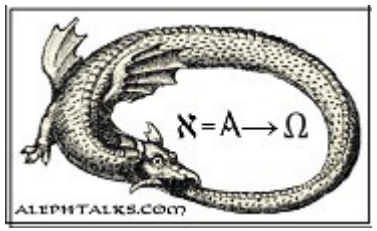
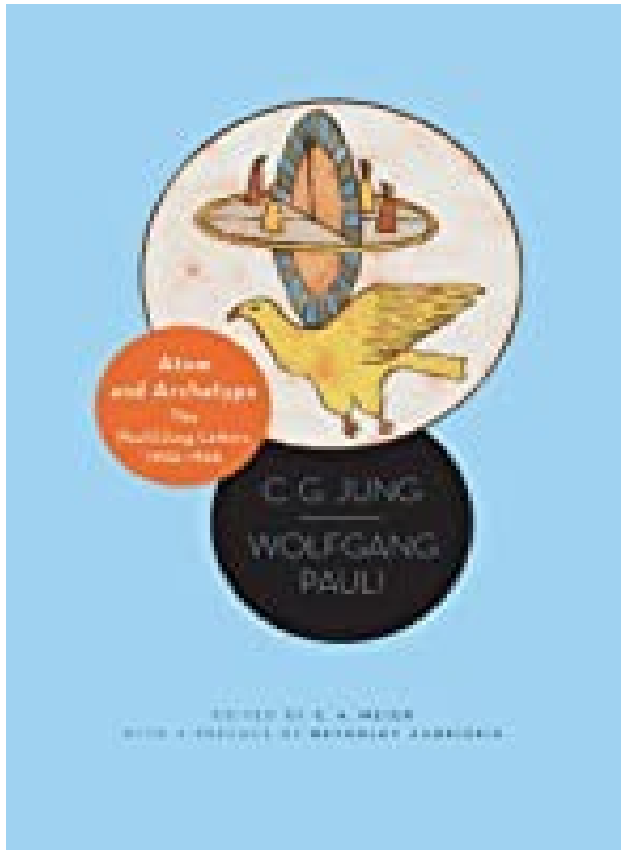
Is Mysticism Where Science, Art, and Religion Meet?



Subject Six
The Letters Between C.G. Jung and Austrian Physicist Wolfgang Pauli, 1932–1958

Wolfgang Pauli and Carl Jung

https://www.brainpickings.org/2017/03/09/atom-and-archetype-pauli-jung/



A Test

- Who said: As the phenomenal world is an aggregate of the processes of atomic magnitude, it is naturally of the greatest importance to find out whether, and if so how, the photons (shall we say) enable us to gain a definite knowledge of the reality underlying the mediative energy processes…Light and matter both behave like separate particles and also like waves. This obliged us to abandon, on the plane of atomic magnitudes, a causal description of nature in theordinary space-time system, and in its place to set up invisible fields of probability in multidimensional spaces? Pauli? No, Jung
- Who said: Division and reduction of symmetry, this then the kernel of the brute. The former is an ancient attribute of the devil..If only the two divine contenders-Christ and the devil-could notice that they have grown so much more symmetrical. Jung? No, Pauli

Wolfgang Pauli

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Wolfgang Ernst Pauli (/ˈpɔːli/;[5] German: [ˈvɔlfgaŋ ˈpaʊli]; 25 April 1900 – 15 December 1958) was an Austrian (and later American / Swiss) theoretical physicist and one of the pioneers of quantum physics. In 1945, after having been nominated by Albert Einstein, Pauli received the Nobel Prize in Physics for his "decisive contribution through his discovery of a new law of Nature, the exclusion principle or Pauli principle". The discovery involved spin theory, which is the basis of a theory of the structure of matter.

