitz writing : - "I find in it" (the Ethics) "plenty of fine thoughts agreeing with mine, as is known to some of my friends who are also friends of Spinoza. But there are also paradoxes which seem to me unreal and not even plausible. As for example, that there is only one Substance, namely God; that created things /

NOTE 2 to PAGE 6, Continued.

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things are modes or accidents of God; that our mind has no wider outlook (nihil amplius percipere) after this life; that God Himself thinks indeed, but nevertheless neither understands nor wills; that all things happen by a certain necessity of fate; that God acts not for an end but by a certain necessity of nature, which is verbally to retain, but really to give up, providence and immortality. I regard this book as a dangerous one for people who will give themselves the trouble to go deeply into it, for others do not care to understand it." Archiv für Geschichte d. Philosophie, Vol. III.

NOTE to PAGE 8.

(1) It is true that Spinoza regards Substance as indivisible, in the sense that it has no real parts; and this may seem inconsistent with the contention that Spinoza's Substance is merely quantitative. But the contradiction is Spinoza's: it is a fragment of the great fissure of inconsistency that traverses his whole system, namely, the confounding of a Substance possessing infinite attributes with a Substance whose reality is reached by the exclusion of all specific determinations. If we hold strictly to the second of these views of Substance, then Substance can be said to be indivisible only on the ground that there is nothing to divide. cf. Spinoza, Ethics, Part I. Prop. 12 and 13 with Tractatus de Intellectus Emendatione, 108, II, III.

NOTE to PAGE 9.

(1) Cf. Descartes, Principia, Part II, Section 8. "Quantity and number differ only in thought (ratione) from that which has quantity and is numbered." Section 11. "It will be easy to discern that it is the same extension which constitutes the nature of body as of space, and that these two things are mutually diverse only as the nature of the genus and species differs from that of the individual, provided we reflect on the idea we have of any body, taking a stone for example, and reject all that is not essential to the nature of body. In the first place, then, hardness may be rejected, because if the stone were liquefied or reduced to powder, it would no longer possess hardness, and yet would not cease to be a body; colour also may be thrown out of account, because we have frequently seen stones so transparent as to have no colour; again, we may reject weight, because /

NOTE to PAGE 9 (Continued).

because we have the case of fire, which, though very light, is still a body; and finally, we may reject cold, heat, and all the other qualities of this sort, either because they are not considered as in the stone or because, with the change of these qualities, the stone is not supposed to have lost the nature of body. After this examination we shall find that nothing remains in the idea of body, except that it is something extended in length, breadth and depth; and this something is comprised in our idea of space, not only of that which is full of body, but even of what is called void space."(Veitch's translation) cf. Principia, Part I. Sections 51-53, 63-65.

NOTES to PAGE 10.

(1) The mechanical view of things "has two forms: Cartesianism and Atomism . . . . . The one, which makes matter continuous, may be called geometrical mechanism; the other, which makes it discontinuous, may be called arithmetical mechanism." E. Boutroux, La Monadologie de Leibnitz, etc. p.36.

(2) Monadology, Sec. 1.

(3) Monadology, Sec. 12.

NOTE to PAGE 12.

(2) "All magnitudes (grandeurs)may be divided ad infinitum. None of them is so small that we cannot conceive in it an infinity of divisions which will never be exhausted." Letter to M. Foucher, Erdmann, p.115.

NOTES to PAGE 13.

(1) "New System of Nature, etc.," Section 11.

(2) Cf. Commercium Epistolicum Leibnitii et Bernoullii, Epist.78 (Vol.1.p.397) "Indeed many years ago I proved that a number or sum of all numbers involves a contradiction, if it be taken as one whole. And the same is true of an absolutely greatest number and an absolutely least number or an absolutely smallest fraction . . . . . Now just as there is no (given) numerical element or smallest part of unity or least among numbers; so there is no (given) least line or lineal element; for a line, as a unity, can be cut into parts or fractions. . . . . Suppose that in a line there are actually $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$, etc., and that all the terms of this series actually exist. You infer from this that there is also an absolutely infinite term, but I think nothing else follows from it than that there actually exists any assignable finite fraction /

NOTE (2) to PAGE 13 (Continued).

fraction however small. . . . . And indeed I conceive points, not as elements of a line, but as limits, or negations of further progress, or as ends (terminos) of a line." Cf. Letter to Foucher (1693), Foucher de Careil, Lettres et Opuscules inédits de Leibnitz,p.120." As to indivisible points in the sense of the mere extremities of a time or a line, we cannot conceive in them new extremities, nor parts, whether actual or potential. Thus the points are neither large nor small and no leap is involved in passing them. Yet the continuous, though it has everywhere such indivisible points, is not composed of them."

NOTES to PAGE 17.

(1) Leibnitz does hold that all real Substances are organic (cf.p.~~147~~.) But the notion of organism, as he uses it, is much more vague that it has since become. According to Leibnitz anything is an organism, if it has a 'soul' or principle of unity, that is to say, if it is other than a mere aggregate of independent elements.

(2) Système nouveau, etc., 3.

NOTE to PAGE 18.

(1) Cf. Janet, Vol.I, p.655. "Every machine pre-supposes some Substance in the pieces from which it is made, and there is no manifold without real units. In short I take as axiomatic this identical proposition, in which the difference is entirely a matter of accent, namely, that what is not really one (un) being is not really a (un) being. It has always been thought that unity (l'un) and being are reciprocal things. "Being" is one thing, "beings" is another; but the plural pre-supposes the singular, and where there is not one being, there will still less be several beings."

NOTES to PAGE 20.

(1) cf. De Anima Brutorum, 12 (Erdm. p. 464 b.)

"Not only is the variety of the object represented in that which has Perception; but there is also variation in the Representation itself, since that which is to be represented varies."

(2) cf. Epistola ad Wagnerum (1710) Erdm. 466 a.

..... "Monads, and, so to speak, Metaphysical Atoms, without parts."

NOTES to PAGE 21.

(1) Professor Ludwig Stein, in his Leibnitz und Spinoza has shown that the term 'Monad' was actually suggested to Leibnitz, not by the writings of Bruno, but by Leibnitz's Contemporary, François Mercure Van Helmont, (1618-1699) with whom he had much intercourse and considerable correspondence. Greek ἡ μόνας to the Greeks meant simply the unit in Arithmetic. Leibnitz himself attributes the term to Pythagoras. In the sense of a numerical unit it occurs in Plato, (Philebus 15 B, Phaedo 105 C, 101 E.) But in addition to Leibnitz, the chief authors who have made much use of the term are Nicholas of Cusa and Bruno.

(2) Hegel, Geschichte der Philosophie, III,, 412.

NOTES to PAGE 22.

(1) cf. p. ~~189~~, also Epistola ad Wagnerum, (1710), Erdm. 466 a. "This correlation of the internal and external, or representation of the external in the internal, of the compound in the simple, of multiplicity in unity, really constitutes Perception."

(2) Monadology, Sectn. 15.

NOTES to PAGE 23.

(1) "We could not say in what the Perception of plants consists, and even that of animals is not well conceived by us. Yet, according to the general sense I give to these words, in order that there may be a Perception, it is enough that there should be a variety in unity; and in order that there may be Appetition it is enough that there should be a tendency to new Perceptions." Letters to Bourguet, IV. Erdmann, p. 732.

(2) Monadology, Sectn. 1.

(3) Monadology, Sectn. 7.

(4) Monadology, Sectns. 3 - 6.

NOTE to PAGE 24.

(1) As to the contrast between Leibnitz's view of Substance and that of Locke, v. Locke's Essay, Fraser's Edition, Vol. I., pp. 399 et seq.

NOTE to PAGE 25.

(1) "There are no two indiscernible individuals. A clever gentleman of my acquaintance, talking with me in presence of Mme the Electress, in the garden of Herrenhausen, was of opinion that he could quite well find two leaves entirely alike. Mme the Electress would not believe it, and he spent a long time vainly seeking them. Two drops of water or of milk, looked at through a microscope, will be found discernible. This is an argument against atoms, to which, no less than to the void, the principles of true metaphysic are opposed . . . To suppose two indiscernible things is to suppose the same thing under two names." Letters between Leibnitz and Clarke. Letter IV of Leibnitz, 4, 6. Cf. Nouveaux Essais, Bk. II, Ch. 27, Sectn 3.

NOTE to PAGE 26.

(1) G.W.F. Von Leibnitz, Eine Biographie, Vol. I., Anmerkungen, p. 32. The Academy of Berlin declared this letter to be spurious; but there seems no good reason to doubt its genuineness. All they proved was that the letter had not been addressed to the person to whom it was said to have been addressed.

Cf.. Locke, "Essay on Human Understanding", Bk. III., Ch. 6, Sectn 12, Fraser's Edition, Vol. I, p. 67; cf. note on p. 380.

NOTE to PAGE 28.

(1) cf. Lettres et Opuscules inedits de Leibnitz, par. A. Foucher de Careil, p.121. "I hold by the actual infinite to such an extent that, in place of admitting that Nature abhors it, as is commonly said, I maintain that Nature affects it everywhere, so as the better to indicate the perfections of its Author. Thus, I think that there is no part of matter which is not, I do not say merely divisible, but actually divided; and consequently the smallest particle must be regarded as a world filled with an infinity of different creatures." Also Letter to Arnauld, Janet, Vol. I, p. 681. "Not only is the continuous infinitely divisible; but every part of matter is actually divided into other parts."

NOTE to PAGE 30.

(1) How the perfect independence of the Monads is to be reconciled with the continuity of their series is a question to be afterwards discussed, ~~v. Sectn IV. of this Introduction, p.~~

For Leibnitz the ideal unity of the Monads (as each representing the same Universe) does not make their mutual independence any the less complete.

NOTES to PAGE 32.

(1) Monadology, Sectn 51.

(2) Cf. Nouveaux Essais, Bk. IV., Ch. 10, Sectn 10.

"As each of these souls expresses in its own way what takes place outside of it and is unable to have any influence upon other particular beings, or rather, as each must draw this expression entirely from within its own nature, each soul must necessarily have received this nature (or this internal ground of its expressions of what is external) from a Universal Cause, upon which these beings are all dependent and which makes each of them to be perfectly in agreement and in correlation with every other. This requires infinite knowledge and power and great ingenuity, especially with reference to the spontaneous agreement of a mechanism with the activities of the rational soul."

NOTE to PAGE 33.

(1) Cf. Theodicy Part I. Sectn. 59. "The Scholastic philosophers believed that there is a reciprocal physical interaction between body and soul; but since a thorough investigation has shown that thought and extended mass have no connection with one another and that they are created things which differ toto genere, several modern writers have recognised that there is no physical communication between soul and body, although there always remains the metaphysical communication, which makes of soul and body one and the same agent, or what is called one person."

NOTE to PAGE 34.

(1) "Leibnitz and Geulincx mit besonderer Beziehung auf ihr beiderseitiges Uhrengleichniss", Tübingen, 1884. Zeller comes to the same conclusion. The illustration appears in a note to Geulincx's Ethica, (pp. 123, 124). The notes did not appear in the first edition of this book, and they do not seem to have been known to Leibnitz. He received the illustration from Foucher, who probably arrived at it independently, not knowing that it was used by Geulincx. Cf. Erdm, p. 130.

L. Stein holds that Leibnitz was unaware of the source of the illustration and may have considered it superfluous to assign any special source for it, inasmuch as it was a universally used simile, characteristic of the Cartesian School (a "Schulbeispiel"). With other references the illustration is used both by Descartes and by Cordemoy. Archiv für Geschichte d. Philosophie, I. 59.

NOTE to PAGE 35.

(1) "When I speak of the force and action of created beings, I mean that each created being is pregnant with its future state, and that it naturally follows a certain course, if nothing hinders it; and that the Monads, which are the true and only Substances cannot be naturally hindered in their inner determinations, since they include the representation of everything external (to them). But nevertheless, I do not say that the future state of the created being follows from its present state without the co-operation(concours)of God,and I am rather of opinion that preservation is a continual creation with an orderly change. Thus Father Malebrauche might perhaps approve the Pre-established Harmony without giving up his own hypothesis, to the effect that God is the Sole Agent (acteur); though it is true that otherwise it (his hypothesis) does not appear to me well-founded." Letters to Bourguet,III.Erdm.p.722.

NOTE to PAGE 36.

(1) Cf. H. C. W. Sigwart, "Die Leibnizsche Lehre von der prästablirten Harmonie in ihrem Zusammenhange Mit früheren Philosophemen betrachtet. "(Tubingen 1822) pp. 107 et seq.

NOTES to PAGE 37.

(1) For an instance of the way in which Leibnitz applies his theory to a particular case (that of the relation between a pin-prick in the body and pain in consciousness), cf. Janet, Vol. I. p. 670. "We have now to inquire how the soul is conscious of the motions of its body, since we can see no way of explaining by what channels the activity of an extended mass can pass into an indivisible being. Ordinary Cartesians declare that no explanation of this union can be given. The authors of the hypothesis of Occasional Causes think that it is "nodus vindice dignus, cui Deus ex Machina intervenire debeat." For my part I explain it in a natural way. From the notion of Substance or Concrete (accompli) being in general, which declares that its present state is always a natural consequence of its preceding state, it follows /

NOTES to PAGE 37 contd.

follows that the nature of each individual substance, and consequently of every soul, is to express the Universe. Each has been from the first created such that, in virtue of the laws of its own nature, it must happen that it is in harmony with what takes place in bodies, and especially in its own body. We need not then be surprised to find that it has the power of representing to itself the pin-prick, when this takes place in its body. And, to complete my explanation on this point, we have:-

State of the body at moment A.	State of the soul at moment A.
State of the body at the following moment B. (Pin prick)	State of the soul at moment B. (Pain)

As, then, the state of the body at moment B follows /

NOTES to PAGE 37. Contd.

follows from the state of the body at moment A, so the state of the soul B is a consequence of A, the preceding state of the same soul, according to the notion of Substance in general. Now, the states of the soul are naturally and essentially expressions of the corresponding states of the world, and especially of the bodies which for the time belong to the soul. Accordingly since the pin-prick is a part of the state of the body at the moment B, the representation or expression of the pin-prick, (i. e. the pain) will be a part of the soul at the moment B; for, as one motion follows from another motion, so one representation follows from another representation in a substance whose nature is to be representative. Thus the soul must needs be conscious of the pin-prick, when the laws of relation require it to /

NOTES to PAGE 37 contd.

to express more distinctly a more observable change in the parts of its body. It is true that the soul is not always distinctly conscious of the causes of the pin-prick and of its coming pain, when these are still hidden in the Representation of the State A, as when we sleep or in some other way are unaware of the approach of the pin. But that is because the motions of the pin at that time make too little impression, and though we are already in some way affected by all these motions and their Representations in our Soul, and thus have within us the Representation or Expression of the causes of the pin-prick, and consequently the cause of the Representation of the same pin-prick, that is to say, the cause of the pain, - yet we can unravel them from the multitude of other thoughts only when they become /

NOTES to PAGE 37 Contd.

become noticeable. Our soul reflects only upon the more marked phenomena, which stand out from the others: not thinking distinctly of any, when it thinks equally of all. After this explanation, I cannot imagine where anybody can find the least shadow of farther difficulty, unless they are prepared to deny that God can create substances which are so made from the beginning that each in virtue of its own nature, is afterwards in harmony with the phenomena of all the others. Now, nobody seems to deny this possibility, and since we see that Mathematicians represent in a machine the motions of the heavenly bodies (as when

Jura poli rerumque fidem legesque deorum
Cuncta Syracusius transtulit arte senex,

which we can do to-day much better than Archimedes could in his day) why could not God, who /

NOTES to PAGE 37 contd.

who excels them infinitely, from the beginning create Representative Substances in such a way that they express by their own laws, according to the natural change of their thoughts or Representations, all that is to happen to every body? This seems to me not only easy to conceive, but also worthy of God and of the beauty of the Universe, and in a way necessary, since all substances must have a mutual harmony and connection, and all must express in themselves the same Universe and the Universal Cause, which is the will of their Creator, and the decrees or laws which He has established, in order to make them fit into one another as well as possible. Thus this mutual correspondence of different substances (which speaking with metaphysical strictness, cannot act upon one another and yet are in harmony as if one /

NOTES to PAGE 37 Contd.

one did act upon another) is one of the strongest proofs of the existence of God or of a Common Cause which each effect must always express according to its point of view and its capacity of expression. Otherwise the phenomena of different minds would not harmonise and there would be as many Systems as Substances; or rather it would be entirely a matter of chance, if they were sometimes in harmony."

(2) This was suggested to Leibnitz by an experiment of Huygens. He joined two pendulums by a bar of wood and found that, though they were set swinging out of time with one another, the vibrations which each gave to the bar of wood caused them ultimately to swing in harmony.

NOTE to PAGE 43 .

(1) Leibnitz, however, interprets clearness and distinctness somewhat differently from Descartes. The distinction of one idea from all others is emphasised by Descartes, while Leibnitz rather lays stress upon the internal distinctness of the idea, the distinctness of its elements. Cf. Meditationes de Cognitione, Veritate et Ideis (1684), Erdm. 79a. "A notion is obscure, when it does not suffice for the recognition of the thing represented, as for instance when I remember some flower or animal formerly seen, but not so well as to be able to recognise it when it appears and to distinguish it from some other near it, or when I think of some scholastic term insufficiently explained, like the "Entelechy" of Aristotle, or "cause" in so far as the name is applied indifferently to material, formal, efficient and final causes . . . . . .

Thus /

NOTE to PAGE 43. Continued

Thus knowledge is clear, when it enables us to recognise the thing represented, and clear knowledge again is either confused or distinct. It is confused when I cannot separately enumerate the marks which are sufficient for distinguishing the thing from others, although the thing really has such marks and essential elements, into which its notion may be analysed. . . . . So we see painters and other artists knowing rightly what is well and what is badly done, but often unable to give a reason for their opinion and saying that the thing they dislike is lacking in something, they know not what. But a distinct notion is such an one as the Assayers have regarding gold, namely one acquired through marks and tests sufficient for the discerning of the thing from all other similar bodies." For Locke's views, v. Essay, Bk II. Ch 29, Sections 1 and follg, Fraser's Edition, Vol.1. p. 486.

NOTE to PAGE 47.

(1) Cf. De Anima Brutorum, 10; Erdmann, p. 464 : - "Sense is Perception which contains something distinctly and is combined with attention and memory. Besides the lowest degree of Perception, which also occurs in those who are stunned, and the intermediate degree, which we call sense, there is a certain higher degree which we call thought. Now thought is Perception combined with reason."

NOTE to PAGE 51.

(1) Leibniz seems strangely to have missed the significance of Descartes's method of doubt, probably because his interest lay more in Descartes's doctrines than in his way of reaching them. "M. Descartes," he says, "has acted like the quacks (charlatans) who, in order to attract people and get a sale for their remedies, set up open theatres in which they show unusual farces and other extraordinary, but not very necessary things. Thus all that he says about the necessity of doubting everything and of treating doubtful things as false, has had no other use than to get him a hearing, to raise a commotion, to draw the crowd by its novelty, and even to get himself contradicted, that he may be the more famous. But he has taken care to reserve for himself a way of rationally explaining his paradoxes." Foucher de Careil, Nouvelles Lettres et Opuscules inédits, p. 12.

We /

NOTE to PAGE 51 Contd.

We must, of course, remember how different is the problem of Descartes from that of Leibniz. Descartes lays special stress upon self-consciousness because he regards himself as having found a principle by means of which to distinguish absolutely the true from the false or doubtful. On the other hand, for Leibniz as for Spinoza, the problem of philosophy is not primarily a problem of knowledge. Leibniz's theory of knowledge follows from his answer to the question :- "What in reality is substance?"

NOTES to PAGE 52.

(1) Nouveaux Essais, Bk.1V. Ch 2, Sectn 1.

(2) "To say, I think, therefore I am (exist) is not strictly to prove existence by thought, since to think and to be thinking are the same thing; and to say I am thinking is already to say I am." Nouveaux Essais, Bk.1V. Ch. 7, Sectn 7.

NOTES to PAGE 53.

(1) Monadology, Sectn 29.

(2) Cf. Meditationes de Cognitione,Veritate et Ideis, Erdmann, pp. 80, 81. Translated in Appendix to Baynes's Edn of Port-Royal Logic. "And I also see that the men of our time abuse that vaunted principle: whatever I clearly and distinctly perceive regarding anything, that is, true or (rightly) predicable (enuntiabile) of it. For often things which are really obscure and confused seem clear and distinct to men judging hastily. The axiom, therefore, is useless, unless there be added such criteria of the clear and distinct as we have given, and unless there is certainty regarding (constet) the truth of the ideas. For the rest, the rules of common Logic, which are also used in geometry, are not to be despised as criteria of true statements, such rules, for instance, as that nothing should be admitted as certain, unless /

NOTES to PAGE 57.

(1) Cf. Monadology, 35-38.

(2) Not that this was perfectly evident to themselves. Descartes, for instance, regards his method of doubt as superior to a logical deduction, based on the Principle of Contradiction. "Here if I am not wrong," says Eudoxus, "you must be beginning to see that he who can make a proper use of Doubt, will be able to deduce from it very certain truths, nay rather, more certain and more useful truths than those which we derive from the great principle we usually lay down as the basis or centre to which all other principles may be referred, 'it is impossible that one and the same thing can both be and not be.'" Recherche de La Verité par les lumières naturelles, Oeuvres de Descartes (Cousin), Vol II, p. 366.

NOTES to PAGE 58.

(1) Spinoza Ethics, Part 11, Prop. 7.

(2) Monadology, 35. Cf. Monadology 31. The principle of contradiction is that "in virtue of which we judge false that which involves a contradiction and true that which is opposed or contradictory to the false."

NOTES to PAGE 59.

(1) Cf. Locke's Essay, Bk. IV, Ch. 8, Sectn 3. Fraser's Edition Vol. II, p. 293.

(2) Cf. Nouveaux Essais Bk. IV, Ch. 7, Sectn 9. "In the natural" (i.e. logical) "order, the statement that a thing is what it is, is prior to the statement that it is not another thing."

(3) Cf. Nouveaux Essais Bk. I, Ch. 3 :- "It is one of my great maxims, that it is good to work out proofs of the axioms themselves." V. Fraser's Edition of Locke's Essay, Vol. II, p. 267, note. V. also Correspondence with Bernoulli, Vol. I, p. 96 - Translate.

