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The New Superorganic[1]

by F. Allan Hanson

Despite proposals by Kroeber and others that society and culture represent a distinct level of reality, the prevailing opinion has been that they are abstractions from the behavior of individuals. Recently that position, methodological individualism, has been challenged on several fronts. Especially with the incorporation of artificial intelligence into many aspects of social life, it is no longer feasible to consider the ultimate unit of social action to be the human individual. Bolstered with a case study of the consequences of automation for the legal profession, the argument here is that agency should be redefined in a more expansive and dynamic manner that includes but is not limited to the individual.

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New occasions teach new duties: Time makes ancient good uncouth.

—James Russell Lowell

As representatives of the most resolutely social of the social sciences, many anthropologists and sociologists have insisted that crucial properties of the human condition emerge from the association among individuals. Religion, mythology, morality, kinship, and other forms of organization, political power, and much else cannot be reduced to or fully explained in terms of individuals. This position—call it "collectivism"—is opposed by "methodological individualism." It holds that collective concepts such as Kroeber's superorganic are only abstractions from the behavior of human individuals and, in its most extreme form, that therefore the phenomena commonly called social and cultural should ultimately be explained in psychological terms. Probably no one has stated the methodological individualist view more crisply than Anthony Flew (1995:61–62):

> All social collectivities are composed of individuals, and can act only through the actions of their components. Whatever is said about any mass movement, organized collectivity, or other supposed social whole, must at some stage be related and in some way reduced to discourse about the doings, beliefs, attitudes, and dispositions of its components. Who actually did and thought what; and what led them to act and to think, as in fact they did, and not otherwise? . . . All this, once it has been sharply stated, should appear obvious and altogether beyond dispute.

A more moderate position has been labeled "relational methodological individualism" (Jones 2000:113). Essentially it holds that society and culture do not represent a new level of reality above that of human individuals but that a full understanding of human behavior nevertheless requires consideration of both the psychological properties of individuals and the roles, relationships, beliefs, understandings, and other products that stem from their historical and ongoing social interactions. Even those collectivists who have most stridently insisted on viewing social and cultural facts in their own right have ultimately acquiesced in this position or something very similar to it. Emile Durkheim acknowledged that society is composed exclusively of individuals but insisted that the social whole is more than the sum of its parts and must be analyzed in social terms (1938: 102–4). A. L. Kroeber allowed that "the social is resolvable through the . . . organic and psychic individual" (1917:208) but held throughout his career that the manifestations of culture or civilization (the result of historical interaction among human beings) must be understood in terms of other cultural manifestations (p. 212; 1948:253–54; 1952). Leslie White and others maintained that collective concepts such as culture refer not to a new level of reality but to a certain analytic perspective. The single reality in question is institutionalized human behavior. Addressing it in terms of what

1. I am grateful to Bartholomew Dean, Rex Martin, and Robert Ulin for having read and commented on an earlier version of this essay. I thank the anonymous reviewers for Current Anthropology for their unusually thorough and helpful comments.

motivates individuals to engage in it is the stuff of individual or psychological analysis; asking how elements of institutionalized behavior are related to each other constitutes institutional or cultural analysis (White 1959:231; Kaplan 1965; Hanson 1975:1–7; Service 1985: 281–83).

Thus even among those who insisted on the necessity of collective considerations for many explanatory purposes, a consensus emerged granting the individual an *ontologically* privileged position. The solid, concrete realities in social life are human individuals and their activities. However, numerous reports have been bruited of late about the demise or adulteration of the individual, in the light of which it has become anything but obvious that individuals can any longer be taken as the sole stuff of social and cultural being. One line of argument questions the historical standing of the individual as the essential unit in human life. Another holds that the development of artificial intelligence implies that agents other than or in addition to human individuals are now also authors of social and cultural action. After discussing these critiques of individualism, I will propose a broader concept of agency that may be preferable to the individual as the basic unit of behavior.

Decentering the Individual

Many scholars now regard the individual as the construct of a particular era rather than a constant throughout history (Foucault 1980:117). Erich Fromm held that the individual was born in the Renaissance. "Medieval society," he wrote, "did not deprive the individual of his freedom, because the 'individual' did not yet exist. . . . [Man] did not yet conceive of himself as an individual except through the medium of his social . . . role" (1941: 43, following Burckhardt 1954[1860]:100–101). Louis Althusser also sees the individual as a contingent, constructed being. In his "Reply to John Lewis," he argues that the engine of history for Marxism-Leninism is not "man" but the class struggle. Human nature is a variable product of particular forms of social relations; the individual as a transcendental agent struggling through history for freedom and independence is nothing more than the concoction of bourgeois ideology (1976:46–54).

Even if of relatively recent origin, the individual may already be in the twilight of its career. In their review of the steps toward postmodernist social theory, Best and Kellner stress the structuralists' and poststructuralists' increasingly radical rejection of humanistic assumptions about the autonomous subject and unchanging human nature (1991:19–20, 27). One prominent theorist imagines that the individual may be disappearing, "like a face, drawn in sand, at the edge of the sea" (Foucault 1970:387).[2]

Edward Said (2000:16; see also Kincaid 1997:2) explains Foucault's project in language, which simultaneously illuminates the grip of the individual on recent social theory and identifies some of the sources of the growing disenchantment with it:

> Classical European philosophy from Descartes to Kant had supposed that an objectively stable and sovereign ego (as in "cogito ergo sum") was both the source and basis for all knowledge. Foucault's work not only disputes this but also shows how the subject is a construction laboriously put together over time, and one very liable to be a passing historical phenomenon replaced in the modern age by transhistorical impersonal forces, like the capital of Marx or the unconscious of Freud or the will of Nietzsche.

Elsewhere Said cites, in addition to Foucault, Lévi-Strauss, Barthes, and Lacan as also discerning the end of the subject (1985:292–93), and one may add Deleuze and Guattari (1983) as well.[3]

The individual is in trouble in more places than just French philosophy. In Melanesia, aboriginal Australia, and elsewhere, the person is defined as much by position in a network of social relations as by individual traits (Strathern and Stewart 1988, Wagner 1991, Myers 1986). Methodological individualism is ill-suited to explaining behavior in these circumstances. Contemporary theory in a number of fields is shifting the unit of action and analysis from the stable, Cartesian individual to fluid information networks consisting of multiple human beings plus various nonhuman elements. The psychologist Kenneth Gergen suggests that "we may be entering a new era of self-conception. In this era the self is redefined as no longer an essence in itself, but relational" (1991: 146). "The concept of the individual self," he continues, "ceases to be intelligible. At this point one is prepared for the new reality of relationship. Relationships make possible the concept of the self. Previous possessions of the individual self—autobiography, emotions, and morality—become possessions of relationships" (p. 170).

Psychologists and other social scientists have also questioned the autonomy of the human individual via the concept of distributed or socially shared cognition (Resnick, Levine, and Teasley 1991, Derry, DuRussel, and O'Donnel 1998, Moore and Rocklin 1998). Thus Jean Lave analyzes learning not as individual acquisition by individuals but as "a social phenomenon constituted in the experienced, lived-in world" (1991:64), while Edwin Hutchins painstakingly demonstrates that the computational process of navigating a ship can be fully understood only in terms of teams of individuals coordinating their several activities with each other and with various technological instruments (1991, 1995). As Lucy Suchman has put it, "humans and artifacts are *mutually constituted*. . . . Agency—and associated accountabilities—

2. For a different perspective on the rise and fall of the individual, see Kamenka and Tay's (1975:129–42) contrast among three legal-administrative traditions: *Gemeinschaft, Gesellschaft*, and bureaucratic-administrative.

