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Language, Communication, Computers and the Law

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Articles

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I. *Introduction*

There is an old story about a drunken man who is looking for an object under a street light. A policeman asks him what he is looking for. "It is my keys", he says. "Did you lose them here?" "No, over there." "Why then are you looking for them over here?" "Because I can see here", is the man's reply.

The real significance of this story is very different from what it appears. It is not the man who is foolish but the policeman. We can only look for something from where *we* can see it. The alternative is to burrow like moles in the dark. But how can we find something that is not there? We can't of course, but we can get a perspective of it by following a ray of light as far as it will go. There are many lights and many perspectives, but no one absolute objective truth, or any one way of finding it.

What has this story to do with the topic under discussion? I want to make two main points with it. The first is that I hope it will excuse the inadequacy of my knowledge and treatment of the topic. This is the negative point; but there is also a positive one. We must not look for the essence of anything, or view it in terms of the conventionally established approach. There comes a point when this approach is exhausted, when it has nothing left to offer us, and our inquiry becomes self-defeating. The prevalent analytical approach to jurisprudence is a case in point; it is the complement of the legal positivism which it purports to analyse. The worst of it is not so much the slant of its own perspective as the blotting out of alternatives. By co-opting all "respectable" opposition, it becomes tyrannical.

Wittgenstein said: "A main cause of philosophical disease — a one-side diet: one nourishes one's thinking with only one kind of example."[1] Jurisprudence is supposed to study law in the round, from a distance. This requires a varied diet, a consideration of its various

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1. L. Wittgenstein, *Philosophical Investigations,* transl. G.E.M. Anscombe, Oxford, Blackwell, section 593.

aspects, and overviews from different perspectives. What does the a code of communication, transmits the social messages of the underlying ideology. The structure as well as the content of this code has been shaped and is constantly being reshaped by it.

Hopefully, to look at law from the novel vantage point of communication will be illuminating for the jurisprude and helpful to those who have ventured into the new field of studying the legal use of computers. Unfortunately *Computers and the Law* has itself become a ghetto where a handful of experts are working on techniques of legal retrieval. No wonder that in an era of money-making technology the wider questions tend to be ignored.

I am confident that if we are willing to pursue this new approach and do the necessary spade work, we will strike pay dirt. By looking at law from the perspective of communication, we can explore its links with another region which has been hidden by the prevailing essentialist cults. The topical question of the legal use of computers will also appear in a new light. If law is not merely a given system of rules and principles but also a means of communication, then it will be adaptable to computers where these are useful instead of remaining inflexible come what may. The real problem is not how to make computers serve the existing communication system of law, but how to improve this system with their help. Legislators, judges and administrators can all play their part to bring that about.

The question is not whether computers should be used for legal purposes. Computers are here and they are here to stay for the foreseeable future. We can no more go back to print than we can return to the oral tradition. One does not have to espouse the inanities of Marshall McLuhan to appreciate his point that the medium of print is not an absolute. On the other hand, we must not exaggerate the benefits computers can confer on the legal process. We only have to look around to see that the computer revolution is, if anything, hastening the demise of humanity instead of giving it a new lease of life. It would be vain to think that the irrationalities which are built into our ideological systems, of which the legal system is a part, can be remedied by the use of computers. But since they are here, we cannot ignore them, and it is as well to know what they can do and what they can't.

II. *Law as a Language of Signs*

Communication is made through signs, and in particular through

language, which is a system of signs for exchanging messages. student of jurisprudence get in fact? A selection from the established doctrines, and the false picture that the problem is to decide between them on rational grounds. The fact that in substance they are on the same side is consistently ignored. The arguments are over details and over abstractions which have lost all utility. Once we start off with the wrong questions, the answers scarcely matter.

I once thought that by reconnecting jurisprudence with philosophy it could be emancipated from its ghetto in the hinterland of law.[2] Initially the advent of "legal philosophy" certainly helped to introduce a new perspective, but the end result has been merely to raise new walls on worked-out philosophical foundations. An approach that has little to offer on its home ground may still prove fertile in other fields. Its general insights may shed light in all sorts of unexpected ways and help to break down the old barriers. Linguistic philosophy has made some valuable contributions to jurisprudence after it had ceased to be innovative in its own sphere. But now it is played out; we need new perspectives to lift jurisprudence out of its present rut.

Law is a complex concept which has many different aspects. To suggest that a particular perspective is useful is not to claim for it a monopoly of truth. I was careful to make this point when I put forward *my model* of the "legal point of view" which made no pretence to grasp the *essence* of law.[3] The fact that I shall here recommend another perspective and venture out in a new direction does not invalidate what I said before; it merely indicates its limits. By pointing out that law is *also* a system of communication I am not abandoning the "legal point of view" which is concerned with a mode of institutional social control through the effective application of a norm-system by the courts.[4] Nor am I thereby denying the conventional link between law and justice, though I would now stress its ideological nature.[5] Law by serving the legal point of view as

2. R. A. Samek, *The Legal Point of View,* New York, Philosophical Library, 1974, p. XV.
3. *Supra* fn 2, p. 86.
4. *Supra* fn 2, pp. 87-88.
5. R. A. Samek, *Justice as Ideology: Another Look at Rawls,* (1981), 59 U. of T.L.J. 787, p. 810. It is important to distinguish between two meanings of "ideology". According to the first, it denotes what Marxists describe as the "false consciousness" of the superstructure of a society which includes its political and legal system. According to the second, it stands for the basic ideas which lie at the foundation, without any judgment as to their objective validity. I shall use "ideology" here in the second sense. See *ibid.,* p. 387.

Language is the medium, not the message. A message is a *signal* sent through the signs of language. No sign can stand on its own feet; it is part of a language of communication and derives its meaning from it. Even body signs are part of a language, and not discrete entities.

The famous 19th century French linguist Ferdinand de Saussure pointed out the arbitrary nature of signs. There is no intrinsic connection between what he calls the "signifier" and the "signified" which together constitute the sign.[6] A table happens to be signified by the sound (and the letters) of "table", but it might have been signified by "lam", which is not to say that there are not historical (as distinguished from logical) reasons why the signifier is called "table" rather than "lam". Language for Saussure as for the latter Wittgenstein is not a collection of names that denotes separate objects but a rule-governed working system in virtue of which certain signifiers are used. Particular words only make sense as part of a language, and not the other way round. It is interesting to note that already Bentham took this line, and that he pointed out the dependence of individual laws on the complete legal system of which they formed part.[7]

Saussure draws a crucial distinction between *"langue"* and *"parole". Langue* is the conventional system of communication which underlies and is activated by the speech acts of *parole.* In a natural language, *langue* and *parole* are organically linked. In Wittgenstein's terms, a language-game[8] is played by triggering the potential of *langue* with the speech acts of *parole.*[9] The speaker uses the prescribed sounds in the prescribed manner in order to communicate messages to the recipient.

