Studies

Department

of

Communications

Electronic
Legal
Retrieval
by
Philip Slayton

A Report prepared for the
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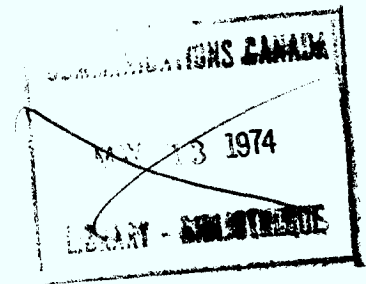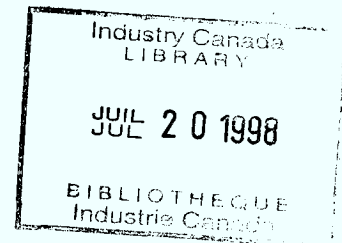
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ABSTRACT

While computerization of the information resources of the professions has greatly increased in the last five years, there has been little examination of its potential impact upon both the body of knowledge and the structures that have historically served the professions. The legal profession in North America, for example, has witnessed the rapid development of various computerized library systems which have placed the possibility of instantaneous retrieval of relevant case law or statutes at the disposal of the practising lawyer and judge.

Using the field of law as a model of a classical profession, Prof. Slayton of McGill University examines the potential impact of these retrieval systems upon the legal environment, particularly as it relates to the possible distortions it may produce in legal problem-solving where the case law has been a traditional tool. Some of the findings are then evaluated in terms of their applicability to other professions.

PREFACE

As the title page indicates, this report was commissioned by the Department of Communications of the Government of Canada.

Research was of three kinds:

1. An extensive consideration of the major writings concerning electronic legal retrieval, and some consideration of writings concerning other types of computer use in the legal field, retrieval systems in professions other than law, and the professions generally;

2. Consultation, discussions and interviews with about thirty people concerned in one way or another with the subject of the report;

3. Particular study of and experimentation with existing electronic legal retrieval systems, notably Projet DATUM of the University of Montreal, QUIC LAW of Queen's University (Kingston, Ontario), JURIS of the Attorney-General's Department of the United States Government, and LEXIS of Mead Data Central of New York (particularly the OBAR version of LEXIS). For a complete description of sources, see Appendix II.

INTRODUCTION

... no one has scrutinized the use of the computer closely or examined its total impact on the practice of law in our society, and perhaps no one can.[1]

This report attempts to be a careful study of electronic (computer) legal retrieval. It is hoped that the study's significance goes beyond both electronic retrieval and the law, and that some general propositions concerning the impact of computers on the professions emerge from the inquiry.

The professions, after all, have much in common. Each is based on "a great intellectual discipline".[2] Each is "an avocation whose activities are subject to theoretical analysis, and are modified by theoretical conclusions derived from that analysis".[3]

Professionals seem to share ways of thinking, routines of work, manners of relating to peers and clients, and self-conceptions. It seems reasonable, on the face of it, to claim that conclusions about the impact of electronic retrieval on the legal professions are relevant, for example, to computer diagnosis in medicine.

But many pitfalls lie in the way of such generalization. In the first place, what occupations can rightfully be considered professions? No satisfactory definition of the word exists.

The Castonguay Commission of the Government of Quebec stated that "the notion of professions . . . has slowly lost its meaning or, in any case, no longer evokes a certain number of precise and exhaustive criteria which would make it possible to distinguish it from other types of occupation of the alleged 'non-professionals'."[4]

Eliot Freidson has written of the word *profession* that it is "evaluative as well as descriptive. Virtually all self-conscious occupational groups apply it to themselves at one time or another either to flatter themselves or to try to persuade others of their importance. Occupations to which the word has been applied are thus so varied as to have nothing in common save a hunger for prestige."[5] Accordingly, we do not really know from what and to what we may generalize.

Secondly, even if one could isolate certain broad characteristics common to law and a number of other identifiable occupations, the differences between "professions" might still be more significant than vague similarities. Theoretical likeness might be eclipsed by operational differences. Broad similarities might pale into insignificance next to particular procedures.

Thirdly, there is the possibility that the law, although indisputably a profession, is an idiosyncratic profession, radically different from its sister occupations. That this is so seems unlikely; yet the possibility, however remote, should put us on guard against glib generalities.

And finally, there are uses other than retrieval for computers in the professions. Conclusions about electronic retrieval are only relevant to other forms of computer use at a very high level of generality.

Despite these difficulties, it may still be the case that particular study of one kind of computer use in one profession will suggest more general problems. At the very least, such study will likely indicate how other particular problems can be explored. Exercising appropriate caution, we can, then, to some extent, extrapolate from our study of electronic legal retrieval to a wider canvas. And electronic retrieval is a good subject for study.

A number of such systems are operational in Canada, the United States, and elsewhere, permitting realistic assessment of the procedure. As well, electronic legal retrieval involves profound theoretical problems concerning the very existence and nature of law, adding another dimension to our inquiry. But in fairness it should be pointed out that we might just as well have examined computerized information retrieval, or diagnosis and therapy systems in medicine.[6]

Two points must be emphasized. First, the problem of the relationship between electronic legal retrieval and law is a

complex problem, with profound ramifications. This study attempts only to open up this field of inquiry, and to suggest some of the types of questions which can reasonably be asked within this framework.

At the very most, it should be considered a general statement of the problem area, and even then it suffers from serious omissions. For example, I discuss how computer use may affect the legal profession, but do not consider how a changed legal profession might affect society at large. Similarly, my analysis of how electronic retrieval may affect lawyers deals only with what may be termed the intellectual dimension of a lawyer's activities; limitations of time and space have prevented my discussing the sociological and psychological dimensions.

Secondly, much more research is required, and of a more detailed and intensive kind. I suggest in my concluding chapter some lines of inquiry that might prove fruitful.

These disclaimers may raise doubts concerning the worth of this study, but it must be remembered that this report is, I believe, genuinely a pioneering effort, charting new ground, and its deficiencies must be seen in that light.

CHAPTER ONE:

THE LAWYERING PROCESS

A. The lawyering process as an intellectual process

The *lawyering process* must not be confused with the *legal process* (the functioning of the court system and the way in which litigation is conducted) or with concepts like *due process* (which describe aspects of justice). The lawyering process is what it is that lawyers — all kinds of lawyers — do.

In discussing this process, I will not give descriptions of a lawyer's day, or attempt to categorize his normal activities. One reason for this omission is that there are many different kinds of lawyers and therefore no descriptions or categories with general validity. Erwin O. Smigel has written that "the separation between the individual and large law firm lawyer is cavernous; it is almost caste-like."[7]

A second reason is the dearth of material descriptive of lawyer's activities; Smigel comments that "few people know exactly what lawyers do."[8]

Thirdly, and most importantly, lawyering can best be described in terms of intellectual activity, given that the most salient characteristic of any profession is a foundation of theoretical knowledge. The key activity of a lawyer meriting a serious attempt at description is thinking about "the law"

It is often said that the practice of law is a craft, or perhaps an art, rather than a science. Apparently this means that lawyering involves creativity which cannot be expressed in words, and certainly cannot readily be duplicated, particularly by artificial means. Carl Stover, for example, has said that "the notion that the majesty and mystery of the human experience, which is the essence in law, can be written into a computer affronts the dignity of man."[9]

More precisely, Lee Loevinger (who coined the word *jurimetrics*) wrote: "the choice of legal terms to describe an act is certainly not a 'logical' operation. Where it is not purely arbitrary, it is, at most, intuitive. Thus, by present methods, the determination of every genuine legal issue is made at the sub-verbal (and usually subconscious) level, where formal 'logic' can neither exist nor exert influence."[10]

Important work has lately been done on the nature of legal reasoning which makes it foolhardy to argue seriously that the lawyering process is intuitive and cannot be rigorously analysed.[11] In a pioneering article, Bruce Buchanan, a Research Associate in the Computer Science Department of Stanford University, and Thomas Headrick, a lawyer, and Vice-President for Academic Affairs of Lawrence University, postulated two models of creative legal research for the legal practitioner, and deduced from those models four stages in a practising lawyer's thought processes.[12]

Model I, called "interpreting the facts and law to a client's benefit", assumes that "the factual situation has been set, certain events have happened, and a client wants to know what his rights, remedies, and risks are."[13] Buchanan and Headrick describe the argument construction process for this model as follows:

"First of all, the lawyer would rarely be looking for a direct answer that his client is liable or not liable. Rather, he would seek to construct a legal argument that would justify the actions of his client. The lawyer would attempt to generalize the already-occurred factual situation and select the legally relevant facts. He does this by reference to legal rules or concepts that make some facts relevant and others irrelevant. He looks at the facts and checks them against potential linkages of rules that would lead to the result he favours and avoid the result he disfavours. Although he may start with one conception of the facts, he may end up emphasizing other facts because of the way in which he constructs a legal argument (that is, a linkage of concepts to the desired legal result).

"The skilful advocate strings together rules in a way that justifies the result he is seeking and at the same time encompasses the factual occurrence in a way that makes the rules he has selected appear to be the ones best applicable to the situation. His search strategy is to identify the string of rules that

both leads to a desired result and plausibly encompasses a set of facts that accounts for what has happened to his client."[14]

Buchanan and Headrick's Model II is called "recommending actions that satisfy a client's goals and avoid unfavourable consequences". In this model, "a client is looking for guidance for a future action, and the client can control the facts or events somewhat to suit his legal needs as assessed by the lawyer."[15] The argument construction process in this model is described in the following way:

". . . the lawyer is no longer involved merely in the argument formation process, but also is concerned with risk assessment with respect to future actions. He starts by identifying the typical situation where the law would sanction the client's proposed actions. Then he checks the law and the potential facts of his client's situation to see if there are any reasons why these desired typical solutions are inapplicable. If he finds some reason, he would then attempt to restructure the existing facts, the legal generalizations of them, and the proposed action to develop a better fit. He would then continue this restructuring and testing until he finds the formulation of existing facts, proposed actions, and legal consequences of them that minimizes the risks and maximizes the sought objectives . . . .

