

Implications of Quantum Stat. Mech.

for interacting subsystems of composite system:

(System) Correlation goes to maximum and stays there,
 $\{S_1, S_2\}$

except for rare fluctuations. (Should work out
in detail)

Some sort of ergodicity arguments
as close mechanics should indicate that if (total energy
specified), then "most likely" distribution between
the systems gives particular system density matrix $S = e^{-H_{tot}} / \text{trace } e^{-H_{tot}}$
ie entropy of subsystem - $\text{trace } S \ln S$
should go to max, except possibly for rare
fluctuations, so that $\text{some}_{\text{for}} \{S_1, S_2\}$ which is equal
to $\text{trace } P \ln P$.

Section on Real Processes:

We have completed the abstract treatment
of measurement and observation with the deduction that
no statistical predictions of orthodox quantum mechanics
will appear to be valid to observers. These observers and
measuring apparatus were assumed to be completely
describable by state functions, which could be
interpreted as states which described gross characteristics
of the observer (memory states, etc.) This discussion is
valid for any possible way in which one could interpret
wave functions as describing observers. (i.e. any possible
quantum treatment of the entire phenomenon must
follow our abstract discussion, since it was based
upon only two hypotheses, that of repeatability of
observation, which is certainly necessary to any meaningful interpretation, and superposition.)

Our discussion of such processes is then logically complete. In this section we shall therefore restrict ourselves mainly to plausibility arguments, rather than detailed proofs, to show that this abstract treatment is, in fact reasonable. (i.e. that situations approximating those discussed in Chap IV can in fact be realized in nature. That, within the framework of pure wave mechanics, ~~that~~ large scale macroscopic objects, obeying classical mechanics, exist in a certain sense. ~~This~~ So that the existence of automatically functioning machinery, classically describable, can be understood on the basis of pure wave mechanics, as well as the processes of correlation which are necessary.

Maybe better to reorganize, have entire chapter on Abstract Treatment of Observation, then in Real Processes give Von Neumann as example of such correlation.

(Only at this point do we specialize to particle description)

After having shown how the existence of macroscopic objects is allowed in the theory, show the meaning of classical mechanics:

i.e., for any system of such macroscopic objects after a sufficient time will be very indefinite. Nevertheless, representable as superposition of cases where each object has fairly well defined position & momentum (wave packets) and further each such element obeys nearly classical laws for a time, (Appeared to observer)

Good article on production of machines capable of surpassing
designer -- info theory -- natural selection --
non-determinate mechanisms, etc Brit J Phil Sci 3, 44
1952

J. Von Neumann : Cerebral mechanisms in Behaviour
London, 1951

~~State matrix~~

Mixed state Φ_{t+} , composite interaction V_t (semiprimitive)

what about $P_t^{S_1}$, ie is $T_p e \downarrow$?

(we know it is initially, hence
and proof
maybe by induction)

(definitely
need semiprime prop.
otherwise could
simply reverse at some
time, say $V_{t+} = V_t^{-1}$)

even so
may still be cyclic.

Now,

simply state Stock process
speciation carries vulnerability, refer to Von N. for details
(also, any outside intervention
makes subsystems matrix lose info!)

Include division of \mathcal{V} into ^{necessary} regions for recording

a. not rec b. gammarial since division of \mathcal{V} complete
(the \mathcal{V} for app can contain all)

c. analogue to does case, where certainly

OK