Wolfgang Pauli

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At the end of 1930, shortly after his postulation of the neutrino and immediately following his divorce and the suicide of his mother, Pauli experienced a personal crisis. He consulted psychiatrist and psychotherapist Carl Jung who, like Pauli, lived near Zurich. Jung immediately began interpreting Pauli's deeply archetypal dreams, and Pauli became one of Jung's best students. He soon began to criticize the epistemology of Jung's theory scientifically, and this contributed to a certain clarification of the latter's thoughts, especially about the concept of synchronicity. A great many of these discussions are documented in the Pauli/Jung letters, today published as **Atom and Archetype.** Jung's elaborate analysis of more than 400 of Pauli's dreams is documented in **Psychology and Alchemy.**

Wolfgang Pauli

Regarding physics, Pauli was famously a perfectionist. This extended not just to his own work, but also to the work of his colleagues. As a result, he became known in the physics community as the "conscience of physics," the critic to whom his colleagues were accountable. He could be scathing in his dismissal of any theory he found lacking, often labelling it ganz falsch, utterly wrong.

However, this was not his most severe criticism, which he reserved for theories or theses so unclearly presented as to be untestable or unevaluatable and, thus, not properly belonging within the realm of science, even though posing as such. They were worse than wrong because they could not be proven wrong. Famously, he once said of such an unclear paper: "It is not even wrong!"

Wolfgang Pauli

"Every true theorist is a kind of tamed metaphysicist," Einstein wrote as he contemplated the human passion for comprehension in the final years of his life. He may well have been thinking about the great Austrian-Swiss theoretical physicist Wolfgang Pauli (April 25, 1900–December 15, 1958), who first postulated the neutrino and was awarded the Nobel Prize for his discovery of the Pauli exclusion principle — a monumental leap in our understanding of the structure of matter. Decades earlier, 21-year-old Pauli had published a critique of Einstein's groundbreaking theory of general relativity. It greatly impressed the elder physicist, who wrote in astonishment:

No one studying this mature, grandly conceived work could believe that the author is a man of 21. One wonders what to admire most, the psychological understanding for the development of ideas, the sureness of mathematical deduction, the profound physical insight, the capacity for lucid systematic presentation, the complete treatment of the subject matter, or the sureness of critical appraisal.

Wolfgang Pauli and Carl Jung

Indeed, this uncommon fusion of psychological acumen and scientific rigor only intensified as Pauli grew older. Around the time he wrote the paper that spurred Einstein's praise, Pauli became enchanted with the work of pioneering psychologist William James. After immersion in it, Pauli met the great psychiatrist Carl Jung (July 26, 1875–June 6, 1961), who in turn was deeply influenced by Einstein's ideas about space and time.

Jung and Pauli struck an unusual friendship, which lasted a quarter century until Pauli's death and resulted in the invention of synchronicity — acausally connected events, which the observer experiences as having a meaningful connection on the basis of his or her subjective situation, a meeting point of internal and external reality.

Wolfgang Pauli and Carl Jung

Although rooted in Pauli's interest in dream analysis, their conversations and correspondence went on to explore fundamental questions regarding the nature of reality through the dual lens of physics and psychology. Each used the tools of his expertise to shift the shoreline between the known and the unknown, and together they found common ground in the analogy between the atom, with its nucleus and orbiting electrons, and the self, with its central conscious ego and its ambient unconscious.

Wolfgang Pauli and Carl Jung

Both men were deeply imprinted by this intellectual cross-pollination. In his posthumously published final work, Jung would write:

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We do not know whether what we on the empirical plane regard as physical may not, in the Unknown beyond our experience, be identical with what on this side of the border we distinguish from the physical as psychic. Though we know from experience that psychic processes are related to material ones, we are not in a position to say in what this relationship consists or how it is possible at all. Precisely because the psychic and the physical are mutually dependent it has often been conjectured that they may be identical somewhere beyond our present experience, though this certainly does not justify the arbitrary hypothesis of either materialism or spiritualism.

