

MONADS IN HARMONY TIME IN THE PHILOSOPHY OF LEIBNIZ

***Revised version of paper printed in:
G. Seel & al., eds.: 'L'art, la science et la metaphysique',
Peter Lang Academic Publishers, Bern 1993***

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In this paper, I want to emphasize the central status of the notion of time as the central key to a deeper insight in Leibniz's philosophy, especially the basic idea of a pre-established harmony, and the perennial relevance of this philosophy as a fertile source of inspiration in various areas.

But why Leibniz? Because he is one of the least known and most frequently misinterpreted, but at the same time one of the most inspiring and fascinating philosophers in history. Moreover, his thought has a special bearing on problems of the modern science of cognition. In order not to transgress the natural limits of a paper, I shall confine my discussion to the ideas of time and harmony in Leibniz. My interpretation will stress analytical precision rather than historical accuracy, and my exposition will in some respects resemble a conceptual reconstruction. Nevertheless, I hope to remain faithful to the spirit of his philosophy.

The fact that Leibniz himself was fond of describing his philosophy as the *System of pre-established Harmony* stresses the importance he ascribed to this idea. Further, Leibniz's preferential illustration in explaining this harmony contains an implicit reference to time, as it compares harmony to an acausal synchronization of a set of clocks perpetually ticking in unison simply because they are perfectly constructed from the outset. Taking this illustration very literally, my intention is to elaborate the range and significance of his idea of harmony, or synchronicity, as it applies to such widely divergent areas as: α) logic, β) physics, and γ) ethics. In my opinion, this time-honoured Stoic triad provides the ideal point of departure towards a deeper understanding of the structure of Leibnizian metaphysics.

But first a short review of his life. In contrast to other child wonders, the so-called child prodigy Gottfried Wilhelm Leibniz (1646-1716) actually lived up to expectations, and few are more deserving than he to be called a "universal genius". He made significant contributions to such diverse disciplines as history, theology, jurisprudence, philosophy, mathematics, physics and logic. Shortly after Newton, but independently of him, Leibniz invented the differential and integral calculus. In the name of *analysis situs*, he established the topology of modern mathematics. In contrast to Newton, who advocated the abstract ideas of an absolute time and an absolute space, Leibniz insisted on the relational character of time and space. He was the first to define a concept of physical energy, and the first to assert the inkling of a principle of the conservation of energy. With respect to modal logic he was the most important intermediary between mediaeval notions and those of his own era, and he proposed a new semantics based on the idea of possible worlds. He administered mines, established scientific academies, corresponded with scholars all over Europe (15,000 letters!), and gave advice to Louis XIV and Peter the Great. The most renowned of his major works include: *Discours de Metaphysique*, 1686; *Nouveaux Essais*, 1704; *Essais de Theodicée*, 1710; *Monadologie*, 1714.

Next, I will present a brief sketch of the Leibnizian system of philosophy. Initially, this has to be expressed in theologically coloured terms, a circumstance that may be ignored if one prefers to discuss the philosophical problems separately. It is natural to start with the idea of God. According to the Christian tradition to which Leibniz adheres God is perfect oneness, concurrently all-mighty, all-knowing and all-loving. Inasmuch as it is impossible to imagine the divine essence to be separate from existence, 'he' exists of necessity and, as time is not found in God, this necessity is atemporal or eternal. The omnipotence of God is demonstrated in his power to create a world resembling himself, but not perfect in the same sense. God's omniscience manifests itself as the ability to survey and comprehend an infinity of possible worlds and to estimate their relative perfection according to their eternally existing notions. Finally, the infinite goodness of God consummates itself as the will to create and realize the best of all possible worlds, which is the world subject to the best of all possible laws, namely those laws that in the simplest way transform a confused multiplicity to supreme order and at the same time promote a free development towards ever increasing perfection.