"How does the lawyer proceed? Working within the general conceptual framework of contracts [here a contract problem is supposed], he can think of a number of actions his client might take. From his legal data base he can extract commentary and cases that help him predict how a court is likely to react to cases involving each of the possible sets of facts. Some sets of facts will appear safer for the client than others; the lawyer will go through the process of matching facts and generalizations about facts in the cases and treatises with the imagined fact-sets involving the client and potential customer litigants to determine whether the fit is good enough to dissuade the customers from risking a lawsuit. His assessments of the varying strengths will enable him to make a rough ranking of the possible actions in order of their legal risk."[16]

From their models, Buchanan and Headrick have deduced four stages in a practising lawyer's thought processes:

1. The lawyer establishes a goal, finds linkages from facts to rules to legal consequences, and measures at various stages the compatibility of a set of consequences with the established goal.[17]

2. "The facts suggest some possibly applicable rules; the rules and the cases using them suggest the relevance and importance of certain facts."[18]

3. The legal problem-solver differentiates between different rules that might apply to the same behaviour and events. "The form of differentiation chosen has to do with his objectives, with the relative weight he attaches to the various facts, and with the inferences he draws from some facts on the basis of his knowledge of additional facts."[19]

4. If the lawyer cannot find cases whose facts are similar to the facts with which he is working, he resorts to finding cases with facts that are analogous to his own. "One method of finding an analogy is through generalization of a legal rule. Although in one case a rule was applied to a specific set of facts, the language in which the court stated the rule may deductively allow its application to a different set of facts."[20]

A good deal of work has been done on how judges reason.[21] A clear and traditional account has been given by Professor Rupert Cross.[22] Cross deals with three thought elements of the judging process — deductive reasoning, inductive reasoning, and reasoning by analogy.[23] He gives the following example of judicial deductive reasoning:

"Suppose A is charged with abortion by using an instrument to procure a miscarriage. The argument in support of a conviction can be set out as follows: According to s. 58 of the Offences against the Person Act, 1861, whosoever, with intent to procure the miscarriage of any woman, shall unlawfully use any instrument, shall be guilty of felony and, being convicted thereof, shall be liable to imprisonment for life. A unlawfully used an instrument to procure the miscarriage of

a woman, therefore A is guilty of the offence charged."[24]

As Cross points out, this kind of deductive reasoning is trivial, "because the crucial decision is made before the reasoning can be cast into syllogistic form. Not only is the syllogism constructed after the facts have been found, but it is also constructed after any legal problems concerning the scope of the rule have been solved."[25] The syllogism in the example is of little interest, since the second premise is that A *unlawfully* used an instrument to procure the miscarriage of a woman." The same objection would apply to deductive reasoning in a case-law context.

Professor Cross is equally critical of the notion that some aspects of judicial reasoning can be described as inductive, which is generally taken to mean that "a judge often extracts a rule for the decision of a case before him from one or more previous decisions."[26]

The comparison is normally made between a judge and a scientist. Cross endorses the words of John Dickinson:

"The judge does not employ the case before him as a means of testing the validity of the rules which he employs in reasoning towards his decision. The whole theory of decision according to law is that the rules are to govern the case, and not, like scientific laws, to be governed by it."[27]

Finally Cross considers judicial reasoning by analogy. He detects three stages in that reasoning when a single precedent is involved:

"First comes the perception of relevant likenesses between the previous case and the one before the court. Next there is the determination of the *ratio decidendi* of the previous case and finally there is the decision to apply that *ratio* to the instant case. Analogy may be said to be employed at the first stage, it plays no part at the second stage but it is frequently decisive at the third where the judge has to consider whether the facts of the case before him resemble those of the previous case sufficiently to necessitate the application of its *ratio decidendi,* or to justify him in applying it if he wishes to do so."[28]

Where several cases are involved, there is the additional stage of the construction of a rule or rules from a number of *rationes*.[29]

The kind of analysis of judicial reasoning given by Professor Cross is, although conventional, controversial. It has been rejected by the influential American realist school of jurisprudence.[30]

Jerome Frank argued that a judge does *not* begin with some rule or principle of law as his premise, apply this premise to the facts, and thus arrive at his decision. In fact, said Frank, judges reason just like the man on the street: "Judicial judgments, like other judgments, doubtless, in most cases, are worked out backwards from conclusions tentatively formulated."[31]

The leading jurimetrician Lee Loevinger has written:

"Legal terms are almost all vague verbalizations which have only a ritualistic significance. As soon as the judge has decided which term to use — negligence, due care, contract, property, right or duty — the decision of the case has been made. The use of terms is like the old custom of donning a black cap to pronounce the death sentence. The costume is chosen only after the decision has been reached. The terms which apply to the case are selected only after the result has been decided."[32]

If this analysis of the judging process is correct, then "close study of the written formal reasons for a judgment, to the exclusion of all else, would seem dangerous. We delude ourselves if we analyse only these reasons, for they do not necessarily explain all or even most of what has happened. To really know why a judge has decided as he has, we should study not only the explanations he offers, but also the judge himself, his personality, character, and attitudes."[33] One consequence has been development of new methods of case analysis which substantially ignore the written judgments — scalogram analysis, for example.[14]

The realists almost certainly go too far in discounting the importance of written reasons for judgment, and by implication the formal reasoning process employed by judges. In at least two ways their kind of analysis falls short of correctly representing reality. First of all, the response of a judge to a legal problem is at least partly a function of his legal training and extensive legal career which have produced a "legal outlook" encompassing a certain style of reasoning. Secondly, "whatever it is that stimulated judicial response, it is the rules and principles of law that define the acceptable limits of that response. . . . The law [*and legal reasoning*], then, defines the outer limits of acceptable judicial response, although admittedly leaving considerable room for manoeuvre within those limits."[35]

The best analysis must fall somewhere between Jerome Frank and Rupert Cross. We must accept the importance in judicial decisions of both personal bias and considerations of social policy; but we must not underestimate the powerful force of long-established legal doctrines and modes of thought.

What of the thought processes of the academic branch of the legal profession? Here one can, perhaps, speak with more assurance of the nature of the intellectual process, for that process is a purpose of academic activity, and presumably is not corrupted by a requirement that practical and tangible results be produced. The fundamental theme of the academic lawyer's activities is *objectivity*. His aim is to understand and describe, and not to produce a pre-ordained result. (Of course, simply to pinpoint objectivity is not to describe meaningfully the process of academic legal thought.)

B. A note on legal research

Principle suggests that the most important characteristic of any true profession is its foundation in a large body of theoretical knowledge. It would seem to follow from this characterization that a substantial part of professional activity requires familiarity with a large amount of information. Accordingly, in the case of lawyers, one would expect to find a significant amount of time being spent by all branches of the profession on legal research.

Examination of legal thought processes supports this hypothesis. The essence of the Buchanan and Headrick analysis of a practising lawyer's reasoning is a discretionary search for rules. Such a search can only take place within the body of legal knowledge. Similarly, a judge must have a working knowledge of the law; only with such knowledge can he reason inductively and by analogy, and even the deductive aspect of his reasoning requires the prior identification of an applicable legal rule. Finally, legal academics, almost by definition, are legal researchers.

From a theoretical point of view, then, we may determine that all lawyers have research as one of their cardinal occupations. Remarkably, what empirical evidence exists goes some way towards refuting this conclusion.

Operation Compulex, prepared by the Canadian Department of Justice, reported: "Statistics gathered during the study indicate that the amount of time a typical lawyer allocates to legal research is not significant. A figure of 20% of total time would be generous for most lawyers' research activities. The time required to find or retrieve the law is typically 30% of total research time."[36] As *Compulex* points out, ". . . legal research must survive in a rather hostile environment."[37] An economic survey of the Massachusetts Bar concluded that practising lawyers that "the average amount of time spent in legal research is ten hours per month".[38] Jerome Carlin found that the lawyer practising on his own spent less time on legal research than on any other single activity.[39]

What of judges? Surely those who sit on the bench and adjudicate in a variety of complex matters are paragons of the legal thought process and assiduous users of all research tools? Little empirical study of the judiciary's research habits seems to have been undertaken. It is beyond question that judges do *some* research.[40] One might well ask, however, how *much* research

they do. Furthermore, it is appropriate to observe that in light of the behaviouralist and realist schools of jurisprudence, no matter how much research judges do, it may be of little significance. Decisions may be made on the basis of personal bias, or at best for reasons of social policy. The purpose of research would then be simply to justify decisions already taken.[41]

As for academics, it has always been considered that one of their prime tasks is legal research. Little data exists which demonstrates that law professors are fulfilling this mandate. A recent Canadian survey was undertaken by Dean Hubert Reid of the Faculty of Law of Laval University on behalf of l'Association des professeurs de droit du Québec et d'Ottawa. Dean Reid defined research as follows: "tout travail systématique réalisé seul ou en équipe, commandité ou non, théorique ou pratique, consacré à l'approfondissement d'un problème et à la recherche de solutions nouvelles".[42] Reid

found that Quebec law professors spent 17% of the autumn semester, 15% of the winter semester, and 32% of the summer vacation on research.[43] These figures suggest a significant commitment to research by law professors.

C. The lawyering process, substantive law, and the legal system

How lawyers think directly influences the body of substantive law. Thinking about the sources of law [44] *produces* the law; if the way of thinking changes, so will the end product.

Consider the activities of the bench. Few would argue that judicial precedent [45] is a source of law, that is, one of the things that goes to make up the body of substantive rules and principles. Precedent is the result of a judge thinking about the law; the *way* he thinks about the law will affect the precedent he produces. If, for example, his concern is rigidly to interpret previous

cases, the kind of legal rule which will result from his deliberations may differ from a rule which is a product of concern for social policy.

Just as legal thought (to some extent) produces substantive law, so (to some extent) does it produce key features of our legal system. Precedent is as much a style of thought as it is a legal doctrine. Even if one views the doctrine as a feature of the system which *imposes* a certain style on legal thought, the connection between the doctrine and legal thinking is indisputable.

Similar reference might be made to the so-called adversary system. The style of thought of the practising lawyer is dominated by the need to benefit his client. This need, be it cause or effect, is inextricably connected with the adversary process, which is "the system of settling disputes whereby conflicting interests are represented by opposing parties, each with the burden of presenting his postion and arguments to the tribunal".[46]

CHAPTER TWO:

ELECTRONIC LEGAL RETRIEVAL

A. The legal information problem

Following the law has been likened to trying to drive an automobile while looking through the rearview mirror. If the mirror is distorted, progress forward is hampered by virtue of imperfect knowledge of that which is going on behind.[47]

Like all professions, law is based on a great body of theoretical knowledge. Access to this knowledge is essential for the lawyer. Access is becoming increasingly difficult — hence the "legal information" problem.

