

Computer Ethnology : A View from Human Sciences

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Computer Ethnology: A View from Human Sciences

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The presence of computers in the academic environment has begun to make itself felt in ways unimagined by the designers of the first *number crunchers*. Although number-based applications, such as circulation control in libraries and statistics in all sciences, continue to dominate, there is a steady awareness of the computer's utility in other domains. As early as the 1960s, pioneering efforts were started to process natural language. It was recognized that the internal storage of the computer could as naturally be equated with alphabets as with numbers. *Word crunching*, most commonly in the form of concordances, rapidly became a major occupation of academics in search of a scholarly application for the behemoth computers of that day. These alphabetized lists of some circumscribed vocabulary, such as the plays of Shakespeare or Malory's *Le Morte d'Arthur*, have been printed as conventional books and taken their place on the shelves of academic libraries all over the world.

A natural consequence of this activity has been the accumulation of large quantities of machine-readable text of all sorts. Some of it has been designed specifically for computer processing; the *Brown Corpus* of edited American writing and its British analogue have served as base lines for measuring the varieties of style and usage in many other samples. The bulk, however, is the residue of concordance-making or some similar work, and is often of minor interest to the compiler once the central goal has been achieved. These texts, perhaps gathering dust as boxes of punched cards or reels of magnetic tape, constitute the beginnings of the *electronic libraries* that will serve the future needs of scholarship.

Among them is a great deal that interests the ethnologist. Many works that are classified primarily as *literature* contain substantial records of behavior among groups that are being studied by ethnologists. The works of Herman Melville and Isak Dinesen come first to mind, but the list could be extended to great lengths. In machine-readable form, these records can be searched by techniques that are being refined and extended every day. Conceived of as free-form databases, they can provide substantial amounts of information to be integrated into the field records of trained ethnologists to add dimensions otherwise not obtainable.

The decades of work with natural language materials has also created techniques to search large files for an increasing variety of information. Ethnologists would be particularly interested, for example, in noting the presence (and even more, the absence) of taboo words or other words specifically associated with particular relationships, activities, or time periods. The recurrence of formulas in folktales can readily

be exhibited by means of standard concordance methods. The management of materials, such as proverbs, that require indexing in a large number of ways simultaneously can now be achieved through database technology. Ethnology can clearly benefit from a close acquaintance with what has already been accomplished in other academic disciplines.

But the transfer of existing methodology, useful as it can be, is not sufficient for a field as vast as ethnology. In approaching the challenge of applying computers to our study of this subject and its presentation in our museums, we need first to appreciate its comprehensiveness. Simply described, it comprises all that makes us human. It therefore includes all our means of communication (which will almost always be principally oral), all the artifacts we produce (from tiny beads to skyscrapers), and all the actions related to both producing and employing the things we make. Implementing any single computer system to capture and control this literally incomprehensible body of data is clearly beyond our capabilities at this moment. It is equally true that any system that starts up with less vision than the entire complex of information that it will ultimately hold is doomed as a waste of energy and money. As our conceptions of how well we can manage our data are expanded by the rapidly developing technology, efforts that are restricted by temporary limits must be superseded by those conceived within the newer and broader possibilities. To plan large now, therefore, even if we must operate small, is the only strategy for insuring that we are truly laying a foundation and not building on sand.

LANGUAGE

Although speech is the facility which most distinguishes mankind from all other animals, it is also perhaps the one that also segregates us most into nations, tribes, sects, and all the other divisions which give us identity and group support but seem inevitably to put us in opposition to everyone outside the group. There is no human action that is not associated with speech. No study of humanity can therefore neglect it or even relegate it to a minor position. Any sense of group history is embedded in words. Any sense of group purpose is expressed in words. Individual roles, rights and responsibilities are communicated to the generations by words. The values by which the group survives are codified in the prayers, charms, songs, tales, proverbs, war taunts, and every other form into which words can be combined. Even the negative aspects of language instruct us in the mores of a group, for the concepts that have not been codified verbally and the words which may be uttered only by specified segments of the group often tell us more than the vocabulary that is recorded.