From the outset, Leibniz placed himself in opposition to the three most prominent of his predecessors: Hobbes, Descartes, and Spinoza. With respect to Spinoza, Leibniz admitted that a substance exists by itself and is explainable only in terms of itself. However, he found it necessary to reinterpret the Spinozean

definition in such a way that it is absolutely applicable only to the unique and supreme substance, God, while it is relatively applicable to all other substances. According to Leibniz, a whole infinity of substances, called monads, are possible; but of these only one is perfect, namely God. He agrees with Spinoza that if more than one did in fact exist, they would mutually limit each other's perfection.

God as creator, eternal and uncreated, is the originator of all other monads. In contrast to the perfect being which exists necessarily, all imperfect monads exist contingently, if they do exist; though all internally consistent monads are possible, not all monads are compossible, *i.e.*, mutually consistent within the same world. To say that something is contingent is to Leibniz equivalent to saying that it is neither impossible nor necessary in the logical sense, *viz.* on pain of contradiction. But in Leibniz's view, because everything that happens occurs by virtue of reason and purpose, the contingent must not be confused with the accidental or arbitrary. It holds for all contingently existing monads that just as they came into existence at some point in the past, they may eventually perish at some point in the future. In this way time is introduced as a concept, and now we must tread cautiously.

In God nothing happens: God *is*. Therefore, when Spinoza in the manner of Parmenides identifies nature or the world with God he excludes time, rejecting the possibility of change. Spinozism's greatest flaw is its view of time as an illusion. By contrast, time is the basic attribute of all possible, or potentially real, worlds. A world devoid of time is a world wherein nothing happens; such a world is not a possible world. As the unmoved mover, God is the primary cause of everything happening in the world. The possible worlds, which as an infinite set constitute the content of divine thought, are thus distinguished by their respective world-times. Just as the real world differs from all of the many possible worlds, so does the real world-time differ from all of the many world-times which are never realized.

Had Leibniz been acquainted with McTaggart, who aspired to disprove the reality of time, he would certainly have recognized the decisive difference in what McTaggart classified as the temporal *A-series: past, present, and future* and the temporal *B-series: before, during, and after*. This distinction could have clarified the difference between possible and real world-time. But, as events turned out, Leibniz ultimately considered all the world-times as possible times, *i.e.* as *B-series*. In my opinion, this discloses a fundamental weakness in the Leibnizian philosophy. Moreover, a possible world-course is a coherent series of reasons and outcomes; but in the real world this coherence manifests itself as a series of causes and effects. This is what Leibniz intended to say; the question is whether or not he succeeded.

This, I believe, is due to the fact that reason-and-outcome express the order of time statically as a frozen *B-series*, *i.e.* a possible world-course, while cause-and-effect express it dynamically as a developing *A-series*, *i.e.* an actual world-course; here, again, it is as if Leibniz misjudged time by regarding it as a kind of relation. My point is that the distinguishing feature of causality, as compared to rationality, reflects on the difference between the production of a thing and its explanation: whereas the cause *produces* its own effect, the reason merely *explains* its outcome. But if one views real world-time as an *A-series*, in contradistinction to the possible world-times which are *B-series*, his entire philosophy can be seen in a new light: the monadology is then reduced from a pretentious ontology to a sober semantics, and such a reduction might enhance its acceptability to modern minds.

It is now necessary to examine the relationship between possible worlds, or world-times, and their contents which are the particular events occurring in time. Events do not hover around in a void, but are always associated with objects and, conversely, objects are best interpreted as coherent sequences of events, or states. An event viewed spatially, as "exterior", simulates the state of at least one "interior", *viz.* that of a monad. In this way, *macrocosm* is reflected in *microcosm*: a monad always mirrors its own cosmos. So instead of saying that a monad has no windows, we might equally well say that a monad is nothing but window. However, according to Leibniz, universal space is not substantially real, but a well-founded appearance. In this way the 'original/copy' dependency is reversed. Whereas each single *monad* represents its own universe as viewed in an individual perspective, the entire *cosmos* is merely a superposition of these individual perspectives. Thus only the monads really exist while their cosmos, defined as the logical sum of all co-existing monads, is nothing but a *phenomenon* reflecting the monadic harmony.