The most obvious aspect of this problem is the exponential increase in the volume of legal materials. The figures are widely quoted.

Writes Irving Kayton: "In Coke's day there were 5,000 printed cases. At the time of Mansfield and Blackstone, 150 years later, there were only 10,000 reported decisions. Today, however, there are over 2,300,000 reported cases, and the number of reported American decisions is estimated to be increasing at the rate of 22,000 per month."[48]

A century ago the Harvard Law Library had less than 15,000 volumes. Today it has over 1,000,000 and adds about 20,000 yearly.[49] Most of this material is relevant to an ordinary lawyer's activity. As Colin Tapper has pointed out, "it is . . . in the nature of a lawyer's work that he must be able to say with complete confidence that he has considered all the documents of the past relevant to his case, or that there are none which are relevant."[50]

The exponential growth in the volume of legal materials has dramatic consequences. First of all, it becomes extremely difficult to find all or even most of the materials relevant to a given legal problem, simply because so much may be relevant; accordingly lawyers have increasingly come to have an inadequate grasp of what they need to know properly to deal with the issue before them. The result is a "depro-fessionalization" of law. Says Felix Stumpf: "The absence of adequate legal knowledge on which to base his skilled judgment means that the lawyer is practising without the benefit of the learning which is necessary for the pursuit of professional endeavour."[51]

A second consequence is inefficiency in legal decision-making processes. As legal sources increase in number and size, fewer legal cases are adequately prepared. To the extent that the legal system attempts to retain its integrity, inadequately prepared cases will be unacceptable. Accordingly, there will be an increase in appeals and re-litigation in proportion to the discovery of cases decided in ignorance of relevant authorities.[52]

A third consequence is an increase in intellectual and geographical insularity. Faced with an overwhelming amount of information, the lawyer seeks to restrict what it is that he must consult. One method is not to consult any materials but those of the local jurisdiction. Another is to refer only to specialized texts dealing with the narrow point in question. The conse-quences may be "a divergence of differ-ent legal systems, and even of different branches of the same legal system".[53]

Fourthly, there exist social conse-quences of the legal information problem. Skilled human beings are used ineffi-ciently; many lawyers are engaged in routine mechanical retrieval, while others are preparing conventional retrieval tools, such as indexes, services and abstracts. In addition, as the volume of legal information increases, so does the cost and complexity of adequate research, and inequality of access develops. The large law firms become larger and more powerful, and the small firm or individual practi-tioner finds his existence jeopardized. The government may acquire a suprem-acy of legal skill. Tapper writes:

". . . where a private individual is arrayed against a large public authority or cor-porate enterprise, he is often at a serious disadvantage. The authority and the en-terprise, knowing that they will inevi-tably be involved from time to time in litigation arising out of their activities, take the trouble to build up a substantial private

reference library of information relating to their own specific field of activity. Many of these materials will be otherwise unknown to the ordinary private lawyer."[54]

It is only fair to point out that some feel the legal information problem to be exaggerated. Frederick Bernays Wiener, a prominent member of the American Bar, has asked rhetorically: "For how many practical problems does anyone need all the cases on a point?... You don't need all the cases. Who needs all the cases?"[55]

Judge Harold Leventhal has made the more intelligent remark that "two cases are better than five cases, and a lot better than seven, particularly if one of them is a well-reasoned case, a leading case, an innovative case."[56]

The recent *Operation Compulex* study of the Department of Justice of the Government of Canada claimed to make an attempt to determine whether the volume of law was becoming a problem for the Canadian practising lawyer and concluded that "lawyers do not perceive this as a problem".[57]

These comments have several explanations. First, there is some truth to the comment of Judge Leventhal; some cases *are* more important than others, and knowledge of them alone may often be sufficient. But not too many issues in law can be resolved by reference to a handful of cases, and in any event, as Tapper points out,[58] even if the researcher decides that just one or two cases provide the answer he seeks, he can only reasonably so decide after canvassing all possibilities, which will involve a major research effort.

The findings of *Operation Compulex* pose greater difficulties. Partly they can be explained on the grounds that the volume of legal materials in Canada is far smaller than that in the United States, although it is probably not less than that in England and the other Commonwealth countries. This explanation, however, is not a justification for the apparent smugness of practising Canadian lawyers, for it merely suggests that they are guilty of the geographical and intellectual insularity noted earlier in this

chapter. And in any event, although the volume of information may be relatively small, it is still large; a glance, for example, at the range of volumes containing all the federal and provincial statutes of Canada shows this to be the case.

The legal information problem is not just a problem of exponential growth; it is also a problem of current awareness.[59] A lawyer must know the state of the art properly to protect those interests he is representing. *Compulex* referred to this difficulty:

"... today's lawyer spends most of his research time dealing with new or amended legislation and recent judicial decisions. So in those cases where research is an important factor, it is obviously most desirable that the legal research system be up-to-date."[60]

The legal information problem is also a problem of the changing significance of legal materials. As conditions alter and judicial viewpoints evolve, the meaning of a judgment or a statute can be dramatically reinterpreted. Having once indexed, or retrieved and interpreted any given piece of legal information, one cannot then say with respect to that piece of information that the job is done for once and all. Even if the growth of legal information were to be suddenly frozen by fiat of an omnipotent super-lawyer, the never-ending task of continuous reinterpretation would remain.

Given the dimensions of the legal information problem, to what extent is this problem met by traditional techniques? The answer must be, "Hardly at all."

Traditional methods cannot alleviate the simple *time* difficulty. A person engaged in a manual search consumes inordinate amounts of time walking about the library and handling books: Kayton has commented that "the point has been reached where the time involved in the sheer physical process of manually picking up and putting down indices and legal digests, as well as the case law volumes themselves,·in the search for pertinent authority (not to mention reading time) has become inordinately long if a reasonably comprehensive search is intended."[61]

This is largely so for conceptual reasons. Traditional methods "label" legal information (assign descriptive words). Information is retrieved by these labels.

This system suffers from two major defects, ably identified by Eldridge and Dennis. In the first place, to work at all well, it requires the researcher to know what it is that he does not know. Write Eldridge and Dennis:

"In order to search at all, it is necessary to guess that the gap in the searcher's knowledge occurs in the field marked by this or that label. The guess is repeated in trial-and-error experiments until some label bears fruit. Two deficiencies are readily apparent. First, the waste of time and effort is prodigious. Second, there exists a perpetual dilemma in the decision to stop research; one *is never sure* that he has seen all the data that he ought to have seen."[62]

Secondly, existing manual search methods allow the researcher to search only one label at a time, whereas almost all legal questions involve multiple labels. "The ability to search for a co-occurrence of five labels at one pass of the documents alone," say Eldridge and Dennis, "would save immense amounts of time."[63]

Of equal significance is the inability of manual search techniques objectively to present the law to the researcher, and to take into account the problem of the changing significance of legal materials. The traditional search method has as its main tools the table of contents and the index.

The table of contents is hierarchical and necessarily imposes a particular view of the law upon the material with which it deals, a view which may not suit or be known to the searcher, and which may rapidly become out-of-date. Dickerson writes:

"The main weakness of a table of contents is that, because it must parallel the physical arrangement of the text to which it relates, it necessarily takes the form of a specific hierarchy of classes and subclasses, thus reflecting a legal point of view in which some particular bases of classification are more fundamental than

others. So long as the legal point of view of the searcher is that of the text and table of contents, the particular scheme of classification helps to guide him to the area he wishes to investigate. On the other hand, for one searching from another legal point of view, the existing compartmentalization may even be a hindrance."[64]

Most indices maintain the hierarchical approach, and so exhibit the same deficiencies as tables of contents. The difficulty is exacerbated, as Kayton points out, by the fact that there are as many legal indices as there are legal publishers, and the researcher must re-establish his hierarchical frame of reference as he goes from one index to another.[65]

With an index, however, at least the possibility exists of a coordinate rather than hierarchical arrangement. In a coordinate system "data is identified either by concepts or by key terms, and is located and retrieved by the coincidence of concepts or key terms used as coordinates."[66] With a coordinate arrangement "the indexer can classify in far greater depth, even to the point of indexing every significant word. Equally important, the searcher can more freely search from differing points of view."[67]

The flexibility of the method is considerable; Loevinger comments that "if the system is adequately designed initially, it will be quite possible to use combinations of terms, or coordinates, for the retrieval of data that were not conceived or used at the time the data were originally stored."[68]

Regrettably, however, most indices retain a hierarchical structure: the discouraging consequence is that "each new decision must be boiled down to fit into a predetermined pigeonhole [which] requires the digester either to leave out those portions of the case for which no pigeonhole exists, or to squeeze them into a pre-conceived mold."[69]

The legal information system, then, may well be on the brink of collapse, a collapse which could destroy the professional nature of the lawyering process. Small wonder that legal researchers have seriously canvassed alternative search means.

B. The electronic legal retrieval solution

. . . the promise of modern scientific method is that it may free legal thinking from its bondage to established hierarchical systems of classification, while still permitting use of the common law method of decision by precedent.[70]

Many electronic retrieval systems exist. The first was probably that devised by Professor John Horty at the University of Pittsburgh Health Law Center, beginning in 1959.[71] The Health Law Project evolved into Aspen Systems Corporation, a commercial firm founded in 1968, which deals primarily with state statutes, and in 1970 had contracts with thirty-one state governments.[72]

In 1967 the Ohio State Bar Association founded Ohio Bar Automated Research (OBAR), which awarded a contract for establishment of a computer research system to Data Corporation. Data Corporation was subsequently acquired by Mead Data Central, a subsidiary of the Mead Paper Company. Mead Data Central runs the LEXIS program, currently has agreements to operate research systems for the New York and Texas Bars, and is actively seeking further expansion.

The United States Air Force operates LITE (Legal Information Through Electronics), which was developed by the Health Law Center at the University of Pittsburgh, and is very similar to Aspen Systems.

The United States Department of Justice operates JURIS, an adaptation of the RECON search and retrieval computer software package and file maintenance routines developed at the Lockheed Palo Alto Research Laboratory for the National Aeronautics and Space Administration (NASA).