(4) Cf. Nouveaux Essais, Bk. IV, Ch. 11. "As to eternal truths, it is to be noted, that at bottom they are all conditional and say in effect : such a thing being supposed, such another thing is."

NOTE to PAGE 61.

(1) According to Leibniz, all true propositions must be such that their predicate is really contained in their subject, although this may not be self-evident. This is simply expressing in another form his view that "in the notion of each individual substance all its events are contained along with all their circumstances and the whole sequence of External things." Correspondence with Arnauld, Janet, Vol.I,p.578.

. . . "Always in every true affirmative proposition, whether necessary or contingent, universal or singular, the notion of the predicate is in some way comprehended in that of the subject; praedicatum inest subjecto; otherwise I know not what truth is. But I require no more connection here than that which exists a parte rei between the terms of a true proposition, and it is only in this sense that I say that the notion of the individual /

NOTE to PAGE 61. Continued.

individual substance includes all the events and all its characteristics, even those that are commonly called extrinsic (that is to say, those which belong to it only in virtue of the general connection of things and on account of its expressing the whole universe in its own way). 'For there must always be some foundation for the connection of the terms of a proposition, and this is to be found in their notions.' That is my great principle, as to which I think all philosophers should be at one, and of which one of the corollaries is the common axiom, that nothing happens without it being possible to give a reason why things should have gone thus rather than otherwise, although this disposes reason often inclines without necessitating, a perfect indifference being a chimerical or incomplete supposition." Correspondence with Arnauld, Janet, Vol.I, p. 617.

NOTES to PAGE 62.

(1) Cf. De Scientia Universali seu Calculo Philosophico, Erd. 83 b. "The difference between necessary and contingent truths is indeed the same as that between commensurable and incommensurable numbers. For the reduction of commensurable numbers to a common measure is analogous to the demonstration of necessary truths, or their reduction to identical truths. But as in the case of ~~said~~ surd ratios the reduction involves an infinite process and yet approaches a common measure so that a definite but unending series is obtained, thus also contingent truths require an infinite analysis, which God alone can accomplish. Accordingly it is by Him alone that these truths are known a priori and with certainty. For although the reason of any succeeding state might be found in that which precedes it, yet a reason for this preceding state can again be given, and so /

NOTES to PAGE 62 Continued.

so we never come to the final reason in the series. But this infinite process itself takes the place of a reason, because in its own special way it might from the beginning have been immediately understood outside of the series, in God, the Author of things, on whom both antecedent and consequent states are dependent, even more than they are dependent upon one another."

(2) Monadology, 36 and 37.

NOTE to PAGE 63.

(1) Monadology 32. In the Theodicy, Sect. 44, he calls it "Determining" (deciding) "Reason".

NOTES to PAGE 65.

(1) Cf. Erd. p. 80 b.

(2) Letters to M. Bourguet, 2. Erdm. p. 720 a.

NOTE to PAGE 66.

(1) Descartes did not admit that everything which is possible is realised, but assigned the choice among possible things to the mere will of God. But this is practically to make the choice arbitrary and consequently to make the contingent (which is the result of choice) fortuitous. Spinoza, on the other hand, by holding that everything possible is realised, made the contingent necessary.

NOTES to PAGE 67.

(1) Cf. Letters to Bourguet, 2, Erdmann, p.719 b. "I do not admit that, in order to know whether the romance of Astraea (Astrée) is possible, it would be necessary to know its connection with the rest of the Universe. That would be necessary in order to know whether it is compossible with it and consequently, whether this romance has been, is now, or shall be (realised) in any corner of the Universe. For assuredly, without that, there will be no place for it. And it is very true that what does not exist, has never existed and never shall exist, is not possible, if by possible we mean compossible, as I have just said . . . . . But it is another question whether Astraea (l'Astrée) is absolutely possible. I say "yes", because it involves no contradiction. But in order that it may actually exist, the rest of the Universe would have to be quite other than it is, and it is possible that it may be otherwise."

(2) /

NOTES to PAGE 67 (continued).

(2) Correspondence with Arnauld, Janet, Vol.I. p.607.

"If we were to reject absolutely things which are merely possible, nothing would be contingent, for if nothing is possible except what God has actually created, whatever God has created would be necessary, - supposing that God has resolved to create anything."

NOTE to PAGE 68.

(1) According to Leibniz, existence (or the creation which produces existence) involves no change in the essence of a thing. Its essence is the same, whether it be in the actual world or merely in the region of the Divine ideas.

NOTES to PAGE 74.

(1) The problem how the simple substance can contain differences is the same as the problem, how the Principles of Contradiction and Sufficient Reason can be treated as independent and co-ordinate. Of this Leibniz offers no clear solution.

(2) Cf. p. 61a, note.

NOTE to PAGE 77.

(1) cf. Spinoza's "Conatus", the "effort by which each thing endeavours to persevere in its own being," and which is "nothing but the actual essence of the thing itself." Ethics, Part III. Prop. 7. Leibniz might say that, on Spinoza's principles, to call this an "effort" is to beg the question.

NOTES to PAGE 79.

(1) Cf.Correspondence between Leibniz and Clarke, Note appended to 4th Letter of Leibniz. (Clarke's translation). "In like manner, to admit a vacuum in nature, is ascribing to God a very imperfect work; 'tis violating the grand principle of the necessity of a Sufficient Reason; which many have talked of, without understanding its true meaning . . . . . To omit many other arguments against a vacuum and atoms, I shall here mention those which I ground upon God's perfection and upon the necessity of a Sufficient Reason. I lay it down as a principle that every perfection which God could impart to things without derogating from their other perfections, has actually been imparted to them. Now let us fancy a space wholly empty. God could have placed some matter in it, without derogating in any respect from all other things; therefore He hath actually placed /

NOTES to PAGE 79(continued)

placed some matter in that space : therefore there is no space wholly empty : therefore all is full . . . . . I shall add another argument, grounded upon the necessity of a Sufficient Reason. 'Tis impossible there should be any principle to determine what proportion of matter there ought to be, out of all the possible degrees from a plenum to a vacuum, or from a vacuum to a plenum." (?The proportion of either plenum to vacuum or of vacuum to plenum). "Perhaps it will be said that the one should be equal to the other; but, because matter is more perfect than a vacuum, reason requires that a geometrical proportion should be observed, and that there should be as much more matter than vacuum as the former deserves to have the preference before the latter. But then there must be no vacuum at all; for the perfection of matter is to that of a vacuum as something /

NOTES to PAGE 79(continued)

something to nothing." Cf. also the beginning of Leibniz's second letter.

(2) Further consideration of the relation between these two great principles in the philosophy of Leibniz is given in the third section of this Introduction, p. .

III. DETAILED STATEMENT of the PHILOSOPHY of LEIBNIZ:

Passing from the general consideration of the doctrines of Leibniz, we now come to their more specific development. We shall, in the first place, examine the relation between his philosophical principles and the ruling conceptions of his mathematics, and we shall afterwards endeavour to trace the Principles of the Monadology in the various departments of knowledge which are concerned with Matter, with Organism and with Self-consciousness. This review of human knowledge, proceeding from the most abstract or simple to the most concrete or complex of the sciences,[1] will reveal to us the interpretation which Leibniz's conception of Substance requires us to give to the judgments of common consciousness. From another point of view, we may consider ourselves as inquiring :- "What are the answers which Leibniz would make to objections against his system, based upon facts, hypotheses or common beliefs in mathematical and physical, biological and mental Science?"

A. LEIBNIZ'S MATHEMATICS in relation to his PHILOSOPHY.

It was partly through Mathematics that Leibniz arrived at the Notion of Substance which is the core of his Philosophy. Dissatisfaction with the Mathematics of Descartes and with its consequences in Physics led him to reject the Cartesian theory of matter and motion and to substitute for it a more adequate theory of Force and a higher Mathematics. Both the Mathematics and the Physics of the time appeared to Leibniz to be too abstract, and the great object of his speculations was to bring them more into touch with concrete reality.

The Transition from Synthetic to Analytic Geometry :

Early in the 17th Century a considerable advance was made in the Science of Mathematics, mainly through the work of Kepler, Cavalieri and Descartes. The Geometry of the Greeks was synthetic or synoptic. It dealt with ideal figures as discrete wholes, not taking /

taking into consideration the possibility of their being analysed into elements, of which they are combinations or functions. Thus the relations of the figures to one another are considered as external. Each is what it is : no one is regarded as having in it the possibility of passing into another A rectilineal figure is one thing; a curvilinear figure is another. The barriers between them are regarded as insurmountable, at least by the methods of exact or demonstrative science. Thus a curve is still a curve, however small may be its curvature. A polygon is still a polygon, however numerous may be its sides. And the kinds of curves are each independent of the others : An ellipse is still an ellipse, however distant one focus may be from the other.

Kepler's introduction of the notion and the name of infinity into Geometry was the beginning of a great change in Mathematical Methods. The geometrical figures of the Greeks were all finite and therefore capable of representation to the eye, or, in /

in other words, capable of being pictured. Every curve must have a definite curvature. Every polygon must have a definite number of sides. Kepler, in order to attain to greater exactness in the statement of mathematical relations, suggested that finite (or definite) figures might be regarded as consisting of an infinite (or indefinite) number of elements. Thus he considered a circle to be composed of an infinite number of triangles, having their common vertex at the centre and forming the circumference by their bases. (1) Such an analytic conception of the figure is, of course, not capable of being pictured. But it at once suggests the possibility of representing the figure, not by a rough drawing or image, but by an infinite numerical series the terms of which are so related to one another that their sum is finite. Accordingly, in thus considering the finite as made up of an infinite number of elements, we have promise of a connection between geometry and algebra, of such a kind that geometrical relations may be symbolised algebraically and the knowledge /

knowledge of them may be extended and generalised by calculation. Such a connection would mean the reduction of the discontinuous concepts of Synthetic Geometry to the comparative continuity of Algebraic Concepts or Numbers. It would thus lessen the abstractness of geometry, and make it more adequate to the continuity of nature, or, looking at the same thing from the opposite point of view, it would enable the continuous system of space-relations to be more completely brought within the range of mathematical demonstration. For instance, problems which the Greeks had to solve by the indirect and unsuggestive method of reductio ad absurdum would now be capable of a direct demonstrative solution, and there would arise many new problems which the old methods could not touch.

The Basis of Analytical Geometry :

This connection between algebra and geometry was definitely established by Descartes in the Analytical Geometry, of which he was the inventor. The basis of the Analytical Geometry is the finding of /

of a definite proportion between the space-relations or ratios investigated by geometry and certain numerical ratios. But the space-relations of geometry are not merely quantitative as are the relations of number. To take the simplest of instances, the square upon a line may be represented by the square of a number. But the square of a number $\underline{n}$ is simply $\underline{n}$ times $\underline{n}$, that is to say, it is the sum of $\underline{n}$ $\underline{n}$'s added together. The square of $\underline{n}$ is a quantity of $\underline{n}$'s or a simple series of homogeneous units, which may be interchanged within the series without in any way affecting the result. On the other hand, the relation of a geometrical square to the line upon which it is constructed (i.e., to any one of the sides) is not purely quantitative. The square is not a sum of lengths. It is a figure with special characteristics. The line cannot intelligibly be regarded as its unit. It is its <u>side</u>, and as the side of a square, it has properties other than those which it would have as a mere line. It is, in fact, part of a unity which is more than that of /

of mere quantity. And yet a quantitative ratio can express the relation between the square and its side, in such a way that the properties of the square may be algebraically calculated without direct reference to the geometrical figure. Thus relations of quantity (that is to say, of mere aggregation) may become signs or symbols of relations which are more than quantitative, relations in which the part is not indifferent to the whole but characteristic of it. All the processes of algebra, however complex and elaborate, are forms of the addition and the subtraction (or separation) of abstract units. Thus the abstract number 1 remains the same, into whatever algebraic combination it may enter as a part. But the conception of a straight line, for instance, varies, (the line has various functions) according to the nature of the whole into which it enters as a part, and according to the special way in which it is related to the whole. Thus in relation to different kinds of figures (rectilineal, curved, etc.,) or on account of the various forms of its relation to one and the same figure, a straight line is a side, a tangent /

tangent, a radius, a directrix, an axis, a sine, etc. There is a closer, more real unity between the part and the whole than in the relation of mere quantity, where the part is indifferent to the special character of the whole.

Relations of purely Quantitative Unity and Geometrical Unity. Infinite series and the infinitely little :

But there is no absolute gulf fixed between quantitative unity and geometrical unity. The difference is, that geometrical unity, while abstract in comparison with organic unity or with the real concrete unity of all existence, is less abstract than merely quantitative unity. And the bridge between the unity which is expressed in the algebra of finite quantities and that which is expressed in the geometry of finite space relations is to be found in the analysis of a finite quantity into an infinite series. No finite quantity can be resolved into an infinite series formed by an addition of independent integers, such as 1 + 1 + 1 etc, or even 1 + 2 + 3 etc /

etc., that is to say, by an addition not conditioned by any special law. But there are certain numerical series in which the terms are not mutually indifferent (nor immediately reducible to a set of mutually indifferent terms) but are arranged, or rather proceed from one another, according to a definite law, which law is of such a kind that, although it never brings the series actually to an end, it results in the sum of the series approaching more and more nearly to some finite quantity. Accordingly it is held that if the series be regarded as consisting of an infinite number of terms, the difference between the sum of its terms and the finite quantity will be infinitely little, and therefore practically negligible.

This "practically negligible" is the key-stone of the bridge between algebraic quantity and geometrical physical, or any other kind of relation. Strictly speaking, if the series be regarded as a pure sum, and therefore ultimately analysable into an addition of homogeneous units, $1 + 1 + 1$, etc., or /

or $\frac{h}{a} + \frac{h}{x} + \frac{n}{u}$,etc.,) the finitude of its sum is incompatible with its having an infinite number of terms. It is only inasmuch as the series is regarded not as a merely quantitative unity, but as a unity determined by a characteristic law or principle, that we are entitled to disregard the "infinitely little" difference between the sum of its terms and the finite quantity. There can be no absolute "infinitely little" in mere quantity. The "infinitely little" here considered is "infinitely little", as determined by the law or character of the particular series. That is to say, we are certain that the law of the series holds unchangeably, however far the process of analysis may be carried; and we have thus inferential certainty regarding the result of the analysis (the equation of the sum of the terms to the whole finite quantity), even although we may be unable actually to count each one of the terms. It is the law or principle of the series which enables us to say that the "infinitely little" difference may be neglected, because the character of the series is not affected by it.

But /

But in neglecting this "infinitely little" difference because of the special character or law of the series, we have virtually passed from the unity of mere quantity to a unity of character, a unity in which the parts are not entirely indifferent to the whole and to one another, but are connected in accordance with some special principle. We have thus given an indefinite increase of elasticity to the formulae of Algebra and have prepared the way for an algebraic representation and calculus not merely of the elementary space unities (figures) of the Greek Geometry, but also of more comprehensive geometrical unities of which these are elements, and further of physical unities and indeed of any unity the elements of which are in themselves capable of a sufficiently accurate quantitative expression. For instance, the phenomena with which physics deals are differences of a unity, elements in a whole. But the unity, the whole, is not one of quantity merely. And yet, its elements are capable /

capable of quantitative expression with a degree of accuracy such that its difference from absolute accuracy may be neglected, so far as physical science is concerned. Consequently it becomes possible to state and to work out problems of physical science in terms of Algebra.

The Infinitesimal Calculus and the Principle of becoming or system:

The practical development of this possibility is the function of the infinitesimal calculus of Leibniz and Newton. (1) As we have already seen, the Analytical Geometry reduces the discontinuity of Synthetic Geometry to the relative continuity of number, or quantity of homogeneous units. But number as a sum of finite units (even though it may take the form of an infinite series) is still to some extent discontinuous. It may, however, be made continuous by regarding its elements not as finite units, but as "infinitesimals" or infinitely little quantities. In other words any numerical unit we may choose to employ may be sub-divided infinitely /

infinitely, and thus every finite number may be regarded as the sum of an infinite series of infinitely small terms. This is the basis of the Infinitesimal Calculus as originally conceived by Leibniz. It may be otherwise expressed by saying that the series of finite numbers or quantities is ultimately to be expressed not as a series of terms which grow by finite increments (like 1 + (1 + 1) + (1 + 1 + 1) etc.), but as a series whose terms flow into one another, their differences being infinitely small. That is to say, any variable magnitudes must be regarded as increasing or diminishing by infinitely small increments or decrements. The work of the Calculus is to determine the relations between unknown quantities or magnitudes, not by considering them merely as fixed wholes and directly finding equations between them, but indirectly, by treating the quantities as variables or as growing, and in the first place finding equations between their elements or differences. (1)

Accordingly, for instance, Newton regarded all geometrical /

geometrical magnitudes as capable of generation by continuous motion. Lines may be regarded as generated by the motion of points, surfaces by that of lines and solids by that of surfaces. That is to say, these figures are distinct from one another, not absolutely but merely in the degree in which they possess certain characteristics. The difference between the point and the line is an infinitely small degree of length, the difference between the line and the surface is an infinitely small degree of breadth, the difference between the surface and the solid is an infinitely small degree of depth. "Motion", in Newton's way of putting it,is in this connection merely a metaphor for continuity.Again in physical science we have to deal with phenomena, which not merely are variable but are continually varying, and the Infinitesimal Calculus is of the utmost value in enabling us to state the laws of these variations,that is to say, to establish proportions between different sets of constantly changing phenomena.

The /

The value of the Infinitesimal Calculus in the interpretation of Nature rests ultimately on this, that the conception of "Infinitesimals" which it employs is a virtual recognition of system in knowledge or of the principle of becoming as distinct from that of abstract being. When we say that a thing (a geometrical figure, for instance) has a certain quality or characteristic in an infinitely small amount, we mean that it both has and has not that quality or characteristic, or, (to use another metaphor made familiar by Psycho-physics) that it is on the "~~Fringe~~ thres-hold" of having it. The identity of the thing is not merely superficial, of such a kind that when a quality seems to pass away from it, the thing ceases to exist and another thing appears: the identity of the thing is maintained through an indefinite amount of difference. Thus, as we have seen, the point, the line, the surface and the solid are all recognised as differences or relations within one system. So in general when we have shown that the difference between one thing and another is infinitely little, we /

we have not converted each into the other, but have explained them both by referring them to a common ground. We can express each in terms of the other, provided we state explicitly their relations to one another within some system. A Parabola is not an Ellipse; but a Parabola is an Ellipse with one of its foci at an infinite distance from the other.

Continuity and the Logical Calculus :

Now, it cannot be said that all this was fully manifest to Leibniz himself; but the truth of it underlies his thinking. The infinitesimal calculus in his mathematics is an expression of the same tendency of thought which makes the Principle of Sufficient Reason so important an influence in his philosophy, - the tendency to a less abstract, less dogmatic, more intensive way of looking at things, in contrast with the a priori deductive methods of the Cartesians. The influence of the mathematics of Leibniz upon his philosophy appears chiefly in connection with his law of Continuity and his prolonged efforts to establish a logical Calculus. As to the law of Continuity /

Continuity it is unnecessary to say more. It is the law of the endless relativity of things, the principle of system, of infinite multiplicity in unity, and we have seen that the Infinitesimal Calculus is an application of it. (1) On the other hand, the endeavour to find a Logical Calculus (implying a universal philosophical language or system of signs) is an attempt to apply in theological and philosophical investigations, an analytic method analogous to that which had proved so successful in Geometry and Physics. (2) It seemed to Leibniz that if all the complex and apparently disconnected ideas which make up our knowledge could be analysed into their simple elements, and if these elements could each be represented by a definite sign we should have a kind of "alphabet of human thoughts". By the combination of these signs (letters of the alphabet of thought), a system of true knowledge would be built up, in which reality would be more and more adequately represented or symbolised. For according to Leibniz, the progress of knowledge consists /

consists in passing from obscure to clear ideas, from clear to distinct, from distinct to adequate. Ideas are obscure when analysis has not proceeded so far as to enable us definitely to distinguish them from others. They are clear when we can so distinguish them, but are not yet able to enumerate their particular elements or qualities. They are distinct when we can enumerate their qualities, and they are adequate only when the analysis is complete, that is to say, when all the elements of the clear and distinct idea are themselves clear and distinct. In many cases the analysis may result in an infinite series of elements; but the principles of the Infinitesimal Calculus in Mathematics have shown that this does not necessarily render calculation impossible or inaccurate. (1) Thus it seemed to Leibniz that a synthetic calculus, based upon a thorough analysis, would be the most effective instrument of knowledge that can be devised. "I feel", he says, "that controversies can never be finished nor silence /

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(1) Cf. p. ~~95~~ 62 Note.

silence imposed upon the Sects, unless we give up complicated reasonings in favour of simple calculations, words of vague and uncertain meaning in favour of fixed symbols (caractères)." (1) Thus it will appear that "every paralogism is nothing but an error of calculation." "When controversies arise, there will be no more necessity for disputation between two philosophers than between two accountants. Nothing will be needed but that they should take pen in hand, sit down with their counting-tables and (having summoned a friend, if they like) say to one another : Let us calculate." This sounds like the ungrudging optimism of youth; but Leibniz was optimist enough to cherish the hope of it to his life's end.

This project of the Logical Calculus or philosophical language connects the Mathematics of Leibniz with his theory of knowledge, while the Calculus of Infinitesimals finds immediate application in his revision of Descartes's theories regarding matter and motion. Descartes treated motion and /

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(1) De Scientia Universali seu Calculo Philosophico, Erdm 83b.

and rest synthetically as constant quantitative wholes. Leibniz regards them analytically as consisting of an infinite series of degrees of one constant force. Accordingly Leibniz admits that the Cartesian laws of Motion have a certain validity in relation to "abstract" Motion, but denies that they are adequate to the "concrete" physical phenomena.

