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### *Synchronicity*

Jung filled a book<sup>1</sup> with anecdotes illustrating the idea of synchronicity, but one will suffice here to stand for all, because [a] it's a great story, and [b] the stories all sound alike anyway, more or less for the same reason that even though The Hero may have A Thousand Faces, they all look like Luke Skywalker.

It is from Izaak Walton's life of John Donne:

At this time of Mr. Donne's and his wife's living in Sir Robert's house, the Lord Hay was, by King James, sent upon a glorious embassy to the then French king, Henry the Fourth; and Sir Robert put on a sudden resolution to accompany him to the French court, and to be present at his audience there. And Sir Robert put on a sudden resolution to solicit Mr. Donne to be his companion in that journey. And this desire was suddenly made known to his wife, who was then with child, and otherwise under so dangerous a habit of body, as to her health, that she professed an unwillingness to allow him any absence from her; saying, "Her divining soul boded her some ill in his absence"; and therefore desired him not to leave her. This made Mr. Donne lay aside all thoughts of the journey, and really to resolve against it. But Sir Robert became restless in his persuasions for it, and Mr. Donne was so generous as to think he had sold his liberty, when he received so many charitable kindnesses from him; and told his wife so, who did therefore, with an unwilling-willingness<sup>2</sup>, give a faint consent to the journey, which was proposed to be but for

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<sup>1</sup> Jung, C.G. "Synchronicity: An Acausal Connecting Principle." *The Structure and Dynamics of the Psyche*, pp. 417-531. Transl. R.F.C. Hull. London: Routledge, 1960.

<sup>2</sup> Somebody's been reading Sir Philip Sidney.

two months; for about that time they determined their return. Within a few days after this resolve, the Ambassador, Sir Robert, and Mr. Donne left London; and were the twelfth day got all safe to Paris. Two days after their arrival there, Mr. Donne was left alone in that room in which Sir Robert, and he, and some other friends had dined together. To this place Sir Robert returned within half-an-hour; and as he left, so he found, Mr. Donne alone, but in such an ecstasy, and so altered as to his looks, as amazed Sir Robert to behold him; insomuch that he earnestly desired Mr. Donne to declare what had befallen him in the short time of his absence. To which Mr. Donne was not able to make a present answer, but after a long and perplexed pause, did at last say, "I have seen a dreadful vision since I saw you: I have seen my dear wife pass twice by me through this room, with her hair hanging about her shoulders, and a dead child in her arms; this I have seen since I saw you." To which Sir Robert replied, "Sure, sir, you have slept since I saw you; and this is the result of some melancholy dream, which I desire you to forget, for you are now awake." To which Mr. Donne's reply was, "I cannot be surer that I now live than that I have not slept since I saw you; and am as sure that at her second appearing she stopped and looked me in the face, and vanished." Rest and sleep had not altered Mr. Donne's opinion the next day, for he then affirmed this opinion with a more deliberate, and so confirmed a confidence, that he inclined Sir Robert to a faint belief that the vision was true. — It is truly said that desire and doubt have no rest, and it proved so with Sir Robert; for he immediately sent a servant to Drewry House, with a charge to hasten back, and bring him word whether Mrs. Donne were alive; and, if alive, in what condition she was as to her health. The twelfth day, the messenger returned with this account: That he found and left Mrs. Donne very sad, and sick in her bed; and that, after a long and dangerous labour, she had been delivered of a dead child. And, upon examination, the abortion proved to be the same day,

and about the very hour, that Mr. Donne affirmed he saw her pass by him in his chamber.

This is a relation that will beget some wonder, and it well may; for most of our world are at present possessed with an opinion that visions and miracles are ceased. And, though it is most certain that two lutes being both strung and tuned to an equal pitch, and then one played upon, the other, that is not touched, being laid upon a table at a fit distance, will — like an echo to a trumpet — warble a faint audible harmony in answer to the same tune; yet many will not believe there is any such thing as a sympathy of souls...

So here we have a vivid portrait of the intimate spiritual connection between Donne and his wife, a striking anecdote — admittedly so perfect that we must assume many layers of embellishment have been interpolated between the story Walton tells and whatever really happened — and the beautiful figure of the attuned lutes — about which it is interesting, considering that this is, after all, an exercise in hagiography, and Walton a fairly pious guy who idolizes the Dean of St. Paul's and mentions young Jack Donne the notorious rake and wit not at all, that he doesn't simply say "God told Donne what had happened to his wife," but suggests a sort of explanatory hypothesis; that he seems to have an intuitive belief that this episode lies within the scope of the philosophy of nature, and that one needn't employ theological cheats like dividing by infinity to set everything equal to zero.

Moreover the idea of sympathetic vibration seems perfect because it not only suggests the kind of resonant excitation that intuitively seems to be involved,<sup>5</sup> but also the host of complications that may beset the

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<sup>5</sup> Compare also Kepler's theory of astrological influence, that the stars worked their effects upon humanity by a kind of sympathetic resonance with the Music of the Spheres. — The Pythagorean discovery in which mathematical physics originated was that the tone emitted by

connection if the resonant cavities are not perfectly attuned; connotes also the suggestion that the cavities need not be identical in shape and size, but need only agree in a characteristic frequency; and intimates a tuning process may have made Donne and his wife consonant with one another,<sup>4</sup> that people who live together intimately may come to think the same thoughts — incline toward one another; as in the famous image of the compass legs in Donne’s own “A Valediction: forbidding mourning”.