The *harmony*, based on the notion of compossibility, explains the future as inherent in the present in the same way as the past is preserved in the present. Just as every event participates in an all-embracing universal instant, so does the single state of a monad mirror all simultaneous states of its compossible monads. But inasmuch as a cosmic instant, understood as the universal realization of all simultaneously compossible monadic states, is both the outcome of everything that occurred previously and the reason for everything that is to happen subsequently, a single event is a point implying a tempo-spatial unfolding of an entire universe. So the unity of the universe is ensured by means of a kind of micro-macro dialectic which may be said to have anticipated the idea of holography by over 250 years! It is as if the world were like a beautiful rainbow produced by the reflection of divine light in the infinitesimal drops of an infinite all-embracing cloud!

Next it is incumbent on us to carefully analyze the idea of spatial extension. From this analysis it will emerge that just as the harmony ensures the coherence of time, it also provides the key to a reconstruction of space by means of time: Dr. Johnson's attempt to refute the immaterialism of Berkeley relied on the senses; as we know, he simply kicked a rock! Hume, who was wiser, knew from experience that the good bishop was not that easily refuted, and therefore he spared his toe! But it is interesting to see what Berkeley wrote in his *Commonplace Book*, as his rejection of the substantiality of matter or extension is very reminiscent of Leibniz: "*Of solidity see Locke .. if anyone asks what solidity is, let him put a flint between his hands and he will know: extension of body is continuity of solid, extension of space is continuity of unsolid, etc. .. Why may not I say that visible extension is a continuity of visible points, tangible extension is a continuity of tangible points?*" This is a precise analysis of the problem of space as it presented itself to Leibniz. But how did Leibniz evaluate the positions of his immediate predecessors?

Descartes saw cogitation and extension as separate substances interacting in man *via glandula pinealis*. Spinoza reduced their status to opposite attributes of nature, the universal substance, by his hypothesis of psycho-physical parallellism. Newton, who in contrast to Descartes and Spinoza accepted the vacuous, regarded abstract space as absolute and characterized it as a kind of "divine tool", viz. the omnipresent *sensorium* of omniscience. When confronted with such speculations Leibniz, like Plato, stressed that extension, when taken as a concept, is delusive. Space as such is not a substance of separate existence, or reality, and it is least of all a divine attribute or sensorium. However, since extension is a property of those extended things whose appearance is corporeal it cannot be reduced to mere illusion. That solidity, which is the basic property of all material objects, cannot be grasped and understood by reason - it can merely be sensed. But Leibniz had not forgotten why Descartes would not immediately accept the testimony of the senses on behalf of the reality of space and extended bodies.

Descartes' point was, that our senses may deceive us; for this reason, our recognition of them is an expression of faith or belief. Although such a faith can be marked either by indolent habit or rational decision, it nevertheless remains faith. Descartes, the inventor of analytical geometry, deemed it necessary to show that his favourite discipline was not merely a mental figment, but is rooted in reality. Therefore he found himself compelled to follow a very tortuous path - to prove that God exists, is perfect, and does not deceive - in order to make sure that his creation, the world, is real and not an illusion. In this connection it is important for us to notice, that the very possibility of divine - or, indeed, demonic - deceit is rooted

in the difference between essence and existence, i.e., between nature and reality. To Leibniz, this difference was crucial; and thus, unlike Descartes, he argued not theologically, but philosophically, by offering an analysis of the idea of extension. As we have already noted, his conclusion was that extension is neither substance nor attribute, but simply a law-like appearance - a well-founded *phenomenon*.

This ascertainment gives rise to a question of legitimacy: By what means can the appearance of extension be justified? And the answer is: by means of time. A monad, like its surrounding cosmos, is first and foremost a temporal sequence, corresponding to modern physics where particles are *world-lines* of *proper time*. Now the identity of an individual particle manifests itself as temporal continuity. Viewed *theologically* the entire history, or program, of a monad is given *ab aeterno* by virtue of its latent idea, which is grasped intuitively by the providence of God. Regarded *cosmologically*, this history, or program, is unfolded as a series of events arranged in space in agreement with the before-and-after relation of the *B-series*. Considered *anthropologically*, through introspection, the life of a human monad is experienced as a changing sequence of sensation and reflection, passion and action, realized in time according to the past-present-future order of the *A-series*.