3. Terms such as "self," "individual," "subject," and "ego" should in some circumstances be carefully distinguished. That is not the case here because I am concerned only with their common reference to the individual human being.

reside neither in us nor in our artifacts, but in our intra-actions" (2000).

Yet another challenge to the centrality of the individual goes by the name of actor-network theory. As developed by students of science, technology, and society, this theory attributes agency not to human individuals but to networks, finite in duration and variable in composition, defined according to the activity under analysis (Callon 1987:93; 1999:182–83; Law 1999:3–7; Latour 1987:84, 89; 1988). These actor networks include, in addition to human beings, a wide variety of nonhuman components (Law 1991:10–11, 16–17; Star 1991:32–33). Thus the network in play in John Law's (1987) analysis of fifteenth-century Portuguese exploration includes designs of ships and the materials for constructing them, navigation devices and techniques, prevailing winds and currents, and the hospitality (or lack of it) of the inhabitants of the West African coast in addition to Portuguese sailors. Distributed cognition and actor-network theory are applicable at any time and place. However, only recently has it become inescapably clear that the stable, Cartesian individual is no longer tenable. What has brought about this clarity is a series of developments in technology.

For one thing, technology has breached boundaries and caused formerly distinct entities quite literally to interpenetrate and flow into each other. One example is transgenic organisms. Tomatoes containing a gene from a deep-water flounder are less susceptible to freezing, a gene from the giant silk moth has been introduced into potatoes to make them more resistant to disease, and efforts are afoot to "splice carbon-based life forms to silicon-based computer systems" (Haraway 1997:230, 216). The increasingly intimate connections between humans and nonhuman entities such as prosthetic devices and machines (especially computers) and our growing dependence on them are resulting in a similar kind of splicing that transforms us into cyborgs: new kinds of beings partly organic and partly mechanical. Far from the stable, clearly defined, and bounded units that populate the traditional worldview, cyborgs are hybrid, indeterminate, and ambiguous (Haraway 1991; Dumit and Davis-Floyd 1998:1).

David Gunkel holds that communication, which involves multiple individuals and is often mediated by electronic or other technological devices, has always been the province of recombinant cyborgs (2000:340). "Borg subjectivities . . . are not conceptualized as preexisting, selfsame, or self-determining individuals. Rather, they are relational subjects constructed and reconstructed based on the vicissitudes of the network. . . . Borg subjects float, suspended between points of objectivity, being constituted and reconstituted in different configurations in relation to the discursive arrangement of the occasion" (p. 345). Similarly, Mark Poster perceives in the shift from written to electronically mediated communication a change in the subject from "an agent centered in rational/imaginary autonomy" to one that is "decentered, dispersed, and multiplied in continuous instability" (1990:6). For example, the notion of the unique author is fading as technological developments such as word processing and hypertext make it easy to modify written texts. These blur distinctions between original author and readers, who are coming to be seen as jointly exercising the role of author (Poster 1990: 114–15; 2001:91–94; Landow 1997:90). The learner, software programmer, and computer all participate in the operation of interactive instructional programs, which pose different questions or tasks on the basis of the learner's performance on previous ones (Bolter 1991:6).

As a result of these developments, recent discussions call for more flexibility in the definition and scope of the unit of social scientific analysis than is possible under methodological individualism. "It is necessary to recast the objects of study, to no longer draw the boundary of the field's object at the human skin but treat humans and their technologies as unitary entities. A range of anthro-techno-science concepts (such as cyborgs and Creolized Objects) can help to do this" (Hakken 1999: 224; see also Downey 1995:369). While this reconfiguration may strain the tolerance of many social theorists of the present generation, it is more natural to those of the next. From their exposure to computer games and educational programs, today's children readily think of digital entities as alive and are comfortable with indeterminate boundaries between organism and machine (Turkle 1998).

Many social thinkers have acknowledged that social interaction involves entities outside human individuals but have still insisted that analysis should proceed in terms of individuals because they are the control centers where decision making (conscious or not) takes place. As Elman Service characterized the thinking of Edward Sapir on this point: "When we locate culture in the mind and above all when we emphasize that it is the minds of *individuals*—and what other minds are there?—we must be suggesting that the true science of culture is some form of psychology" (Service 1985:263). It is of course true that no matter how elaborate the technology, the vast majority of activity today is initiated and controlled by individuals. But it is nevertheless important to recognize that with the development of artificial intelligence, certain nonhuman agents make decisions and engage in other intelligent activities. Knowledge-based or expert systems are computer programs that do the work of human experts, such as drawing up wills or diagnosing disease. Some applications can undertake a variety of tasks without the participation of any human being. Computers play chess not only against human opponents but also against other computers, as when Deep Junior won the right to meet Garry Kasparov by defeating 18 other programs in a 2002 worldwide competition (Gray 2003). Microsoft likens its message queue server to "electronic mail, except senders and receivers are *application programs* instead of *people*—and messages are *data* instead of *electronic letters*." One of its potential uses is to monitor stock in a retail outlet and send orders to the warehouse distribution center, where

another computer receives the orders and issues shipping instructions, all without human input.[4]

In principle it would be possible to analyze activities such as these in terms of the intentions and activities of the humans who programmed the software (Bolter 1991:188). However, to do so would be intolerably time-consuming, difficult, and futile (see Harris 1999:54). With CAD-CAM (computer-assisted design, computer-assisted manufacture), computers become instrumental in making new computers. The line of derivation back to the original work of human programmers becomes longer, more convoluted, and harder to trace. It is getting to the point where human beings are hard-pressed even to *understand* the end product (Rawlins 1997:37). For example, the widespread anxiety and flurry of activity associated with Y2K (the idea that computers would be unable to negotiate the date change to the year 2000), the failure of any significant problem to materialize, and, especially, the absence of any satisfactory explanation of *why* it did not demonstrate how little humans understand automation.

It is also becoming difficult to call upon initial human programming to explain the behavior of artificial intelligence systems that learn. Neural nets and genetic algorithms, for example, learn "directly from data without human intervention . . . by trawling through hundreds or thousands of past transactions" (Goonatilake 1995:5). After a certain period such a system may develop into something quite different from its beginning. Consider Tierra, a computer program designed by the biologist Thomas Rey to simulate evolution by natural selection. He began with a self-replicating digital creature consisting of 80 instructions. Its progeny were designed to replicate themselves with fewer instructions, being selected for by using less CPU time in an environment where that is a scarce resource. Over the generations and with no further human intervention, the system produced new, more efficient creatures. Small parasitic creatures emerged that co-opted the features of larger ones. In response, some of the host creatures developed immunity to the first generation of parasites, following which new parasites capable of penetrating the hosts' defenses were replicated. Rey, the original programmer, could not predict the developments that were taking place (Turkle 1998:321). To attempt to reduce the latter stages of such a system to the intentions and decisions of the original human programmer would be devilishly difficult, as well as pointless.

Redefining the Subject

It follows from the foregoing review of diverse and expanding developments that the human individual can no longer be considered sufficient as the unit of sociocultural action. The particular contribution I hope to make is to propose a model that gives us a way of thinking about how artificial intelligence participates in units that include but extend beyond the individual. I seek a subject that is simultaneously concrete and dynamic: made of tangible stuff and yet variable in composition and duration, transcending the misleading distinction between object and event altogether. In brief, I seek something that combines the fluidity of actor networks with the concreteness of the cyborg.