— Nonetheless: this is mental radio again, and begs the usual question of the constitution of the luminiferous ether. —

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Leibniz in a letter to Basnage de Beauval of January 1696<sup>5</sup> suggests three possible mechanisms to explain how a pair of watches might come to be in agreement. The first, curiously enough, is exactly that of resonant excitation, for which he cites an experiment of Huygens in which two pendulums suspended from the same wooden frame (“the collective unconscious”?) adapted to a mutual agreement in period. — The second is occasional interference by an external observer (something like Newton’s assuming God would occasionally have to readjust the solar system to keep the planets in their orbits); the third, the pre-established harmony. — The question, really, is why the third possibility doesn’t seem like an *explanation* at all. Since this is certainly the most exact description of the phenomenon in question.

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a string depended on the tension in it; the intuitive belief that the harmony of Nature was intrinsically musical lingered long, long afterward.

<sup>4</sup>

<sup>5</sup> Loemker pp. 459-460.

Presumably the idea of resonance was in the air. (And — yes — what does that mean?) The English Puritan John Flavel, for instance, says about the pre-established harmony

The soul manifests its dear love and affection to the body, by its sympathy, and compassionate feeling of all its burdens: whatever touches the body, by way of injury, affects the soul also by way of sympathy. The soul and body are as strings of two musical instruments set exactly at one height; if one be touched, the other trembles. They laugh and cry, are sick and well together. This is a wonderful mystery....<sup>6</sup>

Though then just as easily might one soul excite another, or one soul excite another body. (It is odd it went unremarked that, under this argument, one might as easily walk around in someone else's skin as one's own.)

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None of this works, at any rate, and so Jung in a way simply reverts to Leibniz: he tries to explain everything one might think of as paranormal as meaningful coincidence. — This also sounds like a cheat, but the point is subtler: obviously *anything* can be explained away as coincidence — the fact that the ball flies away from the bat when they make contact, the fact that the glass of the window breaks when the baseball strikes it, the fact that the kids' legs respond when their several wills urge them to take flight — it can all be pre-established harmony, if you are so perverse as to insist upon it — but (on the one hand) it is inconsistent to introduce the idea and then not carry it to its logical conclusion, and (on the other) there is the question whether one can grant the whole causal picture with which we generally interpret our experience *and then ask*, can there be some

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<sup>6</sup> Where on earth did I find this?

additional order? has this left something out? — Can there be an alternative — no, let us be precise: an *additional* — framework of explanation, one based, say, on the internal logic of the psyche, complementary to and existing simultaneously with the physical framework with which we are familiar?

If one believed, for instance, that the relation of cause to effect is (as Hume almost literally put it) itself only coincidence, then why not admit the possibility of acausal connections that are not ordered in time? — And once you have done so it is remarkable how easy it is to explain almost any miracle: the same thought turning up simultaneously in two people's heads — even two people separated in time as well as space, thus visions of the past and future and the transmigration of souls; psychokinetic effects; reversals of entropy, which suffice to explain how the Nazarene (assisted by Maxwell's Demon) could walk on water or rise from the dead (the irreversibility of decay is not absolute, but statistical necessity); conjuring spirits, casting spells, making the rain fall or the crops to fail — luck, pure and simple, can account for almost anything. Since the visible order of the natural world is determined, by and large, by probabilities; most of what seems impossible is only very unlikely.<sup>7</sup> So meaningful coincidence can, should you so desire, explain all paranormal phenomena at once.

It should be made clear that this is not a simple null hypothesis — though it can easily become one, and Jung seemed to be susceptible to that temptation — rather, that we are taking the usual explanatory framework as given, and asking how we can add to it.

That is, if we return to Leibniz, his point of view — this is now long forgotten — was that *every* fact of the world must have some explanation; this was the meaning of the principle of sufficient reason.

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<sup>7</sup> Admittedly the probabilities involved may be infinitesimal. But still.

But though this principle is still a powerful motivation for the formation of hypotheses, the evolution of mathematical physics, commencing (let me wave my hands) with Bernoulli's explanation of Boyle's gas law,<sup>8</sup> restricted the domain of reason drastically: the facts of the world were divided into the differential equations in which causal laws were expressed, and the initial conditions assumed for their solution; the latter were the domain of chance, the former of necessity.<sup>9</sup> — If you shot an arrow in the air, it fell to earth *exactly* where determined by initial position/angle/flex of bow;<sup>10</sup> but what *those* were could not be the concern of physics. — So the governing assumption in theoretical physics became that the time evolution of a system was rigorously determined, but the state in which that evolution commenced was ultimately the result of the (enormously complicated) initial state of the universe, and thus in the absence of the exercise of will and/or experimental design *as random as possible*. — Leibniz did not live to see the triumph of this point of view, but he would have loathed it; whether or not he would have admitted its pragmatic utility.

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Kepler described not only the shapes and periods of the orbits of the planets, but in the *Mysterium Cosmographicum* had attempted to provide sufficient reason for their number and their relative distances from the Sun by associating them with a system of spheres inscribed and circumscribed about the five Platonic solids. — Newton already had abandoned this ambition, explaining their orbits with his laws of motion and gravitation but waving his hands and declaring the

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<sup>8</sup> In *Hydrodynamica* [1738].