Written verbalization is still parole; it fulfils the same role as speech acts by drawing on the code of the language through which the message is sent. The distinction between *phonetics* and *phonology* illustrates the difference between *langue* and *parole:* the former is

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6. F. de Saussure, *Course in General Linguistics,* transl. W. Baskin, London, Peter Owen, 1960. For an introduction to his work, see J. Culler, *Saussure,* London, Harvester Press, 1973.
7. J. Bentham, *An Introduction to the Principles of Morals and Legislation,* ed. S. H. Burns and H. L. A. Hart, London, Athlone Press, 1970, p. 301.
8. A "language game" consists of language *and* the actions into which it is woven. Wittgenstein, *supra* fn 1, section 7. See also Samek, *supra* fn. 2, p. 5.
9. This distinction is by no means free from difficulties. See Culler, *supra* fn 6, p. 30.

concerned with the sounds of speech acts, while the latter is concerned with the logical distinctions in the meanings of the sounds so made. For instance, the addition of an "s" sound may change the singular of a word to plural.

Langue is not so much the technical grammar of a language as its logical or deep grammar which is harnessed by the speaker to communicate information. A message is sent by a speech act of *parole* in the appropriate form of *langue* which provides the code for its transmission. The message is assembled by a combination of signs which excludes other signs. Take the speech act "The table is in the room". The receiver will learn from it, *inter alia,* that there is one object — *not* two, and *not* a person — in an enclosed part of a house, which has usually four legs and a top and can be used for eating or writing. The "information content" of the message is the difference between what the receiver knew before and after the message. The phonetics of the speech act are "arbitrary" in the sense of being logically independent of the meaning transmitted by them.

Applying Saussure's distinction to law, we may say that its *langue* consists of the code of legal conceptual schemes,[10] and its *parole* of legal speech acts. The code of legal conceptual schemes is built on criteria of opposition and combination. E.g., the legal speech act "A is a bailee" refers to the legal conceptual scheme of "Bailment" and potentially to such other legal conceptual schemes as "Contracts" and "Torts" which intersect with it. By using the above speech act the speaker communicates to the receiver a message from which he will learn, *inter alia,* that certain goods have been delivered to A on the condition that he return them, that he must take reasonable care of them even when he is not paid, that he may keep them as security for payment but does not have to keep them indefinitely.

Although the *parole* of law overlaps with that of ordinary language, law has its own *langue.* This is where the lay person makes his mistake; he assumes all too frequently that because much of the *parole* of law sounds ordinary, it refers to the *langue* of ordinary language. E.g., if a lawyer says to a client "you should have a will", he speaks to her in the language of the law and refers to the legal conceptual scheme of "Testamentary dispositions". The lawyer, we may say, uses the *parole* "will" to advise a client in the *langue* of the pertinent

10. For an account of "legal conceptual schemes", see R. A. Samek, *Unjust Enrichment, Quasi-Contract and Restitution: A Study in Organizing Legal Rules,* (1969) 47 Can. Rev. 1, p. 3.

legal conceptual scheme to sign a document in proper form that will give effect to his testamentary wishes. But if someone says in conversation to another "you should have a will" this speech act may refer to the much vaguer legalese "making a will" in ordinary language, or to "volition", "you should have a will of your own".

Legal presupposes ordinary language at every turn; it simply could not be understood without it. However, a distinction must be made between the ordinary and the specialized use of a natural language. When a person speaks as a specialist from the point of view of his specialized field of interest, his *langue* is "bent" or slanted by that point of view.[11] E.g., if a lawyer states that someone has "possession" of a chattel, he uses this term to communicate a message which differs from that normally sent by this sign. The difference is not merely in the meaning of the term; it is in the language of communication that is being used. A sign has no independent meaning apart from the code to which it belongs. The meaning of ordinary words or concepts are determined by their use in the ordinary language code; the meaning of legal words or concepts are determined by their use in the legal code. Not only does the *langue* of law have its own code; it presupposes the operation of an institutional system of which it is an integral part.

Since law is a language of signs, it must communicate through it something other than itself. The content of the message differs from the code through which it is sent. Compare "the table is in the room" with "A is bound to sell Blackacre to B". In the first example the speaker informs the receiver that something is the case. The receiver's information about the world is increased, not his information about language. In the second problem the receiver of the message is informed *inter alia* that certain social, not just legal consequences will follow if he repudiates his agreement. His information about what he can and what he can't do with Blackacre is increased, not his information about property law.

It is of course possible to communicate a second-order message about the language of a code through the code. I can give information about the grammar of a language or about the structure of the legal system, but this is not the normal object of the exercise. If law is a language of signs for communicating social messages which serves the legal point of view, the content of these messages must be social rather than legal. Even if we look at law in terms of the enforcement

11. Samek, *supra* fn 2, p. 38.

of certain norms by the courts without treating it as a system of communication, the content of these norms must be something other than law; it must be social, not legal.

Law is "secondary" not in the narrow sense stipulated by Hart in regard to its secondary rules of recognition, change and adjudication,[12] but in the sense of being essentially procedural. The content of legal rules is not law, or the system would turn on itself. A law which provides legal procedures solely for its own enforcement has lost sight of its social function. From the legal point of view the specific social content of legal rules is irrelevant whether we think of law as a system of sanctions or of communication. We may say, that law is neutral in the sense that it provides a code for transmitting social messages regardless of their specific content, though this will be determined by the prevailing ideology.

There is another way in which law is "secondary". If we look at law as a social practice, it presupposes a lower level practice which is regulated by it. E.g., criminal law presupposes a criminal practice which has as its object to control.[13] By analogy, a system of communication presupposes a lower level social practice which generates information that has to be communicated.

III. *Communication through Computers*

If law is regarded as a language of signs for communicating social messages, the role of computers will be merely an element in the communication process in which law is involved. This means that there is nothing sacrosanct about the existing legal code of communication. The crucial question is "what can be done to enhance the effectiveness of the legal code through the use of computers?" Efficiency obviously has an important economic aspect. An expensive computer might do a great deal for the speed and precision of handling legal information, but it would be useless for lawyers who could not afford to employ it.

The operation of the digital computer, that is one which works with numbers (digits), can be explained initially by analogy to a telecommunication channel. There is an input of information which is coded, transmitted and decoded for output. The code must be fundamentally simple, or it could not be handled effectively by a

12. H. L. A. Hart, *The Concept of Law,* Oxford, Clarendon, 1961, Chapter V.
13. R. A. Samek, *Case for Social Law Reform,* (1977) 55 Can. Bar Rev. 409, p. 413.

machine.

The Morse code is often used as a convenient starting point. It has an alphabet of only two elements — dots and dashes — which can be translated into a binary code of 1 and 0 without difficulty. All we need to say is that "1" means "current on" and "0" means "current off". Electrical pulses can be used to transmit messages by encoding letters, numbers, punctuation marks, parentheses, and instructions to the computer, e.g., in a "five bit" code. A "bit" is a unit composed of the symbols 1 (on) and 0 (off) which may be grouped in numbers of five, 00001, 00010, etc. Unlike morse taps, electronic pulses will not be sent sequentially but contemporaneously over five or more channels, one for each number of the code.[15]

The function of the digital computer is not merely to communicate messages coded for speed and precision, but to operate certain "programmes" which are fed into its data base. Nevertheless, the resulting computations and problem solutions still have to be communicated if only to the user. It should be noticed that ordinary language differs from the computer in that regard more in degree than in kind. If it could not carry out information processing and problem solving it would have precious little to communicate.