The major Canadian systems are DATUM/SEDOJ (Documentation automatique de textes juridiques de l'Université de Montréal), established in 1968 by the Faculty of Law and the Computing Centre of the University of Montreal, and partly financed by the Department of Education of Quebec, the Canada Council, and the Department of Justice of Canada; and QUIC/LAW of the Faculty of Law, Queen's University, initiated in 1969 with the financial support of Queen's University, IBM Canada Ltd., the Trans-Canada Telephone System, and the Government of Canada. Lesser Canadian systems devoted to statute retrieval exist.[73]

The problem of constructing a computerized legal retrieval system has two parts. What information is stored in the computer? What method is used to extract what has been stored?

There are three important methods of storing legal cases in a computer:[74] statistically-determined partial fulltext, depth-indexed text, and full text.

The partial full-text method requires only about 30% of the text to be stored in the computer; the data base is selected accordingly to frequency-dependent statistical word distribution rules which determine whether a word is "informing", i.e., "whether it is useful in discriminating between cases and is therefore informative in a retrieval sense".[75]

The depth-indexing technique requires a human indexer to describe each case in several words or phrases which are used as descriptor or index concepts or terms. These index terms then replace the original text and form the data base.[76]

Full-text construction of the data file, as the name suggests, involves entering the entire text into the data base, with the possible exception of some one hundred very common words — such as *of, the, and, for* — which have little or no information value.

Having put the information into the computer, one must think of a way of

getting it out. In most systems, extracting information involves first characterizing the problem in legal language — e.g., "How does the common law of contract distinguish between a penalty clause and a liquidated damages clause?"

The question (or *statement of interest*) may then be typed directly on a console (in an on-line interactive system), handed to a consultant who will modify it so that it will most effectively retrieve information, or punched on cards which will be introduced either directly into the computer or into a dataphone set which will transmit the information to the computer over telephone lines.

The computer conducts its search by looking in its data base for documents in which words contained in the legal statement appear. It will normally produce, depending on its instruction, the full text of the retrieved information, or citations alone, or summary material such as headnotes, or a KWIC (Key Word in Context) index.

A KWIC index "consists of a listing of each appearance of a given search term, centred on the page preceded and followed by a few of the words that surround the term in the text of the material. KWIC allows one to determine at a glance whether the word is used in a desired context, permitting quick rejection of irrelevant material."[77] Generally, retrieved information is presented on a console or in a printout, or both, at the request of the searcher.

QUIC/LAW[78] is intended to be for lawyers who have neither computer training nor the time and inclination to undergo such training. It was designed as an interactive system, allowing the user to conduct his own searches in direct communication with the computer, without the intervention of a third party; this allows the user to obtain constant feedback, reformulating his questions in light of the system's response.

The developers of QUIC/LAW were first attracted by a search system known as INFORM/360, developed by IBM Corporate Headquarters for handling

full-text files: the advantages of this system were that "it used on-line interactive terminals (CRT terminals within 2000 feet of the computer and typewriter terminals at any distance), and permitted a user to modify or rephrase his question on the basis of tentative search results. It also permitted free-form statements of search criteria; a user could state his question in his own language or could even use a series of disconnected words."[79]

INFORM/360 was additionally attractive because its search strategy was based on statistical probability rather than on Boolean logic, and search results were therefore relatively independent of the precision with which a question was framed.

"Its strategy used term values — precalculated arithmetic weights attached to each term at the time a data base was established. Each arithmetic weight was a value representing the degree to which a particular term was relevant to the contents of the document in which the term appeared, and to the data base in which the document was contained. These term values could be used in quite sophisticated ways to rank retrieved documents in an order of probable relevance. Even though a broadly phrased question might produce a deluge of documents, these documents could be ranked in an order of probable relevance, and the user might examine only the highest ranked part of the retrieved group without the same risk that a highly relevant document would be listed beyond the last document examined. The user was given a choice of five alternate statistical methods for ranking retrieved documents, and, in addition, he was given a further choice of ranking documents by the most commonly used Boolean technique — the Boolean 'and'ing of terms.

"Since the search strategy of INFORM/360 was based on statistics, an increase in the size of the data base was likely to improve the ability of the system to retrieve documents. The system design contemplated very large data bases."[80]

QUIC/LAW found, however, that despite these advantages, the simple

INFORM/360 could not meet their requirements.

First, the system operated under the control of a time-sharing monitor program called the Interactive Applications Supervisor (IAS) which proved to be incompatible with the existing computer facilities at Queen's University.

Second, IAS had high core requirements combined with inefficient core usage and inefficient processing routines.

Third, the IAS and INFORM/360 package did not provide for access to multi-volume data sets, thereby limiting random access and size of the data base.

Lastly, INFORM/360 was plagued by a number of technical deficiencies, including complicated and expensive file creation, and unduly complex dialogue.

Since many of the system's problems stemmed from use of the IAS Monitor Program, it was decided to replace it with direct OS/360-MVT Task Control.[81]

The present[82] data base of QUIC/LAW consists of 67,000 abstracts of recent scientific works on pollution, the full text of Supreme Court of Canada decisions from 1923 to the present, the full text of the 1970 Revised Statutes of Canada, the Ontario Reports 1940-72, the Federal Court Reports, and Federal Statutory Orders and Regulations (an unofficial consolidation as of April, 1969).

Each word in the data base serves as an index word for the term or concept it is or represents. Words used in a search formulation are index *locators;* locator and index words are *matched,* with the matched document then being retrieved in one of several alternative ways. The assumption is that any document mentioning the key words used in the search formulation will be relevant, since the mere occurrence of the words should reveal the significance of the entire document.

Merely citing key words to the computer will produce unmanageable results. Some way must exist for creat-

ing a finer search *mesh,* so that the amount of irrelevant information retrieved will be limited. If, for example, the search instruction was simply PENALTY CLAUSE, the computer would produce all documents in which the word *penalty* or the word *clause* appeared.

QUIC/LAW (like almost all other electronic legal retrieval systems) circumvents this problem by incorporating into the system certain Boolean mandatory conditions. In our example (PENALTY CLAUSE) it is possible to restrict the number of irrelevant retrievals by specifying that only documents which contain *both* the words *penalty* and *clause* shall be retrieved. This is accomplished by using an ampersand and typing on the QUIC/LAW console PENALTY & CLAUSE. Use of the Boolean mandatory condition represented by the ampersand can be extended to the specification of several key terms, e.g. PENALTY & CLAUSE & LIQUIDATED & DAMAGES.

At present there is one limitation to QUIC/LAW use of the Boolean mandatory condition &. Usually when a searcher specifies that he wishes two particular words to co-occur in a document he wishes them to occur close together, since it is likely that they will then symbolize a single concept. But the QUIC/LAW system lacks a positional logic feature, and will retrieve any document in which the search terms occur regardless of their relative positions. It may, for example, given the instruction PENALTY & CLAUSE, produce a document in which the word *clause* appears on page one and the word *penalty* on page ten. One consequence is that long complex cases tend to be retrieved no matter what the search instruction.

A second Boolean mandatory condition employed by QUIC/LAW is the "but not" (%), which directs the computer to retrieve the documents in which the relevant key words occur so long as other words irrelevant to the search concept

or so common as to lack discriminatory value do not appear. For example, the search instruction LIQUIDATED & DAMAGES % PUNITIVE or simply LIQUIDATED % PUNITIVE would, one hopes, produce documents dealing with liquidated damages, but would not produce cases dealing with punitive damages in which the word *liquidated* happened to occur. The danger is, of course, that this search would also not produce cases dealing with liquidated damages in which the word *punitive* happened to occur.

Of particular interest is the ability of the QUIC/LAW system to rank retrieved documents in order of relevance. Ranking value is computed during the search by a statistical algorithm:

"The algorithms used by QUIC/LAW for computing ranking values are based on the assumption that the statistical distribution of a term in the data base being searched and in a given document within the data base can be used as a predictor of the relevance of the document to a query containing such a term. Thus, a ranking value is computed as an association factor between a word and a document; and the final ranking value for a document is obtained by summing the values for each work of the query contained in the document."[83]

At present there are eleven ranking algorithms available to QUIC/LAW users. If the user fails to specify an algorithm (which is generally the case), QUIC/LAW automatically employs a default algorithm which heavily increases the weight of documents in proportion to the number of query terms they contain.

DATUM/SEDOJ,[84] implemented on the Control Data 6400 computer of the Computing Centre of the University of Montreal, has in its data base at the time of writing the full text[85] of the past twenty years of Supreme Court of Canada and Quebec Court of Appeal judgments, and the past twenty-five years of the Quebec Superior Court Reports.

Data is organized into four separate files: text, dictionary, inverted index, and master file. The text file contains all documents in chronological order.

The dictionary file is a consultative tool, containing an alphabetical list of all terms in the entire data base, omitting standard common words, and truncating words longer than twenty characters. This file reveals the number of documents in which any given word is found, and the total frequency of the word's occurrence in the entire data base.

The inverted index file contains each word of the dictionary file arranged in alphabetical order, with a reference to each document in which that word occurs together with its relative frequency in that document; this file is not a consultative tool, but is a conceptual mode of data organization in the computer's memory.

The master file is a coded and condensed image of the text, and is used by the computer to determine the relative positions of words or sentences within a given document. The searcher can then specify these relative positions; he can stipulate that a word must be found within a given number of words from another stated word, or within the same sentence, or within the same document. A negative restriction can also be stipulated, e.g., that a word not appear in the same sentence with another word.

DATUM offers a number of output options:

1. The system will print the full *text* of up to three documents for each line in the query.

2. The *citation* option gives the user a list of documents with document identification (volume, page, and names of parties), summary of abstract, quotations of portions of the text where the search terms occur with the terms underlined, and the page and paragraph numbers

where these quotations can be found in the original text. Up to twenty documents will be given for each line in the query.

3. The *reference* option provides up to fifty document identifications for each query line.

4. If *summary* is specified, instead of document identification, the summary or abstract will be listed.

Where an output option is no longer effective, the next output option applies. After the first fifty documents, only the document number will be listed.

The DATUM group has attempted to meet what is known as the synonym problem. This difficulty has been described by Kayton:

"The computer, by its nature, can do no more than slavishly follow painstakingly detailed instructions. Therefore, a search through the computer-stored documents, i.e. . . the database, by the computer for the word 'remuneration' will not run up those documents in which a term such as 'compensation', 'consideration', 'salary', 'wages', 'bonus', or 'emolument', for example, is used instead. . . it becomes necessary to expand the search question in a way such that the computer will print out cases of citations including representations of the search questions which use synonyms in lieu of the precise words of the initial search question. To search the question properly then, each of the terms A,B,C, and D would have to be replaced in the question presented to the computer by a set of many disjunctive, synonymous or analogous terms. . . The significant question is, however, how many and what synonyms for those terms occur in the data base actually to be searched. The searcher never knows the answer to this question beforehand or he would not have to conduct the search. To require him to know the answer would require him to know that which he came to the computer to find out."[86]

A number of solutions to the synonym problem have been considered: A human intermediary (generally the searcher himself) suggesting synonyms will invariably be unsatisfactory for the reason Kayton gives — the user does not know what it is that he does not know.