<sup>9</sup> This is in a way analogous to the way that atomism provided an elegant synthesis of the antithesis of Heraclitus and Parmenides: is everything in flux, or is everything unchanging? The answer is both: the elements are invariant, but their state is variable. — Atoms are Being, motion is Becoming.

<sup>10</sup> Technically only *in vacuo*, but “I shot an arrow in the vacuum/It fell to earth I know not where” doesn't rhyme.

arrangement of “the System of the World” to have been the work of God at the Creation, and therefore out of bounds. — Later the point of view was gradually advanced that the solar system we inhabit is only one out of zillions,<sup>11</sup> and the number and arrangement of the rocks that comprise it is the mere work of chance.

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Jung made the connection with theoretical physics, though not through any direct understanding but through the mediation of Wolfgang Pauli, who began as a patient and ended up a kind of co-conspirator.<sup>12</sup> — Jung wanted someone to tell him the causal description of the world was incomplete; who better than one of the pioneers of quantum physics, a disciple of Bohr ready to apply the idea of complementarity to literally anything, even the most general conception of the physical picture of Nature.

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Though oddly enough even Pauli didn't seem to understand the essential point, that even classical physics was drastically underdetermined, that there was an enormous freedom of choice left to exploit after the constraints of causality had been imposed; perhaps too completely under the spell of Bohr, he insisted that the quantum-

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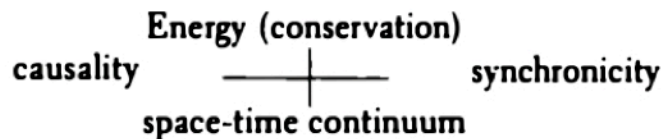
<sup>11</sup> Here “zillion” has the technical meaning “a lot more than a trillion but probably less than a trillion trillion, at least in the visible universe.”

<sup>12</sup> See in particular Letter [37P], 28 June 1949, in *Atom and Archetype: The Pauli/Jung Letters, 1932-1958*, edited by C.A. Meier, translated by David Roscoe. [Princeton: Princeton University Press, 2001.] — Pauli had gone through a series of personal crises in the late Twenties and early Thirties which led him to seek professional help from Jung. Whether this really improved his mental condition is as always open to question, but he rapidly advanced to the status of a collaborator, was a prolific provider of dreams (over 1300 by one count) which Jung made use of — most of the dreams cited in *Psychology and Alchemy* are Pauli's — and following up on his earlier comments was co-author of the volume *The Interpretation of Nature and the Psyche*, in which the essay on synchronicity was first published, contributing a length essay on Kepler and alchemy.



mechanical relaxation of strict determinism was the necessary prerequisite for synchronicity to be possible. — That, and he seems to have fallen in love with the Jungian practice of drawing quaternary diagrams purporting to illustrate the dialectical oppositions of the fundamental conceptual framework, viz.<sup>13</sup>

**That is why I would now like to make the following *compromise proposal* for a quaternary schema as a basis for discussion; it avoids the opposing of time and place and perhaps combines the advantages of your schema and the one I drew up in 1948.**



**On p. 61, where you talk about the “triadic world picture,” perhaps one could replace “by means of space, time, and causality” (8th line from the bottom) by “and the notion of causality.” That would also fit in better with the term “three-principles doctrine,” since *continuity (natura non facit saltus)* can certainly be viewed as a characteristic *principle* for the (classical) scientific age.**

— where the vertical axis represents complementarity in the sense of Bohr, and the horizontal axis represents complementarity in the sense of bullshit. — All this is unnecessary and irrelevant.

(A more contemporary interpretation of the diagram would label the horizontal axis “entanglement”, and one must suspect Pauli had some intuition of the possibilities quantum mechanics had opened in this regard which led him and Jordan, among others, to take a second look at occult phenomena. But the correlation of photon spins and the correlation of human fate with Destiny are radically different ideas, and it is difficult at first glance to see how they might be connected.)

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<sup>13</sup> *Op cit.*, 45P.

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It was Pauli who pointed out to Jung that Schopenhauer had addressed the question of meaningful coincidence long before either one of them, in an essay titled “Transcendent Speculation on the Apparent Design in the Fate of the Individual”.<sup>14</sup> — This had also been the subject of an address Thomas Mann delivered in Vienna on the occasion of Freud’s eightieth birthday in 1936,<sup>15</sup> in which he stated that “the most profound and mysterious point of contact between Freud’s natural scientific world and Schopenhauer’s philosophic one” was

The pregnant and mysterious idea ... that precisely as in a dream it is our own will that unconsciously appears as inexorable objective destiny, everything in it proceeding out of ourselves and each of us being the secret theatre-manager of our own dreams, so also in reality the great dream that a single essence, the will itself, dreams with us all, our fate, may be the product of our inmost selves, of our wills, and we are actually ourselves bringing about what seems to be happening to us.<sup>16</sup>

Which probably made Freud blow a fuse; what could be more Jungian? — But Mann meant well. He was onto something.

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<sup>14</sup> Arthur Schopenhauer, *Parerga and Paralipomena, Vol. 1* (pp. 199-224), transl. E.F.J. Payne. [Oxford: Clarendon Press, 1974. (Originally published 1850.)]

<sup>15</sup> “Freud and the Future”, included in *Essays of Three Decades*, [New York: Alfred A. Knopf, 1947;] translated by H.T.Lowe-Porter. — This made a profound impression on me when I first read it (circa 1970), and of course I set out immediately to find the essay of Schopenhauer in question. Lacking access to a decent research library, I only succeeded decades later. — Another pothole on the Road to Being, as Heidegger might put it.

