

Chapter V

Conclusion

Readers who expect to find a final conclusion in this chapter will be disappointed. Even though future experiments might clarify some points, we would still be left with the philosophical implication which must be debatable (by definition perhaps). Anyway, here are some remarks.

Concerning the different interpretations of quantum mechanics, the ones that seem most promising are the transactional interpretation and the abstract quantum theory of von Weizsäcker. The appeal of the former is that it is nonlocal and philosophically beautiful. The latter, as yet incomplete, seems to be a "theory of everything."

In quantum logic, generalizations seem to be the ground of most recent works while the debate on "Is quantum logic a logic?" continues. The field of fuzzy logic also has a bright prospect because of its wide range of applications to other fundamental problems of science.

Accardi's work on quantum probabilities uses the symmetry condition (4.4) which is, however, not always true. His results are also in conflict with Aerts', but Aerts has his own way of defining conditional probability. Aerts' condition of lack of knowledge about the state and about the measurement is not very clear-cut, but his

examples give very interesting results.

Thus it would seem that before we could move on to analyse the logic of quantum mechanics, we should define the concept of quantum probabilities first, thereby reversing the trend of most previous investigations.

The foundations of quantum mechanics constitute a very lively research field of physical science, touching on mathematics and philosophy. Now and then, it provides us with brief glimpses of the abstract structures and principles underlying the fundamental laws of nature. Isn't that worth the effort ?



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