Wolfgang Pauli and Carl Jung

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Pauli's parallel curiosity about mind and matter is perhaps best articulated in by his friend and collaborator Werner Heisenberg — he of uncertainty principle fame — who would later write:

Behind [Pauli's] outward display of criticism and skepticism lay concealed a deep philosophical interest even in those dark areas of reality of the human mind which elude the grasp of reason. And while the power of fascination emanating from Pauli's analyses of physical problems was admittedly due in some measure to the detailed and penetrating clarity of his formulations, the rest was derived from a constant contact with the field of creative processes, for which no rational formulation as yet exists.

Wolfgang Pauli and Carl Jung

In one of his early letters, Jung considers the analogy Pauli had proposed between the atomic nucleus and the self. He writes in the autumn of 1935:

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Generally speaking, the unconscious is thought of as psychic matter in an individual. However, the self-representation drawn up by the unconscious of its central structure does not accord with this view, for everything points to the fact that the central structure of the collective unconscious cannot be fixed locally but is an ubiquitous existence identical to itself; it must not be seen in spatial terms and consequently, when projected onto space, is to be found everywhere in that space. I even have the feeling that this peculiarity applies to time as well as space… A biological analogy would be the functional structure of a termite colony, possessing only unconscious performing organs, whereas the center, to which all the functions of the parts are related, is invisible and not empirically demonstrable

Wolfgang Pauli and Carl Jung

The radioactive nucleus is an excellent symbol for the source of energy of the collective unconscious, the ultimate external stratum of which appears an individual consciousness. As a symbol, it indicates that consciousness does not grow out of any activity that is inherent to it; rather, it is constantly being produced by an energy that comes from the depths of the unconscious and has thus been depicted in the form of rays since time immemorial.

The center, or the nucleus, has always been for me a symbol of the totality of the psychic, as the conscious plus the unconscious, the center of which does not coincide with the ego as the center of consciousness, and consequently has always been perceived as being external.

Wolfgang Pauli and Carl Jung

- Over the following few years, their correspondence focuses primarily on dream analysis — which both Jung and Pauli saw as a means of illuminating scientific motifs in Pauli's work — but again and again they return to the symmetry of mind and matter. In a letter to Jung from the summer of 1937, Pauli jeers at the narrow materialism of his own field and calls for an openness to other forms of knowing:

Most modern physics also lends itself to the symbolic representation of psychic processes, even down to the last detail. Of course, nothing is further from the thoughts of modern man than the idea of penetrating the secrets of matter in this way … since it seems to him that, relatively speaking, less research has been done on the soul, and it is less familiar than matter.

Wolfgang Pauli and Carl Jung

- The following summer, 38-year-old Pauli writes:

- After a careful and critical appraisal of the many experiences and arguments, I have come to accept the existence of deeper spiritual layers that cannot be adequately defined by the conventional concept of time.

In 1947, when Jung decided to found an institute dedicated to this field of research, he asked Pauli — who had received the Nobel Prize a year and a half earlier — to be among its sponsors. The physicist gladly agreed. In a letter to Jung from that December, he noted that the parallels between their interests provide "serious evidence that what is developing is indicative of a close fusion of psychology with the scientific experience of the processes in the material physical world."

Wolfgang Pauli and Carl Jung

- Pauli writes in 1947

- It is probably a long journey, one we are only just setting out on, and it will especially entail, as a modifying factor, constant criticism of the space-time concept.

  Space and time were virtually turned by Newton into God's right hand (oddly enough, the position made vacant when he expelled the Son of God from there), and it needed an extraordinary mental effort to bring time and space back down from these Olympian heights. Going hand in hand with this, apparently, is the criticism of the basic idea of classical natural science, according to which it describes objective facts to such an extent that there is absolutely no link between them and the researcher (objectifiability of the phenomena independently of the way in which they are observed.)

