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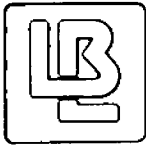
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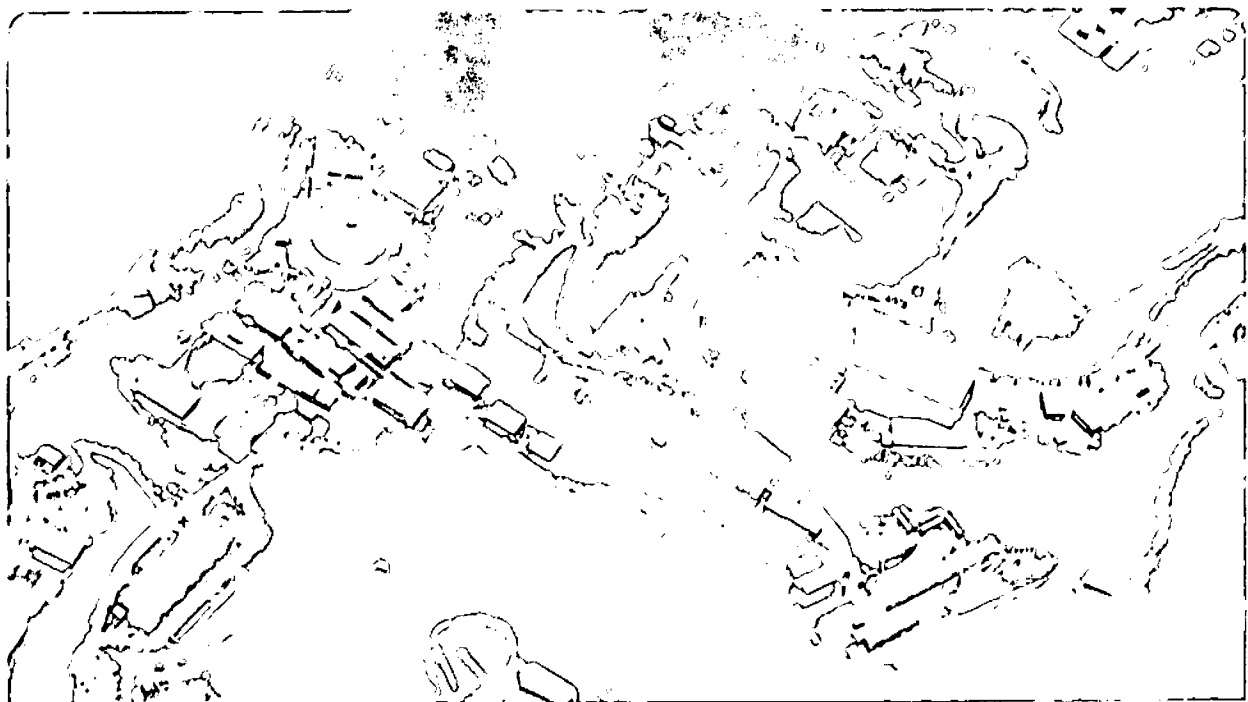
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Stapp Responds to Moldauer*

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Stapp responds: Moldauer's comment¹ rests on his statement that in quantum theory two incompatible observables, O_1 and O_2 , cannot both be assigned definite values. This statement is imprecise. According to quantum theory O_1 and O_2 cannot both be experimentally assigned definite values conjunctively. For when experimental values are considered the observed system must be regarded as an integral part of a whole experimental arrangement, and the arrangements needed to give definite values to O_1 and O_2 cannot occur conjunctively. Also, according to quantum theory, O_1 and O_2 cannot, in general, both be conceptually assigned definite values conjunctively.² For a state that makes O_1 definite will, in general, make O_2 indefinite.

On the other hand, quantum theory asserts that: (1) if the arrangement is suitable for measuring O_1 , then O_1 is experimentally assigned a definite value; and (2) if the arrangement is suitable for measuring O_2 , then O_2 is experimentally assigned a definite value.

Quantum theory assigns in principle a probability to each conceivable result of each alternative possible measurement on any atomic system. The nonlocality property defined in ref. 3 is a mathematical property of the complete set of quantum probabilities, and is thus a mathematical property of quantum theory. In proving this property one conceptually assigns definite results conjunctively to each of four alternative possible mutually incompatible physical systems of object plus measuring devices. The alternative possible devices can be constructed from different sets of particles, and hence will be represented in different Hilbert subspaces. This situation is not equivalent to either of those described in paragraph one. For the projection operators corresponding to the four alternative possible results now act in different Hilbert spaces, and hence commute. Thus the observables are compatible, and the arguments of Moldauer are inapplicable.

The essential distinction here is between four conditions imposed conjunctively on a single physical system and four conditions imposed conjunctively, one on each of four alternative possible physical systems. In the latter case, unlike the former, no contradiction with the quantum formalism can be derived from the conjunctive assignments alone.

As regards Pitowsky's work, his model is no counterexample to nonlocality theorems, for considered as a local model of the individual physical processes it cannot fit the quantum predictions,^{4,5} and considered as a procedure for computing probabilities it is nonlocal.^{6,7}

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