<sup>16</sup> Compare Bloom: “Freud, like some of the ancients, believed there were no accidents. Ethos is the *daimon*, your character is your fate, and everything that happens to you starts by being you.”

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Schopenhauer warns at the outset that the ideas he presents “might perhaps be termed a mere metaphysical fantasy,” but suspects nonetheless that many have thought along the same lines; that there is a general belief in providence, a sense of being guided by fate, which he seats not in knowledge but in the will. He says that though “to attribute to pure evident chance a purpose or intention is an idea of unparalleled audacity” nonetheless “everyone has had at least once in his life a vivid conception of it.”

That “everything that happens takes place with *strict necessity*” he regards as truth *a priori*, but — this reads very strangely — not in the sense of Newtonian mechanics, not in the sense of Laplace, rather by what he takes to be the incontrovertible evidence for precognition: “It is confirmed empirically and *a posteriori* by the fact, no longer in doubt, that magnetic somnambulists, persons gifted with second sight, and sometimes even the dreams of ordinary sleep directly and accurately predict future events.” And as an illustration he cites the plot of *Oedipus Rex*, which he somehow assumes to be taken from life.

He calls this view *transcendent fatalism*, not demonstrable but something that one believes at least some of the time. — Contradicting Spengler in advance, he insists that “plan and totality are to be found not in world history, as professorial philosophy would have us believe, but in the life of the individual. In fact, nations exist only as *abstracts*; individuals are what is real.” He remarks that people looking back on their lives often regard them as having unity of theme and purpose, like that of a literary composition, even though at the time they may have seemed random and meaningless.

In part this is a character-is-destiny argument, an appeal to the determining role of unconscious instinct in steering the course of one’s life — “the turtle in the sand, that is hatched out by the sun, at once goes straight to the water” — and he remarks that the conscious

apprehension of the course of events is something like a perception in a distorting mirror, which when corrected will exhibit the underlying order and aesthetic arrangement.

Thus chance is surface appearance, necessity is the underlying reality: "...we think at every moment we are masters of our actions; but if we look back on the course of our lives ... it looks as if a strange power has guided our steps." — He appeals to the wisdom of the ancients here, of course, but also to Goethe, e.g. *Egmont* "Man thinks he guides his life and directs himself; and his innermost being is drawn in accordance with his fate." — This however leaves us with two radically different interpretations of any given fact or event, the one physical and contingent, the other moral and metaphysical.

Again he emphasizes that this cannot be *demonstrated* — as Wittgenstein would later say, it is something that shows itself but cannot be said — and appeals again to literary examples; the implicit argument being that the design apparent in the plot of a work of Schiller is, like details of character and description, itself somehow drawn from life; that "a secret and inexplicable power guides all the turns and changes of our lives, indeed often contrary to the intention we had at the time." — That the events of one's life are like the events in a drama, in other words, whose author is presumably "what the ancients called fate ... what they understood as the guiding genius of every individual"; in fact here he digresses briefly to discuss the origins of the idea of a guardian angel, and cites a passage in the *Republic* in which Plato imagines the soul before birth choosing its fate and the genius who will be its guardian.

This conception of a divided self is very close, obviously, to the later conception of the unconscious mind, and Schopenhauer clearly states that this guardian is not located without but within: "that occult power that guides even external influences can ultimately have its root only in our own mysterious inner being; for indeed in the last resort the alpha and omega of all existence lie within us."

He notes a similarity to teleology in the natural world, gives some examples which he doesn't understand very well — but — finally states the crux: that causal chains may be related, that they may have become entangled in the past: "...nothing is *absolutely* accidental...definite causes lying high up in the causal chain have long ago necessarily determined that that something was bound to occur precisely at this moment and, therefore, simultaneously with something else."

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Schopenhauer forms the picture of a network formed from causal chains, ordered by time, like meridians from south to north, in which though "every event is the particular link in a chain of causes and effects which proceeds in the direction of time...there are numberless such chains side by side... not entirely foreign to one another and without any interconnection; on the contrary, they are intertwined..."

Thus

... many causes now operating simultaneously, each of which produces a different effect, have sprung from a common cause higher up and are, therefore, related to one another as great-grandchildren are to their great-grandfather. On the other hand, a particular effect occurring now often requires the coincidence of many different causes which, each as a link in its own chain, have come to us from the past. Accordingly, all those causal chains, that move in the direction of time, now form a large, common, much-interwoven net which with its whole breadth likewise moves forward in the direction of time and constitutes the course of the world. Now if we represent those individual causal chains by meridians that would lie in the direction of time, then that which is simultaneous, and for this reason does not

stand in direct causal connection, can be everywhere indicated by parallel circles. Now although all things situated under the same parallel circle do not directly depend on one another, they nevertheless stand indirectly in some connection, though remote, by virtue of the interlacing of the whole net or of the totality of all causes and effects that roll along in the direction of time. Their present co-existence is therefore necessary; and on this rests the accidental coincidence of all the conditions of an event that is necessary in a higher sense, the happening of that which fate has willed.

and here he appeals directly to dreams, and proposes that life is in some sense itself a dream: “indeed it is this analogy with the dream which enables us to observe ... how the mysterious power, governing and controlling the external events that affect us ... might yet have its root in the depths of our own unfathomable nature.”