An alternative is a manually-generated thesaurus (synonym dictionary), i.e., an abstract relation of synonymous words by erudite individuals employing their personal knowledge, standard dictionaries, and related tools. Kayton has pointed out the objection to this approach: "The almost infinite possible variations in words and phrase usages in a particular library, especially as found in the case law, are simply not subject to a priori enumeration".[87]

Because of these difficulties, there has been considerable experimentation with statistically-generated quasi-thesauri, with a complete absence of human intervention. Kayton describes the method:

"In the statistical approach, every word in the database is considered part of a couplet with every other word in the same paragraph (or page, or document, or arbitrarily selected number of sequentially appearing words in a document) with which it appears. The frequency of occurrence of couplets throughout the entire database is counted. An arbitrarily or intuitively determined threshold number is elected, and any couplet having a frequency of occurrence higher than the threshold is considered to be made up of two words that are sufficiently related to each other to be included in the quasi-thesaurus."[88]

This method has at least three deficiencies. First, it considers to be synonymous words which often appear together but which are clearly not synonymous, e.g., *contributory* and *negligence*. Secondly, many words which are truly synonymous will not appear together more than the arbitrarily determined threshold number, and therefore will not be considered as

synonymous by the computer. Lastly, the computer is unable to distinguish between the various meanings of a homographic word; it cannot distinguish between *bar* meaning *a legal association, an estoppel or preclusion, a rod or stick,* or *a saloon or pub.*[89]

These deficiencies led Kayton to develop the SYNDIG (SYNonym DIctionary Generator) thesaurus. A SYNDIG thesaurus is generated from the database of the particular library to be searched (thereby dealing with the problem of a priori enumeration), but uses a restricted human contribution prior to computer processing; the human contribution is to evaluate word by word what a word means in the context of its sentence.[90]

In an attempt to meet the synonym problem, DATUM adopted the Kayton SYNDIG method. Mackaay writes:

"On se souviendra que, selon ce principe, deux mots sont considérés synonymes s'ils peuvent se substituer l'un à l'autre dans un contexte donné sans en changer le sens. Si une telle approche doit faire appel au jugement humain . . . elle a l'avantage de le restreindre à des décisions bien circonscrites, plutôt que de faire intervenir le 'concept même' comme dans le cas des dictionnaires 'classiques'."[91]

The DATUM bilingual thesaurus of synonyms is constructed in three steps. First, human analysts read representative samples of the text and assign lists of synonyms to all important words or expressions (employing the substitution definition of synonym). Then the French and English synonym lists are integrated. Lastly, there is an automatic generation of the thesaurus by the computer, retaining the separateness of homonyms.

Automatic generation is based on three rules:

1. Whenever two lists with the same heading contain more than a certain minimum number of synonyms in the same language, the two lists are

integrated into a compound list of synonyms.

2. Lists with the same heading that do not have sufficient overlap are kept separate as homographic forms of the heading.

3. Within a list, for one language, synonyms are classified into sub-sets according to their proximity to the exact meaning of the heading.[92]

The DATUM system now possesses the capability to search for grammatical variations (thesaurus-g) and synonyms (thesaurus-s) for any search term. Suppose, for example, we instruct the computer thus: BATEAU (E S). The letter E in brackets instructs the computer to search for plural grammatical extensions of the root word; the computer will accordingly retrieve any document containing the word *bateaux*. The letter S in brackets instructs the system to search for all conceptual synonyms of the word which have been entered into the system by the creators of the SYNDIG-style thesaurus. Several different levels of conceptual similarity may be specified. Level 1 is simply the word *bateau* itself. Level 2 would include close synonyms, such as *navire,* the English word *ship,* and so on. Level 3 would be related or associated terms. Thesaurus operation is automatic, but the searcher may opt not to use it and instead declare in full the search terms of his choice.

As yet the DATUM system has not come to grips with the problem of homographic words. This is a particular difficulty in a bilingual system. If, for example, one wishes to retrieve jurisprudence dealing with computers, and enters the search term COMPUTER, the mass of materials received will relate to some such term as *computer les dommages.*

DATUM is not an interactive system. The DATUM user has two methods of conveying information to the system.

1. He may phone in his request. Calls are received by legal personnel, sometimes articling students, and during the course of an informal conversation the user explains his problem. The DATUM consultant decides exactly what the user's problem is and formulates the search.

2. Lawyers are provided with DATUM request sheets containing relevant questions to which they must respond; these sheets are constructed so as to require the user to formulate his question quite precisely.[93]

OBAR, the Ohio system which is a version of LEXIS[94] and is operated by Mead Data Central under contract with the Ohio Bar Association, is a full-text on-line interactive system.

The present database consists of Ohio statutes, all reported decisions of Ohio courts, the United States Code, and decisions of all federal courts. In selected areas (e.g., tax, securities and trade regulation), the database includes some administrative and regulatory materials and legislative history.

Searching is conducted in much the same manner as in the QUIC/LAW or DATUM system. When a search is initiated, the lawyer chooses "any word, phrase or combination of words and phrases which he believes most aptly characterize an authority"[95] for which he may be looking.

The computer then finds and displays on the television screen all the cases which contain those words anywhere in the text. The user must attempt to envision all the ways in which the court might discuss the question of interest to him; accordingly the user must consider a wide range of conceptual and grammatical synonyms and variations.

Jerry Rubin, President of Mead Data Central, has said: "*All* that is required of the user is cognizance of syntactical quirks in the English language while framing his searches, awareness of possible synonyms and homographs of

the words on which he is searching, and perhaps most important, the ability to convert legal concepts into combinations of words or phrases on which to base his search."[96]

OBAR employs mandatory conditions and positional logic as search aids. This can perhaps best be demonstrated by reproducing an actual OBAR search described by Troy.[97]

In any ordinary language, the problem is: "Whether an oil company's purchases of advertising materials used in connection with a large scale promotion and giveaway program were purchased for use or consumption directly in making retail sales and for that reason exempted from sales and use taxation."

The following represents submission of this question to the computer together with the resulting dialogue between user and system:

$ANY EQU TAX OR TAXES OR TAXATION (W2) SALE OR SALES USE 0131 DOC'S; PRINT?

M

ADD REQ.
AND ADVERTI*******OR PROMOTION** OR GIVEAWAY 0014 DOC'S PRINT?

M

ADD REQ.
AND DIRECT OR DIRECTLY 0010 DOC'S PRINT?

Y

FORMAT, O D
40, P.

The dollar sign ($) which begins the search frame signals the computer that the search has begun. The word ANY instructs the computer to search the full text of all cases in its data bank; the system can, if so requested, search particular segments of cases, such as headnotes or opinions only. The letters EQU represent an abbreviation of *equals* and instruct the computer to search for statements logically equal to

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the specifications which follow. NEQ can be used as an exclusionary command. (W2) is a parameter command which in this case instructs the computer to search for sentences in which the word *tax* or *taxes* or *taxation* fall within two words of *sale* or *sales* or *use*.

The system responds to the original search request by retrieving 131 cases (0131 DOC'S PRINT?). The user decides that this represents an unmanageable retrieval, and wishes to modify his search, which he does by adding the requirement that retrieved documents contain the root *adverti* (ADVERTI*******) or the root *promotion* (PROMOTION**) or the word *giveaway*. After a further refinement of the search mesh (AND DIRECT OR DIRECTLY), the searcher is satisfied with the number of documents retrieved and instructs the computer to print them.

OBAR has no thesaurus capability, preferring to allow the lawyer to conceive his own synonyms for search terms. Output options are full text, case citation only, citation and headnote, and citation together with any specified part of the judgment. The search terms appearing in the retrieved material are displayed in a distinguishing colour.

JURIS,[98] the system developed by the United States Department of Justice, is primarily designed to make available to all department lawyers the department's prior work-effort (legal handbooks, form books, appellate briefs, legal memoranda, legal policy and procedure correspondence, and case-file intelligence and evidentiary material for protracted cases). The system is on-line and interactive.

The data base is indexed according to its nature as follows:

1. briefs, memos and directives— manually-selected citation data, key words and phrases, key numbers, and noncommon words of total text;

2. U.S. code, manuals, bulletins and model forms—noncommon words of total text;

3. evidentiary material—manually-selected citation and operational data and manually-extracted phrases and expressions.[99] As yet no thesaurus has been developed.

A search is initiated by entering a key word or phrase; the computer then displays a list of alphabetically-near terms. In this way the user discovers if his search term is in the indexing vocabulary and discovers further what spelling or ending variations of his words may be in the data base.

"Appearing with each displayed term is an indication of how many information items in the retrieval file are indexed to that particular term, and how many of the other terms have been designated as related to it. Related terms can then be displayed to determine if the search interest should be expanded to include any of them."[100]

JURIS has the capability of retrieving total text material on the basis of search words occurring within a specified number of words from each other. It further allows entry into the system through the West Key Number System, allowing Key Number access to information items which have been assigned specific West Key Numbers. Finally, JURIS possesses a KWIC display in either direction. Search constraints are imposed by Boolean logic equations.

C. Experiments in searching

"We're working on it" — Electronic legal retrieval system developer

Kayton has written:

"In the final analysis, total credibility of the results of computerized legal research can only be established by lengthy and continuing comparisons with the result of the best research method otherwise available."[101]

The obverse, equally correct, is that electronic legal retrieval can only be convincingly discredited by lengthy and continuing comparison with the best research method otherwise available, the comparison demonstrating markedly inferior results produced by the computer according to reasonable criteria.

As a simple and quite unscientific experiment, Eric Nadler (a McGill law student entering second year), DATUM, and QUIC/LAW, were asked to search their data bases (the McGill Law Library in the case of Nadler) for information which would provide an "answer" to this simple question: "What Supreme Court of Canada cases reported since 1923 discuss the distinction made in the common law of contract between a liquidated damages clause and a penalty clause?"