An examination of language behavior reveals that the bulk of it conforms to rather rigid patterns. Not only in religious activities but also in many others patterned on them, expressions are dictated more by what speaker's feel is expected of them than by spontaneous reaction to what is said or done. There is as much conformity in language as there is in dress, food choices, or any other overt behavior.

There are prescribed formulas for meetings, partings, acceptance of invitations, beginnings of courtships, refusals to be courted, and all the other situations in which humans find themselves. Challenges are couched in standard forms; the response is equally standardized. Since language is a surrogate for many actions, it must be recognized by all the participants in a verbal action as having unambiguous significance. From an ethnological point of view, there can be no more rewarding method of studying group behavior than through the analysis of a large corpus of its speech.

Partly for convenience, but mostly because speakers sense the propriety of shaping their speech behavior (as well other behaviors) to differing circumstances, utterances can be assigned to categories. In every society a major one constitutes the core of ritual, such as assuring the safe conduct of the individual through perils like birth, marriage, and death. The group must likewise be protected in times of war, famine, natural disaster, or internal disharmony. The prayers or charms appropriate for these situations may vary or be the same, but their universal characteristic is their stability. "Getting the words right" is absolutely essential to their efficacy. So powerful is the exact reproduction of the proper charms or prayer thought to be that historians attribute much of the impulse to invent writing systems to concern for invariability in these sacred formulas. Many primitive cultures buy and sell charms to protect one's person, family and property, as well as curses to inflict harm on those of others. Training in the recitation of liturgies may require many years of apprenticeship.

Other equally prescribed speech acts constitute what we call oral traditions or folklore. Components of this category range from elaborate narratives (achieving their apex in national epics) to short jokes that circulate briefly and are forgotten. The social role of these narratives is highly complex and probably still to be understood. The child begging for a bedtime story may only be forestalling the end of the day's play, but the adult's choice of story and manner of telling it (for example, whether reading or reciting from memory, and whether telling a *real* story, one that is sanctioned by tradition, or a *made-up* one, an exercise in imagination or a recounting of some experience) may reveal a great deal about the nature of the relationship between that child and parent and perhaps between children and parents in the entire group. A complete ethnological record should include not only the full repertory of traditional tales told in a society but also the apparently casual narrative exchanges among representative members of the group, with records of the individuals involved and the circumstances.

Like folk tales, folk songs (which may be narrative or lyric) seem never to have been made up but always to be learned from someone else. Their subjects may be dramatic, epic, romantic, bawdy, or any other mood experienced by humans. The occasions for singing them, however, are as prescribed as for any other speech. The presence or absence of the other sex or of children or adults, the season of the year, whether or not the singer(s) and audience are licensed by drunkenness, whether the song is considered to inculcate piety or to sublimate vice (however those terms are defined) — all these conditions and others determine the appropriateness of each

song at any time. Thus the records of folk songs should include as many of these circumstantial elements as can be observed.

Among other formulaic speech acts that are learned rather than coined are proverbs, imprecations, and similar responses to circumstance that require more ingenuity than most individuals possess. Since these are often required promptly, with no time for reflection, the choice among stock responses available may tell us a great deal about both the individual who chooses and the society that provides him with a repertory to choose from. Moreover, the stock rejoinder compensates for what it may lack in originality by implying a sanction in tradition and in group wisdom. Explicitly or implicitly, the proverbial assertion has behind it the authority of "they say." The speaker of proverbs is armed with a condensed group knowledge far broader and older than his own. In the fabric of language as a social phenomenon, all the foregoing traditional elements must be recognized as the warp that gives substance to the woof of spontaneous and occasional speech.