He notes that in dreams it can occur that the pursuit of some object of desire (he gives sexual examples) is constantly frustrated — and these frustrations are, of course, of our own invention — accordingly “just as everyone is the secret theatrical manager of his dreams, so too ... that fate that controls the actual course of our lives ultimately comes in some way from the *will*.”

It follows that that there is a division in the self between the empirical (conscious) and the hidden (unconscious) will; he points out a curious (and certainly heretical) passage from Scotus Erigena attributing the same internal division to the divinity; appeals to the *noumenon/phenomenon* distinction (that infallible catchall) to explain the duality of freedom/necessity, causality/teleology, contingency/moral necessity — here are the ancestors of the doctrine of complementarity — and, like Heraclitus, identifies character and destiny:

... all the events in a man's life are connected in two fundamentally different ways; first in the objective causal

connection of the course of nature, secondly in a subjective connection that exists only in reference to the individual who experiences them. It is as subjective as his own dreams, yet in him their succession and content are likewise necessarily determined, but in the manner in which the succession of the scenes of a drama is determined by the plan of the poet. Now those two kinds of connection exist simultaneously and yet the same event, *as* a link in two quite different chains, exactly fits them both, in consequence whereof one man's fate is always in keeping with another's, and everyone is the hero of his own drama, but at the same time figures also in that of another. All this, of course, is something that surpasses all our powers of comprehension and can be conceived as possible only by virtue of the most marvelous *harmonia praestabilita*.

Which anticipates exactly the Jungian reduction to the unconscious. As the dream is purely a product of the individual, though it doesn't appear to be, so is the world as a whole.

And so much for the reality principle.

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How Schopenhauer could have understood this question so clearly is a bit of a mystery, since otherwise he shows no evidence of mathematical intuition. But perhaps it can be explained by his musical sense, which — here is another mystery, why doesn't he say this — should have been telling him that the natural model for the relationship is not literary but musical: causality is melody, synchronicity is harmony — or, more precisely, the arrangement of parallel melodic lines in counterpoint.

These are, precisely, his meridians and latitudes.

So if we think of the world as a work of art, the artist we should picture creating it is not the playwright or novelist, but the composer.

And the form of the design, then, would be something like a musical score. With very many parts.

How then do the same thoughts appear in separate minds? — well: here is the theme in the strings, and here it is in variation, over there in the woodwinds. — How can Jung be listening to a patient tell him her dream about a golden scarab when suddenly a scarab beetle taps upon the window and flies into the room?<sup>17</sup> — Same difference.

You picture the author of Nature, then, as a sort of überBach; an artist coordinating a near-infinite number of individual melodic lines in a colossal fugue.

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Mann had adapted Wagner's musical idea of the leitmotif in the composition of *The Magic Mountain*,<sup>18</sup> where it serves as a device which allows moments widely separated within the (enormous) narrative to

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<sup>17</sup> "A young woman I was treating had, at a critical moment, a dream in which she was given a golden scarab. While she was telling me this dream I sat with my back to the closed window. Suddenly I heard a noise behind me, like a gentle tapping. I turned round and saw a flying insect knocking against the window-pane from outside. I opened the window and caught the creature in the air as it flew in. It was the nearest analogy to a golden scarab that one finds in our latitudes, a scarabaeid beetle, the common rose-chafer (*Cetonia aurata*), which contrary to its usual habits had evidently felt an urge to get into a dark room at this particular moment. I must admit that nothing like it ever happened to me before or since, and that the dream of the patient has remained unique in my experience." [p. 22] — A longer version of the story appears in an additional lecture included as an appendix.

<sup>18</sup> See the brief essay "The Making of *The Magic Mountain*" appended to the English translation of H.T. Lowe-Porter [New York: Alfred A. Knopf, 1965], which first appeared in *The Atlantic*, January 1953.



(as it were) resonate, but more apropos is the musical theory<sup>19</sup> of the protagonist of *Doctor Faustus*, the composer Adrian Leverkühn; who has (or thinks he has) sold his soul to the Devil to gain the creative power of a god — a Demiurge, whose compositions are as intricate as worlds, and employ radically original laws of form.

He is intrigued by the Pythagorean aspect of music, its relations with mathematics and astronomy — “Reason and magic,” he says, “may meet and become one in that which one calls wisdom, initiation; in belief in the stars, in numbers ...”<sup>20</sup> — incessantly theorizes about the nature of music and its structure — and, former student of theology that he is, the inherent blasphemy of the act of artistic creation: “*Imitatio Dei* — I am surprised it is not forbidden.”

The ideal toward which he strives is that of the completely determined composition: one in which every element is related to every other element; one in which every element, like one of Leibniz’s monads, reflects the musical universe it inhabits so that the whole may be inferred from any part. — “... I will tell you what I understand by ‘strict style,’” he says. “I mean the complete integration of all musical dimensions, their neutrality towards each other due to complete organization.”

He explains to the narrator that he first approached this ideal in a song which

“... is entirely derived from a fundamental figure, a series of interchangeable intervals, the five notes B, E, A, E, E-flat, and the horizontal melody and the vertical harmony are determined and controlled by it ... . It is like a word, a key word, stamped on

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<sup>19</sup> These disquisitions were largely subcontracted to Adorno, and stole so many of Schoenberg’s ideas that he threatened a lawsuit. See E. Randol Schoenberg, ed., *The Doctor Faustus Dossier*. [Oakland: University of California Press, 2018.]