A good place to start looking is Gregory Bateson's provocative insight that the agent conducting any activity should be so defined as to *include* the lines of communication essential to that activity rather than cutting across them. He instances a blind man using a stick to walk down the street. The agent in this case should not be limited to the man but include all the essential communicating components: the man, the stick, and the street. Considered in this way, while it is clearly composed of concrete components, agency is also fluid because its components vary with the particular activity (Bateson 1972:459; see also Wood 1998; Hutchins 1995: 291–92). Thus when that same blind man reads a book in Braille, the agent becomes the man and the raised markings on the page.

The fluidity of agency should be brought out by identifying it not nominatively, as a collection of objects, but verbally, as an embodied activity, such as "a man reading a book in Braille." Something of this fluidity may be conveyed by using the term "agency" in preference to words with more nominative connotations such as "agent" or "subject." Agency acts intelligently; it manifests mind. As with agency itself, "mind" should be understood as more a verb than a noun, more a way of acting than an object. This is the concept of mind advanced by the philosopher Gilbert Ryle when, critiquing Cartesian dualism, he redefined mind from a nominative "ghost in the machine" to the verbal concept of intelligent performance (1949). Even earlier, the anthropologist Leslie White made the same point when he argued that mind is "minding": not a thing but a way of behaving (1939).

Minding may be understood as the process of managing information. This has two requirements. First, there must be a repository that contains information available for processing. We will refer to that as "memory." Second, there must be procedures for processing information: storing information in memory, retrieving information from memory, and organizing, manipulating, and analyzing information in various ways. Information processing is carried out by "intelligence." Many kinds of beings have memory and process information, including animals and plants. Here we are interested in just two kinds of memory and intelligence. "Human memory" holds information in human minds, while "artificial memory" refers to other repositories that store information: handwritten and printed texts, graphic images, electronic databases, and so on.[5] Symmetrically,

4. http://www.microsoft.com/NTServer/appservice/techdetails/overview/msmqrevguide.asp.

5. From ancient times through the Renaissance the term "artificial memory" referred to "the art of memory," that is, the cultivated or trained memory, as contrasted with "natural memory" that everyone has from birth (Yates 1966:5). In the terminology I am using, that sense of "artificial memory" is part of human memory.

"human intelligence" refers to information processing that is conducted by human beings, while "artificial intelligence" is the province of mechanical information-processing devices. Preeminent among these today, of course, are computers.

The Modes and Evolution of Information Management

These distinctions between types of memory and intelligence can be used to identify three modes of information management. In the oral mode, information stored in human memory is processed by human intelligence. In the textual mode, human intelligence processes information stored in artificial memory. And in the automated mode, artificial intelligence processes information stored in artificial memory. All three modes are fully active today and regularly work in combination with each other, and probably the bulk of information management is still conducted in the oral mode. Nevertheless, there is an evolutionary or historical aspect to them. The oral mode has existed for as long as we have been human. For by far the greatest part of the history of our species, extending well into the twentieth century for nonliterate societies, it stood virtually alone. Processing information stored in human memory with human intelligence, individuals combined their different knowledges and skills for purposes of getting food, finding shelter, defending themselves, entertaining themselves, understanding the world, defining their relationship to the supernatural, and so on. In the process they settled the entire globe and developed the astounding richness and diversity that characterizes human cultures. Some limited artificial memory existed in the form of bodily adornments, rock drawings, and other artworks, but it is difficult to imagine the existence of any artificial intelligence at all during that long period.

The textual mode of information management became a significant factor when the development of writing enabled the storage of large amounts of information in artificial memory, and it received a major boost some 550 years ago with the invention of printing with movable type. Written records greatly facilitated trade and bureaucratic administration and were therefore pivotal in the accumulation of wealth and the rise of cities and states. Writing also stimulated the development of philosophy, science, and scholarship of all descriptions.

Modest beginnings of artificial intelligence can be traced to devices such as the abacus and the Jacquard loom, but the explosion of the automated mode of managing information began in 1844 with the invention of the telegraph and continued with the later inventions of the telephone, radio, and television and, only in the past few decades, widespread use of computers. This has transformed and expedited global communication and the management of large quantities of information to such a degree that even people who lived most of their lives in the precomputer age wonder how we ever got along without them. Human beings are of course responsible for the development of artificial intelligence, but they have developed it so well that it now excels human intelligence in certain kinds of information processing, such as searching large bodies of data for specific items, mathematical calculation, and the solution of complex problems governed by multiple rules (Baldi 2001:92–93). Future advances in artificial intelligence will doubtless enable it to rival or surpass human intelligence in other areas as well.

Extended Agency

The advent of the automated mode of information management has serious consequences for the theoretical issue of agency. Methodological individualism serves reasonably well for the oral and textual modes because in both of them the information processor is human intelligence. Although it is necessary to take into account the interactions of multiple individuals in the oral mode, information stored outside human minds in the textual mode, and various kinds of technologies in both of them, it is still possible to argue that evaluation, motivation, and decisions for action in both of those modes are ultimately explicable in terms of the behavior of individual human beings. But this is not true of the automated mode, where artificial rather than human intelligence evaluates information and determines action. Little if any social action is conducted entirely in the automated mode, but increasingly the automated mode is represented along with the oral and textual modes. Actions that include the automated mode cannot be explained entirely in terms of the decisions and dispositions of individual human beings, and their analysis therefore requires a concept of agency that takes artificial intelligence into account. I call such a concept "extended agency."

The agencies that undertake activities are combinations of human and artificial memory, human and artificial intelligence, and it is useful to sort out the roles of each. In the case of a student using an online catalog to find a book in a library, for example, human intelligence consists of the student deciding to look up a particular book and knowing how to manipulate the computer to do so. Information stored in human memory includes the author or title of the book, why it is desired, and so forth. Artificial memory refers to the library's database, which holds information regarding the materials it owns. Artificial intelligence is what the computer hardware and software do to connect the student with information in artificial memory: processing the input about the author's name or the title entered by the student into an output of call number, location, availability, and other information about the book.

Agency, as I have said, is temporary in duration and variable in composition. If, for example, after checking out the book the student telephones a friend to discuss it, a different agency is in play, including some but not all of the components of the first together with some

additional ones. Here human intelligence is represented by the information-processing activities of the two people in the give-and-take of their conversation, and human memory contains what either or both of them know about the contents of the book and about other relevant facts and concepts. Artificial memory refers to the book itself or written notes that one or both of them may have at hand in the course of the conversation, and artificial intelligence is the operation of the telephone system as it encodes the voices, transmits the signals, and decodes them into a form recognizable at the receiver as human speech.

The dynamic, recombinant quality of this concept of agency is consistent with the view of the world recommended by relativity and quantum theory. From that perspective, according to the physicist David Bohm, everything is an unbroken flow of movement in which supposedly concrete and durable things such as observer and observed are only relatively invariant forms of movement that come together for a time to form wholes and then flow apart from each other into other wholes (Bohm 1980:xi, 47). "Complexity science," as represented by chaos theory, fractal geometry, and molecular biology, entails a similar view (Downey and Rogers 1995:271; Dillon 2000:9). Michael Dillon describes it in terms of "radical relationality"—the notion that everything exists as temporary, recombinant relationships. This view does not allow for unequivocal definitions and distinctions, as between machine and organism or the human and the nonhuman. What might be called slippages, deformations, or contamination from another perspective are not anomalous on this view but ordinary examples of how things work (2000:4, 12–13).