~~and physical, biological and mental science?"~~

~~A. Relation of Mathematics to Philosophy.~~

B. Matter. Descartes's Theory of Matter and Motion :

As we have already seen Leibniz's view of Matter can be understood only as it appears in contrast with that of Descartes. In accordance with his interpretation of the Principle of Contradiction, viz., that the essence of a thing consists in that only which is common to all its manifestations or, (otherwise expressed) in that only which remains after all varieties or specific determinations have been excluded, Descartes maintained that Matter is essentially extension. Bodily substance and magnitude or spatial extent are identical. And all the changes in matter or extension are ultimately reducible to motion. Motion is regarded by Descartes as being "the transference of a portion of matter or a body from the neighbourhood of those bodies which /

which are in direct contact with it, and which we consider as at rest, to the neighbourhood of other bodies or portions of matter."(1) Matter is infinitely divisible. Its division is due to motion. Its forms arise solely from the combinations and separations of its parts, which also are due to motion. "All the variety of matter or the diversity of its forms, depends on motion."(2) "I frankly avow that I acknowledge in corporeal things no other matter than that which can be divided, formed (figurées) and moved in all kinds of ways, that is to say, that which mathematicians call quantity, and which they take as the object of their demonstrations; and in this matter I consider only its divisions, forms (figures) and motions; and, in short, regarding this I will accept nothing as true, which is not deduced from it with as much certainty as belongs to a mathematical demonstration. And inasmuch as by this means all the phenomena of nature may be explained . . . . . it seems to me that in physics no other principles ought to be accepted. /

accepted, or even desired, than those which are here expounded."(1)

Conservation of Motion (or Momentum), its Direction being left out of account :

Again, according to Descartes, the quantity of motion in the world, (or in any material system complete in itself and apart from all external influences) is constant. The motion, (or momentum) whose quantity is thus constant, is in each particular case directly proportional to the mass and the velocity of the moving body, and it may be expressed by the formula M V. Now, no new motion can come to any body from itself: no material body is self-moved, because its essence is pure extension, and the idea of extension does not necessarily involve the transference of parts. To any quantity of matter, whether large or small, motion comes entirely from without. Thus at the creation of the world, the whole material Universe received a certain fixed quantity of motion, which is conserved by /

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(1) Principia, Part II., 64. (Translated from Abbé Picot's French).

by the "ordinary co-operation" (concours ordinaire) of God. Motion is thus a positive thing and not merely relative to rest. Motion is not opposed to motion, but to rest. Motions do not cancel one another: they are quantities which can merely be combined and separated. And, on the other hand, each individual portion of matter must remain in the state in which it is, unless it receives motion from outside itself. The motion of any one body is increased only by a corresponding decrease in the motion of some other; and the motion of any body is decreased only by a part of it passing into some other. Motion is diffused, but never destroyed.(1)

Now, it follows from this, that while the quantity of motion in the world, or in any isolated system of bodies, is constant, its direction is variable. For, as all space is body and is therefore a plenum, moving bodies must continually impinge upon others; and if a moving body be supposed to impinge upon a body at rest, of such mass that the moving body is unable to overcome its resistance and make /

make it move, then the direction of the moving body is changed: it rebounds in the direction from which it came or is deflected in some other way. But as the moving body has been unable to impart any of its motion to the body at rest, the quantity of its motion remains unchanged, while its direction changes - it being, of course, understood that the action of all other bodies, except the ~~four~~ two in question, is left out of account.(1)

Leibniz's Theory of Motion. Conservation of Force :

Now, according to Leibniz, motion is simply change of position. It is not a positive quality belonging, for the time being, to the moving body; but motion and rest are entirely relative to one another. If the relative position of any two bodies changes, we may regard either as moving and the other as at rest.(2) And in general, rest is merely an infinitely small degree of motion: nothing in the world is absolutely at rest. Accordingly, no /

no body begins to move from a state of absolute rest, but from a state which is to be conceived as already one of motion, however small in amount. Actual motion is not something added to a body which, to begin with, is bare mass : it is always gradual growth or increment of a motion which is already there. Descartes, then, was right in interpreting motion as change of position, but wrong in regarding the total quantity of motion in the Universe, or in any independent system, as constant. He was right also in holding that each body tends to continue in the state in which it is; but he was wrong in supposing that one motion cannot oppose another, but can only be opposed by rest. As a matter of fact everything tends to move and would move, were it not for counteracting tendencies to motion in other things. (1) That which is conserved, then, is not actual motion, as an extrinsic property of material substance, but this intrinsic tendency or potentiality of motion, which Leibniz calls Force. As mere change of position does not enable /

enable us to attribute motion to one of the two bodies whose position changes and not to the other, the body which we call the moving body (as distinct from the body at rest) is so, not in virtue of its motion (in the sense of change of position), but because it contains within itself the cause of the change, the force or activity which produces the motion. "The notion of Force," says Leibniz, "is as clear as that of activity and of passivity, for it is that from which activity follows, when nothing prevents it. It is effort, conatus: and while motion is a successive thing, which consequently never exists, any more than time, because all its parts never exist together - while, I say, that is so, force or effort, on the other hand, exists quite completely at every instant and must be something genuine and real. And as nature has to do rather with the real, than with that which does not completely exist except in our mind, it appears (in consequence of what I have shown) that it is the same quantity of force, and not (as Descartes believed) /

believed) the same quantity of motion, that is preserved in nature."(1)

This force, then, which is constant, is not only an actual but a potential reality. It is not mere capacity for motion, mere passive moveableness, nor is it actual manifest motion or activity in general. It is something between the two, an undeveloped or restrained tendency to act, which in appropriate circumstances is the producer of action.(2) This force is to be measured by the quantity of effect it produces. Descartes rightly insisted on the quantity of effect as the thing to be measured; but he conceived the effect in too narrow a way, limiting it to actual motion and overlooking potential force or energy (which Leibniz calls <u>action motrice</u>). The formula for this <u>action motrice</u> is not <u>MV</u> but <u>MV^2</u>. "In the uniform motions of one and the same body,(1) the "force" or work (<u>action</u>)(3) of traversing two leagues in two hours is double the "force" of traversing one league in one hour (for the first "force" /

"force" contains the second exactly twice), (2) the "force" of traversing one league in one hour is double the "force" of traversing one league in two hours (or rather, "forces" which produce one and the same effect are proportional to their velocities). Therefore, (3) the "force" of traversing two leagues in two hours is four times (quadruple) the "force" of traversing one league in two hours. This demonstration shows that a moving body which receives a double or triple velocity, in order that it may produce a double or triple effect in one and the same time, receives a quadruple or nonuple "force". Thus "forces" are proportional to the squares of the velocities. But most fortunately this happens to agree with my opinion regarding force, drawn partly from experience and partly from the endeavour to avoid mechanical perpetual motion. For in my opinion, forces are proportional to the heights by descending from which heavy bodies might obtain these velocities. And as there is always conserved the total force for re-ascending to /

to the same height or for producing some other effect, it follows that there is conserved also the same quantity of motive 'force' (action motrice) in the world; that is to say, to put it definitely, that in any one hour there is as much action motrice in the Universe, as there is in any other hour. But in the same moment the same quantity of force is conserved. And in fact action is nothing but the exercise of force, and amounts to the product of the force into the time."(1) Accordingly, this motive force, power of 'work' or vis viva, the amount of which is constant, includes direction, as well as quantity, of motion. For the measure of it is height, or position relatively to the surface of the earth, and it is changed from potential to actual or from actual to potential motion, according as the body moves to or from the earth.(2)

Leibniz's Theory of Matter. (a) Materia prima :

This doctrine of the Conservation of Force, as Leibniz conceives it involves the rejection of the theory /

theory that material substance is nothing but extension.(1) Extension is pure passivity, bare moveableness, while motion is complete activity and is entirely extrinsic to that which is moved. Force, on the other hand, is, as we have seen, something between the two, viz., a potentiality of motion or action that is always passing into actual action when it is not prevented by a similar tendency in another body. This force, then, shows itself not merely in actual, positive motion, but in hindrance or resistance. And if this force were not of the essence of material bodies, there would be no resistance among bodies and the absurdity of perpetual motion would be true. For, if material bodies consist solely of extension, and if one such body moving should come in contact with another at rest (i.e., destitute of motion), then the former must carry the latter along with it. For, ex hypothesi, there is nothing but space to resist the progress of the moving body, and if motion is possible at all, it must be motion through space, i.e., motion which mere space cannot resist.(2)

Accordingly, /

Accordingly, in addition to extension (however it may be interpreted), every material body must have resistance or impenetrability. This mere passive resistence Leibniz on various occasions calls ἀντιτυπία. The ἀντιτυπία of a body is simply its need of space. It is not mere place : but it cannot be a body unless it has a place of its own. "Matter taken by itself or bare matter consists of ἀντιτυπία and extension. By ἀντιτυπία I mean that attribute, in virtue of which matter is in space. Extension is continuation through space, or continuous diffusion throughout a place." (1) "Matter is that which consists in ἀντιτυπία or which resists penetration; and thus bare matter is merely passive." (2) In so far, then, as a material body is extended and occupies a place which cannot be occupied by any other body at the same time (for this is the meaning of ἀντιτυπία or impenetrability), it consists of bare matter.

Bare /

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(1) De Anima Brutorum, I.
(2) Epistola ad Bierlingium (1711) Erdm., 678 - 3.

Bare or abstract matter, as thus defined (ἀντιτυπία + extension) Leibniz usually calls materia prima.

Leibniz's Theory of Matter (b) Materia Secunda :

But we must beware of supposing that this materia prima is by itself anything actual. No portion of matter, no material body, consists of materia prima alone. For materia prima is simply body considered as if it were purely passive: it is the abstract passivity of body. But, as we have seen, there is, according to Leibniz, no such thing as absolute passivity. Passive resistance, impenetrability, inertia always involve a real force, a tendency to action, though that tendency may actually be prevented by counteracting forces from realising itself at this or that particular moment. Every material body, then, is something more than ἀντιτυπία + Extension. It is essentially force or energy, activity of some kind. And inasmuch as it is a potential activity, a force which tends to realise itself, it is automatic or spontaneous, it contains within /

within itself the principle of its future conditions, it is an Entelechy. Thus every actual material body is materia secunda, from which materia prima is merely a mental abstraction.(1) Every complete substance is materia prima + Entelechy, i.e., passivity + activity.

Now, while materia prima, being abstract passivity, is not to be regarded as real Substance or Entelechy, materia secunda, inasmuch as it is matter, and is therefore extended, is, on the other hand, not to be confounded with individual Substance. Materia secunda must contain an Entelechy, but is not identical with it. Materia secunda is an aggregate of substances: it is to be conceived as quantitative, consisting of partes extra partes, and is thus quite distinct from Substance, which must be conceived as striving force, i.e., under the relation of means to end.(2) Accordingly, every created Monad or simple Substance has materia prima, in so far as it is not entirely active; or, in other words, (since activity and passivity are relative /

relative terms) every created Monad must have materia prima, because its activity is not entirely realised, but is in part potential, because it is not actus purus, activity without passivity. "Materia prima is essential to every Entelechy and can never be separated from it, since it completes it, and is itself the passive potentiality of the whole complete Substance . . . . . God . . .cannot deprive a Substance of materia prima; for He would thus make it wholly pure activity (purus actus) which He Himself alone is."(1) Materia secunda, on the other hand, is not necessarily attached to any specific Entelechy or individual Substance. It is a group of Monads which may vary from time to time, and which, as a matter of fact, is constantly varying. Leibniz compares it to a river.(2) "God, by His absolute power, may be able to deprive Substance of materia secunda."(3) In fact, it is not by itself anything real, but is merely the abstract relation of temporary aggregation or collocation of certain Monads. The only real existences are the Monads, /

Monads, but, in relatively confused and imperfect thought, we may regard them as variously grouped, and these groups, qua groups, are materia secunda.(1)

Phenomena bene fundata :

As materia secunda is an object of confused knowledge, and yet not in itself real, while it has a real basis in the Monads, its powers, acts, and affections are sometimes described by Leibniz as well-founded phenomena (phenomena bene fundata). They are bene fundata in contrast with the phenomena of dreams or visions, which are phenomena pure and simple, not based upon any real bond or connection. Phenomena bene fundata may be distinguished from the phenomena of dreams, inasmuch as the former are vivid, multiplex (i.e., varied in their relations and capable of a variety of tests or observations), and congruous or consistent both with themselves and with the general course of life or experience, which we find in other phenomena. The last of these tests is the most satisfactory, especially when it is supported by the testimony of other people, who have /

have also applied it. "But the most powerful proof of the reality of phenomena (a proof which is, indeed, sufficient by itself) is success in predicting future phenomena from those which are past and present, whether the prediction be founded upon the success, so far, of a notion or hypothesis, or upon custom so far observed."(1) In short, phenomena bene fundata are distinguished from illusions, inasmuch as they are not merely separate and disconnected, but held together in a system so that their antecedents may be traced and their consequents deduced.(2) And Leibniz goes so far as to add :- "Although this entire life were said to be nothing but a dream, and the visible world nothing but a phantasm, I should call this dream or phantasm real enough, if we were never deceived by it, when we use our reason rightly."(3) On several occasions Leibniz uses the rainbow as a simile by which to illustrate what he means by a phenomenon bene fundatum.(4) He simply mentions it without explanation; but we may suppose him to have meant that /

that the rainbow is the type of a phenomenon bene fundatum, inasmuch as, being merely colour, it is not in itself a real substance, but a mere appearance, while, being an appearance which results from the aggregation of certain particles of moisture in a particular way, it has a ground or cause in substance and is therefore bene fundatum and not a mere phantasm.

Thus in general, the secondary qualities of matter, e.g., colour, smell, sound, etc., are phenomena bene fundata. They are not merely subjective, but are confused representations, perceptions or symbols of that which, expressed clearly, is real substance.(1)

Space and Time :

In one of the Letters to Arnauld,(2) Leibniz speaks of space and time as phenomena bene fundata. Possibly, however, he may not have intended this statement to be very rigidly interpreted, and there is much value in the view of Erdmann that space and time are to be regarded as purely ideal, Entia mentalia, /

mentalia,[1] while extended bodies and actual events in time are entia semimentalia[2] or phenomena bene fundata. In any case, what Leibniz desires specially to maintain is that space and time are not real substances nor attributes of real substances. They are nothing but orders or arrangements of co-existing and successive things. Individual substances or Monads, which are the sole realities, are not to be conceived as partes extra partes: the central thought of Leibniz's philosophy is that this quantitative aspect of things should be treated as subordinate, as not belonging to the essence of real things. Hence space is to be regarded, not as the mutual outwardness of real things, but as simply the order of their co-existence, as time is the order of sequence of their phenomena. "Time, extension, motion, and the continuous in general, in the way in which they are considered in mathematics, are only ideal things: that is to say, things which express possibilities, just as numbers do.

Hobbes /

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(1) History of Philosophy, (English Translation), Vol. II, p. 185.
(2) Erdm. 436b.

Hobbes has even defined space as Phantasma existentis. But to speak more exactly, extension is the order of possible co-existences, as time is the order of possibilities which are variable (inconstantes) but yet connected; so that these orders square not only with what actually exists but also with whatever might be put in its place, as numbers are indifferent to whatever can be res numerata."(1) Thus space does not mean any particular situation of bodies nor time any particular succession of phenomena. Space is simply the indefinitely applicable relation of co-existence, while time is the indefinitely applicable relation of succession or order of successive positions.

Leibniz's disproof of the independent reality of space and time is directly based by him upon the Principle of Sufficient Reason. "I say, then, that if space was an absolute being, there would something happen for which it is impossible there should be a sufficient reason, which is against my axiom. And I prove it thus. Space is something absolutely uniform; and, without the things placed

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in it, one point of space does not absolutely differ in any respect whatsoever from another point of space. Now from hence it follows (supposing space to be something in itself, besides the order of bodies among themselves) that 'tis impossible there should be a reason why God, preserving the same situations of bodies among themselves, should have placed them in space after one certain particular manner and not otherwise; why everything was not placed the quite contrary way, for instance, by changing east into west. But if space is nothing else, but that order of relation, and is nothing at all without bodies but the possibility of placing them; then those two states, the one such as it now is, the other supposed to be the quite contrary way, would not at all differ from one another. Their difference, therefore, is only to be found in our chimerical supposition of the reality of space in itself. But in truth the one would exactly be the same thing as the other, they being absolutely indiscernible; and consequently there is no room

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to enquire after a reason of the preference of the one to the other. The case is the same with respect to time. Supposing any one should ask why God did not create everything a year sooner; and the same person should infer from thence that God has done something, concerning which 'tis not possible there should be a reason why He did it so and not otherwise: the answer is, that his inference would be right, if time was anything distinct from things existing in time. For it would be impossible there should be any reason why things should be applied to such particular instants, rather than to others, their succession continuing the same. But then the same argument proves that instants, considered without the things, are nothing at all; and that they consist only in the successive order of things: which order remaining the same, one of the two states, namely, that of a supposed anticipation, would not at all differ, nor could be discerned from the other which now is."(1)

Activity /

Activity and Passivity of the Monads. Mutual Influence of Substances. Cause and Effect:

So far, then, from Space being, as Descartes held, the essence of matter, it is a purely ideal relation which we mentally construct between substances whose reality or essence is not quantitative and is consequently not material.(1) But, as we have seen, every one of these real substances, (the Monads) contains that which, taken abstractly, may be described as materia prima. Every created Monad is both active and passive; for there is no such thing as absolute passivity and pure activity belongs to God alone. As passive the Monad has materia prima, as active it is entelechy. Thus every soul has a body: there is no such thing as an absolutely disembodied spirit, unless it be the Spirit of God. And, on the other hand, mere soulless body has no real existence: it is an abstraction. The world is active, living through and through, even in its infinitesimal parts. It is compact of souls.

Now /

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(1) In spite, however, of this reduction of space, matter, etc., to confused Perception, Leibniz continues to use the language of those who speak of them as real, comparing himself to a Copernican who speaks of sunrise. Cf. Theodicée, 65.

Now, this activity and passivity of the Monads do not mean that any Monad exerts a real influence outside of itself or receives any real impression from a Substance external to it. The relations between the Monads are purely ideal, and their activity and passivity are altogether internal. As we have seen, a Monad is in itself passive in so far as its Perceptions are relatively confused or obscure, active in so far as they are relatively clear and distinct. And similarly, as each Monad perceives or represents the whole Universe from its own point of view, one Monad is said to be passive in relation to another, in so far as certain Perceptions in the former are obscure or confused in comparison with the corresponding Perceptions in the latter; while, on the other hand, the Monad whose Perceptions are clearer and more distinct is said to be so far active in relation to the other or (ideally, of course) to act upon it.(1) Thus, as we have already seen, the Pre-established Harmony is the basis of the inter-relation of the Monads and /

and of their mutual changes. (1) Further, as clear Perceptions are simply the unfolding (explication) or explanation of the corresponding more confused Perceptions, the action of one Substance upon another is to be regarded as meaning that the active Substance, in so far as it is active, contains within itself (or, simply, is) the explanation of the passive Substance, in so far as it is passive. Substances acting upon others are, accordingly, those in which the reason of the changes in the others may be read more clearly than in those in which the changes actually occur. (2) Thus the connection between cause and effect in different Substances is a purely ideal relation, a harmony of internal changes and operations, implying no physical influence of one Substance upon another. And further, the cause of any change is not its obscure antecedent nor any power or activity prior in time to the effect; the true cause is always the reason or explanation, the clear as distinct from the confused /

confused Perception, whatever may be the time-order of the events or phenomena.(1)

Mechanical and Final Causes. Soul and Body :

Every Substance as we have seen, consists of soul and body. And the soul, being on the one hand, the relatively clear Perception of the Substance and, on the other hand, its activity, is the final cause of the Substance, the end for which it is, the self-development of its nature. It must be conceived under the notion of Becoming, as a thing whose essence it is to move towards an end. It cannot, therefore, be adequately described by purely mechanical conceptions. It has something more than a static self-identity: its unity unfolds itself in the series of its changes. Its reality is thus not determined merely by the Principle of Contradiction, taken as a principle of pure or abstract self-consistency. The body of every Substance, on the other hand, i.e., its materia prima, its confused Perception, its passivity, is the physical or mechanical /

mechanical cause of the Substance. Being entirely abstract and in itself a bare possibility, body may by itself be adequately described by mechanical conceptions, under the Principle of Contradiction. Thus we may have an abstract of Science of Physics by which the phenomena of abstract matter are explained on purely mechanical principles, that is, as a system of physical or efficient causes. But if we would explain the concrete reality even of material Substance we must employ dynamical rather than mechanical conceptions, or in other words, we must regard the world as ultimately and essentially a system of final causes, a system which is the expression not of an indifferent all-powerful Will but of an all-powerful Will which knows and decrees the best.(1)

C. ORGANISM

Organic and Inorganic Bodies. Simple and Compound Substances. Dominant Monad:

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The notion of body existing by itself and that of soul existing by itself are results of confused or imperfect Perception. The world consists solely of Monads, each of which is a concrete unity of soul and body, of entelechy and materia prima. Thus nature is throughout living: there is nothing really inorganic.(1) What, then, is meant by the common distinction between organic or living and inorganic or material bodies? In order to answer this question, we must consider more fully the nature of compound Substance.

While the simple Substances alone are real, they appear in groups or aggregates, which we call compound substances. Indeed, although in reality they are secondary, compound substances are prior to simple substances in the order of knowledge. Now, each Monad in any such aggregate perceives or represents all the others in its group, since it perceives the whole Universe, of which they are parts. But as each Monad differs from all the others in the degree of clearness of its Perceptions, there must in each group be one Monad which represents all /

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(1) Cf. Monadology, 63.

all the other members of the group more clearly than each of these represents the rest. This Monad of clearest Perception in each compound Substance Leibniz calls the dominant Monad of the Substance. (1) It has a formal superiority over the others forming the group, though all are really independent. Its control or dominance consists solely in the clearness of its Perceptions. Just as cause is not a real influence of one Substance upon another, but merely the relation of activity in the one to corresponding passivity in the other, or of clear to confused Perception, so the central Monad of any compound Substance has no physical control over the others, but is dominant because of its activity and clearness. Thus the relation between the dominant Monad and the others which, along with it, constitute a compound Substance is similar to the relation between the two elements, active and passive, (entelechy and materia prima), which together constitute simple substance or the individual Monad.

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(1) Monadology 70. cf. Principles de la nature et de la grace, 3.

The dominant Monad is the entelechy or soul of the compound substance, while the remaining Monads, considered as an aggregate, are its body. But this aggregate is materia secunda; and thus we have simple Substance consisting of materia prima and entelechy, and compound substance consisting of materia secunda and dominant Monad.

