

chology. In addition, there is much philosophical discussion on its possible participation in the constitution and operation of consciousness. However, this Note deals with a completely non-technical aspect of the relationship and consequently an understanding of quantum theory is quite unnecessary, providing the conclusions drawn from quantum experiments are accepted. Some of these conclusions might seem to a layman even more preposterous than the claims of parapsychology appear to a physicist, but there is no escaping their veracity. Quantum physics is one of the most firmly established branches of science and its validity has been confirmed by the work done on it, which ranges from sub-atomic experiments to many types of industrial application.

The main types of paranormal mental activity are telepathy and PK and included in the former are phenomena such as crisis apparitions which are probably visual 3-dimensional manifestations of it. The materialist maintains there is no indisputable evidence to suggest that there can be any communication, apart from the established physical means, between two individuals separated by hundreds of miles. (Of course, even Sir Isaac Newton in his day, would have agreed it was utterly impossible for somebody in Europe to hold a conversation with a person in the New World!). Little attention is paid to anecdotal accounts or the results of non-repeatable experiments. There is no answer to questions asking how a signal emanating from an agent in Brighton knows how to locate a recipient in Birmingham, and yet disregard every other possible recipient. Distance between agent and percipient does not appear to affect the signal's effectiveness, thereby suggesting that telepathy must break one of the fundamental laws of science—the inverse square law. Again, nothing has ever been discovered in the brain which could be related to telepathy, and one cannot have an informatory radiation without some means of transmitting it.

The scientific attitude is rather surprising in view of the fact that there exist in the physical world virtual duplicates of these 'impossible' criteria. If an atomic particle explodes into two fragments, A and B, which are allowed to travel apart for a great distance, then an action, such as a measurement of one particle, immediately produces a reaction in the second particle, irrespective of its distance away. (A detailed example of a particular form of interference with the first particle A, and the reaction of the second B, is described by Davies,<sup>1</sup> but only the principle involved is relevant here.) There therefore exists in physics the equivalent of the basis of telepathy. The first particle A corresponds to the telepathic agent, and is able to locate and communicate with particle B without regard to the inverse square law and without affecting any other particles in its sphere of influence. In addition, the disturbance created in particle A induces a configuration in B which is dependent on the type of influence exerted on A, thereby suggesting the transmission of an informatory signal. All this is indisputable, yet it raises exactly the same questions which it is claimed render telepathy an impossibility. By what means does the first particle A communicate with B? How does it know where to find it and avoid extraneous particles? Particle A can be influenced in various ways and B always makes the appropriate response, which suggests an informatory signal from A to B. The parallel with telepathy is obvious.

One of the most extraordinary characteristics of the quantum factor is that the act of conscious observation can affect the properties of the observed particles,

being able, for example, to convert what is referred to as a 'ghost' electron into a concrete reality. It is sometimes claimed that this is confirmation of PK on the grounds that if consciousness can affect physical matters in one set of circumstances, then it can operate in PK experiments, although it does not necessarily follow that the behaviour of a single atom will be duplicated in the case of the immensely larger molecular grouping of a dice.

More importantly, however, is the implication of this situation for dualism and accordingly for parapsychology. Neo-Cartesian dualism presumes there is an interaction between a possibly non-physical consciousness and a material brain. This hypothesis has been unacceptable to many scientists for several reasons: it is impossible to conceive the nature of a non-physical entity, it is impossible to comprehend how anything so insubstantial could modify a physical system, it is impossible to suggest the source of the necessary energy and how it is utilised, and so on. In short, the whole situation is utterly impossible, yet quantum experiments show it does take place.

The quantum factor does not suggest that the mind is not physical, nor does it indicate how the mind might interact with the brain, or even if it does so, but what it clearly proves is that it *could*, and thus makes it impossible for responsible scientists to dismiss dualism and parapsychology out of hand on the grounds that mental influence on a physical body at a distance cannot exist in nature.

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#### REFERENCE

1. Davies, P. (1983). *God and the New Physics*. London: J. M. Dent & Sons Ltd.

#### EXPERIMENTS WITH GOD. ESSAY REVIEW OF CORNELIS W. RIETDIJK'S *EXPERIMENTEN MET GOD*\*

by JOOP M. HOUTKOOPER

There may be as many as a few dozen SPR members that know the Dutch language, but this review is intended to be of interest, not only for them, but also for the general reader of the JSPR.

We no longer live in a classical world. Like a hundred years ago, apples fall down, cannonballs follow parabolic trajectories, and planets move in a predictable way in the sky, but this no longer reflects natural law in a fundamental manner. Though we may not be aware of it, our daily lives are more and more shaped by the applications of quantum mechanics and the theory of relativity.

We also live in an age which may be characterized as moral. The limits on pollution, natural resources are visible on a global scale. Economy develops on a global scale, and, as some say, the Third World War has just ended, having been fought by economic means. The most prominent question society has to deal

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with may be: What to do if we want humanity to stay on its feet? That is, for those who have a hang for morality.

