The conceptual problems associated with the probabilistic structure of quantum theory are as puzzling today as they were nearly half a century ago when the theory was first developed. One sign of the inadequacy of most interpretations proposed so far is the proliferation of new interpretations of the theory. A critical review of all such proposals would be a difficult and unfruitful task, since not all interpretations deserve a detailed analysis. One recent proposal, however, calls for further study due to its original and radical approach. This is the interpretation of quantum theory recently put forward by Nancy Cartwright. Though the proposal under consideration is still in its early stages of development, the direction in which the author proposes to proceed is clear from her lectures and articles. In this paper we bring out a few features of this particular interpretation which appear to be problematic. Since we find the new approach to the interpretation of quantum theory promising in general, it is worthwhile to discuss those aspects of quantum theory which do not easily lend themselves to such an interpretation. These features will surely have to be accounted for within a fruitful framework for the interpretation of quantum theory.

There are two principal theses in Cartwright’s interpretation of quantum theory:

1. that quantum mechanical probabilities are basically transition probabilities, and not probability distributions over determinate values of physical magnitudes.
2. that if the fundamental events are taken to be transitions rather than properties, the need of a non-classical probability structure for understanding the probabilities in quantum theory is avoided.

Thesis (1) has been defended by Cartwright in the work related to her proposal. Her arguments against the interpretation of quantum prob-
abilities as distributions over determinate values of magnitudes take the form of arguments against position probabilities in particular. The major argument is from the classical two slit experiment. Discussing the possible interpretations of position probability, Cartwright writes;

The first and obvious suggestion is that the events are what I have just said they are. $|\Psi(r)|^2$ represents the probability that the system is located at $r$. The two slit experiment teaches, however, that in general quantum systems are not located anywhere. If we assume that the particle was positioned at either the top slit or at the bottom, we generate statistical predictions which strongly contradict experimental evidence. Thus $\Psi$, evaluated at the top slit, cannot represent the probability that the particle is at the top slit; nor $\Psi$, evaluated at the bottom slit, the probability that the particle is at the bottom slit.

The paradoxical features that plague the interpretation of probabilities as distributions over properties, such as a system having a certain position, can be avoided if the probabilities are viewed as being assigned to transitions rather than properties. The first thesis that Cartwright is pushing for is just this change in perspective about the events in quantum theory to which probabilities are assigned.

However, Cartwright’s second thesis seems to be a stronger thesis than the claim that a number of conceptual difficulties in quantum theory might be avoided if probabilities were viewed as basically transition probabilities. In thesis (2), above, she is suggesting that not only are conceptual problems avoided in the move to transitional probabilities, but the use of a non-standard probability theory in quantum mechanics is also avoided. Cartwright has merely put forward this thesis without in any way justifying it. And the core of the thesis is contained in the following statement:

The only probabilities there are in quantum theory are probabilities for energy interchanges (transition probabilities to energy eigenstates). These probabilities are special because there is no interference among different energy transitions; such events either occur or they do not. Hence both the logic and the probability structure over energy transitions is completely standard.

It is the interference of probabilities in quantum theory that has been the traditional argument for a non-classical probability structure. And the paradigm for such interference phenomena is the two slit experiment. In order to defend her claim that transitions do not require a nonclassical probability framework, Cartwright must show that an analysis of the two slit experiment entirely in terms of transitions does not give rise to interference terms in the calculation