While observing this analogy, we must not forget the essential difference between simple and compound Substance. The former alone is really substance: the latter, in so far as it differs from the former, is merely Substance by courtesy or common usage. Simple Substance is a concrete unity: compound Substance, in so far as it is compound, is merely an aggregate. Thus the materia prima or passivity of the individual Monad is a name for its confused, undeveloped or implicit nature taken abstractly; it is confused Perception in the Substance itself. But the materia secunda or body of the compound Substance is not confused Perception in /

in the Substance itself, for the Substance as composed has no Perception of its own, as distinct from the Perceptions of the simple Substances which constitute it. Materia secunda, then, is due to the confused Perceptions of those who observe the compound Substances. Thus to the eye of God there can be no materia secunda, no compound Substance; for in Him there is no confused Perception.

The aggregates of simple Substances which we call things are thus, when regarded as extended bodies, the result of confused Perception. And the differences amongst them, which we describe by the names of organic, inorganic, etc., are really differences in their dominant Monads. If the dominant Monad be a bare Monad, with unconscious Perceptions, we call the body inorganic. If the degree of clearness in the Perceptions of the dominant Monad be a little higher, we call the body a plant and so on. The organic and the inorganic pass imperceptibly into one another, and the degree of organic unity possessed by any body is nothing but the degree of clearness in /

in the Perceptions of its dominant Monad. Thus the parts of an organism are more closely connected, more firmly held together than those of an inorganic mass, because the dominance of the central Monad is greater, more complete, (that is to say, its Perception is clearer) in the case of the former than in the case of the latter.

Body without soul or mere matter, considered as inorganic, that is to say, as an aggregate of parts which have no unity other than their aggregation, is unreal. We may regard it either as an abstraction from concrete Substance or (more nearly in Leibniz's way of thinking) as an imperfect Perception or Representation of concrete Substance. Nature is organic throughout: no real thing is completely inorganic: what we call "inorganic" is really organic in a low degree.

The body of every created Substance is the point of view of its soul. As there is no vacuum in /

in nature, the changes in any body affect every other. Thus in every body the whole world is represented or expressed. But in each dominant Monad or Soul, the aggregate forming its particular body is more distinctly represented than the rest of the world. Thus each soul perceives or represents the Universe through the medium of its own body. While it does represent the whole, it represents it in a form in which its own body is more distinct than any other.(1) The body is like a special lens through which the soul sees the Universe. This, of course, follows from the view that body in general is relatively confused Perception. For each Substance represents the Universe "from its own point of view", and its point of view is simply the degree of confusedness (or of clearness, for they are entirely relative) of its Perceptions.(2)

Changes /

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(1) Monadology, 62. cf. Spinoza, Ethics, Part II. Propns 12, 13, (Scholium) 16 (Coroll.1),26,etc.

Changes in Compound Substances. Development and Envelopment :

Every compound substance is in constant change. No created Monad, as we have seen, can ever be entirely at rest: each, in virtue of its Appetition, is continually either unfolding (developing) itself, (i.e., passing from confused to clearer Perception), or enfolding (enveloping) itself, (i.e., passing from clear to more confused Perception). And thus, as the dominance of any dominant Monad consists solely in the degree of clearness of its Perception, the relations of formal dominance and subordination, which constitute a compound substance, must be continually varying in particular cases. Subordinate Monads must be continually changing their allegiance according as the dominant Monads rise or fall in Perceptive rank. No dominant Monad has a changeless body; because of its own variations, its body "is in a perpetual flux like a river, and parts are entering into it and passing out of it continually."(1) And /

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(1) Monadology, 71.

And there is endless room for variation; because each compound substance is made up of other compound substances (each with its dominant Monad). and these again are made up of others ad infinitum.(1) Thus some or all of the Monads which at one time form an inorganic body may, in new relations, become parts of an organic body and vice versa. And the size of any body, belonging to a particular dominant Monad, may increase or decrease indefinitely.

Metamorphosis. Birth and Death :

Accordingly, the change in compound substance of every kind is always metamorphosis rather than metempsychosis.(2) The fundamental element in every compound substance is the dominant Monad, and the matter or body of the substance is continually changing by a gradual removal and addition of parts. It is the body which bit by bit transfers itself from one soul to another. There is no such thing as the sudden transference of a soul from one body to another entirely new body. Such a transference would /

would involve a sudden or discontinuous change in the soul itself, which is impossible. Though, on the one hand, no soul is limited to any particular set of Monads as its body, yet, on the other hand, no soul can be completely and instantaneously severed from its body and transferred to another. Again, the birth and the death of any organism are simply forms of this metamorphosis.(1) There is no absolute birth, that is to say, no direct and immediate implanting of soul in body, and there is no absolute death, no complete severance of soul from body. All the Monads which constitute the sole reality of a compound substance are alike unborn (ingénerable) and imperishable.(2) They proceed directly from God: they are "fulgurations of His Divinity."(3) None of them comes out of anything else. Thus, the phenomena we call "birth" and "death" are transformations, changes in the relations of the Monads to one another. When we speak of an animal being born /

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(1) Monadology, 73 et seq.
(2) Cf. Principes de la Nature et de la Grace, 6.
(3) Monadology, 47.

born, we mean that the body of a microscopic animalcule has enormously increased in size and that its dominant Monad has undergone a corresponding internal change. The animal was an animal from the first, even in the microscopic, spermatic ~~change~~ stage. In being born it has merely become an animal of a higher kind. In every case the process of birth is, in fact, similar to the change which takes place when a caterpillar develops into a butterfly, "nature being wont to reveal in some particular cases, her secrets, which she conceals on other occasions."(1) Birth is thus indistinguishable from growth, increase, development. And, on the other hand, when we speak of an animal as dying, we mean that its body has decreased in size or been broken up into new compound substances. The animal has not ceased entirely to exist, but has been contracted so that it is no longer perceived. Death is thus the same as decay, decrease, involution.(2) There is no spontaneous /

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(1) Janet, Vol. I, p. 630.

(2) Monadology 74 and 75. Cf. Theodicy 90.

spontaneous generation and no passing from life to absolute lifelessness. For lifelessness is entirely relative: the very dust and ashes still have life.(1)

Indestructibility and Immortality of Souls :

* Accordingly the souls of all living beings are indestructible, while the soul of man is both indestructible and immortal, since it not merely persists in existence but continues to have consciousness, memory, and such other characteristics as constitute personality.(2) It is apparently, in Leibniz's view, impossible for the mind of man to degenerate so as to pass into a lower stage of existence. The possession of self-consciousness is inalienable. The rational soul thus differs from all souls that are beneath it in rank, inasmuch as it does not experience such wide variations as those to which the latter are subject. In the "Correspondence with Arnauld," Leibniz says :- "Others, not being able to explain otherwise the origin of Forms, have allowed /

allowed that they have their beginning in a real creation. While I grant this creation in time, only as regards the rational soul, and hold that all forms which do not think were created with the world, they believe that this creation happens every day when the smallest worm is engendered."(1) There is, then, something comparable to a special creation in the case of every mind or rational soul, although this creation is practically no more than the promotion of a Monad to self-consciousness. "Minds (esprits) are not subject to these revolutions (of bodies), or rather these revolutions of bodies are subservient to the Divine Economy regarding minds. God creates them when the time comes and detaches them from the body (at least from the earthly (grossier) body) by death, since they must always retain their moral qualities and their recollection in order to be perpetual citizens of that universal all-perfect commonwealth, of which God is the Monarch, which can lose none of its members /

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(1) Janet, Vol.I., p.673.

members and the laws of which are higher then those of bodies."(1)

The Vinculum Substantiale :

As to organic substance, one other point requires a brief consideration. In a correspondence with Father Des Bosses, Leibniz draws a distinction between a compound substance, strictly speaking, and a mere collection of things, such as a heap of stones, or a flock of sheep, or an army. The compound substance has a certain unity: it is substantia composita (singular number). It involves something which gives a certain reality to its phenomena (ens realizans phenomena) or in other words there is a genuine bond of connection between its phenomena, (vinculum substantiale). It is unum per se. The mere collection, on the other hand, is not a substance but substances (substantiae, substantiatum, semi-substantia). It has no unity of its own. Whether, as in the case of a heap of stones, its unity consists in the contact of its parts /

parts or, as in the case of a regiment, it is united by a common purpose, the bond of connection is entirely in the mind of an observer. In short, when we regard such a thing as a mere collection, we regard it as without a dominant Monad and therefore as not having a genuine body. It is like the "corporation" which, according to Sydney Smith, "has neither a body to be kicked nor a soul to be damned." It is unum per accidens, in contrast with unum per se.(1)

This distinction, however, is not to be regarded as absolute. It is, in another form, the distinction which we have already considered(2) between phenomena bene fundata and the pure phenomena of imagination and dreams. The vinculum substantiale is simply the connection of the phenomena, in virtue of which we describe them as bene fundata, since this connection arises from the mutual relations of the Monads which constitute the compound substance. The vinculum substantiale is nowhere mentioned by Leibniz /

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(1). Cf. p. 113, note.
(2) p. 115.

Leibniz except in the Correspondence with Des Bosses. It is in no way essential to his philosophy; but it is the suggestion of a way in which his system might possibly be made consistent with the Roman Catholic dogma of Transubstantiation, which requires that bodies should be considered as real Substances.

Leibniz tells us plainly that he has no great liking for the vinculum substantiale, and that it is better to dispense with it, unless any would-be disciple of his finds it necessary as an aid to religious faith.(1) It ought not, however, to be forgotten that Leibniz was encouraged in rejecting the Cartesian view that the essence of bodily substance is extension and motion, by the fact that this theory is inconsistent both with the Roman Catholic and with the Lutheran doctrine regarding the Real Presence in the Eucharist.

D. SELF-CONSCIOUSNESS.

By /

By means of the different degrees of clearness in the Perceptions of their respective souls or dominant Monads, the organic compound Substances of which the world is composed may be divided into three main classes, (1) mere living beings (2) animals and (3) men. Substances of the first class, including plants and all lower forms of existence, have as their soul a bare Monad, having mere Perception or representation, unaccompanied by consciousness. Animals, on the other hand, have a higher degree of Perception, which appears as Consciousness or Feeling (sentiment), including Memory. The soul of man possesses the characteristics of both of the lower classes, but its Perception has a still higher degree of clearness, appearing now as self-consciousness or Apperception. The self-conscious soul or spirit does not merely connect its particular Perceptions in the empirical sequence of Memory; but having a knowledge of eternal and necessary truths, it can represent things in logical order, that /

that is to say, in their necessary rational relations. This is what is meant by its having Reason, or being a rational Soul. The possession of Reason means the power of reflection or self-consciousness, because necessary and eternal truths are simply Perceptions developed to the highest degree of clearness, and consequently the knowledge of such truths is a clear consciousness of what is in ourselves (of the Perceptions which constitute our nature) and hence indirectly a clear knowledge of Substance in general.(1)

Now, as we saw in considering the meaning of life and death(2) while the self-conscious[redacted] or rational soul really differs only in degree from the conscious and the unconscious soul, it can never completely lose its rationality. The animal soul may at death lose memory and descend to a lower grade. But this is not possible in the case of the self-conscious soul. And, /

And, on the other hand, while an animal soul may be raised to self-consciousness, Leibniz finds it difficult to conceive that this can take place without a special act or operation of God. Self-conscious beings have thus a position of peculiar independence, which requires us to devote to them special consideration. We proceed, then, to consider Leibniz's account (a) of the form in which Perception appears in man, and (b) of the form in which Appetition appears in him; these being the two essential characteristics of the human soul as well as of every other Monad.

(a) THEORY of KNOWLEDGE /

(a) THEORY of KNOWLEDGE.

Leibniz seeks a via media between the views of Descartes and of Locke :

Human Perception or Apperception is Knowledge, strictly speaking. Leibniz's theory of Apperception is thus a theory of Knowledge. Now, Apperception is the Perception of eternal and necessary truths. It is clear and distinct knowledge. But the human soul has also knowledge which is not clear and distinct, knowledge of contingent things which it cannot reduce to eternal and necessary truth. This must be so, for otherwise the human soul would be perfectly clear and distinct in its Perceptions, complete and unrestrained in its activity, actus purus. But this characteristic of perfect intuitive knowledge and absolute activity belongs to God alone: the Perceptions of man are always at best only relatively clear and distinct. Accordingly it is impossible for Leibniz to assent to the Cartesian theory of knowledge, which gave worth only to the absolutely clear /

clear and distinct, drawing a hard and fast line between self-conscious thinking and all else. Descartes's use of the Principle of Contradiction was inconsistent with the possibility of relative truth. It explains the universal and necessary, but only by setting aside the contingent as ultimately inexplicable.

On the other hand, the theory of Leibniz is equally opposed to the opposite view, expounded in Locke's "Essay on the Human Understanding." If distinctively human knowledge does not consist solely in the Perception of universal and necessary truths, neither is the human mind altogether destitute of such knowledge and dependent for its ideas entirely upon the contingency of the senses. As the human soul is a Monad, its knowledge does not come to it from outside itself, for it cannot be really influenced by any other Substance. It is not originally a tabula rasa on which externally-produced impressions are made; for no Monad can ever be purely passive or absolutely without Perception. The human mind, being spontaneous in all its /

its activities, must produce its knowledge entirely from within itself. It is not a vacuum, gradually filled ab extra with independent ideas: it is a force or life transforming itself, a growth, a self-revelation.(1)

Thus, in his theory of knowledge, Leibniz may be regarded as seeking a via media between two extreme views, the basis of both of which is mechanical rather than dynamical. Each in its own way fails to do justice to the relations in knowledge, to its unity as a system. Each rests on the absolute (not the relative) validity of certain ideas or impressions: each is a kind of Atomism. The eternal and necessary truths (or clear and distinct ideas) of Descartes are unconditionally valid: they are a priori atoms, forming the totality of knowledge. The "simple ideas" of Locke are equally unconditional in their validity: they are a posteriori atoms or data of knowledge.(2)

But, here as elsewhere, Leibniz would rather reconcile than overthrow. While the mechanical view /

view of things is not the truest, it nevertheless has value in its own sphere. Thus he regards the errors of Descartes and Locke as due in each case to the over-emphasis of one of the two complementary elements in knowledge, the necessary and the contingent. Descartes's view might hold if knowledge were entirely necessary; Locke's might hold if knowledge were merely contingent. But human knowledge is both; it includes both self-evident truths and truths of fact. A true theory of knowledge must de equal justice to both. It must have affinity with the views both of Descartes and of Locke, without altogether accepting either.

Leibniz's solution of the Question of Innate Ideas and the Tabula rasa :

Locke endeavoured to establish his empiricism as against the position of Descartes by denying that there are in the human mind any innate ideas. If there be no innate ideas, all our knowledge must reach us ab extra, through the senses. And accordingly the only true theory of knowledge must explain it /

it a posteriori, entirely from sense-experience. This was the contrary opposite of the Cartesian view that all our genuine knowledge comes from pure thought, in complete independence of the senses, (which are bodily and therefore excluded from the sphere of thinking), and that the only true theory of knowledge must explain it a priori, as a logical deduction from self-evident innate ideas. To Leibniz it seems that the conception of the human mind as a Monad leads to a theory of knowledge which harmonises the other two, by combining in a new form the truth they each contain and at the same time setting aside their errors. As a Monad, the soul of man is not, as in Locke's view, a purely passive tabula rasa, continually receiving external impressions. It is always an active force and it is itself the spontaneous source of all its ideas, i.e., of the entire sequence of its experience. All its ideas are therefore innate . But none of its ideas is from the beginning clear and distinct. When they first appear they are confused and imperfect. The recognition of their self-evidence is the result of

a /

a process, a development from relative confusion to clearness. But what Locke calls sensation is, according to Leibniz, confused Perception, the indistinct representation of things external to the individual mind. Thus the self-evidence of universal and necessary truths is a result of experience, though that experience is purely internal. And though all our ideas are innate, there are many which can never be reduced to the perfect clearness and distinctness of self-evident truth, but which we have nevertheless quite sufficient ground for recognising as true. Further, though our experience is entirely internal, it is none the less objectively real, for it consists in a representation of the whole Universe, in accordance with the Pre-established Harmony between substances. Human knowledge is thus at once a priori and a posteriori, innate and experiential.(1)

Relativity of the Distinction between Perception and Apperception :

The acceptance of this theory involves a change in /

in the point of view held both by Descartes and by Locke. They both argue on the assumption that Perception and Apperception are quite distinct from one another. Descartes's theory of innate ideas rests on his doctrine that absolute certainty belongs to self-conscious thought alone, excluding all other forms of human experience as phenomena of body, which is the contradictory opposite of mind. Locke, on the other hand, denies the existence of innate ideas on the ground that children, savages and idiots do not consciously possess them; an argument which implies that we have an idea only when we are fully aware of it, that is to say, that ideas exist only in self-consciousness or Apperception. Thus Apperception (in the Leibnitian sense) is regarded by Descartes as containing absolute, innate first principles, from which particular truths may be deduced, while by Locke it is held to give, not first principles, but simple ideas, which are the elements out of which knowledge is built. In both cases it is Apperception that is appealed to; mere Perception does not count.(1)

Now /

Now, the great central principle of the Philosophy of Leibniz is the idealising of all substance, by regarding it as throughout Perception or representative. Apperception, Feeling and bare Perception (which is not necessarily anything more than the mere possession of real qualities) are not different in kind but merely in degree. One reality pervades them all; no one of them is separated from another by any impassable barrier. Body is confused soul; soul is clear body. Self-consciousness is not a unique certainty or reality, but a high degree of clearness in that which is already real in lower forms. The self may be exclusive, self-limited, individual; but it is so only in common with every other substance. There is no substance which is not potentially an Ego, a self-conscious being. What Descartes and Locke both ignore is the internal movement, the becoming, the growth and development, which is of the essence of every substance. For them a thing, a mind, an idea, a principle is what it is, unchangeably; so that either, as in the case of Descartes /

Descartes, the variety of real thought is contained, perfect and entire, within its unity, and is to be set forth by pure sub-sumption, the lifting out of class from within class, or, as in the case of Locke, the unity of real thought is a mere aggregate of its varieties, the elements remaining unchangeable, into whatever groups we may gather them .

As against Descartes, Leibniz denies the complete separation of Matter and Mind :

Accordingly, Leibniz brings against Descartes's view of mind essentially the same argument as he used against Descartes's view of matter. The Cartesian view of substance as that which is in itself and is conceived through itself, without need of anything else, resulted in the complete separation of matter and mind. Leibniz, on the other hand, unifies without absolutely identifying them, through his view of substance as that which is continually in process of Perceiving or representing all things. Thus against Descartes's view of matter as an independent substance, Leibniz argues that a true /

true doctrine of substance makes matter by itself an abstraction, for it is really the confused Perception which is potentially clear Perception, Apperception or mind. And similarly, against the view of Descartes that mind is an independent substance, opposed to matter, Leibniz maintains that pure mind belongs to God alone, and that mind as we have it is inseparable from matter and is really nothing but matter raised to a higher power, confused Perception that has passed into greater clearness. As among created substances there is no body without soul, so there is no soul without body.

In Opposition to Locke, he holds that the Mind always thinks :

On the other hand, as against Locke, Leibniz contends that the mind is never without thought. If mind is a tabula rasa, receiving all its impressions from outside itself, a mind without thought is a perfectly natural supposition. And a posteriori Locke holds that in dreamless sleep the mind exists without thinking. Its existence during such a sleep /

sleep is, he thinks, assured to us by our recollection afterwards of what took place in the mind before the sleep. Further, Locke maintains that, as body can exist without motion, mind can exist without thought.(1) Now, the ground of this contention manifestly is that motion and rest are not relatively but absolutely distinct from one another, and similarly, that clear consciousness is absolutely and not relatively distinct from unconsciousness. When a body has no apparent motion, it is absolutely at rest; when a mind has no clear consciousness or Apperception, it is absolutely without consciousness. To this the central principles of the philosophy of Leibniz are in complete opposition.(2) While motion and rest are apparently absolute opposites, in reality, when we regard them not abstractly but concretely in their relation to the rest of the world, they can be understood only as relatively distinct. For otherwise, the law of Continuity, which is the basis of any workable interpretation of the Universe, would be broken. In virtue of this law, then, rest must be /

be considered as an infinitely small degree of motion, and every body possesses at least a tendency to motion or a virtual motion, even if it has no actual, apparent, complete motion. In the same way, when mind is considered concretely, as a real substance related(through its representation of them) to all the other substances of which the Universe is composed, the distinction between consciousness and unconsciousness is seen to be relative. There can be no total absence of Perception, for absence of Perception (representation) would mean absence of relation to the rest of the world, and thus a breach of the law of Continuity. Unconsciousness or apparent absence of Perception is then merely an infinitely small degree of Perception, and every mind must possess at least virtual thought or consciousness, a tendency to clear Perception, even although it may actually appear to be empty of all thought.(1) The mind is not like a block of veinless marble, from which the sculptor may take what figure he pleases.

It /

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(1) Cf.Locke's Essay, Fraser's Edition,Vol.I.p.80,note

It has veins which give the outline of the statue that is to come forth from it.(1) In other words, it is the nature of the mind to "look before and after." Leibniz regards his view as expressing the truth that underlies the Platonic doctrine of reminiscence. The present Perceptions of the mind may be regarded as recollections of the past, inasmuch as they were already virtually contained in these past Perceptions and are developed from them — are, indeed, these past Perceptions grown clearer. And again, the present Perceptions of the mind are forecasts or prophecies of the future, since all its future Perceptions are confusedly wrapped up in its present states.

