

It has, then, its elements of Baconianism, but it is a Baconianism under control; it is not the wild proliferation of irrelevant facts, but a constant association between fact and theory. And most importantly of all, I think, is the fact that this is the only science that is, in fact, open-ended. For here, you see, you can argue. Poisson can say, "Look, Michel," to Faraday, "I do very well with particles. What in hell do you want me to give them up for, to take in a field?" But Faraday can say, "Aha, but look what I can do with the field. I can discover things here that you cannot ever think of in particles." Poisson would shrug, as the French do, and say, "Voila, he's right. I still like my particles, but I will now take in the field."

You now have a real dialogue going on. You have, in fact, an argument which is possible in terms of interpretation. These arguments, it seems to me, are the very essence of the scientific discourse that takes place. Very rarely do you find people arguing about facts. There is nothing to argue about; go find out what it is and if your opponent is wrong and he is generous he will say, "I was wrong." But when you start to deal with such things as the Copenhagen interpretation of quantum mechanics versus, let us say, de Broglie or Bohm's interpretation, what one has here, you see, are arguments on a basic vision.

Both must be subjected to experimental attack, but both are different ways of looking at reality. And in this way, just as one can argue about a painting or a piece of music, or a piece of literature, so too in science one can argue about these interpretations. It is from this argument, from this open-endedness, that two things of extraordinary importance, I think, emerge. The first is that it does, in fact, preserve the freedom of the intellect; that if you see science as essentially a critical tool, then the whole rule of the game is not to agree but to find ways of disagreeing. The man who blows up a theory deserves a Nobel Prize as much as, if not more than, the man who creates one.

Here the stimulus is not to shut up because I am chairman, but to try and show that my theory is wrong. You will still get fired, but you will get a Nobel Prize.

Secondly, this is the human part of science. In this view--and it seems to me only in this view--do human beings exist. A fact-finder is not necessarily human--they say they are going to build