

BUSHY HOUSE

TEDDINGTON

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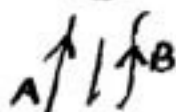
TELEPHONE MOLESEY 2264

Jan 27. 39

Dear Fisher

Your summary of the views current among physicists is entirely just and well balanced as I should judge, even as to the rather indefinite matter of the various numbers holding each sort of view. There is only one small point I would comment on. I have marked it A on p. 6. about the point that though you disturb the object in observing ^{it} you might estimate how much you disturbed ^{it} and so remove the uncertainty. This is a point often not mentioned - as I know because I have tried to put it in and have found it so hard to that I have sometimes missed doing so. I was at Copenhagen in the very early days of Uncertainty and remember how quickly Bohr was on to it. You remember Heisenberg's point that the Compton kick would give the electron a velocity. B. said why should not we observe how the scattered photon went off and so deduce the electron's recoil from it. The point he made is that a microscope must have convergent light, and so you cannot know from which direction the photon came, whether A or B, and so you cannot calculate the recoil.

electron
condenser



I tried very hard to fit this into the account I wrote in my book, but somehow could not make it go, and so was content to make the same point with some of the labor arguments with other examples.

As to personal opinion on your central theme, I find myself strongly on the side that the quantum has not changed anything - i.e. strongly anti-Eddington. The most it can do is to contemplate fluctuations. Take a vessel containing a gas. The pressure varies all the time, and to allow for fluctuations one may imagine one has a sort of safety valve opening up with large fluctuations. The human body may have safety valves like that, but to my mind the essence of free will is that I should be able to settle whether I will let the valve open. In fact the world is like a roulette board, and a free willer wants it like one where he can ~~say~~ win when he likes. However this sort of thing gets one nowhere.

There is one respect in which your view as expressed does not consider the business as a way I am coming round to. This is a set of opinions which Bohr develops nowadays. He is almost unbelievably bad at getting his opinions expressed, and I am not sure at all if I have got it correctly but he warned me that no one liked them at first.

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and that they gradually grows into them, and I find I have been doing so. I cannot develop it for you here, but it is roughly that ~~one~~ in thinking about the world we always take a part of it on trust as a standard to which the rest is referred and his point is that we have got to do this. ~~The consequence is that there is~~ It is a rule of epistemology, and among its consequences is that there is no such thing as for example putting down a complete wave-equation describing the whole world. But he brings it into a lot of other things too, especially biology, and in fact it was thinking on those lines, and hearing his views on eugenics that encouraged me not to refuse to give the Galtor lecture. So if you are going to be there on the 16th you will hear some of it in tabloid form.

Yours sincerely
Charles Darwin