The Petites Perceptions :

Thus in the Monadology,(2) Leibniz maintains the existence of unconscious Perceptions, on the ground that Perception can only proceed from Perception and accordingly that in the passage from the unconsciousness of a swoon or a deep sleep to full waking consciousness there must be an infinite series of /

of Perceptions gradually rising in degree from infinitely little Perceptions, which are apparently indistinguishable from absence of Perception, upwards to the fuller Perceptions of actual waking life. These little Perceptions (petites Perceptions, confused Perceptions, or, as we might now call them, sub-conscious thoughts or mental activities) express the continuity of all souls, from the soul of the pebble to that of the angel, as Leibniz puts it in his Correspondence with J. Bernouilli. The characteristics of these petites Perceptions, which prevents us from being clearly aware of them, are, he tells us,(1) their smallness, their number, or their individual indistinctness. And by means of them he explains such psychological phenomena as our ceasing to be aware of the sound of a mill or a waterfall when we have become accustomed to it. The perceptions are still there, but "having lost the attractions of novelty, they are not strong enough to claim our attention and memory, which are directed to more interesting objects. For all attention requires memory; and often, when we are not, so to speak /

speak, warned and directed to take notice of certain of our own present Perceptions, we let them pass without reflection, and even without observing them; but if some one immediately afterwards draws our attention to them, and speaks to us, for instance, of some noise that has just been heard, we recall it to ourselves and perceive that a moment ago we had some consciousness of it. Thus there were Perceptions of which we were not aware at the time, Apperception arising, in this case, only from our attention having been drawn to them after some interval, however small."(1) The petites Perceptions, accordingly, are merely the confused Perceptions of the self-conscious Monad, and their function and value in Psychology may be estimated by reference to the importance of confused Perception in Leibniz's general doctrine of substance. However great may be their degree of confusion, and however little we may be conscious of them individually or collectively, they are still Perceptions, one in kind with the highest, clearest Apperception or self-consciousness. The realm of self-consciousness /

self-consciousness includes the whole of substance; it is by no means limited to man and spirits higher than man. But in the infinite variety of substances, self-consciousness exists in an infinite variety of degrees; and there are many substances in which its degree is infinitely little, that is to say, less than any degree that can be assigned or named.

Leibniz's Theory of Knowledge in Relation to the Main Principles of his Philosophy :

Thus Leibniz's theory of knowledge is simply the Epistemological expression of the main principles of his philosophy. All truth is innate, virtually if not actually. But there are two kinds of truth. Eternal and necessary truth has its ground in the Principle of Contradiction. It is either self-evident or the result of strict demonstration from the self-evident. "Our mind is the source of necessary truths, and however many particular experiences we may have of a universal truth, we cannot for ever assure ourselves of it by induction, without knowing its necessity through reason ..... The senses may suggest, support and confirm these truths /

truths, but not by demonstrating their infallible and perpetual certainty."(1) On the other hand, truth of fact or contingent truth, while equally innate, is not demonstrable through the Principle of Contradiction, but through that of Sufficient Reason.(2) It is obtained by induction rather than demonstration. It is truth of experience, or Perception which we cannot analyse into perfect clearness and self-evidence, because of the infinite complexity of its relations to the system of things. This infinitely complex mass of relations, which it is impossible for us to reduce to perfect order and simplicity, is our confused Perception. Confused Perception is, then, the representation in us not of our own nature, but of the system of things other than ourselves, that is to say, the other Monads as they are related to us. But distinct Perception is the representation or Perception of our own nature, of that which is in ourselves, and it is at the same time the evolving of some of our confused Perceptions into clearness: it is not something quite separate from /

from our confused Perception. Thus we rise to a knowledge of ourselves through our knowledge of external things.(1) Self-consciousness implies the consciousness of objects: Apperception is, indeed, the very flower of Perception, the beauty to produce which Perception, in all its degrees, is living and growing. In experience or confused thought, rightly interpreted, there is the basis of distinct, rational knowledge. Sense, experience, imagination must not be derided as fiction-makers by the intellect which they have nourished.(2)

The Meaning which Leibniz attaches to "Perception" or "Representation". How does he endeavour to avoid an endless relativity? :

Something remains to be said as to the meaning of this "Perception", "Representation" or "Expression", which is the key-word to Leibniz's theory of knowledge. There is a strong suggestion of Petitio Principii about it. What exactly does it mean? What is perceived, represented, expressed? And what does /

does the Perception, Representation, Expression consist in? If the essence of every real substance is to perceive, represent or express every other, we seem to have come upon the doctrine of the relativity of human knowledge in its worst form. It seems as if knowledge must be compared to the life of those unhappy islanders, "who earn a precarious livelihood by taking in one another's washing."

As to the meaning of the terms, Leibniz says that "one thing expresses another (in my sense) when there is a constant and regular (reglé) relation between what can be said of the one and what can be said of the other. It is thus that a projection in perspective expresses the original figure."(1) Any two things, then, are related to one another as perceiver and perceived, when the predicates or qualities of the one (whatever these predicates or qualities may be) always vary concomitantly with the predicates or qualities of the other. Perception, representation or expression is then a relation of harmony (or development according to some law or principle) /

principle) between the qualities of individual substances. But these qualities are themselves perceptions. What, then, is the ultimate reality of which they are all Representations? Leibniz's answer is that the ultimate Reality is the nature of God or the ideas of God as an intuitive Knower. God alone has a knowledge which is entirely adequate, perfectly realised: in Him the Universe is transparent through and through. There is no reality beyond thought, to which thought must correspond. Thought cannot in any way represent that which is entirely other than itself, that which is separated from it "By the whole diameter of being" (or by an even greater distance if that were possible). For no sign can be entirely cut off from the thing signified. Sign and thing signified must have some ground of unity in virtue of which this relation between them is possible. Thus, pure thought cannot symbolise, represent or perceive that which is absolutely not-thought. Confused thought is the symbol both of other confused thought and of clear thought. Accordingly, as between confused thoughts the /

the relation of sign and thing signified is such that that which is now regarded as sign may from another point of view be taken as the thing signified and vice versa. Nevertheless, it is evident that the clearer of any two corresponding Perceptions will naturally be regarded as the thing signified by the more confused Perception, that is to say, the thing which the more confused Perception is trying to express but is unable to express adequately. And thus the ultimate "thing signified", the fundamental reality, which all other Perceptions in various degrees symbolise or represent, must be perfectly clear and distinct thought, or, in other words, the thought of God. So also God is First Cause as well as Ultimate Reality. For we have already seen[1] that Cause is always reason or explanation, the relatively clear Perception as against the corresponding confused Perception, which is the Effect. Accordingly, as the nature of God is absolutely clear Preception, He must be the Ultimate Cause of all things.

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(1) page 124.

(b) ETHICS.

Degrees of Appetition in the Monads - Impulse, Instinctive Desire, Will :

Every Monad has Appetition as well as Perception. Appetition is the principle of change in the Monad, that in virtue of which the Monad passes from one Perception to another. Like Perception it has an ~~infinite~~ infinite series of degrees; but three main varieties of it may be noted, corresponding to the three main varieties of Perception. Thus the Appetition of the lowest class of Monads, (the bare Monads,) is mere unconscious impulse or tendency, a potential blind force tending to become actual. It is the particular Appetition or change of Perception (representation) which has its source or ground in unconscious Perceptions. This bare impulse may be compared to a watch-spring wound up, which tends to unwind itself:(1) it is a tendency such as that of "the stone which goes by the most direct but not always /

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(1) Nouveaux Essais, Bk.II, Ch 20. Sectn, 5.

always the best way towards the centre of the earth."[1] The Appetition of animal souls is instinctive appetite or desire, which proceeds from Feeling or conscious, yet relatively confused, Perceptions. Like the Appetition of the bare Monads, it seeks immediate present satisfaction, having nothing to guide it but the Consciousness and Memory of the animal soul. Finally, the Appetition of rational souls is self-conscious Desire or Will, a principle of change whose basis is Apperception or clear, rational knowledge.[2] Appetition, like Perception, is one and the same throughout all its degrees and varieties, from bare Force to the freest, most rational Volition. And in the nature of man we find all degrees of it: he is not a purely rational Will, but has instinctive impulses and passions, which belong to the middle class of Appetitions, and physical powers which belong to the lowest class. As on the Cognitive, so on the Practical side of his nature, the law of Continuity holds. /

Feeling. Pleasure and Pain. "Semi-pains" and Semi-pleasures":

The chief features of Leibniz's Ethics are fixed by these general considerations. In applying them, it is necessary for us, who have become familiar with post-Kantian distinctions, to remember that the usual three-fold division of mental elements into Cognition, Feeling and Will, is not of older date than the age of Rousseau(1) and accordingly that Leibniz still works with the Aristotelian two-fold division of the elements into Theoretical and Practical. Thus the "Appetition" of Leibniz covers both Feeling and Will (in our sense of the terms), as well as the lower forms of both, which are conscious and unconscious Forces more or less restrained from full activity, that is to say, more or less potential or virtual. Accordingly, as Appetition and Perception always accompany one another, Leibniz maintains that there is no Perception absolutely colourless and entirely unchanging or at rest. Every Perception /

(1) It is usually attributed to Tetens (circa 1750). But it first comes into prominence through Kant.

Perception has an element of feeling and activity, although the degree of it may be infinitely small. If we can be pardoned the anachronism of using a phrase which Lotze has made familiar, we may say that every Perception has a "Value" or "Worth"; but it must not be forgotten that for Leibniz this Value is not anything absolute or pre-eminently real, but merely the unrealised potentiality of clearness and distinctness in the Perception.

Speaking, then, of human nature, which includes all the varieties of Perception and Appetition, Leibniz says that "there are no Perceptions which are entirely indifferent to us, but when their effect is not observable we can call them indifferent; for pleasure and pain seem to consist in an observable help or hindrance."(1) This, he warns us, is not to be taken as a strict definition of pleasure and pain, for he does not think it possible to give such a definition. But his account of these feelings seems to follow directly from his general point of view. Pain is essentially a hindrance or restraining /

restraining of a Monad's Appetition, while Pleasure is its free action.(1) They are thus entirely relative to one another. And while we speak of the hindrance or freedom of Appetition as Pain or Pleasure, only when the Appetition has reached the degree of consciousness, yet consciousness is separated from unconsciousness by no hard and fast line, and consequently Appetitions of a lower degree may be regarded as minutely painful or pleasant, according as they are retarded or advanced. Thus Leibniz speaks of "semi-pains" and "semi-pleasures" or "little imperceptible (inaperceptibles) pains and pleasures", corresponding to the "petites Perceptions" in the theory of Knowledge. Like the "Petites Perceptions" these semi-pains and semi-pleasures may, by growing in individual intensity or by combining into one totality, become observable in consciousness as complete pains and pleasures.(2) No soul can ever be absolutely ~~oppressed~~ at rest, absolutely without Appetition. And no created soul can be purely active, with a perfect /

perfect freedom. Thus every soul has continual Appetition, which is partly free and partly restrained. That is to say, every soul has continually Pleasure and Pain in some degree.

Accordingly Leibniz takes great interest in the "uneasiness" in which Locke finds the first movings of Desire.(1). This uneasiness is not exactly pleasure or pain, but a vague feeling of discomfort or restlessness, that tends to pass into more definite Desire and so to produce Action. It is thus for Leibniz the confused Perception and undeveloped striving or Appetition out of which, by a process of Evolution, clear Perception and free Volition arise. In so far as this Evolution is restrained, we suffer pain: in so far as it proceeds smoothly without impediment, we enjoy pleasure. Thus every soul instinctively seeks its own pleasure: it follows the line of least resistance. This it does in virtue of it's own nature, which is to unfold itself spontaneously from within, its present state flowing entirely from its past and holding a prophecy of /

of its future. Soul-activity is pleasure, soul-restraint is pain; and it is of the essence of the soul to be active, for every Simple Substance is primarily a Force.

Freedom, Liberty of Indifference and the "Will to will:"

From this Leibniz's view of Freedom directly follows. There can be no such thing as a liberty of indifference, an absolutely undetermined choice; for that would imply discontinuity in the life of the soul. An absolutely undetermined choice can only mean that the state of the soul when it makes the choice is not an orderly unfolding of the state of the soul preceding the choice, but is a begining of action de novo. And this is contrary to the very notion of Substance. Both in the "Theodicy" and in the "New Essays" Leibniz freely illustrates his view by reference to particular instances, such as the parable of the ass between two equal bundles of hay; and he makes it evident that, as a matter of /

of fact, in every case there is in the state of the soul before the choice is made some determining element of Perception. The extreme case, of course, is that of "willing to will", resolving to do a thing contrary to our judgment and wishes, merely because we have the power to do it. Leibniz points out that even here our volition is determined by a previous idea, namely that of showing to ourselves or to others that we possess a certain power.(1) so that in every case the will is determined by some Reason or Perception. The error of abstract Indeterminism arises from neglect of sub-conscious Perceptions and Appetitions. It is thus akin to the error of Descartes and Locke with regard to knowledge, namely that of regarding only self-conscious knowledge or Apperception as real knowledge. We have seen (2) that to regard all thought as self-conscious or reflective would make any progress in thought impossible, because it would imply that the mind thinks that it thinks that it thinks ad infinitum and is accordingly /

accordingly never able to go on to any new thought. Similarly, the doctrine of a liberty of indifference, regarding all Volition as necessarily developed and conscious, implies a power of willing to will that we will ad infinitum. But in fact Volition cannot be restricted to deliberate conscious desire or intention. We do and experience many things which ultimately contribute to determine our will, although we do not at the time deliberately contemplate that they shall afterwards have this effect. (1)

Moral and Metaphysical Necessity :

On the other hand, Volition is not absolutely necessitated as the system of Spinoza requires. Will is not to be identified with the abstract Understanding, whose Principle is that of Contradiction. Will does not invariably act from a reason the opposite of which is self-contradictory: it frequently acts from a sufficient Reason: that is to say, from an inclining or probable reason. We do /

do not act merely because we must, because the eternal nature of things makes it absolutely impossible to do otherwise. We act towards an end or ideal, which is not a mere fiction of our own imagination, but a recognition of the fitness of things, a more or less clear Perception of the best among various possible courses of action. Our will is thus determined by a moral, not a metaphysical necessity, by the inclination which arises from its recognition of the best, however perfect or imperfect that recognition may be. Our will (being our Conscious Appetition) moves in accordance with our ideals; for these ideals are nothing but our Perceptions, the potentialities of our nature, and not merely of our own nature but of the nature of all things, since our Perceptions are Representations of the Whole Universe.

Freedom is Spontaneity + Intelligence :

Accordingly Leibniz, following Aristotle, regards /

regards Freedom as consisting essentially in Spontaneity and Intelligence. But Intelligence is not to be interpreted merely as the Abstract Understanding of pure Self-consciousness: it includes every degree of Perception or Representation. There is thus an infinite variety of degrees in Freedom, and no actual Concrete Substance is subject to an absolutely pure Necessity, that is, to a Necessity which is other than an infinitely small degree of Freedom. And as all Monads alike have Spontaneity (for they unfold the whole of their life from within themselves) the degree of Freedom belonging to any Monad depends on the degree of its Intelligence, that is to say, on the degree of clearness and distinctness of its Perceptions. Similarly in human beings, an action is free in proportion to the clearness of the reasons which determine it. Thus a capricious or wilful action, far from indicating any special freedom of will, is rather lacking in freedom, since its determining reason is so obscure or confused that it /

it is hardly possible to describe it. Its obscurity leads people to overlook it and to fancy that the action is entirely without reason. No human action is undetermined, as none is absolutely necessitated; but the highest freedom accompanies the most perfect knowledge and God is the freest of beings, not because He can do whatever He pleases nor because He always acts spontaneously, from the necessity of His own nature, but because every act of His is determined by infinite Wisdom to the best possible ends.

Good and Evil. The End of Conduct:

So also good and evil are relative terms. Actions are good in so far as they are determined by clear Perceptions, evil in so far as their determining reasons are confused. As error is confused Perception and is thus imperfect truth, so sin is the Action or Appetition which flows from confused Perception and is thus imperfect righteousness. Now, since /

since it is of the essence of the soul to be continually active, since its activity is more free the clearer are its Perceptions, and since pleasure consists in the freedom of its activity, the end of conduct is the highest degree of freedom, which is at once the highest degree of pleasure or felicity, and the highest degree of Perception or Knowledge. Every soul more or less blindly seeks pleasure; but the blinder it is the more does it tend to seek satisfaction in ~~pleasant~~ present, momentary pleasure. Its blindness or confusedness of Perception means that it does not think the matter out, that it does not take into account the deeper nature and connections of things, and thus fails to find the best way to freedom, felicity, wisdom. The soul instinctively tries to take the shortest way to happiness; but the way that is really shortest is apt to appear to purblind souls a round-about way - an Umweg, - and so they fail to achieve their end. "The stone goes by the most direct, but not always the best, way towards /

towards the centre of the earth, not being able to foresee that it will meet rocks on which it will be broken, while it would have more nearly attained its end, if it had had the intelligence and the means to turn aside. Even thus, going straight towards present pleasure, we sometimes fall over the precipice of misery."(1) "We must not abandon those old axioms that the will follows the greatest good it perceives and shuns the greatest evil. That the truest good is so little sought after is mainly due to this, that in matters and on occasions in which the senses have very little influence, most of our thoughts are, so to speak, insensible (sourdes) (I call them in Latin, cogitationes caecae, blind thoughts), that is to say, they are void of Perception and feeling and consist in the bare use of symbols, like the work of those who make calculations in Algebra,without looking from time to time at the geometrical figures. In this respect words usually have the same effect as Arithmetical or Algebraic symbols /

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(1) Nouveaux Essais, Bk.II.Ch.21, Sectn 36. ~~Erdmann's Edition, Vol.I., p.~~

symbols. We often reason in words, hardly having the object in mind at all. Now, this knowledge cannot move us: something vivid is required that we may be moved. Yet it is thus that men most often think of God, of virtue, of happiness; they speak and reason without definite ideas."(1)

Justice. Self-love, Love of Man and Love of God:

Self-love, more or less enlightened, is the ground of all our actions. And the more enlightened our self-love is, the higher is the ethical value of our action and the better are its results. But as, like all other Monads, our souls are not mere self-centered atoms but reflect the whole Universe, our self-love is at the same time, according to its degree, a love for others. To love others is to desire their good as we desire our own. And as it is the essence of our souls to represent or perceive all other souls, the more enlightened our own desire of good is, the more are we seeking the highest good of /

of others and fulfilling the ends of God. We can really love others and express our love to them only in proportion as we clearly perceive what is best for them; and the more clearly we perceive what is best for ourselves, the more clearly we perceive what is best for them. This follows from the very constitution of our being: In other words, we seek our own perfection, however blindly; and we are so united to all other men, that in realising our own perfection we are also realising theirs. Thus the more enlightened our self-love is the more disinterested does it become and the more nearly does it approach to a pure love of God. (1)

Accordingly, love is the root of law. Law is not a merely external arrangment, an arbitrary command, an expression of bare power. It is a moral power, and "moral" means that which is natural to a good man. "A good man is one who loves all men, so far as reason allows. Accordingly, "says Leibniz, "Justice (which is the ruling virtue of that affection, which the Greeks call φιλανθρωπία) will, if I mistake not, be most fittingly defined as the charity of a wise /

wise man, that is to say charity in obedience to the dictates of wisdom. . . . Charity is universal benevolence, and benevolence is the habit of loving."(1)

Thus the ethical progress of man is an approach to the reality that is in God, a bringing forth of the image of God which is hidden in the soul, through growing enlightenment, that is to say, through the Appetition of the soul passing forward to ever clearer and more distinct Perceptions. This feature of the philosophy of Leibniz leads Windelband to describe his Ethics as expressing "the philanthropic ideal of Morality which was characteristic of the Aufklärung period" in Germany. "'Enlighten thyself, and have a care for the enlightenment of thy fellows: so shall you all be happy,' that is the philosophy professed by the whole eighteenth century in Germany."(2)

NOTE to PAGE 82.

(1) In a similar way Cavalieri afterwards suggested that the area of a triangle might be conceived as made up of an infinite number of straight lines, each parallel with the base. The lengths of these lines he regarded as forming an infinite series in arithmetical progression, of which the first term is Zero. The sum of this series is equal to half the product of the last term (i.e., the length of the base of the triangle) and the number of terms (i.e., the altitude of the triangle). As against this it was pointed out that, since a line has no breadth, no number of straight lines can ever make up a plain area. Pascal, however, showed that Cavalieri's method really implied that the infinite series of straight lines is an "indefinite" number of "small" rectangles, which are so small that the minute triangles between them and the sides of the given triangle may be /

NOTE to PAGE 82 Continued.

be neglected in the computation. This "indefinite" of Pascal is the "infinite" of later mathematicians, and his "small" is manifestly their "infinitely little". Thus we have here the transition from the ancient to the modern methods. Pascal vindicated Cavalieri's method on the ground that it differed only in manner of expression from the method of exhaustions, used in the Greek mathematics.

Note to p. 88.

Cf. what Leibniz says regarding the series of changes in a simple substance, Lettre à Basnage (1698) Erd. 153a. "When it is said that a simple being will always act uniformly, there is a distinction to be made: if to act uniformly is to follow perpetually the same law of order or sequence, as in a certain arrangement or succession of numbers, I admit that of itself every simple being, and even every compound being, acts uniformly; but if uniformly means in exactly the same way (semblablement), I do not admit it. To explain the difference in meaning by an instance: a motion in a parabolic curve is uniform in the first sense, but it is not so in the second sense, since the parts of the parabolic curve are not each the same as the others, like the parts of a straight line".

NOTE to PAGE 90.

(1) A succinct account of the famous controversy regarding the discovery of this method and of the different forms in which Leibniz and Newton expressed it, will be found in Dr Williamson's article "Infinitesimal Calculus" in the 9th Edn of the Encylopaedia Britannica. Cf. Merz, Hist. of European thought in the 19th cent. I. pp. 100 - 103.

NOTE to PAGE 91.

(1) From one point of view it may be regarded as the solving of the problem of Achilles and the tortoise. Cf. Leibniz's Réponse a l'extrait de la lettre de M. Foucher (1693), Erd. 118a. "As to indivisibles, in the sense of the mere extremities of time or of the line, we cannot conceive new extremities, whether of actual or potential parts. Thus points are neither large nor small, and no leap is needed to pass them. Yet the continuous, although it everywhere has such indivisibles, is not composed of them, as the objections of sceptics seem to suppose. There is, in my opinion, nothing insurmountable in these objections, as will be found if they are put into strict form. Father Gregory of St Vincent has excellently shown, by the Calculus of infinite divisibility, the place where Achilles should overtake the tortoise which starts before him, according to the proportion of their velocities. Thus Geometry dissipates these apparent difficulties."

NOTES to PAGE 95.

(1) Cf. Lettre à M. Bayle, (1687) Erdm 104. "I have seen the reply of Father Malebranche to the remark I made on some laws of nature which he laid down in the "Recherche de la Verité". He appears somewhat disposed to give them up himself, and his ingenuousness is most laudable; but he gives reasons for it and makes restrictions, which would bring us back into the obscurity from which I think I have delivered this subject, and which conflict with a certain Principle of General Order that I have observed. I hope, therefore, that he will kindly allow me to take this opportunity of explaining this principle, which is of great use in reasoning, and which does not yet appear to be sufficiently employed nor known in all its scope. It has its origin in the conception of the Infinite; it is absolutely necessary in Geometry, and it also /

NOTES to PAGE 95. Continued.

