

From a letter to A.S.E., March 22nd 1940.

What happens with me, is that I am not so deeply impressed by the alleged grand philosophical revelations which especially quantum mechanics is supposed to have brought us. I am just about 10 - 15 years older than most of the enthusiastic champions of that new positivistic out-look - and I was born and educated in Vienna with E. Mach's teaching and personality still pervading the atmosphere. I was devoted to his writings, which I read practically all before I could know a word of the 1913-Bohr theory - maybe about the same time when we were initiated into the restricted theory of relativity. Just as strong or even stronger than Mach's was in this time in Vienna the after-effect of the great Boltzmann, whose splendid pupil and admirer Hasenöhrle had just taken Boltzmann's chair (so cruelly evacuated a year before, 1906). Both Boltzmann and Mach were, as you know, just as much interested in philosophy, more especially in epistemology as they were in physics, in fact all their later writing was pervaded by the epistemological ("erkenntnistheoretisch") out-look. Their views were not the same. But filled with a great admiration of the candid and incorruptible struggle for truth in both of them, we did not consider them irreconcilable. Boltzmann's idea consisted in forming absolutely clear, almost naïvely clear and detailed "pictures" - mainly in order to be quite sure of avoiding contradictory assumptions. Mach's ideal was the cautious synthesis of observational facts that can, if desired, be traced back till to the plain, crude sensual perception (pointer reading). He was most anxious not to contaminate this absolutely reliable timber with any other one of a more doubtful origin.

However, we decided for ourselves, that these were just different methods of attack and that one was quite permitted to follow one or the other provided one did not lose sight of the important principles that were more strongly emphasized by the followers of the other one, respectively.

You easily imagine, Sir Arthur, that with these antecedents one

cannot be very deeply impressed by a "brave new world" which, after having been taken in for a couple of decades altogether by one of these methods, finds itself suddenly let down by its alto naïve application, then rediscovers the other one, which it proclaims as a new invention that has at last succeeded to uproot the old prejudices!

If I had had a dictaphone, I could quote you a conversation (with G. Kirsch, [redacted] in which I tried to explain to him - we spoke about the terrible "jumps" in Bohrs orbits - that very probably the place of an electron within the atom had no meaning, because we had no means of observing it; that we may and must use pictures (Boltzmann), but with open eyes towards their limitations, which are given by what can be observed, because the ultimate aim of our pictures is only to serve as a scaffolding for our sensual perceptions (E. Mach). Maybe I am now embellishing the details - but the time is doubtless, by my remembering my room in the old institute, which we left in 1913.

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We never deal with just one atomic system (atom, electron, molecule). If, after having made a measurement, we make a second one (either a repetition or another measurement) we can never be quite sure that we perform it on the same individual atom. Indeed, apart from very special cases, the probability of it being the same is very low. The special cases are those where a perticle is endowed with excessively high velocity (Wilson chamber).

I think, bearing this in mind, one can remove the silliness of present interpretation - the nonsense of the complete change in the wave function, alleged to be produced by a measurement - Procustations as you duly called it (so did I once in a little note).

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