The agencies responsible for social action do indeed consist of temporary, recombinant relationships. Varying combinations of human and artificial intelligence, human and artificial memory, have become commonplace in contemporary life. They are in play whenever one withdraws cash from an ATM, makes a telephone call, communicates by e-mail, visits web sites, purchases something on the Internet or at the supermarket, and so on, through a myriad of everyday activities. The decisive theoretical break is that it is no longer possible to reduce social action to an invariable prime mover such as, in methodological individualism, the human individual. The concept of agency that I propose differs from methodological individualism in two fundamental ways. First, as I have argued at some length, it is variable, differently composed in different circumstances. Second, it is superorganic in that its decision-making (information-processing) activity often includes elements of artificial intelligence that are not reducible to human intelligence. It is, however, a *new* superorganic because it does not recapitulate earlier notions of the superorganic such as groups considered as entities apart from their members or as a reification of cultural beliefs and values. It refers instead to the empirical agencies that undertake social action. Although variable in composition, temporary in duration, and better understood as conjunctions for action than as fixed objects, these agencies are no less concrete than human beings themselves. They are made not only of flesh and blood but also of plastic and metal, of silicon and lines of code.

An Application

Compared with methodological individualism, this concept of agency has the important advantage that it encourages full consideration of the role of artificial intelligence in those activities that include it. Artificial intelligence works differently from human intelligence, and that difference makes a difference in what is done, how it is done, and what its implications are. This can be demonstrated by the changes that are occurring in the American legal profession as a result of the introduction of the automated mode of information management.[6]

Information stored in artificial memory is simultaneously the necessary food and a potential poison for a system of common law.[7] The doctrine of *stare decisis* directs that cases be decided in a manner consistent with decisions on similar previous cases. Attorneys and judges therefore rely on published records of past cases and legal analyses to identify precedent for the case before them and to frame and evaluate arguments according to more or less settled principles of law. With the passage of time, the number of decided cases obviously increases. If they all are considered as potential precedent, the sheer mass of information stored in artificial memory grows beyond the capacity of any attorney or judge to control, and the edifice of common law threatens to collapse under its own weight.

Near the end of the nineteenth century the West Publishing Company developed a powerful indexing system that organized the law in a taxonomic hierarchy of over 400 topics and upwards of 40,000 subtopics, each identified by a unique "key number." Professionals employed by West classified the issues treated in all published cases according to this system. Consulting indexes organized according to the classification scheme, researchers could readily locate judicial opinions relevant to their needs among thousands of state and federal cases. Some analysts have argued that "the systematization involved in the West key number system may be largely responsible for rendering the common law manageable enough to survive in the United States" (Grossman 1994:79; see also Berring 1987:25).

Framing this in terms of the concepts introduced above, the agencies associated with legal research operated within the textual and oral mode of information management. As for the textual mode, human intelligence represented by West classifiers processed information stored in artificial memory (printed documents) to arrange it in the system's categories, and other human

6. For a more detailed treatment of the impact of automation on legal research, see Hanson (2002).

7. Medieval English law explicitly shifted from reliance on "living memory" (the memory of the oldest living person) to written records by a statute in 1275. This has been called the "formal beginning of the era of artificial memory" (Grossman 1994:4).

intelligence represented by attorneys and judges processed that classified information to construct briefs, arguments, and opinions. In the oral mode, classifiers, litigators, and judges regularly drew on information stored in their own (human) memories in making decisions and in discussing or debating issues with each other.

But published case law continued to expand until, by the early 1960s, American lawyers were again finding its management an intolerable burden. In the mid-1960s the Ohio State Bar Association formed a group to explore whether the aid of computers could be enlisted. They learned of a system designed to help the Air Force manage its huge files of procurement contracts and reached an agreement with its developers to modify the system to suit their needs. After a shaky start, Mead Data Central introduced the computerized legal research service LEXIS for nationwide marketing in 1973. The West Publishing Company, accustomed for decades to dominance in the legal publishing market, came out with the competitor WESTLAW in 1975. Initially clumsy, by 1983 or 1984 WESTLAW had become an automated research service equal in power to LEXIS (Harrington 1984–85:543, 547–54).

LEXIS and WESTLAW place case law, legal treatises, encyclopedias, and law journals on CD-ROM and online databases that can be automatically searched with Boolean keyword queries. The impact on legal research has been immense. Manual research using "the books" was made obsolete as it became possible to do in minutes what had previously required hours of tedious work. However, computerized legal research is more than doing the same thing as before only faster. Now the automated mode of information management is also in play, as artificial intelligence processes (searches) information stored in artificial memory in the form of digitalized databases. Therefore the agencies that conduct legal research have changed, and this has important implications for how research findings are used and even for the profession of law itself.

The crucial point is that the automated mode replaces the textual mode's activity of classifying and searching for legal information. In fact, with automation it is possible to bypass entirely the key number system's essential step of classification of legal documents by human analysts. Instead of classifying, artificial intelligence operates best by indexing—connecting a symbol for a particular topic (generally in the form of an image or a word) with whatever material is pertinent to it in some body of information. Using an index enables one to retrieve information about a topic from the contents of the book or a collection of articles such as the *Reader's Guide*. Textual-mode indexes were constructed by human beings. But computers can index without the participation of human analysts. To search an electronic database for a keyword is, after all, nothing but constructing an index of the database for the word. Indeed, artificial intelligence far surpasses human intelligence when it comes to indexing. Search engines find thousands of matches for words or phrases in electronic databases of millions of documents in less than a second. The great majority of printed documents do not even have indexes, so retrieving information from them by that method is out of the question. In contrast, *any* document stored in an electronic database can be searched by keyword. Those print documents that do have indexes can be searched only for the topics and terms that have been selected by the people who indexed them. With automation, users can search documents for words and phrases of their own choosing; LEXIS and WESTLAW recognize many operators that allow for extremely precise searching.

Perhaps in line with the general goal of making artificial intelligence mirror human intelligence as closely as possible, numerous attempts have been made to design programs that can classify.[8] These, however, have met with limited success because artificial intelligence does not cope well with metaphor, synonyms, homonyms, nuances of meaning, and levels of generalization. Because computers are so much better at the one than the other, classification declines and indexing ascends in the automated environment for the purpose of accessing information.[9]

This has an effect on the way people think. Classification presents people with information in the form of preestablished understandings about how the things of the world relate to each other. People are encouraged to think in terms of given categories—to think in a settled, uniform way. Indexing is a more unruly activity that produces information in an ad hoc, open-ended, problem-specific, user-controlled manner. People must use their own devices to determine, among the results of a keyword search, what is relevant and what is garbage and to interpret what they have found. Thus indexing encourages flexibility and creativity rather than uniformity of thought (see Bolter 1991:22).

Before automation, legal research relied heavily on classification schemes, and this was reflected in legal thinking (Berring 1986, 1987, 1994). Legal information management devices such as the West key number system, treatises, and encyclopedias are all designed to bring order and accessibility to the large, unwieldy, and growing body of published case law. Moreover, the order they bring is achieved by hierarchical, taxonomic classification, the hallmark of which is that concrete particulars are organized as representatives of abstract generalizations. The general categories that began as heads of the taxonomic schemes for classifying legal information

8. Among these are Scorpion (Shafer n.d.), Northern Light (Ward 1999), Vivisimo (http://vivisimo.com), the Cyc Project (Reed and Lenat 2002), and the Semantic Web (Berners-Lee, Hendler, and Lassila 2002, Schwartz 2002). Many of these are still under development, and all of them fall well short of human capacities to classify.