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also holds good in Physics, inasmuch as the Supreme Wisdom, which is the source of all things, acts as a perfect geometrician, and according to a harmony which cannot be bettered . . . . . The principle may be stated thus : - "When the difference between two cases can be diminished below any given magnitude in datis or in the antecedents (ce qui est posé) it will necessarily also be diminished below every given magnitude in quaesitis or in the Consequents (ce qui en résulte). Or, to put it more simply: when the cases (or what is given) continually approach and are finally lost in one another, the consequences or results (or what is required) must do the same. This again depends upon a more general principle, to wit: datis or dinatis etiam quaesita sunt ordinata. (If there is order in the grounds there will also be /

NOTES to PAGE 95. Contd.

be order in the Consequents). But for the understanding of this, instances are necessary. It is known that the case or supposition of an Ellipse may be made to approximate, as much as we like, to the case of a Parabola, so that the difference between the Ellipse and the Parabola may become less than any given difference, provided that one of the foci of the Ellipse be made sufficiently distant from the other, for then the radii vectores proceeding from this distant focus will differ from parallel radii vectores as little as we like. Consequently all the geometrical theorems which may be proved of the Ellipse in general can be applied to the Parabola, by considering it as an Ellipse one of whose foci is at an infinite distance, or (to avoid this expression), as a figure which differs from some Ellipse by less than any given /

NOTES to PAGE 95 Continued.

given difference. The same principle holds in Physics. For instance, rest may be regarded as an infinitely small velocity or as an infinite slowness. Accordingly, whatever is true of slowness or velocity in general ought also to be true of rest, thus understood; so that the law of rest should be regarded as a particular case of the law of motion. Otherwise, if this does not hold, it will be a sure sign that these laws are ill constructed. In the same way equality may be regarded as an infinitely small inequality, and inequality may be made to approximate to equality as much as we like." V. also Nouveaux Essais, Avant-propos, (Erdm. 198a) : - "Nothing happens suddenly (tout d'un coup), and it is one of my great and most certain maxims, that Nature never makes leaps. I called this the Law of Continuity, when I spoke of /

NOTES to PAGE 95. Continued.

of it elsewhere in the Nouvelles de la République des lettres; and the use of this law is very considerable in Physics. It is to the effect that we always pass from the small to the great, and vice versa, through that which is intermediate, in degree as well as in quantity; and that a motion never arises immediately from rest and is never reduced to rest except through a smaller motion, just as we never completely traverse any line or length without having traversed a smaller line. But hitherto those who have laid down the laws of motion have not noted this law, and have thought that a body can receive in a moment a motion contrary to that which it had immediately before." V. also Nouveaux Essais, Bk IV, Ch.16, Sectn 12 (Erd. 392a) : - "But the beauty of nature . . . . . requires the appearance of discontinuity (sauts) and, so to speak, musical /

NOTES to PAGE 95. Continued.

musical cadences among phenomena." In the letter to Bayle above quoted, Leibniz also remarks (Erd. 106a) : - "It is true that in compound things a small change may sometimes produce a great effect. For instance, a spark falling upon a large mass of gunpowder might overthrow a whole town; but that is not contrary to our principle, and might indeed be explained on general principles. But in the case of elements or simple things nothing like this could happen; otherwise nature would not be the result of Infinite Wisdom."

(2) As to the analogy between Symbolic Thought and Algebra, etc., cf. Locke, Essay, Bk II, Ch. 29, Sectn 9; Fraser's Edition, Vol. I, p. 490. Also Fraser, Vol. II, pp. 12 and 124, where further references will be found.

NOTE to PAGE 99.

(1) The consideration of Leibniz's Theology or Philosophy of Religion is beyond the scope of the present volume.

NOTES to PAGE 101.

(1) Principia, Part II, 25. Descartes adds :-

"By a body, or rather a portion of matter, I mean the whole of what is transferred together, although this may be composed of several parts which themselves have other motions. And I say that motion is the transference and not the force or activity which transfers, in order to show that motion is always in the moving object and not in that which moves it; for it seems to me that these two things are not usually distinguished with sufficient care. Further, I mean that motion is a property of the moving thing and not a substance; just as form is a property of the thing which has a form, and rest is a property of that which is at rest."

(2) Principia, Part II, 23. Veitch's Translation.

NOTE to PAGE 103.

(1) Cf. Principia II., 36 (Veitch's translation).

"With respect to the general cause of motion, it seems manifest to me that it is none other than God Himself, who in the beginning created matter along with motion and rest, and now by His ordinary concourse alone preserves in the whole the same amount of motion and rest that He then placed in it. For although motion is nothing in the matter moved but its mode, it has yet a certain and determinate quantity, which we easily understand may remain always the same in the whole Universe, although it changes in each of the parts of it. So that in truth, we may hold when a part of matter is moved with double the quickness of another, and that other is twice the size of the former, that there is just precisely as much motion, but no more, in the less body as in the greater; and that in proportion as the motion of any one /

NOTE to PAGE 103 continued.

one part is reduced, so is that of some other and equal portion accelerated. We also know that there is perfection in God, not only because He is in Himself immutable, but because He operates in the most constant and immutable manner possible; so that, with the exception of those mutations which manifest experience or Divine revelation renders certain, and which we perceive or believe are brought about without any change in the Creator, we ought to suppose no other in His works, lest there should thence arise ground for concluding inconstancy in God Himself. Whence it follows as most consonant to reason, that merely because God diversely moved the parts of matter when He first created them, and now preserves all that matter, manifestly in the same way and on the same principle on which He first created it, He also always preserves the same quantity of motion in the matter itself."

NOTES to PAGE 104.

(1) Cf. Principia, II, 41. "Each thing, whatever it is, always continues to be as it is in itself simply, and not as it is in relation to other things, until it is compelled to change its state by contact with some other thing. From this it necessarily follows that a moving body, which meets on its course another body, so firm and impenetrable that it cannot move it in any way, entirely loses the determination it had of moving in this particular direction, and the cause of this is evident, namely, the resistance of the body which prevents it from going further; but it does not necessarily on this account lose any of its motion, since it is not deprived of its motion by the resisting body or by any other cause, and since motion is not contrary to motion."

(2) Cf. Animadversiones ad Cartesii Principia (1692?) Note to Part II, Sectn 25. (Duncan's Translation p. 60.)

NOTE to PAGE 105.

(1) Cf. Letter to M. Pelisson (1691), Dutens, Vol. I. p. 733. "It must be observed that every body makes an effort to act on outside things and would perceptibly act, if the contrary efforts of surrounding bodies did not prevent it. This has not been sufficiently noticed by our moderns. They imagine that a body might be perfectly at rest, without any effort. But this is due to their failure to understand what bodily substance really is; for in my opinion substance cannot (except miraculously) be without action. This also disproves the inaction which Socinians attribute to disembodied souls."

NOTES to PAGE 107.

(1) Letter to M. Pelisson (no date), Dutens, Vol. I, p. 719.

(2) Cf. De Primae Philosophiae Emendatione, etc., Erdm. p. 122. "Active force differs from the bare potency commonly recognised in the schools. For the active potency of the Scholastics, or faculty, is nothing but a mere possibility of acting, which nevertheless requires an outer excitation or stimulus, that it may be turned into activity. But active force contains a certain activity (actus) and is a mean between the faculty of acting and action itself. It includes effort and thus passes into operation by itself, requiring no aids, but only the removal of hindrance. This may be illustrated by the example of a heavy hanging body stretching the rope which holds it up, or by that of a drawn bow."

(3) Action is throughout this passage translated 'force'. /

NOTES to PAGE 107 (Continued)

'force.' Force (without inverted commas) is given as a translation of Leibniz's force. Action might be translated 'work' or 'power of work'; but that translation could not very well be maintained throughout the passage.

NOTES to PAGE 109.

(1) Letter to Bayle,(1702), Erdm. p. 192. Of course, from one point of view, Leibniz's statement is not quite accurate, since there are many forms of energy of which it takes no account. It is, however, on right lines. It would be interesting to trace a connection between the inevitable inadequacy of his view regarding this matter and the imperfection of his general philosophical position, arising from his combination, without any real synthesis, of the two principles, Contradiction and Sufficient Reason. Such an inquiry would throw light on the metaphysical pre-suppositions of the Modern Law of Conservation of Energy.

(2) Cf. Janet Vol.I, p. 633. "A body of one lb weight which has a velocity of 2 degrees, has twice as much force as a body of 2 lb weight which has a velocity of one degree, because it can raise the same weight twice as high."

NOTES to PAGE 110.

(1) Cf. Janet, Vol. I, p. 639. "Extension is an attribute which cannot constitute a concrete (accompli) being. We cannot draw from it any activity or change. It expresses only a present state, and not at all the future and the past, which the notion of a substance ought to express. When two triangles are found joined together, we cannot infer from them how the joining has taken place. For it may have happened in various ways; but nothing which can have several causes is ever a concrete (accompli) being."

(2) Cf. Dutens, Vol. 6, Part I, p. 175. "If with the Cartesians, we were to admit a plenum and the uniformity of matter, adding only motion, it would follow that there would never be anything in the world but a substitution of equivalents, as if the whole Universe were to reduce /

NOTES to PAGE 110 (Continued).

reduce itself to the motion of a perfectly uniform wheel about its axis or to the revolutions of concentric circles of perfectly homogeneous matter. In that case, it would not be possible, even for an angel, to distinguish the state of the world at one moment from its state at another moment. For there could not be any variety in the phenomena. That is why, in addition to figure, size and movement, there must be admitted forms from which there arises in matter a variety of appearances; and I do not see whence we can draw these forms, if they are to be intelligible, except from Entelechies. Cf. De Ipsa Natura (1693), Sectn 13, Erd. 158b. "Sturm says that motion is only the successive existence of the thing moved, in different places. Let us grant this meanwhile; although it is not altogether satisfactory and rather expresses what results from motion than its /

NOTES to PAGE 110 (Continued).

its formal reason, as it is called. Even so, motive force (vis motrix) is not therefore excluded. For not only is a body at the actual moment of its motion in the place assigned it, but it has also an effort (conatus) or tendency to change its place, so that its succeeding state follows naturally of itself from its present state. Otherwise at the present moment (and hence at any moment) body A, which is moved by body B, would in nothing be different from a body at rest, and from the opinion of Sturm, if it were contrary to ours, it would follow that there is no difference whatever among bodies, inasmuch as in a plenum of homogeneous mass, no difference can be supposed except that which arises from motion."

NOTES to PAGE 113.

(1) Cf. Epistola ad Wagnerum. Erdm. 466. "The active principle is not attributed by me to bare matter or materia prima, which is merely passive and consists solely in ἀντιτυπία and extension; but to body or clothed matter or materia secunda which contains in addition a primary Entelechy or active principle . . . . The resistance of bare matter is not activity, but mere passivity, inasmuch as it has ἀντιτυπία or impenetrability by which indeed it resists that which would penetrate it, but does not re-act unless it has in addition an elastic force. This elastic force must be derived from motion, and thus also from the active force of matter, which must be superadded." Also De Ipsa Natura (1698), 12 :- "Matter is understood as either materia secunda or materia prima; materia secunda is indeed a complete substance, but not a merely passive one; /

NOTES to PAGE 113 continued

one; materia prima is merely passive, but is not a complete substance; and thus there must be added to it a soul or form analogous to a soul, ἐντελέχεια ἡ πρώτη, that is a certain effort or primary force of acting, which itself is an indwelling law, imprinted by divine decree." It should be noted that the expression "Substance", as here applied to materia secunda, is not to be taken too strictly. Materia Secunda is not so much substantia as substantiata. This is more clearly brought out in Leibniz's later writings. V. Note to Sectn 1 of the Monadology and Note on p. 115.

(2) Cf. Lettre à M. Remond de Montmort (1715) Erdm. 736. "Materia prima or pure matter, considered apart from the souls or lives which are united to it, is purely passive. Thus, strictly speaking, it is not a substance, but something incomplete. And materia secunda, as for /

NOTES to PAGE 113 continued

for example, body, is not a substance, but for another reason; namely, because it is a collection of several substances, like a pond full of fish, or a flock of sheep; and consequently it is what is called unum per accidens, in a word, a phenomenon. A real substance, such as an animal, is composed of an immaterial soul and an organic body; and it is the combination of these two that is called unum per se."

NOTES to PAGE 114.

(1) Ad Des Bosses Epistola, 7. (Erdm. 440).

(2) Ad Des Bosses Epistola, 3. (Erdm. 436).

(3) Ad Des Bosses Epistola, 7 (Erdm. 440).

NOTE to PAGE 115.

(1) Cf. Janet, Vol.I., p.629. "In my opinion, ~~one~~ our body in itself, (setting aside the soul), or the Cadaver can be called a substance only by a wrong use of terms, like a machine or a heap of stones which are only beings by aggregation; for regular or irregular arrangement has nothing to do with unity of substance. . . . I think that a marble pavement is perhaps nothing but a quantity of stones, and thus cannot pass for only one substance, but is a collection of several. For suppose there are two stones, for example, that of the Grand Duke and that of the Great Mogul, we might give them both, in respect of their value, one and the same collective name, and we might say that they are one pair of diamonds, although they are actually far distant from one another. But it will not be said that these diamonds compose one substance. More and less have no place here. Accordingly, if we bring them nearer one another, and even /

NOTE to PAGE 115 Continued.

even make them touch one another, they will be none the more united in Substance; and although, after they had been brought into contact, we were to join to them some other body in such a way as to prevent them from separating again, for instance, if we were to set them in one ring, all that would make of them only what is called a unity per accidens. For it is as by accident that they are compelled to share in the same motion. I hold then that a marble pavement is not one concrete (accomplie) substance, any more than would be the water of a pond with all the fish it holds, even although all the water and the fish were frozen together; or than a flock of sheep, in which the sheep should be supposed to be so bound together that they could only walk in step, and that one could not be touched without all the others crying out. There would be as much difference between a substance /

NOTE to PAGE 115 continued.

substance and such a being, as between a man and a community, like a people, army, society or college, which are moral beings and in which there is something imaginary and created by our mind. Unity of substance requires an indivisible and naturally indestructible concrete (accomplie) being, since the notion of such a being includes all that is ever to happen to it. This cannot be found in figure or motion, (both of which, indeed, involve something imaginary, as I could prove), but rather in a soul or substantial form, analogous to what is called "Me". These are the only real concrete beings, as was recognised by the ancients, and above all by Plato, who has very clearly shown that matter alone is not enough to make a substance. But the "Me", or that which corresponds to it in each individual substance cannot be made or unmade by approximation or separation /

NOTE to PAGE 115. Continued.

separation of parts, - a thing which is entirely outside of that which constitutes substance. I cannot exactly say whether there are other real corporeal substances than those which are alive (animés), but at least souls serve to give us some knowledge of the others through analogy."

NOTES to PAGE 116.

(1) De Modo distinguendi phenomena realia ab imagin ariis, (Erdm. 444).

(2) Whether this can be reconciled with the view that materia secunda is a mere aggregate or collection is a matter for further consideration.

(3) Loc. cit. Of course, it must be remembered that the "reality" attributed by Leibniz to phenomena bene fundata is entirely relative to the illusoriness of "pure" phenomena, such as we have in dreams, and is not to be confounded with the reality of substance. Cf. Nouveaux Essais, Bk. 4, Ch. 2 . . . . "The truth of the things of sense consists only in the connection of the phenomena, which must have its reason, (ground), and that is what distinguishes them from dreams: but the truth of our existence and of the cause of phenomena is of another /

NOTES to PAGE 116. Continued.

another kind, because it establishes substances . . . . . Although feelings are usually more vivid than imaginations, nevertheless there are cases in which imaginative persons are impressed by their imaginations as much as, or perhaps more than, another person is by the truth of things; so that I think the true criterion, as regards the objects of the senses, is the connection of phenomena, that is to say, the connection of what happens in different times and places, and in the experience of different men, who themselves are to one another very important phenomena in this regard. And the connection of the phenomena which establishes truths of fact in regard to sense-objects outside of us, is verified by means of truths of reason; as the phenomena of optics are explained by geometry.

Yet it must be admitted that this certitude is /

NOTES to PAGE 116. Continued.

is not of the highest degree . . . . For it is not impossible, metaphysically speaking, that there is a consecutive dream lasting as long as the life of a man; but that is a thing as contrary to reason as would be the fiction that a book could be formed by chance through throwing down type in confusion. For the rest it is true that, provided phenomena are connected, it does not matter whether we call them dreams or not; since experience shows that we are not deceived in our practical dealing with phenomena when we act in accordance with truths of reason." Cf. Locke, Essay, Bk.IV., Ch. 2, Sectn 14. Fraser's Edition, Vol. II., pp.185 et seq. with Prof. Fraser's Notes, and also his Notes on pp.332 and 333.

(4) Cf. Letters to Des Bosses, 28, Erdm. p.728. "I prefer to say that not substances but species remain, and that these are not illusory, like a /

NOTES to PAGE 116. Continued.

a dream or like a sword pointing towards us out of a concave mirror, or as Dr Faustus ate a cart-full of hay, but true phenomena, that is, in the sense in which a rainbow or a mock sun is a species, indeed, as according to the Cartesians and in truth, colours are species."

NOTES to PAGE 117.

(1) Leibniz even suggests in one passage that the primary qualities also are merely phenomena. V. De modo distinguendi phenomena realia ab imagin ariis, Erd. 445. "Regarding bodies I can prove not only that light,heat,colour and similar qualities are phenomenal (apparentes), but also motion and figure and extension.

(2) Janet, Vol. I, p. 675.

NOTE to PAGE 119.

(1) Replique aux Reflexions de Bayle (1702) Erdm. 189. Cf. Lettres entre Leibniz et Clarke, (Clarke's Transln) IIIme Ecrit de Leibniz, 4 (Erdm. 752):- "I hold space to be something merely relative, as time is: I hold it to be an order of co-existences, as time is an order of successions. For space denotes, in terms of possibility, an order of things which exist at the same time, considered as existing together; without inquiring into their particular manner of existing. And when many things are seen together, one perceives that order of things among themselves." The correspondence between Leibniz and Clarke is mainly devoted to this question of the meaning of space and time. Clarke endeavoured to defend the view of Newton that infinite space is real, and is to be regarded as a kind of sensorium of God or as His omnipresent perception of things.

Leibniz /

NOTE to PAGE 119 continued

Leibniz attacks not merely this particular view, but all other theories which makes space real, as for instance, those which confound infinite space with the immensity of God or with any other of his attributes. Cf. Fraser's Edition of Locke's Essay, Vol. I., pp.259, 260.

NOTE to PAGE 121.

(1) Lettres entre Leibniz et Clarke, IIIme Écrit de Leibniz, 5 and 6. (Clarke's Transln). In answer to this Clarke, while professedly admitting the Principle of Sufficient Reason, really denies its validity by maintaining that the mere will of God is to be counted as a sufficient reason and that therefore Leibniz's application of the Principle does not prove his case. Cf. IVme Écrit de Leibniz, 18 :- "Space being uniform, there can be neither any external nor internal reason, by which to distinguish its parts and to make any choice among them. For any external reason to discern between them can only be grounded upon some internal one. Otherwise we should discern what is indiscernible, or choose without discerning. A will without reason would be the "chance" of the Epicureans. A God, who should act by such a will , would be a God only in name."

With /

NOTE to PAGE 121. Continued.

With regard to the general question, cf. Vme Écrit de Leibniz, 62 :- "I don't say that matter and space are the same thing, I only say, there is no space where there is no matter, and that space in itself is not an absolute reality. Space and matter differ as time and motion. However these things, though different are inseparable." In sectn 47 of the same writing, Leibniz gives an account of the origin of the idea of space. "I will here show how men come to form to themselves the notion of space. They consider that many things exist at once and they observe in them a certain order of co-existence, according to which the relation of one thing to another is more or less simple. This order is their situation or distance. When it happens that one of those co-existent things changes its relation to a multitude of others, without /

NOTE to PAGE 121. Continued.

without their changing their relations among themselves; and that another thing, newly come, acquires the same relation to the others, as the former had; we then say it is come into the place of the other; and this change we call a motion in that body, wherein is the immediate cause of the change. And though several, or even all the co-existent things should change according to certain known rules of direction and velocity, we can always determine the relation of situation which each acquires with reference to every other, and we can even determine the relation which each would have or which it would have to every other, if it had not changed or if it had changed otherwise. And supposing or feigning that among those co-existents there is a sufficient number of them, which have undergone no change, then we may /

NOTE to page 121. Continued.

may say that those which now have to those fixed existen[ts] a relation such as that which others formerly had to them, have the same place which these latter had. And that which comprehends all these places is called Space. Which shows that in order to have an idea of place, and consequently of Space, it is sufficient to consider these relations and the rules of their changes, without needing to fancy any absolute reality outside of the things whose situation we consider. And, to give a kind of definition: Place is that which we say is the same for A and for B, when the relation of co-existence between B and C, E, F, G, etc., is in perfect agreement with the relation of co-existence which A formerly had with the same C, E, F, G, etc; provided that in C, E, F, G, etc., there has been no cause of change /

NOTE to PAGE 121 Continued.

change. . . . . Place is that which is the same in different moments to different existent things, when the relations of co-existence between each and certain other existents, which are supposed to continue fixed from moment to moment, agree entirely together. And fixed existents are those in which there has been no cause of change in the order of their co-existence with others, or (which is the same thing) in which there has been no motion. In short, Space is that which results from places taken together. And here it is right to consider the difference between place and the relation of situation which is in the body occupying the place. For the place of A and B is the same; whereas the relation of A to the fixed bodies is not exactly and individually the same as the relation which B (that comes into its place) will /

NOTE to PAGE 121 Continued.

will have to the same fixed bodies: these relations are only in agreement. For two different objects, as A and B, cannot have exactly the same individual affection; it being impossible that the same individual accident should be in two objects or pass from one object to another. But the mind, not satisfied with mere agreement, looks for an identity, for something which should be really the same, and conceives it as outside of the objects: and this is what we here call Place and Space. But this can only be an ideal thing, involving a certain order, in which the mind conceives relations to be applied."

