

COMPUTERS AND VISUAL LITERACY

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by

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ABSTRACT

Two rather important trends are presently occurring in our society, as the result of recent technological achievements. The level of visual literacy, that is the use of purely visual symbols for communication purposes, is increasing throughout our society. This is probably an effect of the wide diffusion of television. Secondly, computers are becoming available and useful to many more people in many more ways. The confluence of these trends, particularly in the presence of a powerful enzyme like vastly enhanced communications facilities, will likely produce some profound changes in our society. One of the more likely changes may be the development of ideographic forms of writing, and new, concept based, structures for information indexing.

ABRÉGÉ

Dans notre société deux tendances apparaissent actuellement comme conséquence de réussites récentes techniques. Le niveau de la reconnaissance visuelle, c'est à dire, l'utilisation des symboles purement visuels s'accroît d'un bout à l'autre de notre société. C'est probablement le résultat de la grande diffusion de la télévision. Deuxièmement, les ordinateurs deviennent disponibles et utiles à beaucoup plus de gens et de façons beaucoup plus variées. La confluence de ces tendances, particulièrement en présence d'un enzyme puissant comme les équipements de communication beaucoup plus efficaces, causera probablement des changements profonds dans notre société. Un changement fort probable est l'évolution de l'écriture en forme d'idéogrammes et des structures nouvelles, basées sur les concepts, pour indexer l'information.

The keynote speaker for the first Man Computer Seminar held by the National Research Council was Professor John R. Licklider. At that time, Professor Licklider engaged in what many must have thought was outlandish forecasting. If my memory is correct, he predicted that the impact of widespread interactive computer graphics could be so profound as to induce us to adopt an ideographic form of writing. At the time, this particular forecast seemed rather remote, but reasonable. Now, we must question the whole basis of causality implied in Dr. Licklider's forecast. Unquestionably, our society is moving in the direction of increasing its use of ideographic communication, and measureably so, but we haven't solved the problems of interactive graphics sufficiently well to consider widespread use of computer based interactive graphics systems. Dr. Licklider's effect seems to be occurring without the cause.

Perhaps the fact of the matter is the other way around. As a result of our society's increasing use of visual symbols and signs, we may be moved to solve the problems associated with the technology and data structures of interactive graphics material.

Simplistic cause and effect linkages may be inadequate in developing an understanding of the processes involved here. The changes in a society's communication habits and the technological developments that support these changes appear most often to be symbiotic rather than cause-effect related. Clearly there are certain trigger events, but when viewed on a grand scale, the interactive nature of technology and society becomes quite apparent. Let us examine the changes in what might be called visual literacy in greater detail.

MacLean's magazine now carries cartoons that neatly divide into two classes. Those with words, and those without. Over the past year, the average has been such that half are wordless, and half have either captions or words in the picture portion. Clearly this must be a policy, for the variation month to month is one cartoon, and the average has held for a year and a half. A decade ago, a cartoon had to have labels. Some bright remarks had to be associated with all pictures even though some might otherwise have been self-sufficient. The consistency of this change suggests that it is important enough to be recognized as a significant thing to control by the publisher. Canadians no longer need trivial words to understand a good visual joke.

A couple of years ago, we designed a visual joke that served as a test instrument to classify people's biases in the area of communications and computers. The visual consisted

of Brian Smith seated at a 2741 terminal, somewhat softly focussed, while in the foreground an acoustic coupler with a very old fashioned telephone set appeared quite prominently. People who saw this picture, and showed essentially no reaction were either visually illiterate, or were technologically undernourished. Those who laughed appreciatively were visually literate technical people who knew what computers and communications were all about. Those who got angry were clearly telephone bigots, while those who laughed outrageously were computer bigots. The visual appeared in Datamation. I leave it to you to guess which classification the editor fell into.

When this picture is shown to many engineers, they fail to respond, for their level of visual literacy is too low. Consider for a moment, the slides engineers use for illustrating a technical paper. Most could be made on a typewriter! More general audiences do get a considerable amount of enjoyment from the visual jokes. This suggests that many who are involved with the development of visual communications and interface technology are not really that well equipped to deal with the problem if appreciation of visual humour is a measure of any importance.

It has been argued that television is the trigger event that caused the quantum jump in visual literacy in our society. Television, however, is the one great example of a culture expressing its visual illiteracy! It is only rarely that the picture is used to express one aspect of a situation while the sound expresses another. TV sound makes fine radio. Our emerging visual literacy has not been strong enough to overcome the legacy left to TV by its parents, radio and cinema. In a similar vein, many astute observers of cinema suggest that talkies set that art back some fifty years. A notable exception to the common run of visually illiterate films is the Beatles' "Yellow Submarine". Some exciting things are beginning to happen in television, and every now and then the CBC comes up with an outstanding example that shows a high level of visual literacy both in its production and in its expectation of the audience.

It would seem as if the thing that triggered this visual literacy revolution is rather insensitive to the effect itself. This is really not too surprising. The significant effect of most great innovations has been visible only after much analysis, and seems only in retrospect to have any relation with the innovation itself. Lyn-White's case that the iron stirrup triggered a reorganization of European transaction patterns illustrates this point. One would hardly consider the iron stirrup an economic type thing. Yet that is the case he builds. Similarly, although television shows little evidence of visual literacy, it could well be the causal trigger.