ARTIFACTS

As well as by his ability to speak, man is differentiated from all but a small number of animals by his ability to make tools. If we except the occasional use of unmodified twigs and stones by intelligent mammals and birds, we can accept the definition of man as the *tool-making animal*. The study of these tools and the artifacts that are made with them ranks with the study of speech as a means of understanding any society. The ingenuity displayed in the modification of available materials is as much a measure of group values as the addition of ornament to objects that are just as useful without it. Many societies devote scarce materials and skills to religious or aesthetic purposes when practical needs are unmet: the soaring cathedral or temple surrounded by humble dwellings manifests a universal social balance of values.

Ethnologists have frequently emphasized the collection of artifacts as a goal of their field trips. They are usually easier to obtain than oral data, especially since their acquisition requires a minimal knowledge of the owners' language. They also can be displayed more satisfactorily in public museums, where the typical visitor would have no interest in verbal records, even if they were translated. Modern museums have shown great imagination, industry, and skill at displaying houses, boats, and other artifacts of many cultures. Sometimes these are miraculously accurate models or copies. A recent extension of this practice has been to reproduce an entire environment — the interior of a dwelling, for example, even occasionally with live demonstrators in costume using the tools and materials of the culture depicted. As teaching displays for visitors, such exhibits clearly supersede the glass cases with rows of inanimate objects that were called museums not too long ago. Now that two-day conferences can be devoted to the single problem of museum lighting, we can expect all the skills of the theater to implement those of the museum as a learning environment.

But for the student of ethnology, it is questionable that much progress has been made in the classifying of objects with the intention of establishing their role within a culture and their relation to parallel objects in other cultures. When we consider the near-infinity of artifacts for planting seeds, for cultivating crops and harvesting them, for processing grain into food, or fibers into cloth, or natural materials into homes, boats, idols, weapons, or the numerous other objects that humans utilize in their complex activities, it becomes obvious that displaying a minuscule sample only whets the appetite without satisfying it. Somehow, all known objects must be cataloged in a universally accepted manner, which will simultaneously demonstrate their total function in their own group and permit comparison with comparable objects in other societies.

Let us take, for example, a cup. If the material is imported at great expense and trouble from a distance, we know something about it not inherent in its structure. If, furthermore, it is highly decorated, and perhaps is used only on ceremonial occasions, we have further significant information. If it is taboo to one sex (say women), perhaps to the point where they may not even see it, if a special place is provided for its storage when it is not in use, if it is given a name and is transmitted through generations as a prized heirloom, if owning it confers status and power (political or magical), if only special drinks may be served in it and only to special participants in solemn ceremonies — clearly, then, we have much more to deal with than a mere thing. Is this cup a utensil or a religious object? What are its relations to those who made it, those who use it, those (perhaps more important) who are forbidden to use it? Are its history and social functions more important than its physical form? Or are the decorations more significant than the cup they are applied to?

The same questions can be raised with regard to houses, boats, tools, clothing, musical instruments, medical implements, or any other artifacts. The traditional styles are highly valued and innovation is introduced only at a great price in cultural disharmony. Things have importance for the way they are used, for the associations attached to them, for the very fact that they are not something else. “Our way of preparing food makes us who we are; our way of building our houses makes us feel at home here and makes others feel insecure; our clothes and ornaments identify us to each other and differentiate us from everyone else. We speak a private language, not only with our tongues but with the things people can see around us.” Any system that ignores this dimension of ethnology ignores all that is vital in the study of men through their works.

It is in handling (at least partially) this complex network of relationships that computers can provide essential assistance to ethnology. The concept of the relational database permits the storage of information at almost any convenient location, but without denying access to it from other locations. Thus the cup mentioned above could — if the logic of the entire database dictated — be entered as an artifact. But strands of association could be established to all the other categories with which it is linked. Any searcher primarily concerned with taboos or with beverages or with ornaments could expect to find this artifact linked to the

term under which the search was being made. Such an almost limitless access to information has never been possible with pre-computer technology.