'Experiments with God' carries as its motto the well known citation from Einstein: 'God doesn't play dice' (1), to which Rietdijk has added 'with the world', thereby indicating a tendency in his thinking.

A few words from the biographical note the book contains: Rietdijk is a physicist and a mathematician. During and following his long career as a physics teacher, he has published, first, books and journal articles about social and cultural philosophy, and second, articles and conference contributions on theoretical physics.

About the first, Rietdijk shows concern about the fate of society in its broadest sense, often expressing rather libertarian and controversial views. (At the end of the sixties he wrote that we should, in the interest of human happiness, spend ten per cent of our GNP on parapsychological research!)

About his, over a dozen, publications in physics: since 1966 he has written on retro-active effects (in a.o. *Philosophy of Science and Foundations of Physics*), and on matter-wave interference. I have heard his publications been described as 'controversial, but technically sound'.

In 'Experiments with God', Rietdijk bridges the gap between these two aspects of his writing. He certainly succeeds in being controversial, and we shall see to what extent he is technically sound.

'Experiments with God' consists of three parts, entitled: '1. The new physics', '2. Are there laws in human destiny? Parapsychology comes of age', and '3. The new science and religion'. Each part consists of five chapters, each chapter being preceded by an abstract.

Part 1 may be compared to Zukav's well-known 'The dancing Wu-li masters'. Rietdijk doesn't dance however, he sets a brisk pace. So he succeeds in the first twelve-page chapter to give a very clear picture of the Bohr-Einstein controversy, the EPR-paradox, the Bell-inequalities and Aspect's experiments validating the strange non-local character of quantum mechanics. To me, Zukav's dance suddenly seemed to be a sluggish meandering.

The second chapter of Part 1 gives an exposé of relativity theory. Rietdijk gives a note on the existence of the four-dimensional space-time continuum, implying that the future already exists. (Very sensibly he adds a remark on the problem of the free will.) In chapter 3, he gives an account of his proof of the retro-active effect in quantum mechanics, underpinning the above implication.

In chapter 4, the non-locality of quantum mechanical systems is viewed from a new angle, showing the significance of the concept of 'action-distance' of events in the four-dimensional space-time continuum. The action-distance of non-locally related events is shown to be zero. Planck's quantum of action is the yardstick of action-distance.

At this stage we have all the elements at hand of the idea how distant events may physically (!) interact, other than through the known physical forces such as the gravitational and electromagnetic. Moreover, we are introduced to the possibility that the non-local interactions may take the form of feed-back relations and this allows the formation of patterns of events, otherwise separated in space and time. This formation of patterns through non-local interactions is termed the 'super-local co-ordination of the orchestration of events'.

In chapter 5 Rietdijk localizes his ideas with respect to others. He tackles on the one hand, the proponents of Eastern-intuitive and holistic approaches, exemplified by Capra's 'The Tao of Physics' and, on the other hand, the positivists who maintain that everything in physics is said by measurement results and the formulas to predict them, foregoing understanding and model-formation.

Both groups are dealt with, fairly but severely. Rietdijk most extensively treats the view of the positivists, including the historical development of a conservative trend and, finally, its self-defeating nature.

Rietdijk returns to the Bohr-Einstein controversy and concludes that both were right to a large extent. Both the dependency on the observation (Bohr) and the objective reality (Einstein) can be maintained about quantum phenomena. Retro-active effects allow pattern formation and 'orchestration' of events. While he admits that he cannot bring the role of the observer to very much clarity, Rietdijk hypothesizes that the retro-active effects play the role of the 'hidden variables' that describe the randomness in quantum mechanical events.

To what extent this very fundamental randomness is determined by the retro-active effects, Rietdijk cannot say, but 'it cannot be excluded that God plays dice with the world to an even lesser extent than as implied by the local causal laws of classical physics'!

At the end of chapter 5 Rietdijk puts forward the idea that the 'orchestration' of events, as allowed by physics, may connect with aspects of nature usually termed psychical, to integrative forces, tendencies and, purposes.

This form of holism, Rietdijk emphasizes, this occurrence of integrating aspects of nature, is not a paradigm, but a phenomenon, that can be revealed by the normal scientific method. There is nothing vague here, like the term 'complementarity' for instance, but a real improvement of our world-picture, which becomes more consistent and better explainable.

In this way, the gap between rational thought and 'integral' or religious thought can be bridged. There is a perspective that this can be achieved without 'water in the scientific wine', discovering by scientific means a 'deeper, lawful consistency' of events, showing that 'something we could name Arch-Cause or God does not play dice with the fate of the world and that of mankind'.

This is at the end of Part 1, still under the heading 'the new physics'. My opinion is that this can all be called 'technically sound', as Rietdijk carefully distinguishes fact and inference from hypothesis and speculation, but the latter always as allowed by the facts. There is one exception, and that is the hypothesis of realism, implicit in his proof of retro-active effects, to which I will return later.