<sup>20</sup> The translations are those of H.T. Lowe-Porter. [New York: Alfred A. Knopf, 1948.]

everything in the song, which it would like to determine entirely. But it is too short a word and in itself not flexible enough. The tonal space it affords is too limited. One would have to go on from here and make larger words out of the twelve letters, as it were, of the tempered semitone alphabet. Words of twelve letters, certain combinations and interrelations of the twelve semitones, series of notes from which a piece and all the movements of a work must strictly derive. Every note of the whole composition, both melody and harmony, would have to show its relation to this fixed fundamental series. Not one might recur until the other notes have sounded. Not one might appear which did not fulfill its function in the whole structure. There would no longer be a free note. That is what I would call 'strict composition'. ... every note, without exception, has significance and function according to its place in the basic series or its derivatives. That would guarantee what I call the indifference to harmony and melody."

"A magic square," I said.

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Jung takes Rhine seriously (at the time, everyone did); argues that time and distance are irrelevant; tries to make an argument for astrology (curiously enough Pauli, no doubt under the influence of Kepler, encouraged him in this), but why align the individual human destiny with the positions of the planets against the fixed stars? or more than once, anyway; the next coincidence might as well be with the arrangement of trash trucks in a parking lot in Philadelphia on the first day of Spring in 1973, or a message spelled out by driftwood on the seashore, or ...

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Pauli on Kepler and the *harmonia mundi*:

He was fascinated by the old Pythagorean idea of the music of the spheres (which, incidentally, also played no small part in contemporary alchemy) and was trying to find in the movement of the planets the same proportions that appear in the harmonious sounds of tones and in the regular polyhedra. For him, a true spiritual descendant of the Pythagoreans, all beauty lies in the correct proportion, for “*Geometria est archetypus pulchritudinis mundi*” (Geometry is the archetype of the beauty of the world).<sup>21</sup>

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One obvious thing about paranormal phenomena that this idea seems to capture is that they should lie beyond the domain of events that can be shaped by the (conscious) will; that the whole idea of occult powers which can be *exerted* to read or control the minds of others, or (say) deliberately affect the spin of the roulette wheel, must be abandoned. — Such things may come to pass, may be destined, may even in a way derive from within the psyche — in some unusual sense of “within” — but they cannot be *made* to happen — they are imposed. You can perceive the reality of your destiny, but not change it. — Only in this fashion could the complementary schemes of explanation be consistent.

{...}

Though it is not causality per se that is being abandoned in this alternative scheme of connection — the traditional idea of action at a distance is quite as strange and wholly unnatural, indeed Newton

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<sup>21</sup> Wolfgang Pauli, “The Influence of Archetypal Ideas on the Scientific Theories of Kepler”, *Writings on Physics and Philosophy*, pp. 219-280; ed. Charles P. Enz and Karl von Meyenn; translated by Robert Schlapp. Berlin: Springer-Verlag, 1994.

himself was only able to accept it after his study of alchemy accustomed him to the concept of occult powers<sup>22</sup> — rather, it is *local* causality, the idea that causal influence can only be exerted in the immediate spatiotemporal neighborhood of a source; that signals *propagate*, rather than being felt instantaneously irrespective of distance or time.<sup>23</sup> If Donne's wife in her anguish had been able to scream loudly enough that he could have heard her on the Continent, she would also have been heard — in sequential order — by everyone else in between; but if the information was transmitted by a vision, not necessarily so — perhaps we can explain away why no one else receives the vision by some idea of being tuned in on some psychic radio dial, but it doesn't seem as though Donne would have had better reception if he had been closer; and indeed the ideas of spatiotemporal transmission and the iterative communication of information by successive intermediary exchanges seem curiously irrelevant. — No, the idea here is purely Leibnizian: that two clocks have been wound up to coincide. Space and time seem to have little or nothing to do with it. These events are correlated in another matrix.

{...}

Suppose, for instance, the kind of meaningful coincidence that would be the basis of a Hollywood RomCom: the couple-to-be are out in the city walking their dogs separately, they approach an intersection from

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<sup>22</sup> Cf., e.g., B.J.T. Dobbs, *The Foundations of Newton's Alchemy*, Cambridge: Cambridge University Press, 1983. In hindsight it is incredible that Newton's warning that this idea was only provisional was so completely forgotten once it had been adopted, and it subsequently became the model for all theories of interaction. Faraday's intuition of the field should never have appeared as a radical departure.

<sup>23</sup> I should emphasize in this connection that the only serious attempt to eliminate the field concept (thus local causality) from electromagnetism, and replace it with direct interactions between charges at a distance — that of Wheeler and Feynman — required not only that forces should be felt at a distance with a speed-of-light time delay, but that reactions should be felt both forward and backward in time. — I.e., the idea of action at a distance has no regard for temporality, and I might just as easily in shaking a charge in the antenna of my transmitter be sending a signal back to the Jurassic as to the cell-phone tower at the top of the hill.

orthogonal directions, arrive simultaneously, and as one rounds the corner one way and the other, the other, they are simultaneously distracted by a fortuitous fender-bender, they collide, their dogs' leashes become entangled, confusion, embarrassment, chagrin, apologies as they sort themselves out; and thus they Meet Cute. — Does anything in this story contradict causality? Not at all. All that is required, really, is that each should have started at the right moment. That their clocks should have been synchronized. — That their meeting was *meant to be*.