To revert to the mechanics of computer operation, the "programmes" are known as "software". The "hardware" of a general purpose (sequential) digital computer consists of the "memory", the "central processing unit" (CPU), and the "peripheral equipment". The memory holds the data base and the programmes. The CPU has two principal parts: the "arithmetic unit", and the "control unit" which oversees the progress of the stored programme. The peripheral or I/O (input-output) equipment enables the computer to communicate with the outside world through its terminals.[16]

Originally when a programmer wanted to place an instruction into his programme, he had to convert it into a code number and then insert it into the computer's memory. But now he can get the computer to translate the "assembly" language into its "machine" language by programming it to do this beforehand. The software made the machine behave as if its hardware were able to accept directly natural

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14. This was invented by the American Samuel Morse in 1837.
15. For an elementary introduction to computers, see R. Lohberg and T. Lutz, *Electronic Brains,* transl. K. T. Dutfield, New York, Sterling, 1965.
16. B. Raphael, *The Thinking Computer,* San Francisco, W. H. Freeman, 1976, pp. 6-10.

language commands in the instructions. Still, each brand and model of computer had its own special assemblers which was determined essentially by its underlying hardware.

The next big step forward was the design of programming languages purely from the point of view of the classes of problems to be solved without regard for the hardware of any particular computer. For instance, FORTRAN (FORmula TRANslator) was invented as a convenient language for scientists and engineers who need to perform many algebraic calculations; and COBOL (COmmon Business-Oriented Language) for business record-keeping operations.

The remaining problem was how to teach existing computers, whatever their machine languages might be, to understand these problem-oriented languages. The appropriate software can make any general-purpose computer accept any well-defined formal language. A "compiler" behaves like a very clever assembler; it scans a programme in the problem-oriented language and translates it into the desired machine-language programme.[17]

There are limits even to the most sophisticated hardware and software. No problem can be solved by a computer unless it is well defined. One advantage of using computers is that it forces people to clarify their own fuzzy thinking, though often the very nature of the problem prevents it from being stated in a form clear enough to be handled by a computer. Problems are rarely solved in the terms in which they are initially expressed. Instead, it is common to choose another data domain through which the problem can be represented. By selecting an appropriate "representation" the original difficulties can be avoided. If it has been well designed, the solution of the idealized problem can be translated into a solution of the real one.[18]

IV. *Information and Problem Solving*

Information is that which is communicated by the source to the receiver, not the communication itself. The receiver gains information and now has something, or if we look at the total, more of something than he had before. This gain is brought about through the medium of the code in which the information is transmitted. In the context of telecommunication and computers, information is generally looked at quantitatively and not qualitatively. What counts is the *rate* at which it can be transmitted over a channel, how much can be packed

17. Raphael, *supra* fn. 16, pp. 14-17.
18. Raphael, *supra* fn. 16, p. 32.

in to maximize communication. The value of a neutral unit of information varies in inverse proportion with the degree to which it clogs up the communication channel. For instance, in the Morse code the most frequent letters were given the shortest symbols, so that the longer ones could be reserved for the units of greater information, thus utilizing the channel to the maximum.

The following illustration should make clear the relevance of this perspective to computers. Suppose I am told that there are eight files in a filing cabinet in one of which is the document I am looking for, and I want to locate it with the minimum of questions. Clearly the wrong way would be to ask "Is it in file one, two, three, and so on?" The most economical method is to divide the files into two lots, one to four, and four to eight, and to ask "Is it in one or the other?" The process can then be repeated until the document is found. This is essentially how a computer operates to get to the required location in its memory as quickly as possible. The choice is really made on probability; it is assumed that the chances of the right file being in the first lot is equal to its being in the second, and so on. The alternatives must be equally likely, or the amount of information in a message which we are practically sure of getting would be the same as that in one which is quite unexpected.[19]

In the above example, the task was one of *selecting* the right information in the smallest number of stages. The information may also be used not to select but to build a picture. Suppose we are taking readings on a measuring instrument. The first problem here is to represent in symbolic form what we believe to be the case. By means of observation we build up a picture step by step. In this case what we acquire is *descriptive,* not *selective* information. The procedure which gives us the most descriptive information will be that which builds up the best and most reliable picture. E.g., a more powerful microscope gives us more information about what we can see through it than a less powerful one; it gives us more descriptive (structural) information.[20]

The distinction between descriptive and selective "information content" is important for the legal use of the computer. Simple information retrieval has a merely selective information content. The operator is concerned to select e.g., the right headnote of a case from

19. D. M. MacKay, *Information, Mechanism and Meaning,* Cambridge, M.I.T. Press, 1969, p. 12.
20. MacKay, *supra* fn. 19, pp. 12-14.

the wrong ones in the most efficient manner. But if we rely on the computer to actually help us solve a legal problem, we require a descriptive information content to build up a picture of the part of the legal conceptual scheme in question. Any more sophisticated programme involves feedback, and interaction between the user and the computer. In this way information is built up "brick by brick" with the user at the controls.

It has been said that there are two complementary ways of viewing any problem-solving task.[21] One is based on *recognition* in the search space of something that seems to shout "I'm the answer". Then this selection must be justified. The other approach is one of *derivation.* In this case the solution is derived from a particular representation of the problem by means of some highly structured procedure, such as logical or mathematical transformations. *Pattern recognition* is the best known example of the first approach. Computers are used to recognize patterns of data, such as printed characters or the sound of spoken words.

So far as the legal use of computers is concerned, the derivation approach is only useful in the most routine case. The lawyer looks for recognition of something in the search space that will if not give him the answer, at least put him on the right track. He will not normally expect the computer to actually work out a problem for him from a to z. Having found a *prima facie* solution he will want to test its validity against other alternatives by feedback of selected areas of the data base. We must not make the mistake of taking subsequent legal justification for the reasoning process which results in the solution. Whatever the processes of reasoning and of justifying may be, they are rarely identical.

The lawyer's crude pattern recognition, aided by computerized browsing of the search space, is very different from the highly technical field of scientific or statistical pattern research. Not only is it difficult to specify patterns of legal doctrine; such patterns leave out of account the often determinant policy considerations and apparent vagaries of judicial behaviour. Particularly in regard to the latter, statistical pattern recognition may prove invaluable, though it should be noticed that a judge's behaviour may shift with a change in individual or collective circumstances.

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21. Raphael, *supra* fn. 16, p. 98.

V. *Legal Classification*

To classify is usually to assign a new sample to a known class or category under an established system of classification. There are innumerable systems of classification, and an infinite number of things that can be classified. In first order legal classification fact samples are assigned to legal categories through the code of legal conceptual schemes. The classification is "decisional", not mechanical; in many cases a sample may be assigned to more than one category. In second order legal classification samples of legal categories are assigned to higher legal categories, e.g., the categories of "offer and acceptance" are assigned to the higher category of "formation of contract".

"Classification by example" is not limited to law. Scientific categories, for instance, may be established in this way rather than by relying on an objective characteristic of a sample that puts it clearly into one category or another. A sample may not quite fit any of the established categories. A scientist then must decide whether to force it into the system by picking on the closest known category, or changing the system by creating a new one. If he is too willing to add to the categories, then the system will lose much of its descriptive value; if, on the other hand, he is to conservative then the system will be too rigid. Another complication is that any basic change may have ramifications throughout the system and previous classifications of samples may have to be revised.[22]

The doctrine of *ratio decidendi*[23] is based on reasoning by example. Since precise boundaries between legal categories cannot be drawn, it is not possible to assign a new sample to one category rather than to another *merely* by analysing competing examples. Similarly, the new sample cannot be subsumed *without a decision* under one prototype rather than under another. To these difficulties must be added the multi-dimensional nature of legal problems. Even from the legal point of view, fact situations may raise several issues and may be subsumed under several legal categories either within one legal conceptual scheme or several. E.g., a sample fact situation may be assigned to "offer and acceptance" or "consideration" in Contracts; to "misrepresentation" in Contracts or Torts; or to "mistake" or "unconscionability" in Contracts or Restitution.

