The Scientific, Intellectual and Social Impact of the Computer. Vol. 426. New York: Annals of the New York Academy of Sciences.

Re Lam: Lighthill 17 years on by Karen Sparck Jones, Computer Laboratory, University of Cambridge.

There is an important point which does not get enough attention in papers like this on progress (or the lack of it) in AI. This is the size of the workforce. In Cambridge, for example, there are around seven times as many registered graduate students in biology as there are in computer science and, more significantly, as hardly more than a quarter of the computer scientists are in AI, there are about twenty-five times as many graduate students in biology as there are in AI. The absolute number of students in AI is not large either. This is of course not to claim that the pattern is the same in all universities and research training establishments. But there is no doubt whatever that for each body learning how to hack inferences there are very many more learning, under some biological or chemical label, to hack molecules. Moreover even if the comparison with biology as a really broadly-defined subject seems unfair (though computer science implicitly claims the same pervasiveness as molecular science), a comparison with physics, a reportedly static subject, shows there are nearly twice as many graduate students in physics as in computer science, and more than six times as many as in AI.

There is also the point that computer science is a postwar development, largely, along with AI, one of the last twenty-five years. Biological research as a recognizable base for modern biology has been going since the seventeenth century, and was thoroughly established, both intellectually and organizationally, in the nineteenth century. It takes a long time to build up a subject to supply the research cadre required to make and, even more importantly, to consolidate, intellectual advances. Physics papers based on work using facilities like CERN, for example, come with more than a hundred authors: teams and teamwork on this scale require the long-term subject preparation which physics, like biology but unlike computer science, has had. When compared with other areas of science AI, and even computer science, is still at a disadvantage, and it is therefore perhaps less depressing that it has made so little progress as surprising that it has made as much as it has.

A Rejoinder by Martin Lam.

I ought to feel diffident about responding further, since I am now in some danger of defending *my* views rather than those of Lighthill—which was not the original idea at all. However it is philosophically true, conveniently, that some propositions are untestable—for example, whether AI would have thrived without Lighthill; or whether if we only wait long enough we shall harvest rich fruits from AI. So I offer a commentary on chosen themes (which means that some points have to go unanswered—possibly, but not necessarily, because they are unanswerable.)

(1) Too much about the British scene; viewpoint typical of officials; not fair to have an outsider adjudicate. Yes, it is true that the British go in for outsiders. A currently popular philosopher-king is active in advising on takeovers and mergers, compensation for people jailed in error, the treatment of a former security officer and the freedom of the Press. So, for better or worse, the designation of Lighthill was in line with British practice—but well within the upper quartile of such appointments, since, given his background or backgrounds, he is surely very much an inside–outsider?