9. The appeal of classification dies hard, however. WESTLAW's analysts still classify new cases according to the key number system. They have recently introduced a tool called KeySearch, which is actually a shell over the traditional key number system. KeySearch translates the terms selected by the user into index topics in the key number system and then searches for cases that have been indexed with those key numbers, almost exactly as people used to do manually. Playing on one of Robert Berring's titles, "Backing into the Future" (1986), the introduction of KeySearch strikes me as an example of advancing into the past.

have been reified into principles thought to preside over "the law," understood as a self-contained, independently existing system. In the humanities and social sciences published literature is generally taken to present a variety of arguments and points of view, and the notion of absolute truth seldom comes up. But in law, Berring holds, the assumption is that the truth is out there, and with proper research one can learn what it is (1994:14). As Calvin Coolidge wrote in 1919, "men do not make laws. But they do discover them" (Schwartz 1993:460). The key number system in particular, Berring argues, enjoyed a significance extending far beyond mere case retrieval. "It provided a paradigm for thinking about the law itself. Lawyers began to think according to the West categories" (Berring 1986:33; see also Bintliff 1996:343).[10] The medium is the message: a technique for managing information became a major factor in the development of a particular conception of the nature of the law.

The same assumptions are embedded in legal education. The basic first-year law-school curriculum, introduced in the latter nineteenth century by Christopher Columbus Langdell at Harvard and taken up by virtually all American law schools, was designed according to the same basic categories of the law that informed the West digests. Having been immersed in these categories both in their training and in their ongoing legal research, eventually lawyers took what were actually organizing decisions of Langdell and the West Publishing Company to be the intrinsic structure of the law (Berring 1994: 22–23; Bast and Pyle 2001:287). That they are, instead, one way of organizing a particular body of legal information—that associated with American common law—is evident from the fact that lawyers in Louisiana, with its civil law system, are often frustrated by the distortions that result from West's efforts to classify their cases according to its key numbers (Kent McKeever, interview, November 6, 2001).

The distinctive management of information in the law also contributes to its traditional isolation from other fields of endeavor. The means of organizing and accessing legal information and its use in the practice of the common law have traditionally been entirely self-referential. The importance of precedent and jurisdictional authority results in cases' being argued and decided with reference to other cases, ideally in the same jurisdiction, with little attention to extralegal considerations. Charles Collier describes how the case method restricts thought to purely legal channels. "A classic pattern or 'formula' for doctrinal scholarship emerges: (1) state the problem; (2) propose a solution; (3) show how the common law, properly reinterpreted, affords the proposed solution. Here the influence of and connection with Langdellianism must be noted. A central implication of Langdell's case method was that, in the study of law, one need not venture beyond appellate judicial opinions" (1991:200). The system is largely self-contained, citations to sources outside the law being relatively rare.

The law's peculiar way of operating has been reinforced by parochial training. Traditionally, law schools have tended to keep aloof from other schools in the university. They usually have their own buildings. The law library is separate from other university libraries and contains almost exclusively legal materials. The segregation of students has been nearly total. Undergraduate programs in law are rare. Law courses are peopled nearly exclusively by law students, who in turn take nothing outside the law school. In my own institution at least, law courses are listed in a separate catalog and the law school even follows a different academic calendar from the rest of the university. Little wonder that lawyers, immersed for three years in this separate world, go forth in the conviction that the law is a domain unto itself.

The introduction of automated techniques has had a transforming effect on all of this. Results produced by Boolean keyword searches of full texts in computerized databases are not presented with any taxonomic, hierarchical organization. They are simply lists of documents that contain matches with the query, sorted perhaps for relevance by criteria such as the position and/or frequency of the query string in them. The most far-reaching consequence of this is a transformation in the conceptualization of the law (Berring 1986:29, 33). Lawyers who regularly use LEXIS and WESTLAW are being weaned away from the hierarchical categories embedded in the traditional research tools. They are coming to think of the law as a collection of facts and principles that can be assembled in a variety of ways for different purposes (Bintliff 1996:345–46). This could call into question the notion that the law actually *has* an intrinsic, hierarchical organization, and that would signal a basic change in the perception of legal knowledge and of the law itself (Katsh 1989:221–22).

Theorists differ as to the significance of this shift. Some hold that automated research is conducive to creative work and the discovery of new precedent. When everyone utilized the same treatises, the West key number system, and other manual research tools, opposing attorneys would tend to develop their arguments on the basis of the cases regularly cited in them, nearly all of which were familiar to judges and experts in that field of law (Bintliff 1996:343–44). In contrast, keyword searches with LEXIS and WESTLAW produce different results depending on precisely how the searcher formulates the query. As John Henry Merryman prophetically wrote in 1977, "One of the most attractive features of the LEXIS system . . . is that it liberates the researcher from [preestablished] indexes and opens up an enormous range of possible avenues of access to the literature" (1977:426).[11] In effect, with every keyword search the

10. Berring's effusiveness regarding the impact of the West classification system on the structure of American law is not shared by everyone. For a thoughtful rejoinder, see Schanck (1990:17–19).

11. As Bowker and Star put it (1999:292), "In opposition to the old hierarchical databases, where relations between classes had to be decided once and for all at the time of original creation, many databases today incorporate object-oriented views of data whereby different attributes can be selected and combined on the fly for different purposes."

user creates a new index of the text. Therefore the capacity to use a text for purposes other than the author's or indexer's is much greater with keyword searching than with classification or a print index. Roberta Shaffer stressed this aspect when asked what appealed to her about online research. "Being liberated," she replied. "Having the choice between looking at something using someone else's taxonomy, like an indexer or a West Key Number system, versus letting your own mind create the taxonomies. With the books, you don't have the freedom to think of it the way *you* think of it. You're constrained by how somebody else chose to present it" (quoted in Halvorson 2000:114–15).

The expansion of agency in legal research to include artificial intelligence does not mean that the role of human intelligence is correspondingly restricted. On the contrary, human intelligence has more latitude than before. Previously people were more constrained to think within the framework of a classification scheme such as the key number system. The greater freedom highlighted by Shaffer stems from the indexing technique of artificial intelligence, which presents human intelligence with a greater diversity of information to evaluate and analyze. This increased diversity means that the attention of different attorneys working on the same issue may be drawn to different and occasionally unfamiliar cases as precedent for the case at hand, and their arguments are therefore less likely to be isomorphic. For Berring, this has the potential to burst the bonds of conservatism and generate a dynamic that will breathe new life into the common law as opposing attorneys propose different cases as precedent and judges are forced to take novel information into account as they formulate their opinions (1986:56; 1994:32–37; see also Katsh 1989:20).

Other legal scholars regard the situation with a more jaundiced eye. They fear that it may foster bad law as some attorneys overemphasize the role of artificial intelligence and neglect the essential place of human intelligence in research. Attorneys may, they suggest, uncritically amass staggering numbers of precedents and literature citations and consider that their job ends there, failing to apply their human intelligence sufficiently at the point where it is indispensable: the development of thoughtful arguments based on careful application of legal principles (Lien 1998:88–89; Krause 1993:576; Selya 1994:408; Munday 1983).

Beyond the loosening of the law's internal organization and procedures, there is evidence that the membrane that isolates the law is becoming more permeable (Posner 1987). Judges today, for example, are citing more nonlegal sources in their opinions. Schauer and Wise (2000) examined all citations in U.S. Supreme Court opinions at five-year intervals from 1960 to 1990 and then for each year from 1990 to 1998. While the trajectory is by no means smooth, they found a distinct increase in the proportion of citations to nonlegal material. Samplings from the Supreme Court of New Jersey and other courts showed a similar pattern. Their analysis centers on the ease of electronic searching. "In previously barely imagined ways the universe of nonlegal information is now easily and cheaply available to lawyers, judges, and other legal decision makers. What once would have required a 2-hour journey now requires only the click of a mouse, and this may well provide the most persuasive explanation of the phenomenon we have identified" (p. 513). This explanation is bolstered by the fact that there is a definite increase in citations to wide-circulation newspapers (p. 503), which judges and their clerks have been able to access easily in the NEXIS database for nearly 20 years and which have also recently become available on the Internet. Schauer and Wise refer to the growing infiltration of nonlegal information as the "delegalization of law" (p. 515).

