

COMPUTERS AND THE CHALLENGES OF MAN

We see man as a creature of certain attributes and abilities. Facing him is the universe of problems -- the host of things to be done, or of things he wishes, the accomplishment or attainment of which he regards as a challenge. His whole history has been characterized by the invention of development of tools which match him to the environment so that he can more efficiently or enjoyably cope with these challenges. Of these tools, the computer is one of the most potent.

Considered this way, with man "here" and his challenges represented as a remoter "there," the question becomes: What needs to be done to get to there from here?

Researchers postulate a possible future in which computational power will be available in a wall socket, like electrical power; or where every man who wants one can buy a small computer as he may one day buy his own nuclear generator for power. Perhaps the computer builder of 1961 finds it hard to comprehend the development of individually available computer power. He might concede that we could develop suitable equipment and effective means for intercommunication between human and helper; but can he imagine all the changes this would cause in our everyday environment and ways of doing things? Can he visualize the tremendous upsurge in intellectual mobility and power that we might experience, and its potential good? Such a

development might be inevitable; intelligent effort could hasten it and direct it into desirable channels.

Another line of machine history from which I like to extract fortifying considerations is the harnessing of automotive engines for transportation. When these engines first became available, their application to the transportation of goods and people was in the large-machine, formal-schedule class. Ships and railroads provided the tremendous service if your problem happened to be amenable to their capabilities and programming. The impact of such machines was great; but I wonder if the people who celebrated them as the acme of human progress saw the huge potential of automotive machines designed to help individuals? Our cars, rucks, fork-lifts, bulldozers, have had an impact on society that would have confounded the engine builder of 1861.

Could he have accepted that ordinary people could learn the rules and skills needed to operate a car in heavy traffic, or that ordinary communities would put up the capital for today's road systems, or that children would learn the complex skills of operation as a natural part of their cultural inheritance? Probably not; and our computermakers today are in the same spot.

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