Let us now contemplate the logical level as a basis of rational explanation. Here we must consider the formulation of the fundamental principle of identity or the principle of non-contradiction. The schematical expression: $A = A$ or $\sim A \neq A$, to which Leibniz frequently refers, is not wholly adequate to his actual intention. As chairman Mao realized, there is nothing contradictory involved in maintaining both the same and its opposite about the same thing, unless it is made to apply in the same way, or at the same *time*. According to Mao this point justifies the claim that the principle of contradiction is the prime mover of all development in time! Leibniz did not go that far although he, of course, was aware of the significance of the reservation concerning *simultaneity*. But he defines substance as a notion to be unfolded by the successive assignment and cancellation of predicates. And now we can grasp his ingenious idea to solve the old problem of extension: *space* is the sum of relations between a multiplicity of substances existing at the same time.

Just as time is the same as *succession*, so is space the same as *co-existence*, and therefore the concept of simultaneity is so crucial, both to physics and to logic. To Leibniz, the notion of a substance is the notion of something which cannot be predicated about anything except itself and which can only be posited as a subject. The notion of the simultaneous existence of more than a single substance is thus necessarily equivalent to the notion of the extension of their relative distances. But only the substances themselves exist separately, and space as the sum of their

mutual relations at right angles to the course of time is merely an expression of the absence of contradiction which characterizes the sum of predicates describing their simultaneous states. In the same way the universe, when comprehended spatially, is nothing but an expression of that mutual consistency and compossibility which distinguishes the description of simultaneous states in all co-existing substances. This is decisive, as substances mirror each other by virtue of their predicates.

The cosmos as an epitome of all possible statements regarding co-existence is therefore rooted in that synchronicity which is implicit in the monadic harmony. In this way, the pre-established harmony of the universe is of a logical character: co-actuality of existence. *Simultaneity, not causality, is the cement of the universe.* Thus it is certain that only one world is real, namely, that world to which we ourselves belong; several simultaneous and, at the same time, real worlds do not exist. With his doctrine of the relational structure of space manifesting itself as the simultaneous totality of particular perspectives, reflections which are at the same time individual and universal, and which are connected by the logical harmony of the monads, Leibniz anticipates those tendencies of modern relativistic cosmology that aspire to model the structure of the universe as a mathematical construction based on the exchange of light signals between equivalent observers.

It is essential to Leibniz that God never acts without a sufficient reason; this is his famous principle of sufficient reason, *principium rationis sufficientis*. The sufficient reason for any thing is always anchored in the nature of this thing as a possibility; therefore, the concept of a possible substance contains as a subject in itself all the predicates which can ever be truthfully asserted of this substance. This means that, to Leibniz, all truth is rooted in the nature or concept of reality; his *principle of inherence*, stating that the predicate inheres in its subject, refers to semantics, but is closely related to the metaphysical principle of sufficient reason. It is a consequence of the principle of inherence that all truth is *analytical*.

But Leibniz also distinguishes between *verités de raison* & *verités de fait*. Truths of reason are statements which are necessarily true, hence they are true of every possible or imaginable world, and their truthfulness is therefore *a priori*. Truths of experience are statements which are contingently true, that is, true only with respect to the real world, and their truthfulness is accordingly *a posteriori*. This intuitively obvious distinction seems however to be somewhat obscured by the idea that truth is analytical. That a given statement is analytical indicates that its truth value can be revealed by an analysis which demonstrates that the predicates assigned to the sentence are contained in the concept of the subject in question; denying the statement, therefore, leads ultimately to contradiction.