This test was of an elementary kind; proper analysis, leading to convincing conclusions, requires intensive experimentation. That experimentation, however, would likely take the form of the trial we attempted, which goes some way towards establishing a testing methodology, and which at least affords a concrete example of how electronic legal retrieval systems actually operate.

In response to the test question, Nadler was immediately (and fortuitously) able to give the names of two cases which he knew, on the basis of past work, to be relevant: *Dimensional Investments* v. *The Queen* [1967] S.C.R. 93, and *Waugh* v. *Pioneer Logging* [1949] S.C.R. 299. He examined the 1958-68 volume of *Cases Judicially Considered*[102] and found that these two

cases had not been cited by the Supreme Court in that period.

The *Canadian Abridgement*[103] provided the names of more than a dozen cases *prima facie* on point, although not all were heard in the Supreme Court or were reported since 1923. Nonetheless they were all examined together with cases mentioned in their text to see whether further references to other cases which might fit the requirements of the search could in this way be located. This method produced two further Supreme Court cases directly on point, but both were heard before 1923 and were consequently discarded.

Finally, Nadler consulted *Butterworths Supreme Court Digest*[104] under the headings "Damages" and "Contract". Neither heading provided any new cases on point.

Nadler noted in passing that *Waugh* v. *Pioneer Logging* was indexed under "Logging Contract", and remarked that "this index is so inadequate as to be misleading. The case did deal with a logging contract, but that fact is of little relevance compared to the major point of the case." Nadler further noted that he was unable to find *Dimensional Investments* v. *The Queen* reported under any heading in *Butterworths Digest*. This part of Nadler's manual search took approximately five hours, and he was unable to add to the two cases he knew of to begin with.

Nadler then attempted a manual search on the assumption that he did not know the names of any cases on point and without relying on subjective and perhaps misleading indices. To make the task easier, this time Nadler restricted himself to Supreme Court cases reported after 1949. He went through each volume of the Supreme Court Reports beginning in 1950, ignoring the index at the back and examining the scopenote for each case. If

Nadler felt on the basis of the scopenote that a case might be relevant, he read as much of the case as was necessary definitely to determine that case's relevance or irrelevance to the inquiry. After approximately nine hours in the library, Nadler located just one relevant case — *Dimensional Investments* v. *The Queen.*

DATUM has only the past twenty years of Supreme Court cases in its data base. The test question was adapted to a DATUM request form[105] which was then mailed to the address given. This form was interpreted by a DATUM consultant, who made the actual request of the system (unfortunately the printout does not reveal the precise terms in which the request was phrased).

DATUM retrieved twelve cases.[106] On the printout the DATUM consultant marked as pertinent the cases of *Dimensional Investments* v. *The Queen* and *Perini Pacific* v. *Greater Vancouver Sewerage and Drainage District* [1967] S.C.R. 189. The consultant indicated that the remaining ten cases were "doubtful". Nadler examined *Perini Pacific*, and commented that it was irrelevant to the query; he observed that in his earlier manual search he had looked at *Perini Pacific* and had rejected it as not on point.

Nadler then took two-and-a-half hours to consider the ten doubtful cases, and reported that he could not see the relevance of any of them to the search query. These cases mentioned some or all of the key words in the search question, but the distinction between liquidated damages clauses and penalty clauses was never a legal issue concerning the court.

Finally, Nadler commented that if one took into consideration the time required to check all cases provided by a computer (a seemingly indispensable task), the time difference between electronic and manual search might not be so great. Furthermore,

the larger the data base, and accordingly the more data produced in response to a query, the less this differential is likely to be.

On June 8, 1972, with the assistance of Professor Hugh Lawford, Director of QUIC/LAW, and in telephone communication from Montreal with QUIC/LAW personnel in Kingston (not in an interactive situation), we put the test question to the QUIC/LAW system.

On Professor Lawford's advice, three separate searches were run on the data base. These searches were defined in the following way:

1. CASES WHICH DISCUSS THE DIFFERENCE BETWEEN PENALTY CLAUSES AND LIQUIDATED DAMAGE CLAUSES;

2. LIQUIDATED;

3. LIQUIDATED & PENALTY & CLAUSE.

In response to search (1), QUIC/LAW produced 1624 documents, statistically ranked according to the default algorithm in order of "relevance". The first case listed was *Waugh* v. *Pioneer Logging*. *Dimensional Investments* did not appear in the first thirty cases listed (this is as many cases as the system was asked to print).[107]

Fifty-one ranked documents were retrieved in response to search (2); *Waugh* was again first, and this time *Dimensional Investments* appeared sixth.

Finally, nine cases were retrieved by search (3), with *Waugh* heading the list and *Dimensional Investments* coming third.

Nadler examined the first twenty cases produced by search (1), the first twenty-five produced by search (2), and all cases produced by search (3). He concluded that no new cases or relevance were found by QUIC/LAW.

He observed that,

(a) particularly long cases tended to be retrieved no matter what, since the longer

the case the more likely it is that a key word will appear;

(b) there was a massive irrelevant response to search (1) since every case with the word *damages* in it was retrieved;

(c) the word *liquidated* generally appeared as the past tense of the transitive verb *to liquidate* and not as an adjective modifying the noun *damages*.

QUIC/LAW was then tested in an interactive manner (in Kingston).[108] The test text was an article discussing the interpretation of the common law of contract by the Supreme Court of Canada;[109] we tried to discover

(a) how a user has to proceed to retrieve relevant cases (using the article as a measure of relevance), and

(b) whether QUIC/LAW would discover any relevant cases omitted by the article (i.e., not found by manual search).

Identifying to the system Supreme Court cases as the desired data base, we began by asking QUIC/LAW: WHAT CASES DISCUSS FORMATION OF CONTRACT? This question produced 1309 documents statistically ranked by the default algorithm. In the first twenty-six cases, none of those mentioned in the article, under the heading "Formation", appeared. The computer did cite one case (ranked ninth) which appeared to be relevant but which was not discussed in the article: *Taylor* v. *Silver Giant Mines* [1954] S.C.R. 289.

The query was then reformulated as WHAT CASES DISCUSS OFFER AND ACCEPTANCE IN CONTRACT? This question produced 1465 documents. Within the top-ranked five, two of the cases were exactly on point and were discussed by the article; other retrieved cases up to rank twenty-two were considered and rejected as not on point.

We were now concerned that we had yet to retrieve *Calvan Consolidated Oil & Gas* v. *Manning* [1959] S.C.R. 253, an

important Supreme Court case in the formation of contract area. We were determined to frame a request in such a way that this case could *not* be omitted (realizing that such a search is dramatically atypical).

The following query was put to QUIC/LAW: ACCEPTANCE & ABSOLUTE & UNEQUIVOCAL & CONTRACT. The *Calvan* case did not appear. We tried SUBJECT TO CONTRACT, but did not even attempt to examine the product, since the number of retrieved cases was immense (*inter alia* all cases containing the word *contract*, since Boolean mandatory conditions were not employed).

We then asked QUIC/LAW: WHAT CASES DISCUSS UNILATERAL OFFERS IN CONTRACT? It was reassuring to see the key case of *Dawson* v. *Helicopter Exploration* [1955] S.C.R. 868 ranked first. To see whether the article had omitted relevant cases, we now inquired WHAT CASES CITE 'DAWSON V. HELICOPTER EXPLORATION'? but did not examine the product when we saw that 254 documents had been retrieved (*inter alia* all documents with the word *exploration*). The query was reformulated to DAWSON & HELICOPTER & EXPLORATION. This question produced two documents — the *Dawson* case ranked first, and *Time Motors* v. *Minister of National Revenue* [1969] S.C.R. 501, a case with which we were unfamiliar. We examined the *Time Motors* case and found it to be relevant.

We now decided to try and find all Supreme Court cases which discuss the remedy of specific performance of a contract. To begin with, we simply asked WHAT CASES DISCUSS SPECIFIC PERFORMANCE OF A CONTRACT?

This question produced 1670 documents, with the totally irrelevant case of *Canadian Pacific Railway* v. *Attorney General for Saskatchewan* [1951] S.C.R. 199 ranked first. The relevant cases of *Kloepfer Wholesale Hardware* v. *Roy* (1952) 2 S.C.R. 465, *Dobson* v. *Winton &*

Robbins [1959] S.C.R. 775, *Frobisher* v. *Canadian Pipeline* [1960] S.C.R. 126, and *McKenzie* v. *Hiscock & Dowie* [1967] S.C.R. 781, were ranked respectively second, third, eighth and fifteenth. The *Dobson* and *Frobisher* cases were not cited in the test article.

In order to compare the merits of various methods of framing a request, we now asked **SPECIFIC & PERFORMANCE & CONTRACT**. This formulation produced 170 documents, with the four relevant cases ranked within the first eight, and *C.P.R.* v. *A.G. for Sask.* appearing third.

In an attempt to eliminate such plainly irrelevant cases as the *C.P.R.* case, we now used the Boolean mandatory condition "but not" (%) and first asked **SPECIFIC & PERFORMANCE & CONTRACT % LAND % CONSTITUTIONAL**. The computer replied that this query contained too many words, and asked us to try again.

The question was rephrased to **SPE-CIFIC & PERFORMANCE % LAND % CONSTIT$**. Again the computer rejected this query as containing too many words.

Finally, the query **SPECIFIC & PERFORMANCE % LAND** produced one relevant case, *Gray* v. *Cameron* [1950] S.C.R. 40, ranked first. At least two of the other irrelevant cases turned out to be about contracts for the sale of land, although the word *land* was not specifically mentioned in the text, *property* or *house* being used instead. This particular result led Nadler to comment that "system developers who ignore the thesaurus problem are in for an unpleasant surprise."

We now turned to the doctrine of anticipatory repudiation. The question **WHAT CASES DEAL WITH ANTICIPATORY REPUDIATION?** produced the two highly relevant cases of

Canadian Acceptance Corporation v. *Fisher* [1958] S.C.R. 546 and *Canadian Egg Products* v. *Canadian Doughnut Company* [1955] S.C.R. 398, ranked second and third respectively. Omitted were *McBride and Hogaboam* v. *Johnson* [1962] S.C.R. 202 and *Chapman* v. *Ginter* [1968] S.C.R. 560, cited by the article. These latter cases were not obtained by rephrasing the search to **ANTICIPATORY & REPUDIATION & CONTRACT**.