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22. Raphael, *supra* fn. 16, p. 100.

23. For a critique of this doctrine, see R. A. Samek, *The Dynamic Model of the Judicial Process and the Ratio Decidendi of A Case,* (1964) 42 Can. Bar Rev. 433.

The plaintiff cannot bring several actions on the same cause, but he can plead in the alternative: e.g., if not Contracts, then Torts; and if not Contracts and Torts, then Restitution. Moreover, if, as I have suggested, we adopt the "synthetic approach" and give weight to the different perspectives which lie behind the different legal conceptual schemes, a fact situation may be classified as one that involves Contracts, Torts *and* Restitution. On this approach the case is disposed of by calling on the resources of *all* these conceptual schemes to contribute in various degrees to the solution. I have claimed that the synthetic approach is in fact followed informally by many judges.[24]

If we look at law as a system of communication, the problem of classifying may be described as one of translating ordinary language statements about facts into the legal code. The lawyer may be compared to an assembler who translates natural language into machine language so that it can be processed, only here the processing language is law. Once the lawyer grasps that he is using a code when he does his stuff, a further reprocessing through an auxilliary electronic code should not frighten him off. The only question is how easily such a code is accessible technically and economically.

For legal communication to be successful the message must be retranslated into ordinary language and describe the social consequences of the legal result. A legal solution is worthless unless it can be understood by the client it must reach. Similarly, a computer must ultimately serve the consumer who employs it. Of course, I have been oversimplifying. Legal language *is* used for many purposes and to communicate many different things; in Karl Llewellyn's words, there are many "law jobs" to be done. A lawyer who appeals a case may only be interested in a point of law, and so may the judge. Ultimately, however, the legal code must communicate social messages if law is to be a social system of communication.

VI. *Artificial Intelligence*

The "artificial intelligence" of machines is contrasted with the natural intelligence of persons. At the same time contradictory claims are made about the capacity of machines to simulate human intelligence. On the one hand computers are dismissed as mere tools of man,

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24. R. A. Samek, *The Synthetic Approach and Unjustifiable Enrichment,* (1977) 27 U. of T.L.J. 335.

while on the other hand man himself is turned into a machine that differs little in principle from high powered computers. As to the first claim, the computer is of course a tool in the wide sense of having been created by man; computers are not yet born.[25] But it does not follow from this that computers are simple mechanical tools which can only deliver that which has been fed into them.

In an age of increasingly sophisticated electronic machines with multiple feedback devices, the computer can be used not merely to store and process information, but to learn from its "mistakes" within the framework of an overall programme which it is itself filling out. Far from being conscious of every move that the computer makes, the user is often relying on it to spare him the trouble of getting involved in the details of the operation. A computer's central memory may be deliberately shielded from overload by auxiliary storage systems which can be tapped automatically when the need arises, and whole subroutines may be developed which remain independent of the computer's central programmes.

Looking at the other side of the coin, there is a limit to what can be done by the most sophisticated computer. This is not merely so by virtue of the impossibility in many cases of working out effective procedures or *algorithms* as they are called. After all, what constitutes an effective procedure will vary from case to case, especially in interactive programmes which enable the operator and the machine to increase each other's effectiveness. Kurt Gödel has shown that no formal system can ever be complete in itself.[26] Man is primordial. He may create a computer that will destroy him, but it will remain dependent on his programmer. Natural intelligence can never be *reduced* to machine language, for the language of instruction cannot be reduced to the language from which it is constructed.

The fact that human beings may be regarded as neuron, homeostatic or other systems does not turn them into machines. If they are "machines", then they are of a different order with senses, emotions, memory and language so finely tuned that no artificial intelligence can take their place. Above all, the irreducible "feel" of human existence cannot be duplicated by any feedback device,

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25. But they will be when genetic engineering computer-designs embryos. God help us.

26. See, e.g., J. Weizenbaum, *Computer Power and Human Reason,* San Francisco, W. H. Freeman, 1976, p. 221.

and is far too "vague" to be within reach of any effective computer procedures.

The transcendent nature of man is reflected in the transcendent claims made for law. As long as law wears the mantle of justice, it cannot be locked into a computable set of rules, or predictions about judicial behaviour. Both these perspectives are useful as means but harmful as ends.[27] The intuitive hunch of a good lawyer can never be embodied in a computer programme, but it can in many cases be exercised more effectively with its help. The formal aspect of law is merely the tip of a social iceberg. Hence to simulate "legal" decisions requires more than a legal data base. The complexities of using computers to arrive at correct doctrinal decisions pale before the task of computing the underlying social considerations. Again this is not to say that the computer is useless for this purpose. Artificial intelligence can greatly enhance natural intelligence as long as it is not misused to replace it.

VII. *Teaching the Computer How to Learn*

All learning can be said to be by feedback, that is by profiting from the result of past experience. Computer-learning may be either self-learning through a programmed learning system, or learning interactively through dialogue with the user. In neither case do we use the computer merely to retrieve some information in a given memory space; we utilize its memory through feedback to achieve a desired result. The user relies on the computer to find the best technique for realizing it. We can draw an analogy here with an automatic guided weapons system. The computer works out the trajectory under the guidance of a general programme to find the target.

Simply transferring data into a memory so that it can be retrieved if required, such as entering a list of names of employees, salaries, and addresses, involves minimum feedback and learning. Updating such a list is more demanding and could be described as goal-directed. The goal would be to keep files up-to-date by comparing the new data with the old and changing them where necessary. But unless the computer is given a free-hand to develop its own method for

27. The human propensity is to displace concerns about ends with concerns about means. See R. A. Samek, *The Meta Phenomenon,* New York, Philosophical Library, 1981.

bringing about this goal, we are telling it what to do, and not how to learn from doing its job. The name of the game is trial and error. The computer puts its "mistakes" to use for perfecting its search techniques, not just to terminate the search.

There is a good deal of middle ground between regarding the computer as a mechanism for primitive information retrieval and believing that it can replace the human user. At present far too much emphasis is placed on its immediate cash value to the practitioner, though this is understandable seeing that he pays the lion's share of the bill. Once we recognize its enormous value for legal scholarship, the present state of the art will be perceived merely to scratch the surface of its potential. We are still looking at computer use through the wrong end of the telescope. Its real challenge is not to mechanize manual research; it is to re-examine the very ground on which we stand. For instance, by getting the computer to analyse statistically different elements of the judicial process, new light will be shed on the relationship between doctrine and judicial behaviour.

The suppression of the crucial part of ideological values in judicial decision making hides its real nature. What is truly frightening is not so much the use of the computer for making legal decisions as limiting it to a restricted legal data base. The legal and other uses of the computer are not mutually exclusive. The problem is not to teach the computer to "think like a lawyer," that is to reduce social to legal phenomena and solutions, but to reverse that process.