Here we encounter a third fundamental principle of Leibniz: the principle of contradiction or, rather, the principle of non-contradiction, which is apparently the same as the principle of identity, *principium identitatis*. A variant hereof is the principle of the identity of the indiscernible, *principium identitatis indiscernibilii*, which expresses the individuality of the monads. Thus we ultimately have three closely related basic principles: α) *the metaphysical principle of rationality*, which refers all truth to God; β) *the semantical principle of inherence*, claiming all truth to be analytical; and γ) *the logical principle of identity* or non-contradiction which, by virtue of the discernibility condition, relates epistemology to ontology.

As we have already seen, every world - the real one and the many possible ones - comprises a totality whose temporal development is perfectly determined. Only the transformation from reason-outcome relations to cause-effect relations, which effectuates the change of rational contexts to causal contexts, can represent the transition from potentiality to actuality in the universe to which we belong. How can we explain, on this background, that he deemed it possible to defend the *idea of freedom*? Unlike Hobbes and Spinoza, he was certainly not a determinist, but his case seems to be considerably weakened by the principles mentioned above. How could he avoid that collapse of *modal distinctions*, the concepts of possibility, actuality and necessity, for which he so harshly reproached Spinoza?

Spinoza, claiming the modalities to be indistinguishable, accepted only one kind of necessity, viz. the possible: that which is not necessarily not the case but, being nevertheless actualized at some point, only apparently differs from necessity. To counter this, Leibniz invoked the intuitive differences between three kinds of necessity: logical, physical, and ethical. But, as the possible is equivalent to that which is not necessarily not the case, he might as well have spoken of three kinds of possibility, defining necessity accordingly. So we recover the Stoic trisectioning of philosophy into 1) *logic*, 2) *physics* & 3) *ethics*, as reflected in their modalities:

1) *Logical necessity* is absolute and unconditional; representing the threat of contradiction, it reflects the rules of language and is valid for all possible worlds. Absolute necessity is connected to reality through the necessary existence of God; the prerogative of divine existence is to be necessary simply because it is possible, but the inference from possibility to necessity and actuality applies only to God. Modern commentators have identified Leibniz's logic with the Lewis system *S5*.

2) *Physical necessity* is relative, conditional, and based on divine convention; manifesting itself in the laws of nature, it expresses the structure of the real world. Relative necessity applies to the temporal unfolding of all of the possible worlds because if any of those worlds had been realized instead of that which we call real,

its development in the course of real time would have been perfectly deterministic. Nevertheless, the development would also have been perfectly free in the sense that it would have been the realization of the conceptual content inherent in the very notion of this world as known and provided from eternity by divine omniscience.

3) *Ethical, or moral, necessity* is imperative; aiming at the proliferation of happiness within the real world, it presupposes the freedom of the human will as a capacity to make good deeds, and it derives its strength from duty or conscience. Imperative necessity is ordained by the divine will which freely and deliberately has revealed its inherent goodness by creating the very best of all possible worlds, that worlds which is governed by the best of laws, thus allowing the possibility, in the course of time, of a perpetual increase of the sum of goodness and happiness. The goodness of God is chosen freely, because nothing can compel him to be good; interpreted in this way, divine liberty and divine providence seem to be compatible even if divine providence is understood to be infallible, as it obviously has to be. Human freedom can then be seen as an imperfect analogy to the freedom of God.

Voltaire, nevertheless, found sufficient reason to spurn these speculations. With his reference to the earthquake in Lisboa, he felt that he had refuted Leibniz just as thoroughly as Dr. Johnson would later claim that he had refuted Berkeley. Theologically, his objection is insignificant, for faith is always in conflict with that which is readily perceived by the senses; he who obstinately refuses to believe can always find support in his experience. Philosophically, whether or not one adheres to scepticism seems to be a matter of personal taste and temperament; at least one should be aware, as emphasized by Kierkegaard, that a decision of the will cannot be effected by argumentation. Historically, however, it is clear that the two Christian apologists were confronted with the same difficulty, so aptly described by Hume: *'This (reasoning) admits of no answer and produces no conviction'*.