{...}

Do I believe any of this? Do I believe that the fate of the individual is scripted by Necessity — coded, as it were, into the initial conditions of the universe?

Like Schopenhauer I have had this feeling at times, but my reaction to the coincidences that form its basis is more like one of disbelief: they can't be serious, I think, this is too cute. Surely this is just another joke by the gods at my expense.

{...}

Here's a good one: I am sitting at my work table reading with my phone set off to one side, dark and dormant. Without any (apparent) action on my part, it wakes up, displays the time — 4:32 — and promptly goes back to sleep. — Was this the result of my making some unconscious motion that awakened the phone? (In which case, how did I know what time it was?) — A joke programmed into its source code by some comedian? — Or a joke programmed into the source code of the world?

{...}

— all right, I give up — the Uncanny Experience:

I dropped acid one afternoon<sup>24</sup> and, though it was not approved behavior (perhaps I was just trying to avoid more bad interactions), wandered off by myself to my room. Everything seemed unnaturally still. (The cliché was that you could feel the walls breathing, but this time it felt like they were holding their breath. — If that makes sense. — No, it doesn't have to make sense, does it? Anyway that's what it felt like.) I pulled out the *I Ching* and my designated coins, and started flipping hexagrams to tell my fortune. The first few didn't seem to say much, which was rather boring, so I decided to make something interesting happen: I began *selecting* the hexagrams that I wanted to read by *directing* the fall of the coins. Finally I pushed back the pronouncements of the oracle to the one at the beginning of the book; read some suitably dramatic shit about the dragon lying hidden in the deep and the unshakable cool of the Superior Man, and gave up — too frightened, I think, to carry the experiment any further.

So what did this mean?

Well, I was really stoned. But more than that, I seemed to have achieved a state of coherence. I was, as the scientologists aptly<sup>25</sup> put it, Clear. There was a great stillness in my mind. All noise had been removed. I seemed to have attained some kind of perfection. — In this, the Stone Age of music visualization, we would often feed the outputs of the stereo into an oscilloscope; the results on the display (as Fourier analysis would suggest) were usually complicated and somewhat random, but there had once been one magic moment in “Piece of my Heart” where Janis had hit a mathematically perfect note, and to our stoned amazement a perfect ellipse had appeared on the screen. — It felt like that.

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<sup>24</sup> This was probably in the Fall of 1968.

<sup>25</sup> This may be the only thing they got right.

Nonetheless I never really understood what happened. It appeared that I was flipping the coins and calling the outcomes *before* they happened. — What was this? — False memory? — Was I just choosing to interpret the results according to my anticipations of what they ought to be? just seeing what I wanted to see and not segregating desire from observation adequately? Hallucinating? — It didn't seem like that, nothing was moving, everything seemed rather flat and colorless, black and white. — I was flipping the coins very slowly, so that the outcome was easy to fix in advance? — The flip wasn't really that slow, but somehow I was physically determining the outcome anyway? (I had seen things like that happen, physical capability strangely amplified, people shooting pool on acid, for instance.) — The drugs had scrambled the time-ordering of my memory? — I simply wasn't sure.

The funny part was that I was wondering all this *while it was happening* and still couldn't decide what was going on. Because even stoned out of my gourd I was skeptical to the core. — Was it that I was living Moore's paradox? that I was making the oracle tell me what I wanted to hear, and I still didn't believe it? — No, more likely this, just the old joke once again: I wouldn't belong to any cosmic destiny that would have me as a member.

{...}

What did Leibniz mean when he said this was the best of all possible worlds? He was one of the inventors of the calculus of variations, in which you solve problems like the curve of fixed length which encloses the maximum area (the circle) and the curve of constraint along which a body under the influence of gravity falls between two fixed points in minimum time (the brachistochrone), and he thought sufficient reason must pick out a world that maximized some quality/quantity as the one that actually exists.

So far as anyone can tell this idea — or at least, this scheme for generating ideas — is exactly right. Variational principles are fundamental in theoretical physics: the evolution of a mechanical system obeys the principle of least action, the Boltzmann distribution in statistical mechanics is the one that minimizes information/maximizes entropy under the constraint of constant total energy, transition amplitudes in quantum mechanics are determined by a looking-glass version of the principle, the Feynman path integral; the evolution of the entire cosmos must somehow involve a sum over all possible geometries — all this is testimony to the genius of Leibniz.

But his own version of the idea was different. There is a silly theological interpretation, the one Voltaire ridiculed, which says that all is for the best in this best of all possible worlds (and moves the goalposts in the definition of “good” as needed),<sup>26</sup> but his real idea, the idea of the logician, was something more like mutual consistency: that possible existents were not all mutually compatible, and that the world as it is realized represents a sort of *maximal* compossible set. — Accordingly everything that *could* exist, *did* exist; and thus the principle of sufficient reason and the complementary principle of plenitude.<sup>27</sup>

So how would Leibniz have interpreted Schopenhauer? Once he had understood the factorization of information about the mechanical evolution of the world into initial conditions and laws of motion expressed in terms of differential equations, he would have wanted to select the set of initial conditions that led to the most *interesting* cosmos. — The one, we might guess, that harbored the most meaningful coincidences. The maximally entangled knot of individual destinies. The cosmic fugue with the largest number of independent parts and internal symmetries. — Of course “interesting” and

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<sup>26</sup> F.H. Bradley was funnier: this is the best of all possible worlds, and everything in it is a necessary evil.

