



Physics World

FEATURE

Against 'measurement'

John Bell¹

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Abstract

Surely, after 62 years, we should have an exact formulation of some serious part of quantum mechanics? By 'exact' I do not of course mean 'exactly true'. I mean only that the theory should be fully formulated in mathematical terms, with nothing left to the discretion of the theoretical physicist...until workable approximations are needed in applications. By 'serious' I mean that some substantial fragment of physics should be covered. Nonrelativistic 'particle' quantum mechanics, perhaps with the inclusion of the electromagnetic field and cut-off interaction, is serious enough. For it covers 'a large part of physics and the whole of chemistry' (P A M Dirac 1929 Proc. R. Soc.A 123 714). I mean too, by 'serious', that 'apparatus' should not be separated off from the rest of the world into black boxes, as if it were not made of atoms and not ruled by quantum mechanics.

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