

# On Quanta, Mind and Matter: Hans Primas in Context (Fundamental Theories of Physics)

Between classical and quantum\*

N.P. Landsman

Radboud Universiteit Nijmegen  
Institute for Mathematics, Astrophysics, and Particle Physics  
Toernooiveld 1, 6525 ED NIJMEGEN  
THE NETHERLANDS

email landsman@math.ru.nl

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## Abstract

The relationship between classical and quantum theory is of central importance to the philosophy of physics, and any interpretation of quantum mechanics has to clarify it. Our discussion of this relationship is partly historical and conceptual, but mostly technical and mathematically rigorous, including over 500 references. For example, we sketch how certain intuitive ideas of the founders of quantum theory have fared in the light of current mathematical knowledge. One such idea that has certainly stood the test of time is Heisenberg's quantum-theoretical *Eindeutigkeit* (reinterpretation) of classical observables, which lies at the basis of quantization theory. Similarly, Bohr's correspondence principle (in somewhat revised form) and Schrödinger's wave packets (or coherent states) continue to be of great importance in understanding classical behaviour from quantum mechanics. On the other hand, no consensus has been reached on the Copenhagen Interpretation, but in view of the paradoxes of it one typically finds in the literature we describe it in detail.

On the assumption that quantum mechanics is universal and complete, we discuss three ways in which classical physics has so far been believed to emerge from quantum physics, namely in the limit  $\hbar \rightarrow 0$  of small Planck's constant (in a finite system), in the limit  $N \rightarrow \infty$  of a large system with  $N$  degrees of freedom (at fixed  $\hbar$ ), and through decoherence and consistent histories. The first limit is closely related to modern quantization theory and microlocal analysis, whereas the second involves methods of  $C^*$ -algebras and the concepts of superselection sectors and macroscopic observables. In these limits, the classical world does not emerge as a sharply defined objective reality, but rather as an approximate *appearance* relative to certain "classical" states and observables. Decoherence subsequently clarifies the role of such states, in that they are "inselected", i.e. robust against coupling to the environment. Furthermore, the nature of classical observables is elucidated by the fact that they typically define (approximately) consistent sets of histories.

This combination of ideas and techniques does not quite resolve the measurement problem, but it does make the point that classicality results from the *elimination* of certain states and observables from quantum theory. Thus the classical world is not created by observation (as Heisenberg once claimed), but rather by the lack of it.

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INSTEAD OF A "FESTSCHRIFT" In June Hans Primas turned 70 years old. Although he Fundamental Theories of Physics On Quanta, Mind and Matter.alcaladeljucaroficial.com: On Quanta, Mind and Matter: Hans Primas in Context ( Fundamental Theories of Physics) (): Harald Atmanspacher, Anton Amann.on quanta mind and matter hans primas in context fundamental theories of physics softcover reprint of the original 1st ed edition download and read on.If you are looking for a book On Quanta, Mind and Matter: Hans Primas in Context (Fundamental. Theories of Physics) in pdf format, in that case you come on to.On Quanta, Mind, and Matter: Hans Primas in Context. Front Cover Hans Primas in Context Volume of Fundamental theories of physics, ISSN On Quanta, Mind and Matter: Hans Primas in Context / edited by H. Fundamental theories of physics ; v. Subjects. Quantum chemistry. Quantum theory.22 Jul - 22 sec Reading On Quanta, Mind and Matter: Hans Primas in Context (Fundamental Theories.On quanta, mind, and matter: Hans Primas in context. Responsibility: H. description: viii, p.: ill. ; 25 cm. Series: Fundamental theories of physics ; v. on quanta mind and matter hans primas in context fundamental theories of physics. Online Books Database. Doc ID fc Online Books Database. On Quanta.GMT on quanta mind and pdf - In physics, a mind and matter hans primas in context fundamental theories of physics (PDF, ePu.Find On Quanta Mind And Matter Hans Primas In Context Fundamental Theories Of Physics book in our library for free trial. We provide copy of On Quanta Mind.If looking for a ebook On Quanta, Mind and Matter: Hans Primas in Context ( Fundamental Theories of. Physics) in pdf form, in that case you come on to faithful.Concepts of Observation and Knowledge in Physics,Philosophy, and Cognitive. Science. On Quanta, Mind, and. Matter. Hans Primas in Context. Kluwer Publishers, Dordrecht, 7. . A fundamental link between system theory and .Hans Primas. from: \$ Chemistry, Quantum Mechanics, and Reductionism: Perspectives in Theoretical Chemistry. Hans Primas. On Quanta, Mind and.and periodicity in stable homotopy theory am ,on quanta mind and matter hans primas in context fundamental theories of physics,harley davidson.into astro van,on quanta mind and matter hans primas in context fundamental theories of physics,kia sorento dealer repair manual,communication sciences and.development,david buschs canon eos 7d mark ii guide to,on quanta mind and matter hans primas in context fundamental theories of physics,biology.examination book with cd rom,dodge challenger owners manual ,on quanta mind and matter hans primas in context fundamental theories of physics.sportage repair manuals free,label parts of a viking longship,on quanta mind and matter hans primas in context fundamental theories of physics, mazda protege repair manual,getting ready for third grade math packet,design management.List of philosophical publications by Hans Halvorson (Princeton University), Critique of the Fine-Tuning Argument", and "Plantinga on Providence and Physics". argued that quantum theory is characterized by its satisfaction of three fundamental On quanta, mind, and matter: Hans primas in context - H. Atmanspacher.

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