Wolfgang Pauli and Carl Jung

- Four decades before the revered physicist John Archibald Wheeler (who coined the term “black hole”) made his influential assertion that “this is a participatory universe [and] observer-participancy gives rise to information,” Pauli plants the seed of a grand question:

Modern microphysics turns the observer once again into a little lord of creation in his microcosm, with the ability (at least partially) of freedom of choice and fundamentally uncontrollable effects on that which is being observed. But if these phenomena are dependent on how (with what experimental system) they are observed, then is it not possible that they are also phenomena (extra corpus) that depend on who observes them (i.e., on the nature of the psyche of the observer)? And if natural science, in pursuit of the ideal of determinism since Newton, has finally arrived at the stage of the fundamental “perhaps” of the statistical character of natural laws … then should there not be enough room for all those oddities that ultimately rob the distinction between “physics” and “psyche” of all its meaning…?

Wolfgang Pauli and Carl Jung

If you turn Pauli's words over in your mind for a few moments, you'd realize just how radical and enormous a proposition this is. Indeed, it was this letter that catalyzed the series of conversations in which Pauli and Jung came up with the concept of synchronicity — the ultimate dependency between the observer and the observed. By the fall of 1948, they were using the term regularly in their correspondence. In a letter from mid-1949, Jung writes to Pauli, enclosing a manuscript of his first paper on the subject:

Quite a while ago, you encouraged me to write down my thoughts on synchronicity… Nowadays, physicists are the only people who are paying serious attention to such ideas.

Wolfgang Pauli and Carl Jung

A few days later, Pauli echoes this faith in interdisciplinary thinking by sharing with Jung one of his great intellectual influences:

The idea of meaningful coincidence — i.e., simultaneous events not causally connected — was expressed very clearly by Schopenhauer in his essay “On the Apparent Design in the Fate of the Individual.”

This essay of Schopenhauer’s had a lasting and fascinating effect on me and seemed to be pointing the way to a new trend in natural sciences. But whereas [he] wanted at all costs to cling to the rigid determinism along the lines of the classical physics of his day, we have now acknowledged that in the nuclear world, physical events cannot be followed in causal chains through time and space. Thus, the readiness to adopt the idea on which your work is based, that of the “meaning as an ordering factor,” is probably considerably greater among physicists than it was in Schopenhauer’s day.

Wolfgang Pauli and Carl Jung

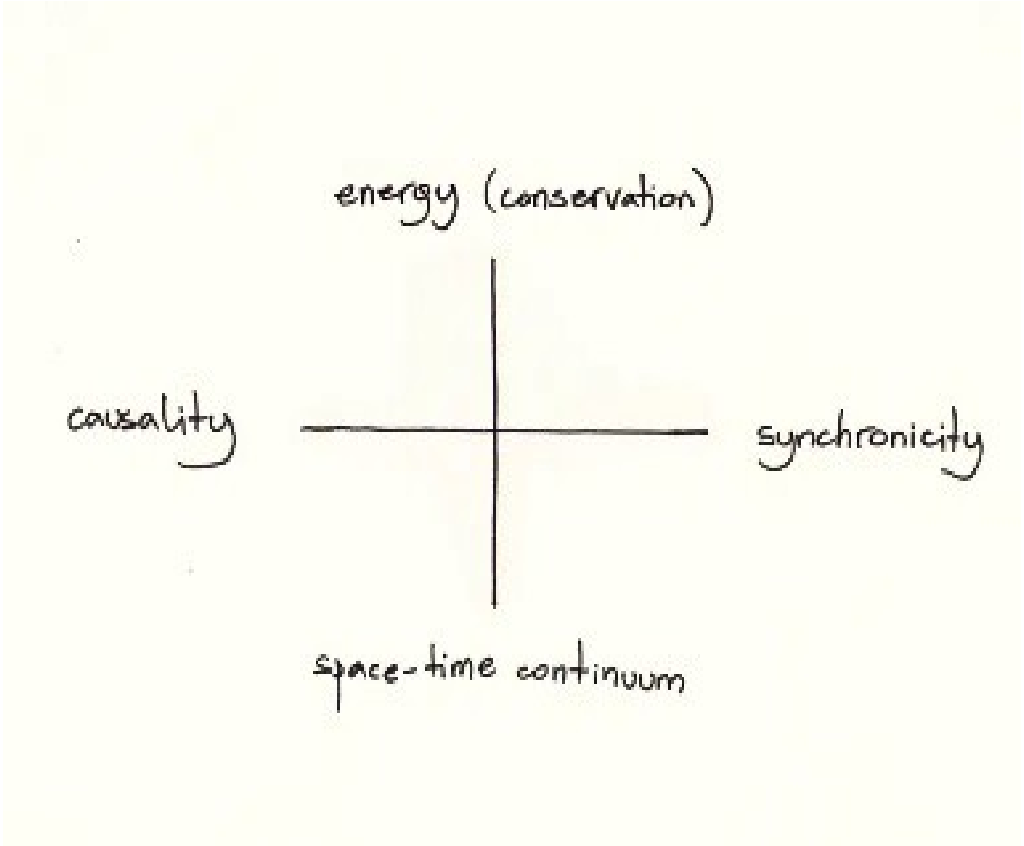
In a subsequent letter from the autumn of 1950, Pauli — who preferred the term "meaning-correspondence" over "synchronicity" as a way of placing greater emphasis on the meaning of events than on their simultaneity — adds:

In truth, nature is so fashioned that — analogous to Bohr's "Complementarity" in physics — any contradiction between causality and synchronically can never be ascertained…. How do the facts that make up modern quantum physics relate to those other phenomena explained by you with the aid of the new principle of synchronicity? First of all, what is certain is that both types of phenomenon go beyond the framework of "classical" determinism.

I nevertheless, as a physicist, have the impression that the "statistical correspondence" of quantum physics, seen from the point of view of synchronicity, is a very weak generalization of the old causality… Although microphysics allows for an acausal form of observation, it actually has no use for the concept of "meaning."

Wolfgang Pauli and Carl Jung

In the letter, Pauli diagrams the concepts discussed:



Wolfgang Pauli and Carl Jung

:Six days later, Jung picks up the thread and crystallizes the definition of synchronicity:

Synchronicity could be understood as an ordering system by means of which “similar” things coincide, without there being any apparent cause.

With an eye to Pauli’s diagram, he considers the role of space and time in synchronicity:

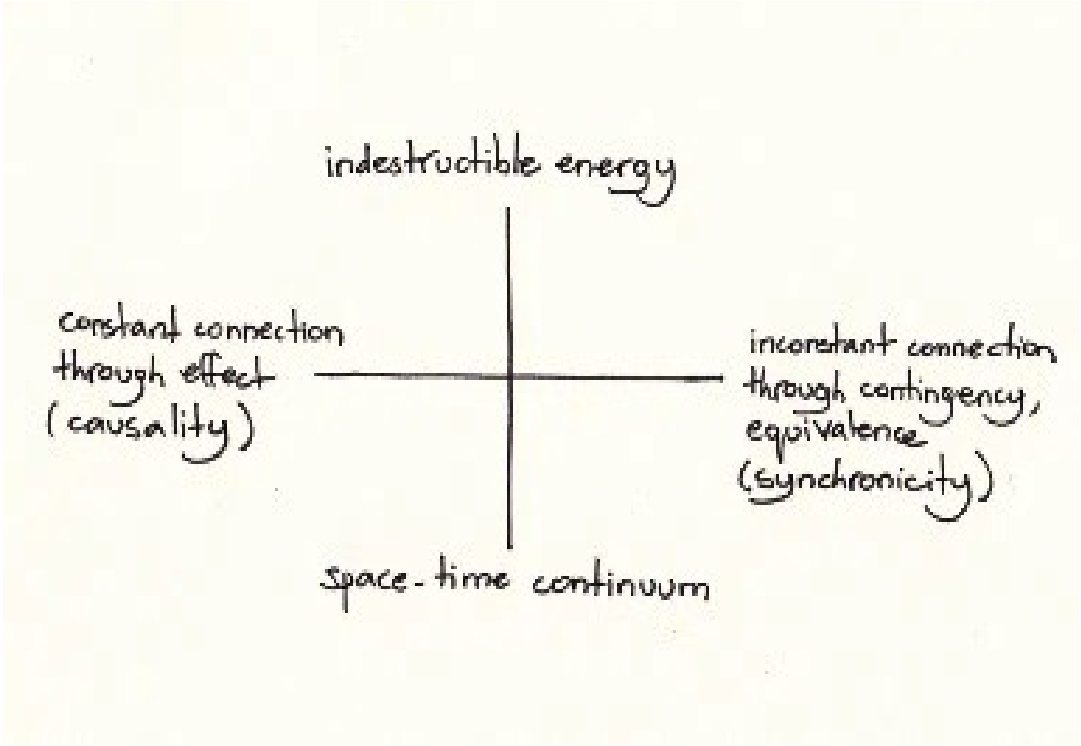
Wolfgang Pauli and Carl Jung

- Modern physics, having advanced into another world beyond conceivability, cannot dispense with the concept of a space-time continuum. Insofar as psychology penetrates into the unconscious, it probably has no alternative but to acknowledge the "indistinctness" or the impossibility of distinguishing between time and space, as well as their psychic relativity. The world of classical physics has not ceased to exist, and by the same token, the world of consciousness has not lost its validity against the unconscious… "Causality" is a psychologem (and originally a magic virtus) that formulates the connection between events and illustrates them as cause and effect. Another (incommensurable) approach that does the same thing in a different way is synchronicity. Both are identical in the higher sense of the term "connection" or "attachment." But on the empirical and practical level (i.e., in the real world), they are incommensurable and antithetical, like space and time.

I would now like to propose that instead of "causality" we have "(relatively) constant connection through effect," and instead of synchronicity we have (relatively) constant connection through contingency, equivalence, or "meaning."