I have suggested that law is a system of communication. This does not mean that we should accept its signals uncritically. Like any language, law carries the messages which are in keeping with the society it serves. Although the lawyer is dealing in social values, he perceives his role through the distorting mirror of the prevailing ideology. The seeming autonomy of the legal point of view exemplifies this truth. By enlarging the computer's data base we can help to lift the legal veil. On the other hand, it would be absurd to look to the computer for changing the social content of the communication system of law. As is only too evident, it too is the servant of the ideology which has created it. The most we can hope for is that the informational revolution will prove so radical that it will break its own chains.

VIII. *QUIC/LAW, WESTLAW and LEXIS*[28]

There are two main electronic legal retrieval systems in use in North America, the Canadian QUIC/LAW (QL/Search) on which the U.S. WESTLAW was built, and the U.S. LEXIS system. All use digital computers to search their data banks for words, phrases and numbers. QL Systems was incorporated in 1973 to carry forward work commenced by the QUIC/LAW project at Queen's University. Since then, it has developed the first Canadian commercial information retrieval system. Its data base contains the full text of federal and some provincial Canadian statutes, the headnotes of the Supreme Court of Canada and Federal Court Reports plus those of some provincial reports, and other materials. The system may be entered by questions in ordinary language and by key words and phrases.

WESTLAW has a much larger data base, and its *Full Text Plus* system now contains the full text of statutes and cases as well as an indexed system of headnotes and synopses. The introduction of the new system deprived LEXIS of its main advantage as the only full text system of cases in North America. Now it is left with the disadvantages of not having an indexed system of cases. Each headnote in WESTLAW is classified under the West's system of Digest Topics and Key Numbers. You can use the Digest Topic and Key Numbers as part of your search request. This, WESTLAW claims, is important when there are many alternative expressions for a particular term, or when you want to exclude certain legal subjects from your search.

The headnotes in WESTLAW have a uniform style for citing statutes and courts' rules as compared to the full text of decisions which use different citation styles. By using the appropriate citation you will retrieve all relevant cases that construe a statute or court rule. You can also evaluate cases faster because the synopsis at the beginning of each case gives you a concise overview of the decision.

WESTLAW assigns a relevance value to each headnote by computing how closely it matches the search request in word usage and frequency, and then displays each in order of relevance. But it should be noted that this relevance is verbal and not conceptual, with the result that frequently conceptually irrelevant headnotes are listed first. In both systems searches for cases may be made by the

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28. I would like to acknowledge gratefully the information made available to me by the companies concerned.

name of the case, or by the name of a party or of a judge, and the search may be limited by the level of the court, by the state and by a date or range of dates. In both systems the search space may be restricted by patterns of key words. In WESTLAW this is defined by sentence or paragraph only. LEXIS offers the KWIC (Key Word in Context) format under which the search words appear in a window with about twenty-five words on each side. Both systems provide instant citation services, including past and future cites of the search case, comprehensive cites of statutes and regulations, parallel cites and cite verifications, and Shephard's citations.

This is not the place to compare the above systems in any detail, but short of proving that WESTLAW's indexing is useless or uneconomic it must give that system the cutting edge. The issue is no longer whether an indexed or a full text system is better. No index is fool proof. What is more, it narrows the ambit of its search to its scheme. Not only does it impose a particular structure on legal phenomena; it promotes a legalistic view of the judicial process.

No good judge stays within the framework of legal classifications even though he uses it to justify his decision. A full text system has the advantage of tracing factual connections which escape a legal index. Take LEXIS' example of "leaving an ignition key in an unattended boat". Such patterns may prove valuable in a search independently of the legal concepts and principles involved. Fact pattern searches are not only, as LEXIS claims, particularly useful in areas of law where principles are well defined and cases are decided on nuances of fact; they are also useful in the converse case where the principles are so ill defined that the facts cry out for classification.

LEXIS' claim that hierarchically organized indices are ill-suited for finding cases involving two or more fields of law, e.g., Tax and Contracts, requires further elaboration. Certainly valuable time can be saved if we can retrieve the precise precedents in a well defined boundary area by embarking on a search of a combination of these words in a text. But this search may in practice turn up more irrelevant cases than an index. Moreover, the very choice of such search words as "Tax" and "Contracts" presupposes an index of legal classification without which even the most precise precedent could not be interpreted.

It is of course true that the search words may not be in the index because of its structure or because equivalent words have been used. But the converse may also be true; these words may not be in the full text either. The question is not whether an indexed system is

adequate, but whether a full text system is so. I suggest that it is not. Whatever we may think of legal classifications, we cannot ignore them. Valuable and cathartic as American Realism was, it did not recognize the communication function of law and threw the baby out with the bathwater.

Saussure's distinction between *parole* and *langue* can be used to demonstrate the need for a legal index. I have said that the *langue* of law consists of the code of legal conceptual schemes, and the *parole* of its speech acts. We cannot remain on the phonetic level of words because on that level they are not signs for anything. The advantage of an index is that its keys provide an established route to the legal code and its authoritative sources, though not necessarily at the first go to the right part. This is why an interactive system is so important. It enables us to select in a dialogue with the computer the relevant part(s) of the legal conceptual scheme(s) and of their source materials.

Initially the connection between the facts and the legal code can be made through technical words like "detinue" or semi-technical words like "trespass", or through apparently ordinary descriptive words such as "handicapped". Sooner or later a merely descriptive link must be translated into legal language. Even if the appropriate part(s) of the governing legal conceptual scheme is reached by ordinary search words, it cannot be "milked" except in the proper legal way.

In some cases it may be easier to locate the relevant part of a legal conceptual scheme and its source materials by a descriptive expression. For instance, in a problem involving a "seeing-eye dog" it may be quicker to search under that expression than to look at a legal index under "human rights" and "blind". But a good index should contain this expression under "blind". Conversely, if we have to search the full text of statutes and cases for "seeing-eye dog", this will sooner or later take us into human rights legislation. We must use the legal code to get its benefit.

A full text system can never take the place of an index. It is no use having maximum recall of the occurrence of certain words or phrases at the price of a maximum retrieval of irrelevant material. As I have stressed, we are not merely concerned with the *parole* of these words and phrases, but with their value as signs in the *langue.* Since there is always more than one *parole* route to these signs, there is nothing to assure us that the search words and phrases are precisely those which have been used by all judges and legislators in referring

to the *langue* of the legal conceptual schemes. Short of having a thesaurus of synonyms and antonyms, generalizations and particularizations, and grammatical and orthographical variations, we cannot put our trust in a full text system.[29] The criticism that any indexed system has gaps is balanced by the equally cogent objection that this is true of full text systems as well.

To sum up, an indexed system has the advantage of providing us with a shortcut to the desired part of the legal code and its source materials. It does seem rather senseless to shut our eyes to its existence and then to try and get inside it through verbal mechanics. In terms of Saussure's distinction, it is like trying to understand *parole* by ignoring its connection with *langue.* Since no index system is perfect, a full text back-up system is certainly useful, but this is no reason for not putting first things first. WESTLAW's criticism of a merely full text retrieval system does not go to the heart of the matter. The crucial trouble with an unindexed system is not that descriptive search words may not connect up with legal materials, but that unless we use them as signifiers in relation to a legal index, they cannot fulfill their functions as signs of a code.