I have made some slight alterations in Clarke's translation for the sake of clearness. As to other details of Leibniz's doctrine of Space, cf. Fraser's Edition of Locke's Essay, Vol.I., pp.158 and 186.

NOTE to PAGE 123.

(1) Cf. Spinoza's views of Action and Passion in Ethics, Part III., especially Definitions 1 and 2 and Propns. 1, 2 and 3. Also, Ethics, Part V., Prop. 40, Corollary.

NOTES to PAGE 124.

(1) Cf. p. 30. v. also the last letter in the correspondence between Leibniz and Arnauld, in which Leibniz gives a summary of his position (Janet, Vol. I., p.689):- "There must be everywhere in body Substances indivisible, unborn and imperishable, having something corresponding to souls. Each of these Substances contains in its own nature "legem continuationis seriei suarum operationum" (the principle of succession of the series of its own operations) and all that has happened and shall happen to it. All its actions come from its own nature, except its dependence upon God. Each Substance expresses the entire universe, but one does so more distinctly than another, and each expresses it more especially with regard to certain things and according to its own point of view. The union of soul with body, and indeed /

NOTES to PAGE 124 Continued.

indeed the operation of one Substance upon another, consists only in the perfect mutual accord of Substances, definitely established through the order of their first creation, in virtue of which each Substance, following its own laws, agrees with the rest, meeting their demands; and the operations of the one thus follow or accompany the operations or change of the other."

(2) Cf. Monadology, 49 et seq.

NOTE to PAGE 125.

(1) Cf. Draft of a letter to Arnauld, Janet, Vol.I. p.636. "The hypothesis of concomitance is a consequence of my notion of Substance. For, in my view, the individual notion of a Substance includes all that is ever to happen to it, and it is in this respect that concrete things (êtres accomplis = res completae?) differ from those which are not so. Now, the soul being an individual Substance, its notion, idea, essence or nature must include all that is ever to happen to it; and God, who sees it perfectly, sees in it all that it will ever do or suffer and all the thoughts it will have. Accordingly, since our thoughts are nothing but the consequences of the nature of our soul and the rise in it in virtue of its notion, it is useless to seek in it the influence of any other particular Substances, besides that such an influence is absolutely inexplicable. It is true /

NOTE to PAGE 125 Continued.

true that certain thoughts come to us, when there are certain bodily motions, and that certain bodily motions happen when we have certain thoughts; but that is because each Substance expresses the entire Universe in its own way, and that expression of the Universe which is a motion in the body, is perhaps a pain in relation to the soul. But we attribute activity to that Substance whose expression is the more distinct, and we call it cause. Thus when a body passes through water, there is an infinity of motions of the parts of the water, such as there must be in order that the place which the body leaves may be filled up again by the shortest way. We say that this body is the cause of the motions, because by its means we can explain distinctly what happens; but /

NOTE to PAGE 125 Continued.

but if we consider what is physical and real in the motion, we may equally well suppose that the body is at rest and that everything else moves, in accordance with the hypothesis, since the whole motion in itself is only a relative thing, viz., a change of situation (position) which we do not know how to explain with mathematical exactness; but we do attribute it to a body by means of which all is distinctly explained" (i.e., so far sufficiently explained, though not with mathematical exactness.) "And in fact, taking all the phenomena little and great, there is only one hypothesis which serves to explain the whole distinctly. And we may indeed say that, although this body may not be an efficient physical cause of these effects, its idea is at least, so to speak, their final, or, if you like archetypal (exemplaire) cause in the /

NOTES to PAGE 125 Continued.

the Understanding of God. For, if we wish to find whether there is anything real in the motion, let us imagine that God wills directly to produce all the changes of Situation in the Universe, exactly as if this vessel were producing them in passing through the water; is it not true that there would actually happen exactly the same thing? For it is impossible to assign any real difference. Thus, in metaphysical strictness, we have no more reason to say that the vessel compels the water to make this great number of ripples by means of which the place of the vessel is filled up, than to say that the water is compelled to make all these ripples, and that it compels the vessel to move in conformity with it; but, except by saying that God has willed directly to produce so great a number of motions all tending to this /

NOTE to PAGE 125 Continued.

this one thing, we can give no reason for it, and as it is not reasonable to have recourse to God for the immediate explanation of matters of detail, we have recourse to the vessel, although actually, in an ultimate analysis, the agreement of all the phenomena of the various substances comes only from this, that they are all productions of one and the same Cause, to wit, God; and consequently each individual Substance expresses the resolution which God has taken with regard to the whole Universe."

NOTE to PAGE 126.

(1) Cf. Epistola ad Bierlingium (1711), Erdmann p.677.
"You ask about spiritual or rather incorporeal, things, and you say that we see the mechanical arrangement of the parts but not the principles of the mechanism. True; but when we see motion also, we understand from this (what we see) the cause of motion, or force. The source of mechanism is primary force (vis primitiva), but the laws of motion, according to which impulses (impetus) or derivative forces arise out of the primary force, issue from the perception of good and evil, or from that which is most fitting. Thus it is that efficient causes are dependent upon final causes, and spiritual things are in their nature prior to material things, as also they are to us prior in knowledge, because we perceive more immediately (interius) the mind (as it is nearest to us) than the /

NOTE to PAGE 126 Contonued.

the body; and this indeed Plato and Descartes have observed." Also, Lettre à M. Remond de Montmort (1714), Erdmann, p.702. "I have found that most of the philosophical sects are right in a good part of what they maintain, but not to the same extent in what they deny. The Formalists, such as the Platonists and Aristotelians, are right in seeking the source of things in final and formal causes. But they err in neglecting efficient and material causes and in inferring, (as did Mr Henry More in England, and some other Platonists) that there are phenomena which cannot be explained on mechanical principles. But, on the other hand, the Materialists, or those who hold exclusively to the Mechanical Philosophy, err in setting aside metaphysical considerations and in trying to explain everything by that which is dependent on the imagination. I flatter myself that /

NOTE to PAGE 126 Continued.

that I have discovered the harmony of the different systems and have seen that both sides are right, provided they do not clash with one another; that in the phenomena of nature everything happens mechanically and at the same time metaphysically, but that the source of the mechanical is in the metaphysical." Also Janet Vol.I., p.632. "We are obliged to admit many things of which our knowledge is not sufficiently clear and distinct. I hold that the knowledge of extension is very much less so" (than that of substantial forms, of which he has been speaking,) "witness the remarkable difficulties as to the composition of the continuous; and it may even be said that bodies have no definite and precise shape, because of the actual sub-division of their parts." (i.e., their sub-division ad infinitum). "So that bodies /

NOTE to PAGE 126. Continued.

bodies would without doubt be something merely imaginary and apparent, if there were nothing but matter and its modifications. Yet it is of no use to mention the unity, notion or substantial form of bodies, when we are explaining the particular phenomena of nature, as it is of no use for mathematicians to investigate the difficulties de compositione continui, when they are working at the solution of some problem. These things are none the less important and worthy of consideration in their own place. All the phenomena of bodies can be explained mechanically or by the corpuscular philosophy, according to certain principles of mechanics, which are laid down without taking into consideration whether there are souls or not; but in an ultimate analysis of the principles of physics and even of mechanics, it appears that we /

NOTE to PAGE 126 Continued.

we cannot explain these principles by modifications of extension alone, and the nature of force already requires something else."

NOTE to PAGE ~~107~~ 126.

(1) In the second of two dialogues entitled Phoranomus seu de Potentia et Legibus Naturae (1689) Leibniz gives an account of the progress of his views regarding Dynamics and Physics. "When first I escaped from the prickly thorn-brakes of the schools into the more pleasant fields of later philosophy, I was greatly taken with that fascinating ease of understanding, in which I saw a lucid imagination comprehending all the things which formerly were wrapped in dark notions. And after long and careful deliberation I at length rejected the "forms" and "qualities" of material things and reduced all things to purely mathematical principles; but since I was not yet versed in Geometry, I was convinced that a continuum consists of points, and that a very slow motion is broken by little bits of rest, and I was inclined to other doctrines /

doctrines of this kind, which commend themselves to those who seek to comprehend all things with the imagination and who do not notice the infinite which is everywhere latent in things. But although when I became a Geometrician, I put off these opinions, there yet remained for a while Atoms and the Void, as relics of a state of mind that was in revolt against the idea of the Infinite; for although I granted that every continuum can in thought be divided ad infinitum, yet I did not really accept the view that in things there are innumerable parts which follow from motion in the plenum. At last not only was I freed from this scruple, but also I began to recognise something deeper in bodies, which could not be comprehended by the imagination . . . . . This ought not to seem wonderful, for it is the nature of foundations to /

NOTE to PAGE Continued.

to be humble, but if they are securely laid, great masses arise upon them. Accordingly when I as yet acknowledged the jurisdiction of imagination alone in regard to material things, I was of opinion that any natural inertia in bodies was unintelligible and that a body at rest in vacuo or in a free space must receive the velocity of another, however small that other might be; and that this does not actually happen in our experience I attributed to the system established by the wisdom of the Supreme Author of things, in which all things are ruled by the most just laws. Nor indeed did I doubt that the origin of the system might be rationally thought out on mechanical principles from those very laws of natural bodies, which explain occurrences by the combination of motions, such as I expounded regarding several cases /

NOTE to PAGE Continued

cases in a treatise which I published when a young man . . . . . Perhaps it will now also be worth while to consider these rules of mine, since they seemed to have clearly much reason in their favour. Conceiving, then, in matter nothing else than extension and impenetrability, or in one word, the filling of space, and understanding by motion nothing but change of space, I saw that a body moved differs, from moment to moment, from the same body at rest, in this respect at least that the body set in motion has always a certain effort (conatus) or (to use the expression of Erhard Weigel, a distinguished mathematician of Saxony) a tendency, that is a beginning to start (initium pergendi) although meanwhile it may happen that owing to a contrary effort, equilibrium arises (equal efforts tending in opposite directions) and all progress /

NOTE to PAGE Continued.

progress and motion is stopped. . . . . Further I saw that every effort (conatus) is compatible with every other conatus, since also every motion can be combined with every other motion, so as to produce a third motion, which can always be Geometrically determined. And therefore there appeared to be no way in which conatus could naturally be destroyed or removed from the body." Leibniz proceeds to deduce on these principles, three laws of motion, which, however, agree neither with actual concrete experience nor with the similar laws of Descartes, and he finally goes on to say :-

"Nevertheless, all things considered, I at length saw that it is impossible to find a solution of the difficulty by means of such rules. . . . . I gathered that the nature of matter is not yet sufficiently known to us nor is it possible to explain /

NOTE to PAGE Continued.

explain the inertia or the power (potentia) of bodies, unless there is something in them besides extension and impenetrability. . . . . I am of opinion that the mechanical principles and reasons of the laws of motion do themselves arise not from the necessity of matter, but from some higher principle than imagination, and one independent of mathematics. . . . . Besides I began to have considerable doubts as to the nature of motion. For when formerly I regarded space as an immoveable real place, possessing extension alone, I had been able to define Absolute Motion as change of this real space. But gradually I began to doubt; whether there is in nature such an entity, as is called space; whence it followed that a doubt might arise about absolute motion. Certainly Aristotle had said that place is nothing but the surface /

surface of what surrounds us (superficies ambientis), and Descartes, following him, had defined motion (that is, change of place) as change of neighbourhood (mutatio viciniae). Whence it seemed to follow that that which is real and absolute in motion consists not in what is purely mathematical, such as change of neighbourhood or situation, but in motive force (potentia motrix) itself; and if there is none of this, then there is no absolute and real motion. . . . . Accordingly I found no other Ariadne thread to lead me out of this Labyrinth, than the calculation of forces (potentiae), assuming this metaphysical principle, "That the total effect is always equal to its complete cause" (Quod effectus integer sit semper aequalis causae suae plenae). When I discovered that this agrees perfectly with experience and /

NOTE to PAGE Continued.

and satisfies all doubts, I was the more confirmed in my opinion that the causes of things are not, so to speak, senseless (surdus) and purely mathematical, like the concourse of atoms or the blind force of nature, but proceed from an Intelligence, which employs metaphysical reasons". Archiv für Geschichte d. Philosophie, I 577. In the first of these Dialogues Leibniz says :- "As in Geometry and numbers, through the principle of the equality of the whole to all its parts, Geometry is brought within the scope of an Analytical Calculus, so in mechanics, through the principle of the equality of the effect to all its causes or of the cause to all its effects, we obtain certain equations, as it were, and a kind of Algebraic Mechanics". loc.ci. p. 576.

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(2) Yet it must not be supposed that the soul has perfect knowledge of all that takes place in its own body. Cf. Janet, Vol I., p.648. "It does not follow that the soul must be perfectly conscious (apercevoir) of what happens in the parts of its body, since there ~~are~~ are degrees of relationship between these parts themselves, which are not all expressed equally, any more than external things are. The distance of the latter is balanced by the smallness or other disadvantages of the former, and Thales sees the stars, when he does not see the ditch before his feet." Cf. Janet, Vol I., p.668. "In natural Perception and in animal feeling, it is enough that what is divisible and material, and is actually divided among several beings, should be expressed or represented in one indivisible being or in Substance which possesses a real unity. We cannot doubt the possibility of /

NOTE to PAGE 132. Continued.

of such a representation of several things in one only, since our soul gives us an instance of it. But this representation is accompanied in the rational soul by consciousness, and then it is called thought. Now, this expression occurs everywhere, because all Substances are in sympathy with one another, and each receives some proportional change, corresponding to the least change which happens anywhere in the Universe, though this change is more or less observable, according as other bodies or their actions have more or less relation to ours. And I think that M. Descartes himself would have admitted this, for he would doubtless allow that, because of the continuity and divisibility of all matter, the least motion has its effect upon neighbouring bodies, and consequently upon one body after another ad infinitum, the effect proportionally diminishing. Thus, our body /

NOTE to PAGE 132. Continued.

body must be in some way affected by the changes in all others. Now, to all the motions of our body there correspond certain more or less confused Perceptions or thoughts of our soul. Hence, the soul also will have some thought of all the motions in the Universe, and, in my opinion, every other soul or Substance will have some Perception or Expression of them. It is true that we are not distinctly conscious of all the motions of our body, as, for instance, that of the lymph; but this may be compared with the fact that I must have some Perception of the motion of each wave on the shore, in order that I may be conscious of that which results from the totality of them, namely the great noise that I hear when close to the sea. Even so, we experience some confused result of all the motions which take place in us; but being /

NOTE to PAGE 132. Continued.

being accustomed to this internal motion, we are not distinctly and reflectively conscious of it, except when there is a considerable change in it, as at the beginning of an illness. . . . . Now, since we are conscious of other bodies only through the relation they have to our own, I was right in saying that the soul expresses best what belongs to our own body. Thus we know the satellites of Saturn or of Jupiter, only in consequence of a motion which takes place in our eyes." Cf. Spinoza, Ethics, Part II. Propositions 24 and 27.

NOTES to PAGE 134.

(1) Cf. Correspondence with Bernouilli, Vol. I, p. 424. "I would readily allow that there are animals (in the ordinary sense) incomparably greater than ours; and I have sometimes said in jest that there may be some system similar to ours, which is the watch of a very great giant." Also Monadology, 66 et seq. cf. Spinoza, Ethics, Part II, Lemma VII. Scholium.

(2) Cf. Correspondence with Bernouilli, Vol. I, p. 424. "I do not admit μετεμψύχωσις into a new animal, but μεταμόρφωσις, αὔξησις, μείωσις of the same animal."

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(1) Cf. Correspondence with Bernouilli, Vol. I, p. 415. "You argue entirely to my mind when you say that changes do not take place per saltum. And further, I do not laugh at your conjecture, but I definitely avow that there are in the world animals as much larger than ours, as ours are larger than microscopic animalcules. Nor does nature know any limit. And again, it may be, nay it must be, that in the very smallest grains of dust, and indeed in the least atoms (atomulis) there are worlds not inferior to our own in beauty and variety; nor is there anything to prevent what may appear a still more wonderful thing, that animals at death are transferred to such worlds; for I regard death as nothing else than the contraction of an animal."

(2) Cf. Lettre à M. Des Maizeaux. (1711) Erdm. p. 676. "I am of opinion that the souls of men pre-existed /

NOTES to PAGE 137 (Continued).

pre-existed, not as rational souls, but merely as "sensitive" (sensible) souls, which attained this higher degree, (that is to say, Reason) only when the man, whom the soul is to animate, was conceived. I grant an existence as old as the world not only to the souls of the lower animals, but in general to all Monads or simple substances from which compound phenomena result; and I hold that each soul or Monad is always accompanied by an organic body, which is nevertheless perpetually changing; so that the body is not the same, though the soul and the animal are. These rules apply also to the human body, but apparently in a higher degree than to other animals which are known to us; since man must continue to be, not merely an animal but also a person and a citizen of the City of God, which is the most perfect possible state, under the most perfect Monarch."

NOTE to PAGE 139.

(1) Janet, Vol. I, p.657. Cf. Theodicy 91. "I would be of opinion that the souls which will some day be human souls have, like those of other species, been in the seed and in their ancestors up to Adam and have consequently existed since the beginning of things, always in some kind of organic body. . . . . It appears to me also for various reasons probable that they then existed only as sensitive or animal souls, endowed with Perception and feeling, and devoid of reason; and that they remained in this state up to the time of the begetting of the man to whom they were to belong, but that then they received reason; whether we suppose that there is a natural means of raising a sensitive soul to the rank of a rational soul (which I find it difficult to conceive) or that God has given reason to this soul by a special act, or (if you like) by /

NOTE to PAGE 139, Continued.

by a kind of transcreation. This is the more easily admitted, as Revelation informs us of many other immediate acts of God upon our souls. . . . . And it is much more in harmony with the divine justice to give to the soul, already physically or as an animal corrupted by the Sin of Adam, a new perfection, namely Reason, than, by creation or otherwise, to put a rational soul into a body in which it is to be morally corrupted." Cf. Janet, Vol.I. p. 630. "The rational soul is created only at the time when its body is formed, being entirely different from the other souls we know, because it is capable of reflection and resembles in miniature the divine nature."

NOTE to PAGE 141.

(1) A. Lemoine, in his Thesis entitled Quid sit Materia apad Leibnitium (Paris, 1850), discusses fully the Letters to Des Bosses, with the object of showing that the vinculum substantiale is an excrescence upon the Philosophy of Leibniz, and that the use he makes of it involves inconsistency with his general position. Erdmann, in his History of Philosophy, Vol. II, holds that it is not to be regarded merely as a concession to the religious scruples of Roman Catholics, but that it is really a part of Leibniz's life-long endeavour to reconcile the Roman Catholic and Lutheran Churches

NOTES to PAGE 143.

(1) Monadology, 18-30, Principles of Nature and of Grace, 4 and 5. Of course it is not to be supposed that the scale of organic being ends with man. There must be between man and God a continuous succession of other embodied souls, each more perfect than the one beneath it. Otherwise the law of continuity would be broken. "It is also reasonable to suppose that there are below us Substances capable of Perception, as there are such Substances above us; and that our soul, far from being the last of all, occupies a middle position, from which it is possible to go up or down; otherwise there would be in the order of things a defect, which certain philosophers call vacuum formarum." Sur le Principe de Vie (1705), Erdmann, p.431. Leibniz calls these higher beings génies (genii).

(2) p. 137.

NOTES to PAGE 147.

(1) Cf. Nouveaux Essais, Bk II, Ch. I, 2. "This tabula rasa, of which so much is said, is in my opinion nothing but a fiction, which Nature does not allow and which has its grounds only in the incomplete notions of philosophers, like the void, atoms and absolute or relative rest of two parts of a whole in regard to one another, or like the materia prima, which is conceived as absolutely passive (sans aucunes formes). Things which are uniform and contain no variety are never anything but abstractions, like time, space and the other beings of pure Mathematics. There is no body, whose parts are at rest, and there is no substance which has nothing to distinguish it from every other. Human souls differ, not only from other souls, but also from one another, although the difference is not of the kind that is called "specific". And I think I can prove that every substantial thing, whether soul or body, has its own special relation /

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relation to every other; and one must always differ from another by intrinsic characters; without mentioning that those who say so much about this tabula rasa after having removed from it the Ideas, cannot tell what remains of it, like the scholastic philosophers who leave nothing in their materia prima. Perhaps it may be replied, that this tabula rasa of the philosophers means that the soul has originally and by nature nothing but bare faculties. But faculties without any activity, in a word the pure potencies (puissances) of the scholastics, are themselves only fictions, which nature knows not and which are obtained only by making abstractions. For where in the world shall we ever find a faculty, which is shut up in mere potency without any activity? There is always a particular disposition to action, and to one action rather than another. And besides the disposition there is a tendency to action, and indeed /

NOTES to PAGE 147 (Continued)

indeed there is always an infinity of these tendencies at once in every object; and these tendencies are never without some effect. Experience is necessary, I admit, in order that the soul should be determined to such and such thoughts, and in order that it may take notice of the Ideas which are in us. But by what means can experience and the senses give ideas? Has the soul windows? Is it like a writing-tablet? Is it like wax? It is plain that all those who think thus of the soul, make it at bottom corporeal. There will be brought against me this axiom, accepted among the philosophers, that nothing is in the soul that does not come from the senses. But the soul itself and its affections must be excepted. Nihil est in intellectu, quod non fuerit in sensu, excipe: nisi ipse intellectus. But the soul contains the Notions of Being, Substance, Unity, Identity, Cause, Perception, Reasoning and many others /

NOTES to PAGE 147 (Continued).

others, which the senses cannot give. This agrees well enough with your author of the "Essay", who finds the origin of a considerable section of the Ideas in the mind's reflection on its own nature."