<sup>27</sup> The principle of the identity of indiscernibles can also be taken as a corollary.



“meaningful” are still problematic, but he would have waved all that away.

Is this reasoning all that radical? Actually not. In contemporary cosmological speculation theoreticians run up against the embarrassing problem that physical theories, viz. the so-called Standard Model of elementary particle physics, depend upon a fairly large set of free parameters, the values of fundamental physical constants like the strengths of interactions, the masses of the fundamental particles, etc. — a few dozen of them — and that for almost all choices of these apparently arbitrary parameters the physical world we see could not exist. — What does Leibniz tell us here? that there are two alternatives: either sufficient reason can be found for the existing choices — thus e.g. the eccentric literature which attempts to derive the value of the electromagnetic fine structure constant from pure reason — or, if no sufficient reason exists, then (the principle of plenitude) all possibilities must be realized.

And sure enough, the scientific tabloids are full of speculation about the so-called multiverse. — About which let me remark that I actually prefer the version that appears in the comic books: Kang the Conqueror is more entertaining than inflationary cosmology, and the reasoning behind him is probably more rigorous.

{...}

One shouldn't exaggerate the degree to which this principle of maximizing (as one might put it) the elegance of the cosmos is identical with Schopenhauer's notion of the Will dreaming his personal destiny: from the standpoint of theoretical physics, human individuals don't really exist, at least not as simple (significant) objects — the idea instead would be to impose some kind of maximal symmetry group, and then (since the vacuum is always the simplest realization of any such symmetry) to ask what happens when the

system is tweaked, ever so slightly, away from perfection; the idea of spontaneously broken symmetry is the one really deep philosophical idea to emerge from elementary particle physics.<sup>28</sup>

In any case Leibniz and Schopenhauer would want to do more than turn a few knobs on the front of the console and tune in the cosmos where — say — the zeros of the Riemann zeta function determine the elementary particle spectrum. They'd want the whole state of the universe to follow uniquely from pure reason *a priori*. Or at least they'd want to come close enough to declare victory and throw a party.

{...}

Since there's no use pretending we aren't trying to interpret the world as a work of art — with aesthetic criteria — and imagining ways in which it might attain maximum semantic content — the best guess — here I am almost serious — would be something like a principle of maximum information content; doesn't it seem as though a universe that permits the evolution of life is better than one that does not? for instance. — This would presumably entail properties like the existence of stable matter, etc., that are otherwise not guaranteed.

But really the problem is too difficult to approach directly. We have to try first on simpler models.

{...}

The principle of local causality states that an event can only have a physical effect on other events which are close to it.<sup>29</sup> What one might

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<sup>28</sup> It is analogous to the idea of the swerve in Lucretius.

<sup>29</sup> We actually want to say *infinitesimally* close, which requires a lengthy digression to define adequately. So we won't.

call the Proustian view of space and time<sup>30</sup> is that events separated by a considerable distance in time and space may in some other sense be essentially adjacent — Donne in France and his wife in her agony, for example.

If purely as a mathematical question we ask whether the same set of events can have two entirely different spatiotemporal interpretations, the answer at the level of point set topology is already trivially yes. If we ask whether this can remain the case at higher levels of structural complexity, the answer is still yes: one familiar example is the classification of norms on the rational numbers consistent with multiplication which allow the definition of a distance satisfying the axioms for a metric space:

$$\begin{aligned}\|x\| = 0 &\Leftrightarrow x = 0 \\ \|x \cdot y\| &= \|x\| \cdot \|y\| \\ \|x + y\| &\leq \|x\| + \|y\| \\ d(x, y) &\equiv \|x - y\|\end{aligned}$$

implying

$$\begin{aligned}d(x, y) = 0 &\Leftrightarrow x = y \\ d(x, y) &= d(y, x) \\ d(x, z) &\leq d(x, y) + d(y, z)\end{aligned}$$

Such norms can be shown (up to scaling) to be of two types, the familiar

$$\|x\| = |x|$$

and the p-adic

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<sup>30</sup> In re which see below (xv), (3/28/01).

$$\|x\| = \left\| \frac{a}{b} \right\| = \frac{1}{p^{\text{ord}_p(a)}}$$

where  $p$  is a prime, and

$$\text{ord}_p(a) = \max\{n \geq 0: p^n | a\}$$

Thus 1 and 65537 are close 2-adically, though in the standard metric (or any other  $p$ -adic metric) they are rather far apart.

,A more recondite example is provided by the existence of exotic differentiable structures on four-dimensional Euclidean space,<sup>31</sup> but — at any rate — it isn't that difficult to invent possible worlds in which entirely different conceptions of space and time can coexist. Though the question remains, of course, what correspondence they may have with this one.

{...}

The other possibility that always seemed intriguing was the Gödel ambiguity: that the truth of the world might not all be provable from the axioms. — One might think of proof as being like causality, and synchronicity being whatever gets added afterward.

(Though this seems less less a new perspective on synchronicity than a new perspective on logic. — Save that thought...)

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<sup>31</sup> See Michael H. Freedman and Frank Quinn, *Topology of 4-Manifolds*. Princeton: Princeton University Press, 1990.