Wolfgang Pauli and Carl Jung

Jung illustrates this proposition with his own variation on Pauli's diagram:



Wolfgang Pauli and Carl Jung

In a letter sent twelve days later, Pauli responds by introducing the crucial concept of scale into these considerations of synchronicity:

Synchronicity should be defined in a narrower sense so as to comprise effects that only appear when there is a small number of individual cases but disappear when there is a larger number… In quantum physics, there are not just effects that appear with large numbers instead of with small ones, and not only is the term “meaning” not the right one here (which you have written about at great length) but also the concept of the (psychic or psychoid) archetype cannot be used so lightly in the acausalities of microphysics.

In a letter from October of 1953, more than twenty years into their correspondence and a decade into their shared obsession with synchronicity, Jung writes to Pauli:

It means a lot to me to see how our points of view are getting closer, for if you feel isolated from your contemporaries when grappling with the unconscious, it is also the same with me, in fact more so, since I am actually standing in the isolated area, striving somehow to bridge the gap that separates me from the others. After all, it is no pleasure for me always to be regarded as esoteric. Oddly enough, the problem is still the same 2,000-year-old one: How does one get from Three to Four?

The Physics of Synchonicity of Pauli and Jung

- Synchonicity arises from information scan/response exchange in compactified dimensions

26 REAL DIMENSIONAL SYMPLECTIC[1] UNIVERSE	
10 Matter Dimensions	10 Dark Matter Dimensions
Space-Time 4 Dimensions (x,y,z,ict^2)	Space-Time 4 Dimensions $i * (x,y,z,ict) = (ix,iy,iz,-ct)$
Symplectic Calabi-Yau Manifold 6 Compactified Dimensions 3 Holes – Genus 3 Hodge Diamond (9,11,6,7)	Symplectic Calabi-Yau Manifold 6 Compactified Dimensions 4 Holes – Genus 4 Hodge Diamond (17,12,21,12)
Symplectic Calabi-Yau Manifold 6 Synchronizing Compactified Dimensions 8 Holes – Genus 8 Hodge Diamond (8,23,21,17)	

[1] Symplectic = real and imaginary pairs.
[2] ict = √(-1) * speed of light * time.

The Physics of Synchonicity of Pauli and Jung

- Synchonicity arises from information scan/response exchanges in compactified dimensions