Picturephone as a visual service seems to have been less than a success. The understanding of visual communications that was available when the decision was made to proceed was just not great enough to assure a successful service offering. The level of visual literacy of the subscriber rose considerably over the decade or so that it took to perfect the technology of Picturephone. Because the change was along an unmonitored dimension, the designers were insensitive to the impact of that change. Only recently have utility studies been done to examine the supposed value of visual communications in the Picturephone style. The studies, done by Alex Reid of London, have thrown serious doubt on that utility.

A Russian medical doctor made a series of brain lesion studies on Chinese victims of the Korean War. Similar studies had been done in the west, and a clear pattern existed between specific wounds and particular skill losses. A well founded relationship tied a certain type of wound and loss of the ability to read or write. The studies on Chinese victims established that different wounds affected Chinese literacy skills, and the wounds that eliminated literacy in Caucasians had no effect on Chinese literacy skills. It would seem as if the two forms of writing, phonetic and ideographic, are really quite different, even to the extent of involving different brain areas.

Marshall McLuhan claims our society is highly visual. His use of this expression is very confusing, for he is describing a characteristic for which we have no commonly accepted explicit terminology. He is referring to our propensity to organize in linear sequences. The prototype for this kind of behaviour, according to him, is the motion of the eyes scanning printed text, moving from letter group to letter group in slavish sequence. He suggests that the skill to associate a string of aural symbols with a string of visual ones, when very highly developed, inhibits the ability to directly associate meaning with visual symbols. Hence to the extent that a society devotes itself to phonetic literacy skills, it seems to lose its visual literacy skills. This does not seem to be disputed by our current knowledge of different cultures. The Japanese case is closest to providing a challenge, with its set of phonetic characters built into their basically ideographic writing form. This appears as an improvement over the Chinese system, and probably serves to increase the ease with which new ideas can be introduced into the written language. The predominance of characters appearing in text are ideographic. The phonetic ones are identifiable even to western eyes!

Our own situation seems to support his view of mutual exclusivity of the two forms of literacy. One can amass a considerable amount of data to support the case that our use of purely visual symbols and signs has increased considerably in the last decade. That this is not due to our bilingual situation alone can be demonstrated by a similar trend in the United States. Coincident with this trend has been a trend towards what McLuhan would describe as a more aural style of doing things, as opposed to his linear or visual way. Multi-screen presentations, simultaneity, doing several things at once, appreciation of surprise and a substitution of making for matching. Hence, as our visual literacy is rising, our visual orientation in the McLuhan sense is falling.

Given the implication that can be gained from the brain lesion investigations, it does not seem that there is any really basic reason for McLuhan's notions of mutual exclusivity between the phonetic and visual literacies. Perhaps with the combination of rising visual literacy and availability of computers and their supportive technologies, we can develop high levels of literacy in both the phonetic and visual modes.

Chairman Mao has decreed that the system of Chinese writing shall be simplified, that Mandarin shall be the universal dialect, and that a phonetic alphabet shall be developed. Much progress along this line has been made. While the Chinese are busy going one way, we seem bent on going the other. Eventually we may all end up with the Japanese trick of having both an ideographic and a phonetic form for written communication, but with a more equal emphasis on the two parts. It would be interesting to do an analysis of Japanese brain lesions to determine if particular wounds affect skills in one or other of the two sectors of their writing system.

Quite clearly the seeds for some very significant changes are germinating. Also, as in the case of Picturephone, the seeds of many disappointments. The complexities and subtleties of visual communications hold many surprises. The research necessary to remove the uncertainty from these surprises is to a large extent in areas that are not neatly context free, and many workers used to nice context free scientific methodologies will be distressed. The balance between performing the experiment and evaluating it becomes reversed, with evaluation consuming the lion's share of the resources. It is no longer a matter of determining if an experiment can be done or not, it becomes a question of whether or not one can afford to properly evaluate it. Overruns involving an order of magnitude error are not unknown in this evaluation area.

Editing as a concept is central to any communications means. As we talk, we are stringing together prestored verbal symbols in an online editing process in response to the ideas in our heads. On a computer terminal, one can create written material with almost as much ease. In the purely visual field, we have no techniques that are within a country mile of being as convenient. The Asian ideographic writing evolved to meet this challenge, given the brush and ink technology. Now, with the computer to aid in both the editing and teaching sectors, surely we can devise a really meaningful form of ideographic communication that greatly speeds and eases the access to stored human experience.

If you have ever tried to edit a television tape you will now understand why the content of television is so visually illiterate. It is only recently that television has become easy to edit. And then only for the very large production centres. The video tape manufacturers' total lack of understanding of the importance of editing has been very effective in containing the VTR "Revolution". One very notable and exciting ray of hope is the efforts of a group of dedicated souls in Montreal, started by the National Film Board, who call themselves Videographe. By bringing editing processes to the community, they have proven that ordinary people off the street can produce video material that is first rate. The common people have a sense of the visual that exceeds the professional's estimation. Subsequent funding of this enterprise has proven quite difficult. It is a most interesting case study.

We have before us what may be one of the great leaps forward, the development of a society that is proficient in both phonetic and ideographic communications, and is equipped with the tools to make both these forms of communication really effective. There are many problems. Our particular cultural limitations, our technological limitations and our limited understanding of language are but three. Canada is in an ideal position to lead the world in this effort. We have the technological resources, we even have the wealth, if we are careful, and some of our native people can teach us much about visual literacy. Hopefully, our television lathering of the Inuit won't destroy their visual competence.