It does not follow from what I have said that an indexed system is adequate for predicting the outcome of legal decisions. Judges, as I have already indicated, do not act on doctrine alone. The American realists were right in criticizing the singular naiveté of that view. But we must not go to the opposite extreme and dismiss all doctrine as worthless. As things are, counsel will still have to argue his case largely in terms of conceptual schemes, and judges will have to *justify* their decision with reference to the authorities. Hence, though we may suspect the large claims made for the legal code, we cannot afford to do without it; and if the computer can help us in that regard, so much the better.

IX. *Electronic v. Manual Retrieval Systems*

Electronic retrieval systems have four main advantages: speed, precision, convenience and economy. Obviously, not any system, let alone the most expensive one, will be rewarding for any lawyer. In a capitalist system the economic factor is paramount in practice. We must look at the total budget of a law office in terms of its

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29. C. Tapper, *Legal Information Retrieval by Computer: Applications and Implications,* (1974) 20 McGill L. J. 26, p. 33.

human and material resources, and then undertake a cost benefit analysis which will include the cost benefit of automated management and retrieval services. Computers must not be treated in opposition to manual search, and the costs of legal retrieval must not be calculated in isolation from the other expenditures.

The old DATUM system developed by the University of Montreal between 1963 and 1973 relied on a "service centre" instead of installing a computer in the user's office.[30] This carried out comprehensive research which was not limited to automated retrieval. In some cases it will be advantageous to contract out research, particularly for small firms which lack the necessary resources or skill or volume to do it economically themselves. Even large firms which are linked to a computer may find it economic to rely on service centres for certain parts of their work. For these reasons the question whether or not electronic research should be done by specialized service centres or by private firms is misleading. Similarly, what personnel in a firm should use the computer will depend on the circumstances and the kind of retrieval that is conducted. With the simplification of assembly languages the actual physical training will become less and less onerous. On the other hand, computer assisted legal retrieval will always demand some skills that must be acquired in practice.

The present trend is very much in favour of computerization since each year the relative cost of computers is decreasing. But this does not mean that we should merely mechanize the old manual techniques. We do not construct a modern rail system by modelling it on the horse and buggy, and when we use a plane we expect to fly to our destination, not to roll there on the ground. Just as there is no one transportation system so there is no one communication system which is best. "Best" must always be limited to what is best for the purpose in hand, given the available resources. To fly a short distance may be more trouble and expense than it is worth. It goes without saying that there is no reason for confining oneself to any one system, except on purely economic grounds. Surely the best system in many cases will be a mixture of what is available.

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30. C. Fabien, *Computerized Legal Research in Canada,* working paper, Automated Legal Research, 1979, p. 2.

X. *Simulating Lawyers' Reasoning*

In a plea for interdisciplinary work between lawyers and computer scientists, B. G. Buchanan and T. E. Headrick remark that legal information retrieval has been hampered by two misconceptions.[31] Lawyers have viewed the computer as at most a storehouse from which cases and statutes might be retrieved by well designed indexing systems. Computer scientists, on the other hand, have viewed law as a collection of facts and correct legal principles, and assumed the computer to be most helpful when it could retrieve the right answer quickly. But the lawyer, the authors state, hardly ever looks for clear answers: more often than not he constructs legally acceptable arguments in the pursuit of objectives. Interdisciplinary research could lead both to a greater understanding of the legal reasoning process and to the design of machine methods for performing parts of it.

After mentioning the difficulties of turning simple key-word searching into sophisticated natural language communication, the authors stress the need to break down intuitive legal reasoning into clear sets of sub-problems. This is bound to prove unsettling for the lawyer who will be aware of the gap between what he wants to say and what the rigourous demands of machine language will let him say. Even after one machine-readable representation has been found for a class of problems, this will not necessarily be the best for all of them. The lawyer must be prepared to experiment with alternative representations.

The authors distinguish between two models of creative legal research, though they admit that so little is known about the process that they are necessarily oversimplified and incomplete. In the first model, the fact situation has been set and the client wants to know what his remedies and risks are. In the second model, a client is planning a future action and can control the chain of events to some extent. His objective is not merely a favourable legal result, but a combination of legal, business and other goals.[32]

The existing retrieval systems, Buchannan and Headrick contend, help only on the periphery of the processes described in both models. They retrieve cases and statutes that are potentially relevant. Ideally the lawyer would not want from the computer mere lists of statutory provisions and cases related to legal concepts that may help him

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31. B. C. Buchanan and T. E. Headrick, *Some Speculation about Artificial Intelligence and Legal Reasoning.* (1970-71) 23 Stan. L. Rev. 40.
32. Buchanan and Headrick, *supra* fn. 31, p. 47.

put together an argument or design a new search. He would want a system that would produce legal arguments — the end products of his search. To begin designing such a system, the authors say, we have to know more about the mental processes of a lawyer. Only then can we begin to structure the processes a computer could imitate.

According to Buchanan and Headrick, the lawyer first establishes and pursues a goal: he seeks some satisfactory legal result for his client. There are some crucial steps in this process: one is his perception of linkages, of how a set of facts calls into play a rule, which then calls into play another rule. Another is his decision about whether an indicated legal result is compatible with his goal. If it is incompatible, he will reject the rule by distinguishing the facts, and choose one that will serve his goal better.

It should be noted that what the authors have in mind when they speak of the lawyer's first mental step in terms of realizing a satisfactory "legal" result is one that produces the social consequences best suited to his client's case. Similarly, when they describe the lawyer's second mental step as a process of fact recognition and characterization, they emphasize that the "facts" are interpreted adversarily and that there is no uniform way of recording them. By the same token, the authors point out that the lawyer's third mental step of rule selection from the facts is result-oriented, and that more than one rule may be chosen from the same facts. Finally, they make a similar point about the lawyer's fourth mental step of drawing analogies through the generalization of a legal rule.[33]

In view of the authors' admission that none of these steps is clear-cut, it is surprising to find them so sanguine about applying a scientific computer programme to them. In the absence of efficient procedures, it is hard to see how such a programme can possibly work. This is presumably what W. E. Boyd means when he states that legal data are not as easily labelled as scientific ones.[34] He also questions Buchanan's and Headrick's assumption that "lawyering" is essentially a search for controlling legal rules. Referring to Edward Levi, Boyd claims, that it is that which underlies the rules at a given point in time, and not the rules themselves that is important.[35] Although Buchanan and Headrick acknowledge that analogies are an essential

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33. Buchanan and Headrick, *supra* fn. 31, pp. 51-52.
34. W. E. Boyd, *Law in Computers and Computers in Law,* (1972) 14 Ar. L.R. 267, pp. 283-284.
35. Boyd, *supra* fn. 34, p. 285.

element of legal reasoning, they fail, Boyd says, to acknowledge that they are at the heart of the judicial process. Unhappily, he comments, analogy is probably the least developed area of artificial intelligence.

XI. *Normalized Language and the ABF Computer*

I have already referred to the difficulty of making the computer understand ordinary language. Every computer programme must be clear and definite; shades of meaning, background through open contexts, emotive over or undertones, and vague metaphors cannot be adequately conveyed in machine language. Natural language assemblers are restricted to those parts of ordinary language which can be computerized, and that is a much more severe restriction than merely resolving ambiguities, and the problems created by synonyms, antonyms and the syntactical ordering of sentences. All these can be attended to provided that we limit the context to one which the computer can handle. Even for the simplest forms of retrieval, some formalization of the input is required.