The only search formulation which we could think of that actually produced the *Hogaboam* case were the word *Hogaboam* itself and a reference to the leading English case on anticipatory repudiation, *Frost* v. *Knight* (1872) L.R. 7 Exch. 111.

The last experiment conducted was an attempt to see whether QUIC/LAW could find an actual case on a specific point. The case we had in mind was *St. John Tugboat* v. *Irving Oil Refinery* [1964] S.C.R. 613.

To begin with, we asked the system **IS THERE ANY CASE IN WHICH A TUGBOAT WAS KEPT AVAILABLE FOR THE ORIGINAL HIRER FOLLOWING EXPIRATION OF THE FORMAL CONTRACT OF HIRE?** In response to this formulation, the *St. John Tugboat* case was retrieved ranked fourth.

We now simply asked **TUGBOAT & CONTRACT & EXPIRATION**. Much to our surprise the computer replied that no documents met these specifications.

We asked **TUGBOAT** alone. Three documents were retrieved, but *St. John Tugboat* was not among them.

This was a clear system error, and we alerted QUIC/LAW personnel. They attempted to retrieve our problem case by asking **ST. JOHN (1) & TUGBOAT (1)** but this did not produce the document, and

at this point the QUIC/LAW staff retreated in confusion.

These various experiments in searching are not nearly scientific enough to allow particular and valid conclusions to be drawn from them. At best, they are interesting (and they may not even be that), for they demonstrate how electronic legal retrieval operates from the user's perspective and show the technique required to search.

Furthermore they do suggest certain problem areas which might merit further and more controlled research leading to more detailed analysis. Some of these problem areas may be:

1. the extent to which computer retrieval offers a *real* timesaving, taking into consideration the time required to substantiate the results;

2. the consequence and propriety of employing consultants to interpret search requests and search results (as DATUM does);

3. the helpfulness of statistical ranking of the kind performed by QUIC/LAW;

4. the problem of unusually long cases which tend to be retrieved no matter what key words are employed in the search;

5. the question whether the best search formulation is a colloquial one, or one employing Boolean mandatory conditions;

6. the desirability of combining a Boolean mandatory condition capability with a thesaurus capability; and

7. the implications of technical difficulties in a system which will prevent (without the user's knowledge) retrieval of cases which should be retrieved on the basis of the search formulation.

D. A note on radical computer use in law

... the computer embodied a unique property, which was this: It could be made to act like anything else that one desired, if one could manage somehow to define how the other thing behaved.[110]

Eldridge and Dennis have pointed out that supposed limitations of the capability of computers "are really limitations of our ability to verbalize the operations we wish the computer to perform. When students of learning theory, decision theory, and human thought processes in general can describe logically the processes by which humans perform mental operations, it seems likely that there will be computers to simulate such operations readily."[111]

Just how far can computers go in simulating human thought processes? One common claim is that computers are always predictable, and that unpredictability is an element of human originality. Apter has pointed out that, in the first place, human processes may not be truly random; Freud for one argued that every product of human thought, including errors, is meaningful.[112] Secondly, a computer programmed according to general heuristic principles, or programmed to think analogically, or equipped with a randomizer, may well solve problems in a way not anticipated by its programmer. Scriven has shown that paradoxically the very mechanical nature of a computer makes its product as unpredictable as the product of human thought:

"First, there are errors of inadequate programming, which cannot be dismissed as mere operator errors, since a program often involves tens of thousands of characters in the 'machine language', not all the consequences of which can be foreseen by the programmer any more than Euclid foresaw all the consequences of his axioms. Secondly, there are mechanical breakdowns within the machine.... Thirdly, there are variations due to uncertainty — principle effects in junctions, relays, thermionic values, etc.... Fourthly, there is the cumulative inaccuracy possible

with analogue computers. Fifthly, there is the possibility of deliberately using a randomizer in the circuitry .... Sixthly, there is the rapidity of operation that makes the fastest computer unpredictable in fact.

"... the only safe conclusion is that some computers are 'in principle' unpredictable in a way essentially similar to the way human beings are."[113]

Another commonly-suggested limitation on the ability of a computer to solve a problem is the claim that a computer can only act rationally. Apter has convincingly disposed of this point:

"... the term 'rational' may be used in different ways. If it means 'deductive', we have already seen that computers, through learning, may function inductively. If it means 'deterministic', then it can be pointed out that random (or quasi-random) processes may be incorporated in computer programs. If it means 'non-emotional', ... computers may be programmed to develop emotional attitudes and also supply Freudian defence mechanisms to their information processing. If it means 'non-fantasy', then it is ironic that one fashionable theory of dreaming likens it to the process of clearing and revising computer programs."[114]

It may well be possible, then, that computers can simulate human thought processes, subject only to our ability to articulate the nature of those processes. We have seen already the attempt of Buchanan and Headrick to describe legal thought processes.[115]

Following on this description, Buchanan and Headrick suggested that it may well be possible for a computer to operate on the legal data base the way a lawyer does. They suggest that a program similar to Heuristic

DENDRAL might well simulate the creative aspects of legal research. Heuristic DENDRAL, designed at Stanford by Joshua Lederberg and Edward Feigenbaum, and programmed by Georgia Sutherland, Allan Delfino and Bruce Buchanan, runs on the Stanford IBM 360/367 computer.[116] The function of the program is described in this way:

"The task of the Heuristic DENDRAL program is to make inductive inferences from experimental data to explanatory hypotheses in a complex area of science. The data are analytic data resulting from fragmentation of organic chemical molecules within a mass spectrometer. The explanations the program seeks are models of the original chemical compound that produced the data. Using general principles, the program tries to relate the facts (data) to an hypothesis that clarifies the facts or shows why the facts should be expected. It attempts to reason from the facts to the most plausible conclusion, given general principles governing the relation of facts to conclusions."[117]

Buchanan and Headrick argue that Heuristic DENDRAL, which reduces the size of the search space whilst including the correct solution in the space, does what a lawyer does "when he identifies his problem in a generic way and constructs a list of plausible (or possible applicable) rules, which then by another set of thought processes, are tested by a closer look at those rules as applied in previous cases, and the facts in the client's case."[118]

L. Thorne McCarty has devised a pilot project along the lines suggested by Buchanan and Headrick.[119] The problem domain chosen by McCarty is the taxation of corporate reorganizations, and particularly the definitional provisions,

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Section 368 of the Internal Revenue Code and its predecessors.

The TAXMAN system has the following elements:

1. description of situations and events in the corporate reorganization area;

2. analyses of these descriptions according to legal principles;

3. heuristic mechanisms for building and modifying the given descriptions and their respective analyses, plus a capacity to call interactively when necessary on a human user.[120]

A "description" is a semantic net, with names of things as nodes, and names of properties or relations as links. A semantic net can be expanded indefinitely, and can be represented in a computer data structure.

To accommodate the "arguable" nature of any legal proposition, McCarty has adopted the convention "that every assertion in the semantic net have attachable to it an additional piece of data structure giving its justification (i.e., why it was asserted in the first place) and some indication of how it can be subsequently attacked."[121] TAXMAN's analysis mechanism aims to add a final assertion supported by plausible arguments to the description structure (e.g. x sequence of events constitutes a tax-free reorganization for reasons y).

McCarty sees as his biggest problem incorporating within TAXMAN the ability to draw analogies and distinctions between past and present cases. One possibility explored by Kling[122] is to view an analogy "as a certain mapping between the two structures analogized, with the most plausible or interesting mappings selected out from the combinatorial possibilities by the usual heuristic procedures."[123]

McCarty suggests as an alternative the generation of hypotheticals: "an analogy might be viewed as a transformation of one description through a sequence of simple hypothetical descriptions into a second description, the intermediate hypotheticals being selected again by heuristic criteria."[124]

CHAPTER THREE:

THE IMPACT OF ELECTRONIC RETRIEVAL ON THE LAWYERING PROCESS

A. The Intellectual Impact

The modern electronic computer . . . is perhaps the most significant technological development for lawyers since the introduction of Gutenberg's movable-type press. [125]

The computer is . . . easily converted into an anxiety-relieving deus ex machina. [126]

Computers used in legal research have three striking and apparently desirable attributes: they are very *fast*; in systems employing a natural language complete-text technique (and almost all systems do), they are very *objective*; and they operate in systems which if properly designed are very *flexible*, capable of infinite expansion in almost any direction.

They are very fast partly for reasons of mechanical design, and partly because of their ability to search for a co-occurrence of labels. They are very objective if the system is a full-text system (and particularly if it is an on-line inter-active system), because no human intelligence interposes its values and judgments between the searcher and the data base. They are very flexible because in a full-text system there is no (possibly obsolete) hierarchical index to be respected.

Seemingly, computer retrieval of legal materials is a good thing. It is generally presented as at least that, and by those who develop and sell systems it is sometimes put forward as being a good deal more (the word *revolutionary* is often used). However, I want to suggest that electronic legal retrieval systems designed to assist in, or substitute for, a key part of the legal thought process have been developed with little understanding of what that process is, and what the consequences of changing it will be.

Spengler noted that in science, conceptual structures may determine what a scientist "sees":

"We may turn for the purposes of illustration to the Whorfian hypothesis that the structure of a people's language determines the 'world view' of their culture. Among the implications of this hypothesis is the view that each language tends to facilitate some kind of expression and inquiry, and to hinder others . . . this type of

handicap was experienced by Galileo when, in his inquiry into uniformly accelerated motion, he underestimated the role of the time factor. He lacked the necessary idiom and the theory of fluxions which Newton was to develop; and so the 'time factor' was slow to receive due weight in the representations of reality employed. . . . The obverse of this sort of explanation is that, as the Whorfian hypothesis suggests, if there is ready to hand a collection of verbal symbols seemingly suited to express what they are not really suited to say, that which is observed is likely to be compressed into these symbols and thereby distorted, particularly if these symbols are limited in number as well as in applicability to the task of expressing the observed." [127]

We are not, of course, confronting in computerized legal retrieval a change in verbal symbols. We may, however, be dealing with a change in logical structure imposed on constant verbal symbols, and although we cannot say in the law that what is observed is thereby distorted, we may be able to say that what is created is thereby changed.