Law schools are also becoming less insular. Many law faculty members now engage in interdisciplinary research and writing (Kissam 1986:297–99, 318–19), and law schools are increasingly hiring faculty members who do not have law degrees and who teach courses outside the traditional boundaries of the law (Hanson 2002: 590–91). They now frequently participate in interdisciplinary programs that offer Master's degrees in other fields such as public policy or economics as well as the J.D. Newer law journals, such as the *Ecology Law Quarterly, Law and Sexuality*, and the *Southern California Interdisciplinary Law Journal*, have distinctly interdisciplinary orientations. Of course, this is a two-way street. Automation began earlier and has proceeded farther in law than in many other disciplines, where, for example, online versions of full-text journal articles are only now becoming common. The rich trove of easily accessible information is a strong enticement for nonlawyers to incorporate legal materials into their own research (Hanson 2002:589–92).

The law is changing both in its relations to outside fields and in its internal practices of conducting research and assembling information. A theme common to all these changes is that the fixed categories reflective of classification are giving way to more flexible thinking associated with indexing. And that shift is attributable to the prominent place that the automated mode of information management has assumed in the law.

Conclusion

A methodological individualist strategy that seeks to explain all social behavior in terms of the drives, intentions, and other characteristics of human individuals is no longer tenable. Full understanding of what is going on requires a superorganic model that recognizes that the oral and textual modes of information management are now routinely supplemented by the automated mode. This in no way banishes human beings from the scene. Their role continues to be indispensable; in fact, it is often expanded. In the law, for example, people design computer searches, interpret the results, cite sources, argue about what constitutes precedent, write articles, plan expanded law-school curricula, decide to hire faculty with new qualifications, and so on. Nevertheless, because of the participation of artificial intelligence,

such activities should be explained in terms of superorganic, extended agencies that include but are not limited to human individuals. These agencies pursue activities differently from unassisted humans and with different outcomes. To generalize from our case study of the law, it appears that the inclusion of artificial intelligence in agency significantly increases the amount of information that must be taken into consideration, places greater demands on human intelligence to evaluate the relevance of that information, and encourages greater flexibility and creativity in its interpretation.

Comments

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The relationship between individuals and their culture and society has been debated since the emergence of the social sciences as a discipline. An important issue has been the scope of individuals' autonomy from or dependence on the systems of ideas, beings, and objects surrounding them. Hanson's paper contributes to the debate in a very interesting manner through an analysis of the new situations created by the development of artificial intelligence and automated forms of information in contemporary societies. He argues that methodological individualism, which seeks to explain social behavior in terms of the drives and intentions of the agent, is no longer adequate for understanding the complex processes that are taking place. According to him, the increase of information and artificial intelligence necessitates that human activities be considered part of a "new superorganic."

Hanson distinguishes three modes of information management—oral, textual, and automated—and suggests that the emergence of this last mode requires a rethinking of the issue of agency that takes artificial intelligence into account. His concept of concrete "extended agencies," which today include human individuals but are not limited to them, interestingly does not view these individuals as overwhelmed by the system. In the context of the automation of information, new forms of action can take place, which, he argues, enhance the possibilities for individuals in that they require more flexibility and creativity than ever.

The idea that, in a new superorganic, human potential is not lost in the automated mode of dealing with information expresses a rather optimistic perspective on human evolution. Clearly, many concrete advantages for humans are associated with the automation of information, among them classifying, comparing, searching, etc., at a speed that would be impossible with human intelligence alone. Hanson is right about this, and his concept of a new superorganic seems appropriate for identifying the new situations in which we find ourselves. Yet, the new flexibility and creativity allowed in this new context of action is accompanied by the reduction of other ways of dealing with the surrounding world and learning from it. A whole dimension of human action in and on the environment, that of the senses, is gradually being set aside.

While Hanson is correct that the automation of information favors a certain quality of life, one cannot deny that it also participates in the marginalization of what is called "direct experience." The more humans participate in extended agencies, the less they directly process the information they deal with. This may be quite useful in some domains of activity, such as the production of information, but in the process humans are losing other faculties. Societies that are not yet confronted with the expansion and generalization of the automated mode of information still require from their members direct contacts with what they are dealing with, be it nature, kin, ancestors and spirits in other realms of reality, or something else.

Several dimensions of the human potential to act and to learn through the senses and personal experience are still part of the everyday life of members of cultures that value the observation-reproduction of the practices of elders and others. These dimensions of direct apprenticeship through imitation and reproduction are of course also present in new-superorganic societies, but the recourse to artificial intelligence and the automated, indirect way of dealing with information are rapidly increasing in them. Marketing, commodification, mass consumerism, financial profit, etc., require numerous extended agencies; efficiency in these matters requires more than what unaided and slow human action can do.

Since Kroeber first wrote on the superorganic, a complex process of change in human life has taken place. We already see two types of societies distinguished in terms of the type of agency involved—(more) human or (more) extended. Those that develop more and more automated ways of being produce different types of humans from those in which action is based on what is directly available to individuals (the body, other individuals, and tools). Beyond the gap between types of societies, Hanson's analysis implicitly points to the emergence of two ways of being human. Increasing some capacities (through "extended agencies") while losing other forms of creativity and flexibility, notably that of experiencing the world through the body ("personal agency"), contributes to the reduction of the human experience of life. Without returning to methodological individualism, this situation requires studies pointing out the other side of the new superorganic.

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Hanson is one of several anthropologists who take seriously the idea that the recent deployment of automated information technologies has transformed social dynam-

ics and, further, that the implications of these transformations should impact, inter alia, anthropology's understanding of culture. His article properly critiques the distortions imposed by presumptions of methodological individualism on the issue of agency, an issue to which he assigns appropriate philosophical as well as anthropological importance. Like a good cyberspace ethnographer, Hanson makes a set of investigable empirical claims, the central one being that the artificial intelligence fostered by the new technologies is the driver behind the changed dynamics in social formation reproduction that in turn demand the re-appreciation of trans-individual agency implied by the notion of a "new superorganic."

While Hanson's critique of the "old" superorganic might have been more fully developed, I find no reason to dissent from his initial positions. His illustrative case, the transformation in the practice of law, is an excellent ground on which to test the basic empirical issue of cyberspace studies—the extent to which the clear potential of social transformation is actualized in practice. Nonetheless, I will dissent from several specific aspects of his argument. Hanson gives a very useful survey of the several literatures that critique the modernist ontological privileging of the individual. As is clear from this survey, several of these critiques—especially those developed around actor network theory, with which I am most familiar—have either no connection to automatic information technologies or only a moderate one. There are definitely good reasons to believe that the critique of doctrinaire individualist agency has been given substantial impetus by cyber-events (the debate in the 1990s over cyber-rape is a good example), but critique need not be made on these grounds. In a similar manner, popular concern over community in cyberspace has led to a rethinking of social science theorizing on this important topic, but this does not prove that it is cyberspace itself that changes the basic dynamics of community.