Russell, Lovejoy, and other critics, have found determinism inevitable. The problem is that Leibniz weakened his case further by adding two assumptions. First, the real world, created as the best of the infinite set of possible worlds, enjoys a privileged status which is accorded to it by virtue of its own nature. Second, even if the best world were not selected with necessity, it is still a foregone conclusion that the specific world which is selected must be the best world of all. The opinion that these supplementary assertions muddle his entire argument may appear justified. Worse still, it is difficult to see how he could have avoided them, because an omnipotent and omniscient creator who nevertheless fails to select the best of all the available possibilities can hardly be considered perfect.

I will consider the problem of freedom in some more detail, since it is so crucial to my topic: the Leibnizian idea of time. It was in the process of a constant battling with this problem that Leibniz invented his 'possible world' semantics. His proposal, so original that it has continued to inspire modern logicians such as S. Kripke, merits careful consideration. Let us therefore return to theology with the reassurance that the reader can decide for himself whether or not to divest the philosophical problem of its mythological trappings. If it is assumed that the creator is not only perfect, but also necessarily perfect, does it not then of necessity follow that this perfection will manifest itself in the inevitable choice of the best? Leibniz would probably not have admitted that, but even then his logic continues to offer loopholes for a consistent defense of the freedom of God.

According to N. Rescher, the loophole lies in the fact that, in order to reach the conclusion that the real world is created with necessity, one has to make the further assumption that this world is not only the best, but is necessarily the best. God, whose eternal providence encompasses every world which can be conceived, infallibly perceives a certain possible world to be better than all others; however, his providential comprehension does not of itself involve necessity. While it is true that God is a perfect mathematician who, using the calculus invented by Leibniz, is able to compare maxima and minima with unflinching exactitude, such an analysis is infinite and can never be brought to a univocal conclusion. The counterfactual conjecture that God might have selected another world as being the best is not incompatible with his infinite wisdom. But B. Mates does not accept this idea.

Although no finite intellect would be able to test the divine calculation, God would certainly himself be capable of deciding whether or not he was in error. Neither would it be feasible to imagine that no definite world was the best of a whole set, finite or infinite, of possible worlds which were better than all others, because if this were the case, God would have had absolutely no reason to create. According to Mates, the solution to the problem lies instead in acknowledging that nothing in the nature of any possible world could compel God to create that world. Inasmuch as God simply could have abstained from creating a real world, we must conclude that the present universe is created in freedom. In contrast to Spinoza, who explained away freedom as being awareness of necessity, we now realize that to Leibniz, freedom was the fundamental concept, all necessity in the world-course of events being anchored in the complete and perfect freedom of the Creator.

In connection with the principle of the analytical nature of truth, the most perplexing question is whether or not Leibniz considers existence to be a predicate. This at least is a necessary prerequisite with respect to God, as it would otherwise

be impossible to infer his existence from his essence; but it is equally obvious that it cannot apply to anyone or anything else. When confronted with this difficulty, one might proffer the objection that that which is predicated is not existence as such, but rather a qualified existence - an existence of perfection, or of privation, respectively. This proposal, however, ignores the fact that qualification applies not to existence but to essence. The principle *essentia involvit existentiam* expresses the perfection of God. From this we deduce by contraposition that the created beings are imperfect in the sense that their existence is contingent; their lack of perfection can therefore be expressed in the principle *essentia non involvit existentiam*.

In order for Russell, Lovejoy, and others, to have been well-founded in their criticism of Leibniz, they would have had to demonstrate that, just as it applies to God that his essence involves his existence, so the very same principle applies to everything else besides God, and they would therefore have been compelled to prove that, necessarily, *essentia = existentia* for all substances in the present world. This is equivalent to claiming that the idea of contingency is logically impossible; this is the same as claiming that none other than the present world is possible; furthermore, it is the same as saying that the present world has the nature of God. It is at once clear that no one is capable of lifting such a burden of proof, not even with the strongest possible interpretation of *principium rationis sufficientis*.