Layman E. Allen has proposed a "normalized" language for the drafting of statutes, regulations, contracts and other legal documents.[36] As he makes clear, such normalization is necessary not merely for the use of computers, but to simplify and standardize communication through legal documents. Normalization results in documents that are easier to understand in the dual sense that they can be read faster and more accurately than ordinary ones.

Allen's normalization is concerned with syntax, not semantics. Semantics, as used by him, refers to how the meaning of the overall sentence is influenced by the meaning given to individual words and phrases. Syntax refers to how the meaning of the overall sentence is influenced by interpreting words that express semantic relationships. For instance, in the sentence "persons who are doctors and lawyers qualify", "persons", "doctors","lawyers", and "qualify" are semantic words, while the word "and" is syntactic. Whether a psychologist with a Ph. D. is a doctor for the purpose of this sentence is a semantic question; whether a person who is a doctor but not a lawyer qualifies as a syntactic question.

J. A. Sprowl with Layman Allen's assistance developed formalized language into a new kind of computer programme and processor

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36. Layman E. Allen and C. Rudy Engholm, *Normalized Legal Drafting and the Query Method,* (1977-78) 29 J.L.E. 380.

called "ABF", named after the American Bar Foundation by which it was sponsored.[37] The central idea was to draft computational procedures from statutes and regulations. Statutes drafted in Allen's normalized language are typically set forth within the syntax "If . . . and . . . then . . ." rather than as general rules followed by exceptions, exceptions to exceptions, and cross-references to other rules. For example, section 65 of the Uniform Sales Act (1979) reads:

> Where the goods have not been delivered to the buyer, and the buyer has repudiated the contract to sell or sale, or has manifested his inability to perform his obligations thereupon, or has committed a material breach thereof, the seller may totally rescind the contract or the sale by giving notice of his election to do so to the buyer.

Allen suggests rewriting this statute in normalized form as follows:

IF

the goods have not been delivered to the buyer,

AND

the buyer has repudiated the contract to sell or sale

OR

the buyer has manifested an inability to perform his obligations under the contract to sell or sale,

AND

the seller gives notice of his election to rescind to the buyer,

THEN

the seller may totally rescind the contract or sale.[38]

Allen's normalized language for statute drafting resembles a conventional computer-programming language in so far as all standard programming languages assign precise meanings to words such as "and," "or," "not," and "then". The close similarity of Allen's normalized language to a conventional programming language lead Sprowl to design a processor that can be "programmed" by feeding into it normalized statutes and regulations. A specialist in an area of law, he says, can thereby create within it a normalized "image" of the law relating to his or her specialty. Such a processor can direct an attorney's attention to the critical issues by asking questions derived from the normalized statutes. The processor can accept the answers supplied by the attorney and display the conclusions that necessarily

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37. J. A. Sprowl, *Automating the Legal Reasoning Process: A Computer that Uses Regulations and Statutes to Draft Legal Documents,* (1979) A.B.F.R.J. 1.
38. Sprowl, *supra* fn. 37, p. 11.

follow from them. An important advantage of the ABF processor, Sprowl claims, is that it links a small group of specialists to a large group of generalists who lack both the specialized legal and the computational skills to undertake the search themselves.

Take the normalized version of s. 65 of the Uniform Sales Act. In the above procedure, Sprowl says, the words "if", "and", "or", "then", and "not" are operator words which the ABF processor fully understands. The remaining words are space holders for propositions that may be either true or false. The processor scans the procedure and recognizes that it is to determine the truth of the proposition "the seller may totally rescind the contract or sale". Accordingly, it derives questions from the language of the procedure and displays them to the attorney. The exact number of questions needed will depend on the answers supplied.

The first question derived from the above procedure is

Have the goods been delivered to the buyer?

If the attorney types "yes", then no further questions need to be asked, for the conclusion simply does not follow. If this question is answered "no", then there is still the possibility that the seller may be permitted to rescind. Accordingly, the processor next asks:

Has the buyer repudiated the contract to sell or sale?

If this question is answered "yes", it is unnecessary to inquire whether he has also "manifested his inability to perform". But if the buyer has not repudiated the contract, then the processor asks.

Has the buyer manifested his ability to perform his obligations under the contract to sell or sale?

If both of the above two questions are answered "no", then once again no more questions need to be asked. But if the buyer has either repudiated the contract or has manifested his inability to perform, then the processor asks the following final question:

Does the seller give notice of his election to rescind to the buyer?

Only if this question is answered "yes" does the processor conclude that the seller may totally rescind the contract or sale, and displays this conclusion to the attorney or legal assistant. The processor may then use it to control the assembly of a form document.[39]

Without wishing to belittle the ingeniousness of the proposed procedure, it seems to assume that the questions asked relate to matters

39. Sprowl, *supra* fn. 37, pp. 36-37.

of fact, and that if the answers are provided the processor can automatically churn out the legal conclusion. But none of the questions are factual in the sense that they can be answered with the resources of ordinary language. All the questions are asked from the legal point of view and require this perspective for their answers; in other words the *parole* of the words used must be related to the *langue* of the legal conceptual scheme of "sale of goods" if the correct social message is to be transmitted in the answer. "Delivery", "repudiation", "inability to perform" and "notice of election to rescind" are all legal code words with very special meanings, and not merely ordinary language signs.

This difficulty is of course not peculiar to the Uniform Sales Act, or statute law, or to Sprowl's computational procedure. Once we recognize that law is a specialized language of communication, it will be evident that it cannot be reduced to ordinary language simply by normalizing it. To send the desired social message requires processing the initial statement of the facts through the *langue* of the legal code. This cannot be done at the *parole* verbal level of the statute.

There are certainly routine cases in which a computer can be taught to produce a doctrinal solution. If the case is at all complex, decisions on how to classify the facts will have to be made. The problem is not one of ambiguity, but lies in the inherent open texture of legal conceptual schemes. It cannot be resolved on the level of doctrine; the search must be extended to the social context of the legally selected facts and to the underlying ideology of the judicial system. Unless the computer can be programmed to take account of these factors, its legal solutions will often prove wrong.

Sprowl makes it clear that he wants the computer to do something more than retrieve legal conclusions: he wants it to use them to draft legal documents.[40] His chosen method is to build up the document step by step by answering the questions asked by the computer on the basis of the programmed procedures. Sprowl claims that experience to date indicates that attorneys can be trained to set up and maintain such systems with little or no programmer assistance.[41]

It follows from what I have said that if computer drafting is to be more than standard processing of facts, all the difficulties of reaching legal conclusions will beset the drafting procedures. This

40. Sprowl, *supra* fn. 37, p. 45.
41. Sprowl, *supra* fn. 37, pp. 80-81.

is not to deny that the computer may lend itself very well to the drafting of routine documents, and to the development of interactive drafting systems which assist a generalist to draft documents which he could not have done on his own.