(2) Locke's opposition to Descartes, great though it was, ought not to be emphasised to such an extent as to hide the fact that they have much in common. For instance, we know that Locke's first attraction to philosophy came from a reading of Descartes, and he may perhaps owe the suggestion of some of his leading ideas to such passages as the following extract from an unfinished dialogue of Descartes, in which the method of doubt is wittily set in contrast with the scholastic metaphysics. The question is:- "What is man's first knowledge? In what part of the soul does it dwell? And why is it so imperfect at the beginning?" Epistemon, the representative /

NOTES to PAGE 147 (Continued).

representative of scholastic learning, says:- "That appears to me to be very clearly explained, if we liken the imagination of infants to a tabula rasa on which our ideas, which are, as it were, the living image of objects, are to be painted. Our senses, the dispositions of our mind, our masters and our intelligence are the different painters who can execute this work, and those among them which are least fitted to succeed, begin it; namely imperfect senses, blind instinct and foolish nurses. At last comes the best of all, intelligence; and yet is it still necessary that it should serve an apprenticeship of several years and for some time follow the example of its masters, before it dare rectify one of their errors . . . . . It is like a clever artist, called to put the finishing touches to a picture sketched by learners. Though he use all his art, correcting gradually /

NOTES to PAGE 147 (Continued).

gradually now one feature, now another and putting in all that has been omitted, there must still remain great defects in it, because the picture was badly drawn at first, the figures were ill-arranged and little attention was given to proportion." Recherche de la Verité par les lumières naturelles, Oeuvres de Descartes (Ed. Cousin) Vol.11,p.345, cf. ibid, p. 375:- "All truths follow from one another and are united by a common bond; the whole secret consists in beginning with the first and most simple, and rising gradually to the most remote and most complex." V. also Fraser's Edition of Locke's Essay, Prolegomena, p. 20.

NOTE to PAGE 150.

(1) "If all our ideas (connaissances) are innate in so far as they are ideas distinct in themselves, they are all acquired in so far as they are ideas distinct for us." Boutroux, "Nouveaux Essais" etc. Introduction, p. 83.

NOTE to PAGE 151.

(1) Cf. Nouveaux Essais, Bk, II, Ch. I, 19. "Philalethes (representative of Locke). 'That body is extended without having parts and that a thing thinks without being conscious (s'apercevoir) that it thinks, are two assertions which appear equally unintelligible.' Theophilus (representative of Leibniz). 'Forgive me, sir, but I must tell you that in your contention that there is in the soul nothing of which it is not conscious, there is a petitio principii, which has already dominated our first discussion. It was there used for the overthrow of innate ideas and truths. If we were to grant this principle, we should not merely find ourselves in conflict with experience and reason, but we should have without any reason to give up our opinion, which I think I have made sufficiently intelligible. But our opponents, very clever though they are, have never produced any proof of what they so often and so confidently /

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confidently declare regarding this matter, and besides it is easy to prove to them the opposite, that it is not possible we should always deliberately reflect on all our thoughts. Otherwise the mind would make a reflection upon each reflection ad infinitum, without ever being able to pass to a new thought.

For Instance, in being conscious of some present feeling, I should always have to think that I think of it, and again to think that I think of thinking of it and so ad infinitum. But I must surely come to an end of reflecting upon all these reflections, and there must, in short, be some thought which we allow to pass without thinking of it; otherwise we should always dwell upon the same thing.'

NOTES to PAGE 155.

(1) Could this be regarded as a strictly logical development of one side of Descartes's Philosophy, thus revealing Descartes's inconsistency? Descartes would say that, as thinking is the essence of mind, mind cannot exist without thought and yet it may exist without any specific thought.

(2) Cf. Nouveaux Essais, Bk.II, Ch. I, 10. Philalethes. "But I cannot conceive it to be more necessary for the soul always to think than for the body to be always in motion, the Perception of ideas being to the soul what motion is to the body.". . . . . Theophilus. "You are right,sir. Activity is no more inseparable from the soul than from the body, a state of the soul without thought and absolute rest in the body appearing to me to be things which are equally contrary to nature and of which there is no instance in the world. A substance which is once in activity /

NOTES to PAGE 155 (Continued)

activity will be so always, for all its impressions persist and are merely mixed with other new ones. When we strike a body we arouse in it, (or rather determine) an infinite number of vortices as in a liquid, for at bottom every solid has some degree of fluidity, and every fluid has some degree of solidity, and there is no way of ever entirely stopping these internal vortices. Now we may believe that, if the body is never at rest, neither will the soul, which corresponds to it, ever be without Perception." ..... Ph. "But this proposition:- The soul always thinks, is not evident by itself." Th. "I don't say it is. It requires a little attention and reasoning to see it. Ordinary people recognise it as little as they recognise the pressure of the atmosphere or the roundness of the earth." Ph. "I doubt if I thought last night. This is a question of fact, to be settled /

NOTES to PAGE 155 (Continued)

settled by sense-experience." Th. "We settle it in the same way in which we prove that there are imperceptible bodies and invisible motions, although some people regard these things as absurd. In the same way there are Perceptions without much sharpness, which are not distinct enough for us to be conscious of them or to remember them; but they make themselves known by certain consequences they have."

NOTES to PAGE 157.

(1) Nouveaux Essais, Avant propos. Cf. Locke, Essay, Fraser's Edition, Vol. I, p. 48, note, and p. 60, note.

(2) Sections 21 and 23.

NOTE to PAGE 158.

(1) Nouveaux Essais, Avant-propos. Cf. Bk. II, Ch. 9, Section 1. "We ourselves have also petites Perceptions, of which we are not conscious in our present state. It is true that we might quite well be conscious of them and reflect upon them, were we not prevented by their multitude, which distracts our mind, or if they were not effaced or rather obscured by greater ones . . . . . I should prefer to distinguish between Perception and Apperception. For instance, the Perception of light or colour, of which we have Apperception (are conscious) is made up of a quantity of petites Perceptions, of which we have no Apperception (are not conscious) and a noise, of which we have Perception, but of which we take no notice, becomes Apperceptible by a small addition or increase. For if what precedes had no effect upon the soul, this little addition would have none either, and no more would the whole have any."

NOTE to PAGE 159.

(1) Nouveaux Essais, Avant-propos. "For the better understanding of the petites Perceptions which we cannot individually distinguish in the crowd, I am wont to employ the illustration of the moaning or noise of the sea, which we notice when we are on the shore. In order to hear this noise, as we do, we must hear the parts of which the whole noise is made up, that is to say, the noises which come from each wave, although each of these little noises makes itself known only in the confused totality of all the noises taken together, that is to say, in the general moaning of the sea, and no one of them would be observed if the wave which makes it were alone. For we must be affected a little by the motion of this wave, and we must have some Perception of each of these sounds, however little they may be; otherwise we should have no Perception of a hundred thousand waves, for /

NOTE to PAGE 159.(Continued).

for a hundred thousand nothings cannot make something. We never sleep so profoundly as not to have some feeble and confused feeling ; and we should never be wakened by the greatest noise in the world, if we had no Perception of its beginning, which is small; just as we should never break a cord by the greatest effort in the world, if it were not strained and stretched a little by less efforts, though this little extension which they produce is not apparent."

Cf. Nouveaux Essais, Bk.II, Ch.I, 11. "We think of a number of things at once, but we take notice only of the thoughts which are most distinct: and matters cannot be otherwise, for if we were to take notice of all, we should have to think attentively of an infinity of things at once, all of which we feel and all of which make impression on our senses. I say even more /

NOTE to PAGE 159.(Continued).

more: Something from all our past thoughts remains, and none can ever be entirely effaced. Now when we sleep without dreaming, and when we are stunned by some blow, fall, illness, or other accident, there appears in us an infinite number of little confused feelings, and death itself can produce no other effect on the souls of animals, which must without doubt, sooner or later, regain distinct Perceptions, for everything in nature happens in an orderly way ..... Each soul retains all its preceding impressions and cannot split itself up..... In each substance the future has a perfect connection with the past. This is what constitutes the identity of the individual. Yet memory is not necessary nor even always possible, because of the multitude of present and past impressions, which come together in our present thoughts, for I do not believe that there are in man any thoughts /

NOTE to PAGE 159.(Continued)

thoughts which have not at least some confused effect or which do not leave some vestige to be combined with later thoughts. We can certainly forget things; but we might also recollect them after a long interval, if only we were reminded of them in the right way."

NOTES to PAGE 161.

(1) Nouveaux Essais, Bk. I, Ch. 1.

(2) Thus Leibniz rejects the view of Locke that our real knowledge, as distinct from merely probable knowledge, "extends as far as the present testimony of our senses, employed about particular objects that do then affect them, and no farther." ("Essay," Bk.4, Ch. 11, Section 9, Fraser's Edition, Vol.II, p.332.) Cf. the corresponding passage in the Nouveaux Essais. "Yet I think that we might extend the names of knowledge and certainty to things other than actual sensations, for clearness and plainness (evidence) extend further, and I regard them as a kind of certainty: and it would without doubt be an absurdity seriously to doubt whether there are men in the world, when we do not see any. To doubt seriously is to doubt practically, and we might take certainty as a knowledge of truth which we cannot doubt practically without madness ; and sometimes we take certainty /

NOTES to PAGE 161, (Continued).

certainty in a still more general sense and apply it to cases in which we cannot doubt without deserving to be greatly blamed. But evidence would be a luminous certainty, that is to say, a certainty such that, because of the connection we see between the ideas, we have no doubt whatever. According to this definition of certainty, we are certain that Constantinople is in the world, that Constantine, Alexander the Great, and Julius Caesar have existed. It is true that some peasant of the Ardennes might justly doubt these things, from lack of information; but a man of letters and of the world could not do so, without great mental derangement." Cf. also Locke's Essay, Bk.II, Ch. 21, Section 75. Fraser's Edition, Vol. I, p. 373.

NOTES to PAGE 162.

(1) Cf. Nouveaux Essais, Bk.II, Ch.21, Section 73. "The senses furnish us with material for reflection, and we should never even think of thought, if we did not think of something else, that is to say, of the particular things with which the senses furnish us. And I am persuaded that souls and created spirits are never without organs and never without sensations, as they cannot reason without symbols."

(2) In the Nouveaux Essais, Bk.IV, Ch.11, Section 14, there is an interesting passage explaining in more detail a part of the logic of Leibniz. It contains some remarkable anticipations of more modern views. "Propositions of fact also may become general in a way, but it is by induction or observation; so that it (the general proposition of fact) is nothing but a multitude of similar facts, as when we observe that all quicksilver evaporates by the force of fire; and this is not a perfect generality, because we /

NOTES to PAGE 162. (Continued).

we do not see its necessity. General propositions of reason are necessary, although reason also furnishes some which are not absolutely general and are only probable, as for instance, when we presume that an idea is possible, until a more strict investigation reveals its contrary. There are, finally, mixed propositions, which are drawn from premises, of which some come from facts and observations, while others are necessary propositions: and such are numerous geographical and astronomical conclusions about the globe of the earth and about the course of the stars, which conclusions are obtained by combining the observations of travellers and astronomers with the theorems of geometry and arithmetic. But as, according to the usage of logicians, the conclusion follows the weaker of the premises and cannot have more certainty than it, these mixed propositions have /

NOTES to PAGE 162. (Continued).

have only the certainty and generality which belong to observations. As to eternal truths, it is to be noted, that at bottom they are all conditional and say in effect: Granted such a thing, such another thing is. For instance, when I say :- Every figure which has three sides will also have three angles, I say nothing but this, that supposing there is a figure with three sides, this same figure will have three angles. I say this same figure, and it is in this respect that categorical propositions, which can be stated unconditionally,(although fundamentally they are conditional) differ from those that are called hypothetical, such as the following:- 'If a figure has three sides its angles are equal to two right angles.' In this latter case we see that the antecedent (namely, the figure with three sides) and the consequent (namely, the angles of the three-sided figure are equal to two right angles) do not have the same /

NOTES to PAGE 162.(Continued).

same subject, as they had in the preceding case in which the antecedent was :- 'This figure has three sides,' and the consequent:- 'The said figure has three angles.' Nevertheless the hypothetical might often be transformed into a categorical, by a slight change in the terms, for instance if in place of the preceding hypothetical, I were to say :- "The angles of every three-sided figure are equal to two right angles." The Scholastics have argued much de constantia subjecti, as they called it, that is to say, how a proposition regarding a subject can have a real truth, if the subject has no existence. The fact is that the truth is only conditional and says that, supposing the subject ever exists, it will be found to be so-and-so. But it will still be asked:- On what is this connection founded, since there is within it reality which does not deceive? The reply will be, that it is in the connection of /

NOTES to PAGE 162.(Continued).

of ideas. But it will be asked again:- Where would these ideas be, if no mind existed, and what would then become of the real foundation of this certainty of eternal truths? That leads us at last to the ultimate foundation of truths, namely, that Supreme and Universal Spirit, which cannot but exist, whose understanding, to speak truly, is the region of eternal truths, as St Augustine has recognised and says in a vivid way. And lest it should be thought unnecessary to have recourse to this, it is to be noted that these necessary truths contain the determining reason and regulative principle of existences themselves, and, in a word, the laws of the Universe. Thus these necessary truths, being anterior to the existence of contingent beings, must have their foundation in the existence of a necessary substance. It is here that I find the original

of /

NOTES to PAGE 162. (Continued).

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of the ideas and truths which are graven in our souls, not in the form of propositions, but as sources from which application and opportunity will produce actual statements."

NOTE to PAGE 163.

(1) Janet, Vol.I, p.668. "Expression is common to all soul-principles (formes). It is a genus, of which natural Perception, animal feeling and intellectual knowledge are species." Cf. note to page 133.

NOTES to PAGE 167.

(1) Nouveaux Essais, Bk.II. Ch. 21, Sect 36.

(2) Cf. Nouveaux Essais, Bk.II. Ch.21, Sectn 46.
"There are unfelt inclinations, of which we have no consciousness (Apperception); there are felt inclinations, whose existence and object we know, but which are formed without our being aware of it, and there are confused inclinations, which we attribute to the body, although there is always in the mind something corresponding to them; and finally, there are distinct inclinations which reason gives us, and of whose force and formation we are aware."

NOTE to PAGE 169.

(1) Nouveaux Essais, Bk.II. Ch.20. Sectn 1. Cf. Locke's "Essay" (corresponding place), with note in Fraser's Edition, Vol. I. p. 302.

NOTES to PAGE 170.

(1) Cf. Nouveaux Essais, Bk. II. Ch 21, Sectn 46.

"I think that fundamentally Pleasure is a feeling of perfection, and Pain a feeling of imperfection, provided the feeling is sufficiently marked for us to be definitely conscious of it (s'en apercevoir)".

(2) Nouveaux Essais, Bk.II. Ch.20, Sectn 5.

NOTE to PAGE 171.

(1) Nouveaux Essais, Bk.II. Ch.20. Sectn 6. Cf.Sectn 36. "If you consider your 'uneasiness' as a real discomfort or pain, I do not admit that in this sense it is the sole goad to action. Most frequently the goad is those little unfelt Perceptions, which we might call imperceptible pains, were it not that the notion of pain implies Apperception. These little impulses consist in the continual freeing of ourselves from little hindrances, at which our nature works without thinking about it. In this really consists that uneasiness, which we feel without knowing it, which makes us act in passion as well as when we appear most tranquil, for we are never without some activity and motion, which comes merely from this, that nature is always working so as to put herself more at ease."

NOTES to PAGE 173.

(1) Cf. Nouveaux Essais, Bk.II.Ch.21, Sectn 25. V. also the corresponding passage in Locke's "Essay" (Bk.II,Ch.21. Sectn 24), Fraser, Vol.I p.327. "Men say that, after having known and considered everything, it is still in their power to will, not only what pleases them most, but also the opposite of that, just to show their freedom. But it is also to be noticed that this very caprice or obstinacy or, to say the least, this reason, which prevents from obeying other reasons, also comes into the balance and makes pleasing to them that which otherwise would not please them at all, and accordingly, their choice is always determined by Perception. Thus we do not will merely what we will, but what pleases us, although the will may indirectly and, as it were, from afar contribute to make a thing pleasing to us or not."

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NOTES to PAGE 173 Continued.

A hint of Leibniz's Psychology of Volition is given in the Nouveaux Essais, Bk.II.Ch.21, Sectn 39. "Several Perceptions and Inclinations conspire towards complete Volition, which is the result of their conflict. There are perceptions and inclinations which are individually imperceptible, but the totality of which produces an uneasiness, which impels us without our seeing the ground of it; several of these Perceptions combined to gether, direct us towards some object or away from it, and then we have desire or fear, also accompanied by an uneasiness, but an uneasiness which does not always amount to pleasure or pain. Finally there are impulses, actually accompanied by pleasure and pain, and all these Perceptions are either new sensations or images remaining from some past sensation, accompanied or unaccompained by memory /

NOTES to PAGE 173 Continued.

memory which renews the attractions these same images had in these preceding sensations, and so renews the old impulses in proportion to the vivacity of the imagination. From all these impulses there finally results the prevailing effort, which constitutes the full Volition. Yet the desires and tendencies of which we are conscious are also frequently called Volitions (although less complete) whether or not they prevail and give rise to action. It thus readily follows, that Volition can hardly exist without desire and aversion(fuite); for I think we may call this the opposite of desire. There is uneasiness not only in the troublesome passions, like hate, cruelty, anger, envy, shame, but also in their opposites, such as love, hope, favour and glory. It may be said that wherever there is desire, there is uneasiness; but the contrary is not always true because often /

NOTES to PAGE 173. Continued.

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often we have uneasiness without knowing what we want, and then there is no definite desire. . . . . As the final determination (to action) is the result of weighing, I should think it may happen that the most pressing uneasiness does not prevail (in influencing the will); for, even though it might prevail over each of the opposite tendencies, taken singly, it may be that the others, combined together, overcome it. The mind may even make use of the method of dichotomy to make now one and now another set of tendencies prevail, as in an assembly we can make one or another party prevail by a majority of votes, according to the order in which we put the questions. It is true that the mind ought to make provision for this beforehand; for at the moment of struggle, there is no time for these artifices. Everything /

NOTES to PAGE 173 Continued.

Everything which strikes us at that moment has a strong influence upon the result and helps to make up a compound direction, composed almost as in Mechanics, and without some quick turning aside we cannot stop it. "Fertur equis auriga nec audit currus habenas."

(2) p. 151 , note.

NOTE to PAGE 174.

(1) Cf. Nouveaux Essais, Bk.II. Ch. 21, Sectn 23. "We do not will to will, but we will to do, and if we willed to will, we should will to will to will and that would go on ad infinitum. Yet we must not overlook the fact that by voluntary actions we often contribute indirectly to other voluntary actions, and though we cannot will what we desire, as we cannot even judge what we desire, we may nevertheless so act beforehand that when the time comes we may judge or will that which we would wish to be able to will or judge to-day. We devote ourselves to the people, the kind of reading, the conditions generally that are favourable to a certain side, we give no heed to what comes from the opposite side, and by these and many other directions, which we give to our minds, usually without definite intention and without thinking /

NOTE to PAGE 174 Continued.

thinking of it, we succeed in deceiving ourselves or at least in changing ourselves, becoming converts or perverts, according to the experiences we have had."

NOTE to PAGE 174

(1) There is an interesting suggestion of the views of Leibniz in Montaigne's Essais Bk. II, Ch.14. Leibniz may quite well have read it. "It is a pleasant fancy", says Montaigne, "to think of a mind exactly balanced between two like desires: for it is indubitable that it will never come to a decision, inasmuch as determination and choice imply inequality of value; and if we should be set between the wine and the bacon, with an equal desire to drink and to eat, there is doubtless nothing for it but to die of thirst and hunger. To provide against anything so inconvenient as this, the Stoics, when they were asked how our soul comes to make choice between two indifferent things, so that out of a large number of crowns we take one rather than another, though they are all alike and there is no reason which disposes us to a preference - the Stoics reply that this motion of /

NOTE to PAGE Continued.

of the soul is extraordinary and exceptional, arising in us from a strange, accidental and fortuitous impulse. It seems to me they might rather have said that nothing comes before us in which there is not some difference, however slight; and that, to sight or to touch, there is always some preference which tempts and draws us, though it be imperceptibly: just as if we suppose a piece of twine equally strong throughout, it is utterly impossible that it should ever break. For in what part of it is the breaking to begin, the flaw to appear? And for it to break in every part at once is against all nature."

NOTE to PAGE 180.

(1) Nouveaux Essais, Bk.II. Ch.21, Sectn 35. As this passage suggests, Leibniz is full of moral optimism. Cf. Sectn 38 of the same chapter. "When I consider what power, ambition and avarice have in all those who once set themselves in this line of life, which is almost entirely without sensuous and immediate attractions, I despair of nothing, and I hold that virtue, accompanied as it is by so many substantial blessings, would have infinitely more effect (than these vices), if some happy revolution of the human race were some day to give it vogue and make it fashionable."

NOTE to PAGE 181.

(1) Cf. De Notionibus Juris et Justitiae, Erdm. 118 b.

"To love is to take pleasure in the happiness of another, or, what comes to the same thing, to make the happiness of others a part of our own. Thus is solved the difficult problem (which is also of great importance in Theology) how there can be a disinterested love, not based on hope or fear or any consideration of utility: namely, in this way that the happiness of those whose happiness gives us pleasure becomes a part of our happiness, for things which give pleasure are sought for their own sakes. And as the very contemplation of beautiful things is pleasant, and a picture by Raphael moves an intelligent man, though he may not be the owner of it, so that it becomes a joy and delight to him inspiring in him something like love; so when /

NOTE to PAGE 181 Continued.

when the beautiful thing is also capable of happiness, his feeling for it passes into actual love. But Divine love excels all other loves, because God can be loved with the happiest result, since nothing is happier than God and nothing can be conceived more beautiful or more worthy of happiness. And since He possesses the greatest power and wisdom, His happiness not only becomes a part of ours (if we are wise, that is, if we love Him) but even constitutes it."

NOTES to PAGE 182.

(1) De Notionibus Juris et Justitiae (1693), Erd. 118a. Cf. Nouveaux Essais, Bk.II. Ch.28, Sectn 5. "According to this notion (externally imposed law), one and the same action would be at the same time morally good, or morally bad, under different legislators, just as our able author (Locke) considered virtue as that which is praised, and accordingly one and the same action would be virtuous or not, according to the different opinions of men. Now, as that is not the meaning that is usually given to morally good and virtuous actions, I would prefer for my part to take as the measure of moral good and virtue the invariable rule of reason, which it is the office of God to maintain. So we may be assured that by His means, every moral good becomes also a physical good, or as the ancients said, every honest act is useful; /

NOTES to PAGE Continued.

useful; in place of which, if we would express the view of our author, we should have to say that moral good or evil is an imposed or ordained good or evil, which he who has power in his hand endeavours by rewards or penalties to make us do or shun. The good thing is that what proceeds from the general ordinance of God is comformable to nature or to reason."

(2) Windelband, Geschichte der Neueren Philosophie, Vol.I.p.477.