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1. Why were you initially drawn to philosophical issues concerning technology?

I began as a cultural anthropologist interested in Polynesia, first the small, remote island of in French Polynesia (where I did fieldwork for my dissertation and first book in the mid-60s) and then the New Zealand Maori. I was in a structuralist phase at the time, and traditional Maori culture thoroughly satisfied my thirst to detect general patterns beneath the surface forms of ritual, myth, folklore, art, and behavioral customs. By the middle 1980s, however, I found myself yearning to relate my research to the challenges of contemporary society. At the time my theoretical tastes were expanding to include poststructuralism. Foucault's *Discipline and Punish* was a seminal work for me. I was deeply impressed with its analysis of how material conditions and practices shape human lives. The section on the examination was particularly provocative, and Foucault's discussion of it as part of the disciplinary technology of power turned my interest to technology, broadly defined. In the margin next to Foucault's question, "Who will write the history of the examination?", my wife wrote "Allan will!" My major effort was *Testing Testing: Social Consequences of the Examined Life* (1993). Combining my structuralist and poststructuralist leanings, it sought underlying commonalities among diverse tests from lie detection and drug tests to vocational interest and intelligence tests, and analyzed them as disciplinary technologies of power in Foucault's sense.

One category of testing I did not include was medical tests. The original plan was to devote the next major project to that. That changed when the dramatic advances in new reproductive

technologies in the early 90s and their massive potential to affect society led me to turn the study, and then I whittled it down to a focused analysis of the not-so-new reproductive technology of donor insemination. I was intrigued by the widespread speculation that, when it becomes feasible, people will use technology to improve their children's intelligence, athletic abilities, and other traits. Donor insemination has such eugenic potential, as is demonstrated by sperm banks advertising that their donors are Nobel Prize winners or otherwise gifted individuals. It struck me that an empirical test of the speculations regarding future use of reproductive technologies for eugenic purposes could be run by investigating actual criteria that have been used in selecting sperm donors. Moreover, donor insemination has important implications for feminism, because its growing use by single women and lesbian couples makes it easy for women to have children and form families without the active participation of men. I analyzed questionnaires from women who had used donor insemination, and interviewed many of them by telephone. The eugenic predictions were not well supported, and I found an array of attitudes toward the patriarchal family ranging from outright rejection to a desire to recapitulate it as closely as possible.

Probably the recent technological innovation that has impacted the lives of more people more profoundly than any other is the automation of information in the computer revolution. One cannot study technology very long without addressing it, and it became my next research focus. I will discuss some of what I learned later.

2. What does your work reveal about technology that other academics, citizens, or engineers typically fail to appreciate?

Although I have always been interested in the theoretical and philosophical aspects of whatever I study, I work more in the anthropology than the philosophy of technology. That means I am primarily interested in the cultural principles that inform technological practices, and their general consequences for individual and especially social life. In my work on testing, for example, I looked at a wide variety of tests and divided them into two categories. Authenticity tests are concerned to identify some state of being characteristic of an individual, a state that usually has moral or legal significance. Examples are lie detector tests and drug tests. Is this person telling the truth? Is he taking illicit

drugs? Qualifying tests, on the other hand, measure a person's ability or inclination to perform certain activities. These include vocational interest tests, aptitude and intelligence tests, and all kinds of academic examinations (How much information can the student provide about 17th century England? How well can she solve algebraic problems?). The outstanding social consequence of testing is that it does not really assess pre-existing qualities. It manufactures them. Tests create what they purport to measure. As it is recognized and rewarded in social life, for example, intelligence is not so much a free-standing entity as an artifact of intelligence tests. This is the seldom recognized by massive social consequence of testing in contemporary society. Its capacity to form personal traits makes it a powerful technology of social discipline.

A major argument in my work on information technology is that it does not just enable us to do what we have done all along, only faster and more easily. It changes what we do and, most importantly, how we think. I am especially interested in how automated techniques for retrieving and assembling information are very good at indexing but very poor at classifying. They are extremely powerful in bringing together items that share a word or phrase, as in keyword searching (which amounts to constructing an index of the data set for the keyword query). But, unlike human intelligence, in the absence of such common terms, they cannot classify the data set into categories with similar content. This brings about a change in human thinking. Before automation most information was presented in already classified forms, such as encyclopedias, subject catalogues, and textbooks. For the most part, people accepted, worked within, and saw the world in terms of the pre-established classifications they had been taught and used. Information retrieved electronically does not come already classified, making it necessary for the human user to select from among the results of a search what is relevant and what is not ("garbage"). Sometimes the presence of items in automated search results that would not have been included in traditional classifying practices stimulates the human analyst to gain a new insight into the topic, or see it in a different way. This in my opinion is the most important unintended and little-recognized consequence of the automation of information: it presents the human mind with new challenges of interpretation and opens new possibilities for creative analysis.

Evidence for this shift is visible everywhere as fixed forms and

institutions give way to greater flexibility of thought and action. In education and research the imperative to learn and work within the limits of one pre-packaged scholarly discipline is rivaled by interdisciplinary programs in universities and research projects that routinely cross disciplinary boundaries. Law and business firms now stress horizontal communication between departments as much as vertical communication within them, and they increasingly operate in terms of temporary task forces that bring together individuals with different areas of expertise for the purpose of dealing with particular problems and initiatives.

3. What, if any, practical and/or social-political obligations follow from studying technology from a philosophical perspective?

This question follows directly from the preceding one, because if the philosophical and cultural study of technology reveals unrecognized aspects with practical or social implications, the scholar should draw as much attention to them as possible. My work on the automation of information highlights at least two such implications. Both of them are pertinent to the culture wars.