Part 2 starts with an account of parapsychology. In view of the preceding chapters it is not surprising that Walker's version of observational theory is adopted as a theoretical approach. Rietdijk sees the tendency for coincidences to occur as most fundamental. In the case of PK the coincidence is between the goal pursued by the agent and the actual outcome. With clairvoyance it is between the impression of the percipient and the actual situation. Super-local pattern formation is put forward as the possible mechanism to achieve this.

While Rietdijk acknowledges the special role played by the observer, he really does not see the role of coincidences and he refers to Jung, Schopenhauer, Von

Scholz and Koestler to argue that there are integrative forces working to achieve meaningful coincidences.

The integrative forces run from the simple 'like attracts like'—hypothesis of Kammerer, to a more teleological version. For many years, Rietdijk has collected meaningful coincidences in his own experience. To facilitate their explanation he puts forward three further hypotheses: The first is introducing a dualistic element, namely that consciousness is just as primary as matter and playing a role in super-local pattern formation. The second is about God as pattern forming agent with the whole universe as a body and human beings possibly playing the role of cells. The third hypothesis is building upon Jung's collective unconscious, stating that cultures, nations or other smaller or larger groups of human beings may act to some extent as integrated 'supersouls'.

In the following chapters of Part 2, the role of super-local pattern formation is related to parapsychological concepts, like goal-orientedness, the psychical inductor, voodoo, experimenter effects, psi-missing and the cross-correspondences described by W. H. Salter. The main thrust is that quantum mechanical randomness propagates into real-life events and this provides room for the 'orchestration' of events. The findings of parapsychology support this view. Coincidences can be seen as exemplary to the fact that the integrative forces produce events that show likenesses, often of a meaningful character. Moreover, Rietdijk sees a sense of purpose in all this, at the level of the individual, the group and the universe.

When Rietdijk introduces religiosity, morality and the Grand Pattern of events in which we all take part, this reviewer is subject to mixed feelings. Of course, religious experiences and feelings are known to exist widely and morality may be founded as I suggested in the introduction of this review. Nevertheless, moral judgments cannot logically be derived from existential judgments. Here Rietdijk is not clear. His religious notions are of a general Christian nature and bear some similarity to Einstein's. However, as he tries to convince the reader that scientific and religious world views are part of the same pattern, apparently it becomes difficult to stick to his own 'No water in the scientific wine'.

In the last part of the book Rietdijk gives his view on trends in society and how this relates to his view on religion. Of course, he turns against nihilism, relativism and the like, but nowhere does he become dull. His ideas bear much resemblance to the Enlightenment, but with an underlying religious foundation which implies a continuing 'creation' and an increasing degree of integration and organization.

He is wise enough to see that the 'orchestration' of events may well play a role in less beneficent developments, like, for instance, that of Nazism. Such might be seen as a consequence of operating within the limits of quantum uncertainty and the course of development from primitive to more integrated forms of matter.

I have to criticize the book on a few points: Unlike other assumptions made, there is implicit in the proof of the retro-active effect the hypothesis of realism, namely of unobserved quantum mechanically random events. I take issue with this hypothesis. In its place, I have advocated the hypothesis of indefinite reality (2), from which a very different world-view might be developed. Most valuable is the fact that we have an unobvious choice between two alternatives which might be settled by experiment.

Furthermore, about the Grand Pattern, it might be asked what it has to say about humanity that is different than could be said about the dodo. But that's mere uneasiness with the result, not an argument against it.

More problematic are the introduction of consciousness as a primary concept, which is in my opinion unnecessary, and the introduction of morality which is shaky.

Concluding, I cannot resist to borrow from the book a citation of Giordano Bruno: 'Si non è vero, è bene trovato.' That is to say, Rietdijk's choice of hypotheses is not necessarily that of the reader. The book argues for an enlightened form of Christian belief, which is maybe nothing new, but it is applaudable that the assumptions needed are so clearly distinguished as such. This makes the book a pleasure to read, even while disagreeing with it. The arguments, primarily developed from modern physics, are such that they are understandable to the interested lay-person.

For parapsychologists, the book contains interesting connotations to real-life events, like meaningful coincidences, but also to observational theory, such as the above-mentioned hypothesis of realism. Rietdijk suggests all his assumptions are experimentally testable. The crucial experiment, determining whether there is an omniscient observer looking over our shoulder, still has to be invented.

I hope this book will be translated into English soon and on that occasion an index would be a welcome addition. It will provoke profound discussions and deserves a wider readership.

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NOTES

1. Translating between languages is always tricky, but in this case playing a negligible role, I believe. The original citation is in German: 'Der liebe Herrgott würfelt nicht.' It might be noted here that, apart from the intended meaning, Einstein also expressed a general sentiment. This may be illustrated by words written by Ira Gershwin in 1934: 'To get into Hebben, don' snap for a sebben! Live clean!' From 'It ain't necessarily so', from 'Porgy and Bess', in: The best of George Gershwin. Chappell, London, 1976.
2. See, for instance, J. M. Houtkooper, L. R. Gissurarson and E. Haraldsson: Why the ganzfeld is conducive to ESP: A study of observational theory and the percipient-order effect. *European Journal of Parapsychology*, 7(nr.2-4), 169-192, (1989).