Regarding Hanson's assertions that the practice of law in the United States has changed, I agree that there is a clearly discernible pattern of increased interchange between legal and social science scholarship, that lawyers do more online searching, that WESTLAW's practice manifests certain modernist proclivities, and that there is now more frustration with WESTLAWed law. These associations do not, however, confirm the causal links he argues for. The decision of the Supreme Court to rely on social science data in *Brown v. Board of Education* was only the first of many cases fostering cross-disciplinary discourse. The powerful popular critique of legal practice is paralleled by a similar critique of medicine. Both of these patterns have no obvious connection with automated information technologies.

It is true that "brute force" machine indexes can replace human coding of texts. The problem of machine indexing is that all occurrences of a word are of equal relevance, with the result that, even if weighted by number of occurrences, searches using such tools are much more likely to produce "false hits." In his footnote 9 Hanson acknowledges movement toward the "hybrid" systems, combining machine indexing with human coding, that Pfaffenberger (1990) describes as dominant in the world of general libraries.

Hanson needs to make a stronger empirical case that the law is so very different. In particular, he needs to avoid the tendency, so rampant in cyber-hype, to take the potential for transformative change as indicative of its actuality. Given that many of his references to changes in the practice of law are drawn from the mid-1980s, I suspect that they are more reflective of "early-uptake enthusiasm" than of an institutionalized "new paradigm."

At a more general level, Hanson, like many computer scientists, tends to equate data processing with intelligence, blurring the difference between information and knowledge. This trope was popular among corporations trying to market "knowledge management" technologies, but the trope disappeared, along with the marketing, just before the bursting of the dot.com bubble. As I have shown (Hakken 2003), they were replaced by "knowledge management fatigue syndrome." Were we to become a "knowledge society," a much higher, even transformative degree of collective agency would likely be manifest. Automated information technologies may become part of distinctly new ways of networking knowledge, but they will be very different from those that merely "mine data." I find the work of the technology philosopher Albert Borgmann (e.g., 1999) a more satisfying account of the relationship of information and agency. Borgmann shares my skepticism about the implications of technologizing information and is equally alive to its pitfalls and its potentials. Hanson may well be right, but I remain to be convinced. Let the ethnography decide!

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I am charmed to see Hanson illustrating such a theoretical and far-reaching issue in social science with such a mundane example as the case law research methods from my own much-disparaged field. However, despite the boldness of his approach and the creativity of his insights, I think that he dismisses methodological individualism too quickly, that his proposed alternative is too vague and complicated, and that his discussion of legal research illustrates the problems with the methodology that he proposes rather than the one he criticizes.

Although methodological individualism is a reasonably well-defined approach to social theory, it is not a theory but a premise that underlies a variety of theories. One of these is rational actor theory. For a majority of social scientists, this theory fails to account for a variety of human behaviors and social institutions in precisely the way Hanson describes. But methodological individualism is also the basis of phenomenology, which avoids these defects and possesses significant advantages. According to Husserl (1962), all social action arises from

individual behavior, and all thought is located in the conscious minds of discrete individuals. Because human beings can communicate through language, however, they are capable of creating intersubjective understandings, that is, shared ideas that are stable and cumulative over time. The coordination of these ideas among individuals produces social traditions and institutions. In fact, human thought at anything above the most primordial level is possible only because intersubjective understandings provide an interpretive structure for the individual. Husserl is the originator of the idea, now so prominent in social science, that the human perception of reality is socially constructed.

Husserl's approach is preferable to theories that ascribe autonomous action to social collectivities because it is more rigorous and ultimately provides a more satisfactory account of social action. Of course, it is often useful to describe institutions, nations, or mass movements as social actors, but this is verbal shorthand and leaves important matters unexplained. We can say, for example, that a school of fishes turns away from an oncoming shark, but we have a much more convincing account of the observed behavior if we can explain what motivated each individual fish and how these individual actions were coordinated.

Hanson seems correct in saying that artificial intelligence can produce nonhuman entities that are capable of independent action. Phenomenology does not deny this, any more than it would deny that a fish is capable of independent behavior. But neither the fish nor the computer negates phenomenology's account of human action, and Hanson moves a bit too quickly from the possibility of genuine artificial intelligence to a description of a computer-based indexing system as part of an emergent entity that includes its human users. The displacement of West's pre-set key-note system by the more fluid word search system of LEXIS and WESTLAW has certainly changed the way lawyers construct their understanding of decided cases (Berring 1987). But this change is explicable by the simpler and more rigorous method of phenomenology, which suggests that collectively developed means of communication affect our intersubjective understandings. In fact, this is essentially the approach Hanson employs. Although he proposes a theory of extended agency, his explanation for the impact of technology is framed in terms of the way it affects the conceptual frameworks of individual decision makers.

The problem with such a complex, highly metaphorical departure from methodological individualism as the one Hanson proposes is that not only is it difficult to use but the effort to use it creates the tendency to oversimplify other aspects of the issue under consideration. Hanson uses his theory to explain how judges identify prior decisions "to frame and evaluate arguments according to more or less settled principles of law." But the idea that judges are guided by prior decisions is a very conventional model of legal decision making. Political scientists argue that judicial decisions are controlled by ideology (Segal and Spaeth 1993) or strategic considerations (Epstein and Knight 1998), while legal scholars engage in an extensive debate about the complex ways that doctrine is deployed in conjunction with these and other factors (Dworkin 1986, Feeley and Rubin 1998, Fiss 1982). In addition, judicial decision making is an increasingly small part of our legal system; the administrative state has produced new ways of thinking about law that are quite remote from the one Hanson describes (Rubin n.d.). A public health inspector searching online reports from restaurants to decide which ones to inspect would be using the computer in a rather different way from the one Hanson discusses.

Of course, Hanson is offering only one example from a very large field, but that is exactly Husserl's point. Since all understanding is ultimately located in the human mind, unnecessarily complex methodologies are likely to overload our conceptual capacities and thereby do us a disservice. Thus, the phenomenological view of human beings, in good hermeneutic fashion, provides an argument for using that very same view as a mode of explanation.

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Hanson challenges us to rethink the concepts of mind and agency to incorporate artificial intelligence as a processual component of human action. In spite of a venerable tradition of theory centered on the action of individuals, Hanson reminds us of classical and more recent critiques of methodological individualism and, by extension, universal renderings of the human subject. Appealing to Bateson's cybernetic communication and Haraway's cyborgs, Hanson argues that our dependence on computers and information sciences necessitates broadening our view of agency to recognize the independent potential of information systems to act in a manner that is not simply an extension of human individuals and human intelligence. He encourages us, therefore, in a manner reminiscent of Kroeber's critique of "organic" models of culture, to embrace a "new superorganic" that renders obsolete theoretical models grounded exclusively in individuals and human intelligence. There is little doubt that his imaginative uses of the superorganic will generate controversy, as I suspect that many scholars like myself are not quite prepared to attribute agency to artificial intelligence.

Although Hanson's critique of methodological individualism is cogent and his support for an expanded agency well argued, I believe that his conclusions share some of the same faults that were present in Kroeber's original formulation of the superorganic. As did Kroeber, he pays insufficient attention to the concrete and historical positioning of human agents, or co-subjects, and thus glosses over the issue of power, especially the technical and political uses of information sciences. He essentially takes up the philosophical and anthropological oversights of privileging individuals as the unit of anal-

ysis without addressing their origins. According to Heller (1981), the emphasis on individuals as significant agents and thus units of analysis emerged gradually during the Renaissance in association with universal reason and, perhaps most important, individualized proprietary rights that would, in turn, become the foundation of modern civil society. MacPherson (1962) has referred to the individualization of proprietary rights as "possessive individualism," thus giving a concrete political cast to what otherwise could be understood in abstract philosophical or psychological terms. The critical challenge to the social science celebration of individuals follows, therefore, from identifying relations between cultural and methodological emphases on individuals and the formation of modern civil society. While Hanson's references to Althusser and Foucault are suggestive of such a historically sensitive critique of methodological individualism, the associations of the "possessive individual" with the political formation of capitalist society are left undeveloped. Consequently, the issue of power so important to the works of Althusser and Foucault remains unaddressed.