Of course, the more natural expedient would be to show that, in any case, we have to accept the principle *essentia ≠ existentia*, even with respect to God. But, as I have shown formally in another context, this position is inconsistent, and Leibniz, of course, would agree. He further assumed that God as the perfect being must possess a consummate idea of everything imperfect; if not, his whole system would be ill-founded. I find the validity of this assumption dubious, however, for must the notion of a thing not be precisely as imperfect as the real thing itself? Indeed, what could then be more natural than the concept of an imperfect, hence contingent, thing being the concept of that which is not given immediately in its entirety, but rather piecemeal from moment to moment during the course of time?

If this were so, God would be unable to know all future truth though he might be omniscient in the sense of knowing all truth that can possibly be known. In modern terms, even for a divine Creator, an exact calculation of all future states of our universe may demand a computing ability so great that only the universe itself would suffice as an adequate computer. If this were the case, then the whole divine calculation would have to be performed *in real time*, and the calculation could thus not be completed except concurrently with the existence of the world. The future could then not be known 'in advance of all time'; rather, truth would

have to emerge in due succession, *a posteriori*, in concurrence with factual reality. To this Leibniz would reply that the divine intelligence has no need of a computer; but the question is whether it behoves God to know contingent truths timelessly. The Bible, in fact, treats the idea of a divine providence in very few words.

Further, mention must be made of monadology as a model of semantics. As pointed out, the logician S. Kripke has utilized the Leibnizian system of possible worlds for the purpose of interpreting modern ideas of modal and temporal logic. In our context, the models for temporally based systems are of most interest; here, it is worth noting that Leibniz's own semantics offers an original alternative to the semasiological models of Kripke for so-called ramified, or branching, time. In these models, the order of time is often pictured as a tree with a straight trunk, to represent the actual world of the past, terminating in the immediate present as a nodal point from which possible worlds point like branches towards the future. But whereas a real tree is static, the tree of time, of course, must be conceived of as being dynamic, as the nodal point of the present steadily moves upwards.

In contrast to this, Leibniz (perhaps for lack of imagination) seems to have conceived the course of time in his possible worlds as being necessarily linear; nevertheless, his final picture is in some respects reminiscent of branching time. We can here compare the set of possible worlds at any instant to an incompletely twisted rope having most of its strands sticking out in all directions towards the future, whereas the rest of the rope is already twisted smoothly towards the past. The course of time, and the successive displacement of the present, can then be likened to the work of a divine ropemaker who steadily continues his twisting, thereby increasing the measure of finished rope with all the strands wrung parallel; only the thickness of the strands would have to be zero, as their number is infinite. In the context of such a semantics, of course, all world times being perfectly linear, it makes no sense to speak of the *trans-world identity* of monads.

To conclude, I will discuss a famous example: Caesar crossing the Rubicon. According to Leibniz, the concept of Caesar implies timelessly that he is the one who, of his own free will, at a certain moment of his life chooses to cross the river. Anyone else having a past indistinguishable from that of Caesar, but not crossing the river, is not 'our' Caesar, and their similarity never amounts to full identity. All truth concerning the real course of time, Leibniz insists, is given of eternity, and the truth of the whole world is mirrored in the truth of its minutest event. Therefore, the possibility that Caesar will not cross the river is excluded *a priori*, and yet, Caesar acts freely because providence has perceived that he will act freely. This shows that Leibniz does not consider the human will to be free in the sense of

having the liberty to choose between different options, except in relation to other possible worlds. No possible world, considered in itself, allows for any exception. The idea of human freedom always refer to other possible worlds.

It is one thing to insist that the Leibnizian solution is consistent, but quite another to acknowledge its plausibility. For my part, I have to dissociate myself from any attempt to hypostasize the possible worlds of Leibniz into a metaphysics. I do not maintain that it is wrong to do so - I merely insist that it is unnecessary - not only philosophically, but also from the point of view of Christian theology. Therefore I denounce both the semantics proposed by the logician D. Lewis and the so-called many worlds interpretation of quantum physics advanced by H. Everettⁱⁱⁱ, as both involve the unnecessary assumption that possible worlds are not mere mental constructs, but that they also exist in some obscure way, at least virtually. But I accept the 'many worlds interpretation' as an interesting model to illustrate the possibility of bifurcation and choice in a perfectly deterministic context.