One, by no means original with me, is that electronically mediated communication can fuel the culture wars. Television now has innumerable channels, many devoted to a single topic such as extreme sports or news with a particular slant. Internet blogs, list-servs, and chat rooms often vociferously promote one political or social point of view. All of these forms of narrowcasting make it possible to saturate oneself with information that reinforces one's biases and particular interests and blocks out other points of view. In this way electronically mediated communication can encourage the formation of isolated groups, many of which are hostile to each other, and that escalates the culture wars.

The other implication cuts in the opposite direction. I have mentioned already how automated information retrieval privileges indexing over classification, and how this challenges the human user to consider new possibilities and reach new insights. It follows that indexing tends to open minds, especially when compared with thinking confined within classification's pre-established categories. Polarization and the culture wars thrive on minds that are closed, that are neither interested in nor able to understand the Other. The best antidote is to understand and appreciate cultural differences. One important step toward that is the greater

open-mindedness stimulated by automation's retrieval of information by means of indexing rather than classification, as already discussed. Especially important, this is not a matter of people deciding that they should be more open to the Other, as is the case, for example, with cultural relativism. It causes people to change their habits of using information. They don't think at all about whether they should be more open minded to people who are different from themselves, but nevertheless, that is a consequence of their changed habits. This is encouraging because different ways of thinking are more likely to become established when they result from changing habitual behavior than from direct efforts to convince people that they ought to change their minds.

If these two practical implications of information automation pull in opposite directions, which is stronger? People who are interested only in reinforcing what they already think will become more deeply entrenched with narrowcasting. They will become, if anything, more polarized in the culture wars. People who use electronic resources out of curiosity or in the pursuit of scholarly or business projects will find themselves becoming more open to new ideas and insights. This will position them to be more tolerant of cultural differences, and thus will be a force for calming the culture wars.

My current research is actually an attempt to evaluate the relative strength of these two positions. I am interested in the contention between absolutism and tolerance in contemporary American society. My initial focus is the law as a particularly interesting site for exploring this. It has the responsibility to umpire among disputing interests, but a debate exists within the law itself as to whether it should be entirely neutral or champion the Right Side. Those who hold the latter view are largely fundamentalist Christians who hold deeply committed positions on issues such as abortion and gay marriage. They promote their position through certain schools and legal foundations dedicated to training and practicing law with an evangelical and even theocratic mission. My goal is to learn how much of an impact this is having on our legal system and on society in general.

4. If the history of ideas were to be narrated in such a way as to emphasize technological issues, how would that narrative differ from traditional accounts?

The main difference is that the individual would not have enjoyed so prominent a place in explanations of action. Contrary to

the widespread and long standing theory of methodological individualism, we are beginning to realize that the unit of action is not the human individual but something larger and less permanent, something that is often termed “cyborg,” and which I call extended agency or the new superorganic. Any action should be understood as undertaken by a conglomeration that may include one or more human beings and other components such as plants, animals, machines, and other objects. The activity that I am participating in right now, for example, is done, at a minimum, by my embodied human intelligence (my thoughts expressed through my fingers as I type), a computer and a word processing program. Should I discuss it later with my wife, the pertinent agency will consist, again at a minimum, of our two embodied human intelligences (ideas expressed in audible language) and the printed-out text of what is now being written. Any activity is best described in terms of agencies with multiple components, that form, dissolve, and reform in different combinations to undertake other activities. Of the two activities just described, my intelligence participates in both (although differently embodied ... I’m typing in the one and talking in the other), but the other components (the computer, the print-out, my wife) participate in only one.

Because telephones, calculators, computers and other forms of artificial intelligence so obviously participate in what we do, technological issues have made it particularly clear that entities other than the individual human being must be taken into account in explanations of action. But this insight could, and probably should have been achieved much earlier in the history of ideas, because it is equally clear that activities in the preautomated era need also to be understood in terms of recombinant, extended agencies. This includes the interactions of multiple human beings, the participation of plants and animals, and the use of tools going back to the Paleolithic. Had this been grasped earlier, the history of ideas would have been different, and human hubris would probably not have gotten so out of hand.

5. With respect to present and future inquiry, how can the most important philosophical problems concerning technology be identified and explored?

Certainly many issues will command the attention of future researchers, among them the social consequences of nanotechnology, biotechnology, robotics, and the implications of computer-mediated communication for human relationships and community.

I will be particularly interested in research on how further developments in reproductive technologies will impact heterosexual and homosexual relationships, marriage, family structure, and the possibility of a new eugenics.

Another critical issue, and one that I am currently working on, is the implication of cyborg or extended agency theory for responsibility. With methodological individualism, allocation of responsibility was simple, probably overly so: if human individuals are the authors of action, then they are responsible for it. But if we are now to recognize that the agencies that do things extend beyond people to include nonhuman components, where does responsibility lie? With the agency as a whole? With one or a few parts of it? Who or what should be blamed or praised? What form should rewards and punishments take? An example all too familiar to teachers is students' current excuse of preference for why term papers are late: "my hard drive crashed." Often this does not get them very far, but in fact it is more plausible than the earlier favorite—the dog ate it—because today hard drives are in fact essential to the production of term papers while dogs have never been.

This is something, as I say, that I am currently working on. The job is far from complete, but I think the most fruitful way to approach it is to recognize that we already apply responsibility-linked concepts such as "fault," and "blame" and "approval" to inanimate objects, machines, animals, children and corporations as well as to individual adults. Analysis of those usages reveals that responsibility and the related sanctions represent a family of ideas with variations that depend on the type of being in question. My hunch is that, considered in this light, extended agencies will not require a radical revision of the notion of responsibility that we presently use.

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