Likewise, the abstract association of cybernetic systems and artificial intelligence with human agency never really takes up the implications of such an expanded domain of agency for co-subjects which are differentiated. While Hanson is less concerned with particular subjects than with the nature of "agency" reformulated to incorporate artificial intelligence, he does emphasize their interrelations, and thus one cannot avoid the implications for theory of a generic subject. Ironically, the notion of the generic subject takes us down the same path as the methodological individualism that Hanson critiques. It does not enable us to pursue the group dynamics from which social life is contested or the resistance to systemic exploitation and domination, nor does it allow us to pursue the differentiated social foundations upon which the autonomy of cybernetic systems ultimately depends.

Finally, the fact that Hanson does not take up human agency as differentiated prevents him, I believe, from evaluating artificial intelligence as an "agency" related to commodity production. While artificial intelligence ostensibly operates independently of parameters that are initially humanly established, we should not lose sight of artificial intelligence as a human product and therefore a commodity. The analogy (or, perhaps, literal equivalence), between artificial intelligence and commodities is important in that Marx argued (as would Althusser) that the fetishism of commodities leads to their seeming independence from human labor. In fact, economics has made a science of studying the independent circulation of commodities at the expense of human labor and class relations of production and consumption. Although there is much potentially to admire in the uses of artificial intelligence and computer technology, when artificial intelligence is regarded as an agent independent of its being an object of human labor we risk overlooking its relation to human labor, the differential access of various groups to its benefits, and its potential uses as a medium of surveillance and social control. Again, although surveillance and social control were paramount to Foucault's panopticon, their relation to agency is not broached by Hanson. Therefore, just as Kroeber's influential notion of the superorganic failed to address subjects who are positioned and differentiated, this in my estimation is the principal fault of the "new superorganic."

Reply

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I am grateful to the four colleagues for the time and effort they have taken to comment so thoughtfully on my essay. Their remarks seem to fall into two general categories. Hakken and Rubin doubt that a strong enough case has been made to sustain my notion of a new superorganic, while Ghasarian and Ulin are concerned about the effect of the theory on certain crucial properties of the human individual.

Hakken suggests that the essay overemphasizes the impact of automation. He has no problem with jettisoning methodological individualism, but he doubts that the advent of automation requires it. My use of actor network theory is suspect, for example, because while it does challenge methodological individualism it is often on the basis of cases that do not involve automation. Judicial decisions incorporated evidence from outside the law, such as the use of social scientific data in the 1954 Supreme Court decision in *Brown v Board of Education*, well before LEXIS and WESTLAW came on the scene. It is not my intention to claim that automation alone necessitates the concept of extended agency. It has been needed for a long time. My reference to actor network theory is intended more to make that general point than to say anything specific about automation. This is why the main example in my discussion of actor network theory is John Law's analysis of fifteenth-century Portuguese voyages of exploration. Nor do I claim that computer-assisted research methods are solely responsible for broadening legal thinking. "Brandeis briefs," which use evidence drawn from outside the law, were introduced in 1909 when Justice Brandeis drew upon social science and statistics in his brief for *Muller v Oregon* (Berring 2000:1688). But I do claim that the participation of artificial intelligence in action has drawn attention with special urgency to the necessity to develop a theory of agency that goes beyond methodological individualism. And I claim, further, that the concept of extended agency that includes artificial as well as human intelligence is important for understanding developments in legal thinking and practice since the introduction of LEXIS and WESTLAW.

Hakken (probably) and Rubin (certainly) are willing to concede that automation has changed legal thinking, but

neither is willing to buy the proposition that a new superorganic theory of social action is necessary to explain it. Rubin holds that it can be understood more simply with Husserlian phenomenology. His description of that theory is essentially the same as the one presented in my essay under the name of "relational methodological individualism": while the ultimate entity that thinks and acts is the human individual, what it thinks and does can be fully understood only in the context of the individual's relationships with other individuals, with cultural institutions, and with technology. Rubin would therefore explain changes in legal thinking and practice in terms of the influences of automated research procedures on individual lawyers, who alone are the thinking and acting agents, rather than incorporating those procedures into agency itself. Perhaps the difference between us can be explained by how we approach the problem. I imagine that Rubin began with what is happening in the law and decided that it could be explained most simply in terms of phenomenological methodological individualism. That is certainly reasonable, but I addressed the matter differently and arrived at a different conclusion. My line of thought was to consider transgenic organisms, cyborgs, computerized expert systems that operate without human supervision, computers that learn, that play chess, that assist in the design and manufacture of the next generation of computers, the effect of hypertext on the concept of the author, and so on. I then agreed with a number of writers, including Hakken (1999:224), that we need to define agency in a way that goes beyond the individual. Having redefined the thinking and acting subject as extended agency, I then concluded that it could be applied to issues such as changes in the law. Parsimony plays an important part here, because the same theory of agency applies, among other things, to expert systems that draw up wills or track and stock inventory, students looking up books in an online catalog, what is going on in the law, and Portuguese voyages of exploration in the fifteenth century.

Ghasarian wonders if the incorporation of artificial intelligence into agency diminishes the sensual, bodily side of human experience. Although he appreciates that automation may offer new opportunities for flexibility and creativity in human cognition, he is concerned that what is direct human sense experience of the world in nonautomated societies becomes indirect—and therefore less immediate and rich—in automated societies. He hopes that this side of the issue will be investigated. I hope so too, but I do not share his anticipation that such studies will reveal that automation makes for grayer experience. In addition to his recommendation that such studies be conducted in societies where automation has not progressed far, I would hope that they would be done in societies such as our own, where one thrust in the development of automation is precisely to heighten sensual experience. Beyond the thrill of computer games and the titillation of lurid photographs, there are special goggles and gloves designed to heighten the visual and tactile experience of cybersex, violence, and risk-taking adventure. As was asked about hallucinogenic drugs in previous decades, one can ask now whether the enhancements of hyperreality devalue or intensify sensual experience.

Ulin claims that the new superorganic overemphasizes the place of artificial intelligence and underemphasizes the place of human subjects. It attributes too much independence to artificial intelligence—which is, after all, a human product—and therefore misses the extent to which it is a political tool for exploitation and control. And it reduces the individual to a "generic subject," insufficiently recognizing the different positions of surveillance, domination, and resistance that people hold in systems of power. Ulin finds this ironic, because the methodological individualism that I criticize is also susceptible to the notion of the generic subject. It is ironic indeed, because the poststructuralist critique of the idea of a constant subject characterized by unchanging human nature is one of the arguments I use against methodological individualism as I develop my notion of the new superorganic. What I cannot understand is why Ulin thinks that extended agency entails a generic subject. Variability in all its components, human as well as nonhuman, is one of the defining features of extended agency. It is built on the idea that different individuals play different roles and even the same individuals play different roles—in different circumstances (such as in the examples of the blind man walking down the street and reading Braille or the student looking up a book and discussing it with a friend). There is nothing in the theory that obscures realization that some agencies engage in domination or surveillance (as an FBI operation in accordance with the U.S.A. Patriot Act) and other agencies resist it (the interaction of politically motivated hackers with their computers comes to mind). The new superorganic does not fail to recognize the differential positions of human subjects; it encourages it.

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