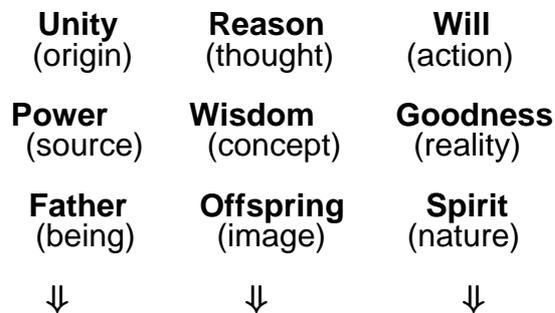
It was essential to Leibniz to exclude all chance (*God does not play dice!*) However, as long as we adhere to the traditional notion of a timeless truth it will present no difficulty to incorporate an element of real chance into his metaphysics. In precisely the same way as divine providence allows for the spontaneity of human freedom, it could make provision for the free play of chance and accident. The truth of any event, whether induced by reason or by chance, might be known of eternity in the sense that, given the event as a present fact, we would be allowed to infer that it had always been the case that this specific event would occur. Nevertheless, I challenge the philosophical dogma of a truth extraneous to time. In my view, all contingent truth is continuously emerging in time, created by God; thus, all truth comes into existence in precisely the same way as does reality itself. Now truth endures, while all reality must eventually perish. Truth *is* eternal, then. But, as Kierkegaard emphasized: *'True eternity is prospective!'*

G O D

A Perfect One

Oneness in Itself

Essence = Existence



M O N A D S

The Imperfect Many

Oneness in Otherness

Essence / Existence

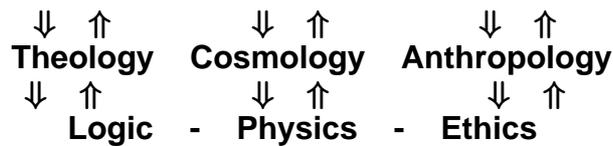
Truths of Reason : Valid of All Possible Worlds

C R E A T I O N

Truths of Fact : Valid of The Only Real World

Cosmos = Harmony

MONADODOLOGY



Mogens True Wegener

LEIBNIZIAN PRINCIPLES

THE PRINCIPLE OF REASON

Principium Rationis Sufficientis

'every truth is founded on reason'
'there is a sufficient reason of all truth'

THE PRINCIPLE OF INHERENCE

Praedicatum In-est Subiecto

'the notion of a being is the source of all truth of it'
'all truth of a being inheres in the notion of that being'

THE PRINCIPLE OF IDENTITY

Principium Identitatis Indiscernibiliae

'all beings are known and distinguished by their notion'
'a being is identical to itself and different from all others'
(antecedent necessity: eternal, absolute, unconditional)

THE PRINCIPLE OF FACTUALITY

Unumquodque, quando est, oportet esse

'what is the case from now on is necessarily the case'
'no fact can be denied except on pain of contradiction'
(subsequent necessity: temporal, relative, conditional)

THE PRINCIPLE OF CONTINGENCY

'in a perfect being essence and existence are inseparable'
'in an imperfect being essence and existence are separable'
(*necessitas consequentis* \neq *necessitas consequentiae*)

THE PRINCIPLE OF COMPOSSIBILITY

'the notion of a possible world is free of contradiction'
'the notion of a possible world is complete ab aeterno'

THE PRINCIPLE OF CONVENIENCE

'the laws of nature are determined by divine choice'
'the causal order bears the sign of divine wisdom'

THE PRINCIPLE OF FREEDOM

'God of his free will has created the best world'
'all nature is rooted in the freedom of God'