XII. *Stretching "Taxman"*

L. T. McCarty describes his programme TAXMAN as capable of performing a very rudimentary form of computer-aided legal reasoning.[42] Given a description of the facts of a corporate reorganization case, he states, it can analyse them in terms of several legal concepts. By looking at the adequacy of his formal model in this particular area of the law. McCarty seeks to throw some light on the structure and dynamics of legal concepts generally. He claims that the TAXMAN programme provides a more structured, more flexible and potentially more powerful alternative to the existing full-text or key-word retrieval systems and to the question and answer systems which are designed to terminate in a legal conclusion. The prevailing retrieval systems generally store the full text of legal documents and retrieve parts of them by key words or combinations of key words. Although this can be very useful, it is confined to looking only at the "surface statistics" of legal language. By contrast, the extended version of TAXMAN would store a representation of the underlying conceptual structure of a statute or of a case and retrieve it by a sophisticated pattern-matching operation.[43]

Another approach, McCarty says, is based on computer-aided instruction (CAI). The computer poses questions designed to elicit the essential facts of a case, and then suggests a tentative analysis or poses an additional factual question. Although there are parallels with TAXMAN, the user faces a series of pre-programmed questions and usually responds in a strictly multiple-choice format. In the extended version of TAXMAN, on the other hand, the most important and difficult work is done at the start, when the description and analysis mechanisms are designed to capture the basic conceptual structure of the problem domain. Once this is done, the "analysis" and "planning" modes of the system can be programmed in a uniform and systematic way. This permits a much greater flexibility in the

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42. L. T. McCarty, *Reflexions on TAXMAN: An Experiment in Artificial Intelligence and Legal Reasoning,* (1977) 90 Harv. L. Rev. 837.
43. McCarty, *supra* fn. 42, p. 889.

interactive process, and much less concern about details of the interaction. In general, then, the TAXMAN approach appears to have much greater long-range potential than a CAI system.[44]

The most interesting aspect of TAXMAN is its attempt to increase the efficiency and scope of computer-aid by building an interactive system with the capacity of moving the problem for analysis or planning from the lower level of fact-matching to higher levels of generalization and abstraction. The idea is to reach legal conclusions by representing in the data base of the computer a library of fact situations and a hierarchy of legal concepts under which they might be subsumed. The problem facts will then be matched against competing conceptual legal patterns to find the best fit.

The suggested method is really an attempt to move from the ordinary language code in which fact situations are described, to the specialized code of legal conceptual schemes into which they must be translated. The translation may be made at different levels of generality and abstraction. There is not merely one mechanical fit for each fact situation: both facts and legal concepts may be described at different levels of generality, and the link will be made by the computer at the most convenient junction. Where a history of transactions is involved, *state* descriptions must be brought up to date by *event* descriptions. The input will be first an initial state description, then a list of chronologically arranged event descriptions, and finally a full sequence of modified state descriptions.[45]

The difficulties lie not so much in representing fact situations and the appropriate legal concepts in the data base as in programming the innumerable ways of describing facts and legal concepts, and their interaction. "Facts" from the legal point of view and according to the legal code, are by no means the same as ordinary facts. The management of facts for the purpose of an actual or hypothetical trial by evidence removes any hard and fast distinction between facts and law: the law reaches into the facts and colours them in its own light. Since the law is never static, the facts take on different colours with the times.

McCarty is aware of some of these difficulties even in the relatively narrow field of corporate reorganization. He admits that reliance on the established concepts does not allow for the rise of new legal

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44. McCarty, *supra* fn. 42, pp. 890-891.
45. McCarty, *supra* fn. 42, p. 866.

categories, which remain shadowy until they break through the surface. This is merely another way of saying that no formulation of legal doctrine can provide an exhaustive set of criteria for solving a current legal problem. An interactive computer system may be invaluable in putting us on the right legal track, but it will be even more so if it can provide us with information about the adequacy of the current legal concepts. Not only are new legal categories waiting in the wings; the established ones may be circumvented to give effect to the perceived equities of the case and the underlying policies of the controlling statutes or precedents.

According to McCarty, the basic idea of the extended version of TAXMAN is to develop a data base consisting of (1) a large number of factual descriptions, taken from reported cases, revenue rulings, treasury regulation hypotheticals, etc.; (2) a wide variety of legal concepts and rules taken from the Code, the Regulations, and other sources; and (3) the set of all possible legal characterizations for each factual description in the data base in terms of the stored concepts and rules. The system could then be used simply as a device to retrieve the fact situations which match certain patterns of interest, or which satisfy certain aspects of a legal concept or rule. It could also be used to analyse a new case: the user could describe the new case to the system and then generate a range of applicable higher-level concepts. Finally, the system could be used for planning: the user could describe an initial situation and a desired end result, and then generate a number of possible transaction patterns with the desired consequences.[46]

There is a "utopian" note in this computerized do-it-all system. I have stressed that there are limits to what can be made computable, which requires clear and efficient procedures. Every programmer is impaled on the horns of a dilemma: either he is content to leave a gap between artificial and human intelligence, or his programme will remain vacuous. The computer presupposes a higher level human programmer just as a computer code presupposes a higher level natural language. The vision of a computer age which fails to heed this lesson is far from utopian. Man can delegate tasks requiring intelligence to the computer, but he cannot delegate his intelligence without losing it. This is well exemplified by the use of computers in the law. There is a certain tension between law and technology. As long as law lays claim to an intrinsic connection with justice,

46. McCarty, *supra* fn. 42, p. 888.

it will, in principle at least, transcend the power of any computer. To reduce it to a set of mechanical rules is to turn it into a bureaucratic machine.[47]

XIII. *Conclusion*

Law may be regarded as a language of signs for communicating social messages which serve the legal point of view. Applying Saussure's distinction between *parole* and *langue* to law, we can say that its *langue* consists of the code of legal conceptual schemes and its *parole* of legal speech acts. The role of computers is merely an element in the communication process in which law is involved. There is no reason to confine legal communication to print. Instead of foisting the computer as an extra on an already outdated system, we should try with its help to rejuvenate it. The crucial question is not "does the computer have a legal use?" but "what can be done to enhance the effectiveness of the legal communication system through the use of computers?" Similarly, the crucial question is not "are computers capable of legal reasoning?", but "what can be done effectively with computers and at what economic cost?"

The role of the computer in law is still too often perceived merely as an auxiliary means of retrieving legal materials, and the choice between computer systems is one between full text and indexed retrieval. The advantage of an index is that it provides us with a shortcut to the desired part of the legal code and its source materials. It does not follow from this either that a full text system is not useful as a back-up, nor that an indexed system is adequate for predicting the outcome of legal decisions. Judges by and large try to decide cases on their merits, though these will be judged within the framework of the controlling precedents with reference to which they will have to be justified.

The computer *can* be taught to learn. Computer learning may be either self-learning through a programmed learning system, or learning interactively through dialogue with the user. In both cases we utilize the computer's memory to achieve a desired result with the help of feedback. There is no reason why a goal-directed search should not be enhanced by interactive dialogue where this is useful. Not only can the human agent not be replaced by the computer; in the field of law at least, it cannot function effectively without him except

47. R. A. Samek, *supra* fn. 5, p. 810.

in routine cases.

The fact that human beings can be viewed as neuron or homeostatic systems does not turn them into machines. If they are "machines", then they are machines of a different order with senses, emotions, memory and language so finely tuned that no artificial devices can take their place. The transcendent nature of man is reflected in the transcendent claims made for law. As long as law wears the mantle of justice, it cannot be locked into a computable set of rules, or predictions about judicial behaviour.