OTHER ASPECTS OF ETHNOLOGY

It is not necessary to elaborate the additional components necessary for a complete ethnological record. The almost infinite catalog of movements in working, eating, dancing, and other activities constitute a major element of the ethnological record. People learn, by instruction or imitation, how to hold tools and implements, how to move their feet, hands and bodies in walking, running, fighting, dancing, love-making, orating, and all the other actions that constitute their physical lives. These, however, are integrated with the oral actions and the nature of the artifacts they are associated with. Eating behavior, for example, is often conditioned by whether one is alone, with one's family, in the presence of strangers, or in a large group of relatives. Such paradigms of behavior can be multiplied for each aspect of personality: men walk differently from women, older people from children, superiors from inferiors. Gestures are specifically identified with sex, age, social status.

Already the movie camera has come to the assistance of the ethnologist in recording techniques of hunting, food preparation, handicrafts, dancing, musicianship, and even such simple actions as carrying parcels. What the camera cannot do, though, is integrate these records with the other aspects already mentioned. The viewer of a film may wonder, but almost always without satisfaction, whether the tool he sees being used has oral behavior associated with it (as when prayers are spoken at its first use), but unless the maker of the film knew and recorded that behavior, few immediate means presently exist to lead into that path of inquiry.

That is where computer technology offers opportunities beyond anything available through other technologies. The videodisc (and its descendants, the increasingly capacious optical disks) permits the storage and retrieval of both still and moving images. (That it can *freeze* in the middle of a moving sequence and go either forward or backward in slow motion is an almost accidental benefit for the student of physical activities.) Even more relevant for ethnological study is the disk's accessibility under program control. With proper descriptors added, the millions of frames on each disk can be displayed in any sequence that either the programmer or the user can devise. Surely, split screens will be available soon to allow side-by-side comparisons of all types. Most significantly, each viewer of the same disk can ask it as many different questions as occur during any session. These can be as wide-ranging as "How many dances require specific gestures with individual fingers?" or "Which societies expect participants in banquets to wear headgear of exotic feathers?" They can be as narrow as "In the Arunta culture, does the father always occupy an assigned position in the eating group, and is it a particular point of the compass?"

So far, the computer has functioned in ethnology chiefly to produce printouts, paper listings which may reveal associations among the various elements of the

complex social web that the subject tries to trace. As useful as these may be as improvements over the card files or notebooks they supersede, they suffer the same limitation in their fixedness. The only match for the dynamism of the material itself must be a dynamic combination of the computer and the video/optical disk. Almost all this technology is in place. It needs only acceptance and commitment from the community of scholars that can benefit from it. If proper preparations are made now, if world-wide standards are adopted, if earlier attempts at structuring ethnological material are studied as models, then the full advantage of the marvelous new technology can push these studies with amazing speed and vitality far beyond the limits they have so far reached.

GLOBAL IMPLICATIONS

The significance of ethnology, it must be recalled, goes far beyond academic study. More perhaps than any other subject, it is the basis for the universal community into which we are evolving whether we wish to or not. Other technologies — jet travel, movies, satellite television transmission, the videodisc as an information-storage device — are eroding the rigid boundaries between nations. As Pakistanis become a major ethnic group in Birmingham, as Mexicans move freely in and out of the agricultural economy of Texas and California, as Taiwanese commute regularly to Europe and North America for technical education and business, the need for understanding of formerly *alien* cultures far exceeds the academic curiosity that once motivated it. The Swedes and the Germans have a great need to understand the Turks who constitute a major component of their work force.

Similar ethnic communities in every country must be understood if the pressures to integrate and to maintain an individual identity are to be balanced, even partially, in a manner satisfactory to all groups. On the global level, the continued peace of the world, literally the survival of the species, depends on a degree of intercultural understanding that ethnology can help to produce. That achievement can be produced by the intelligent, sensitive employment of the computer as a tool for storing, retrieving, analyzing and exhibiting the marvelously varied responses of mankind to its physical, social and spiritual needs.