It should *not* be thought that the law and logic (in a formal sense) are inherently incompatible. Dickerson has observed that "symbolic logic and mathematics are essentially no more than precise and less ambiguous languages . . . these media provide abstract systems into which any substantive content can be poured without necessarily contaminating it." [128]

Dickerson further noted that mathematics "is primarily concerned with the relationships between the symbols themselves (the syntactic dimension), not the relationships between the individual symbols and the ideas to which they may respectively refer (the semantic dimension)." [129] But although the syntactic may aptly represent the semantic, on the other hand it does not necessarily do so and, to the extent that

it does not, the concepts represented by verbal symbols may be distorted.

Do computer legal retrieval systems adequately reflect contemporary legal thought patterns? Buchanan and Headrick, it will be recalled, isolated four stages in a practising lawyer's thought processes:

1. the lawyer establishes a goal, finds linkages from facts to rules to legal consequences, and measures at various stages the compatibility of a set of consequences with the established goal;

2. the facts suggest some possibly applicable rules, and the rules and the cases using them suggest the relevance and importance of certain facts;

3. the lawyer differentiates on the basis of his objectives between different rules that might apply to the same behaviour and events;

4. if the lawyer cannot find cases whose facts are similar to the facts with which he is working, he attempts to find cases with facts that are analogous to his own.[130]

The salient general characteristics of electronic legal retrieval systems are as follows:

1. storage is on a full-text basis;

2. searching is by means of key word;

3. there is a Boolean logic capability;

4. there may be a statistical ranking capability;

5. a thesaurus may be operative;

6. there may be a positional logic feature; and

7. generally the system is of an on-line interactive kind.

These features may be summarized by saying that the state of the art in electronic legal retrieval allows the user (in a hypothetical system) to retrieve in an interactive fashion the full text of sta-

tistically ranked legal documents in which certain key words or their synonyms appear in a certain relation to other key words or their synonyms.

The Buchanan and Headrick models show that in most situations the practising lawyer, confronted with particular facts that pose a legal problem, is looking for:

(a) the same or a very similar factual situation;

(b) an analogous factual situation; or

(c) a rule which benefits his client and is *prima facie* applicable to his case.

The crucial question for the purpose of appraising electronic retrieval is whether these research needs can be translated into key words positionally related to other key words (the constraints imposed by the system).

Quite a good case can be made out for it being possible with respect to research need (a); the key aspects of a factual situation can likely be represented by words (most factual occurrences can be described in words without distortion).

A less convincing case can be put forward with respect to research need (b); the difficulty here is to know what constitutes an *analogous* situation, and this creative problem cannot convincingly be handled by the computer, even one with a thesaurus capability. (A thesaurus allows retrieval of analogous words, but will not directly locate analogous concepts or cases.)[131]

It is research need (c) which creates the gravest difficulty. Electronic legal retrieval of a legal rule or concept (that is, of a document in which the rule or concept appears) can only be accomplished if the user indicates precisely in words either the nature of that rule or concept, or the nature of the document in which it will be found. *It is exactly this that the user cannot do.* In the first place, by definition *he does not know what it is that he does not know.* Despite extravagant claims made, computer retrieval in full-text systems has not overcome the

curcial deficiency of the tradional index. Eldridge and Dennis pointed this out at an early stage,[132] and Dennis more recently expanded on the point:

"If the full-text, no-index approach is used, when it comes time to retrieve, a fallible human must decide for which words and phrases to search, and the computer simply scans for matching language. In effect, the problem of indexing has been merely transferred from indexer to searcher."[133]

Secondly, a legal concept or rule, unlike a factual occurrence, cannot adequately be described, and any retrieval system which imposes this requirement on the user is doomed to failure. At the very least, it is demonstrably true that no two lawyers, no matter how similar their training, background and outlook, will describe a given legal concept in the same way using the same language.

It may be objected that if in this and other respects electronic systems are no better than manual systems, at least they are no worse. But electronic retrieval *is* worse than manual retrieval in the crucial function of concept searching. Computer retrieval, emphasizing precise enunciation of research needs, does not permit *random conceptual searching.*

It is this kind of search, allowed by a normal library situation, which permits the user rapidly and intuitively to transfer his attention from one part of the data base to a different part. Arguably it is only in this fashion that the practising lawyer can meet crucial research need (c), and it is here that legal creativity is to be found.

It will be remembered that Rupert Cross, in his analysis of judicial reasoning, argues that the deductive element in that reasoning is trivial, since the crucial characterization is done before the reasoning can be cast into syllogistic form. He notes too, that little that a judge does can properly be described as inductive, since in law, unlike in science, rules govern cases, rather than cases generating rules. Cross emphasizes the importance of

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judicial reasoning by analogy, and describes his basic view of the judicial process in a passage I have already quoted:

"First comes the perception of relevant likenesses between the previous case and the one before the court. Next there is the determination of the *ratio decidendi* of the previous case and finally there is the decision to apply that *ratio* to the instant case. Analogy may be said to be employed at the first stage, it plays no part at the second stage, but it is frequently decisive at the third where the judge has to consider whether the facts of the case before him resemble those of the previous case sufficiently to necessitate the application of its *ratio decidendi,* or to justify him in applying it if he wishes to do so."[134]

On the basis of this description by Cross one may say that a judge faced with facts presenting a legal problem does one or more of the following things:

(a) looks for the same or very similar factual situations;

(b) looks for analogous factual situations;

(c) determines the *ratio decidendi* of identical, similar or analogous cases; and

(d) decides whether to apply that *ratio* on the basis of how much the previous case resembles that instant case, or — more likely — policy considerations.

What is different from the functions of a practising lawyer is function (c), determining the *ratio*, and function (d), deciding whether to apply that *ratio*. It is evident that these functions do *not* have equivalent research needs, and cannot be assisted by an electronic retrieval system.

Determining the *ratio* is not dependent upon retrieval application of any particular information, but requires a sophisticated form of analysis which no computer yet existing and none envisaged can undertake.

Deciding whether to apply the *ratio* is to some extent dependent upon the degree of similarity between facts, but no machine is required to make (or can make) this type of assessment, and in any event the importance of fact comparison is dwarfed by the role of policy considerations. By definition no machine can determine what considerations of policy are relevant and should be applied.

It could be argued that the analysis of judicial reasoning by Professor Cross places too little emphasis on considerations of policy and does not take into account such important factors as personal bias exhibited by judges. But as I have observed elsewhere, "whatever it is that stimulated judicial response, it is the rules and principles of law that define acceptable limits of that response. . . ."[135] What this means is that although judges may be *motivated* by non-legal considerations, they must render judgment in terms of legal concepts.

The consequence is that judges may well often be looking for a rule which achieves a particular purpose and is *prima facie* applicable to the case at hand. This research need is the judicial equivalent of research need (c) of the practising lawyer. It is precisely this need that cannot be met by electronic legal retrieval, and it is exactly here that an important source of legal development is to be found.

B. The impact on law and the legal system

The decision as to what law is to be entered into a system's data base is in part a social and economic decision. Dennis has observed in this connection that if the system "functions as a commercial venture, then the economic value of the information to its users will have primary importance. If it is supported by some sort of subsidy, other values may be more important."[136]

If law of the kind contained in systems' data bases is unduly emphasized in the legal system, as it may be if the systems work well, then those who make the social and economic decisions (what law to enter), and those who influence those decisions (probably by financing them), will have it in their power seriously to distort the substantive law.

In order to protect the law, either neutral financing of one system must be arranged (probably direct or indirect government financing of a system open to all), or else there must be a variety of systems representing many competing social and economic interests, so that balance may be maintained.

Dennis noted also[137] that a decision had to be made as to *how much* is entered into a system. "It needs to be decided whether we absolutely have to go back all the way to the beginning, or whether a 'law' of diminishing returns sets in. What, for example, is the relative value of pre-1900 law as compared with the law of this century?"[138]

The implications of this decision extend beyond technology and economics. The amount and age of law available affects the strength and the use of the doctrine of precedent; the extent to which that doctrine is affected may well be the measure of fundamental change in development of the body of substantive law.

McCabe has written that "the computer, since it deals with measured, finite, concrete, and structured things, tends to compel the legal profession to reduce its concepts to absolutes. Consequently, as we become ever more dependent on it, it will create a back pressure to cause us to structure our laws, and the profession itself, to fit it."[139]

Law and the legal profession may fall into the grip of "rule obsession"; at least one foreseeable consequence of such obsession is virtual elimination of judicial legislation. This disappearance will be the consequence, in the first place, of pressure on the legislature and judiciary to use unambiguous terms, since it is unambiguous terms that electronic retrieval can best deal with. Distinction and re-interpretation as a judicial device will thereby be eliminated.[140]

Secondly, improved retrieval systems may fill *lacunae* in the law, removing a fertile field of judicial law-making. Baade writes:

". . . in fields primarily regulated by substantially unlitigated and poorly codified or compiled statutes, a total search might well produce sources of indisputable authority which would unsettle . . . what heretofore were assumed to be firmly established rules of law. . . . The courts would no longer be able to evolve new rules of law merely by deliberately or accidentally overlooking inconvenient prior decisions."[141]

A consequence of the demise of judicial law-making will be mechanical application of rules obsessing the profession. The result might be that law "becomes nothing more than an instrument of the state, without norms to guide it or the state."[142]

At least one commentator has described beneficial results that might flow from what has been pejoratively termed "rule obsession". Dickerson observed at the Queen's University Conference that the reason why rules of law take the form they do may be simply that they have been shaped by the limitations of traditional means of storage and retrieval: "It is possible that their great generality has resulted not entirely from considerations of justice and public policy but partly from the accident of our previous inability to cope with more specific and detailed rules?"[143]

Dickerson earlier suggested that "it may now be possible to develop, classify, and preserve more specific and detailed legal rules than have heretofore been practicable, without being overwhelmed by this proliferation to the point of losing sight of basic legal principles or the integrating objectives that the law is intended to serve."[144]

A further consequence for the substantive law of computerized legal retrieval systems is the "overload" possibility. Stover has written, "it is possible that too much information could result, jamming the process of legal reasoning"[145] and Rostow said that "forgetting is almost as important as retrieval. We have to find devices for forgetting . . ."[146]

Why should we forget? We have noted already the tremendous volume of legal materials increasing in size at an exponential rate. It may be that the legal system can tolerate such growth only so long as complete access to this vast body of information is impossible.

If complete access were possible, the researcher would be presented with far more information than he could possibly comprehend. The consequences might be rejection of *all* information (or perhaps purely arbitrary selection of some information) with a resulting destruction of the professional status of law.

An alternative consequence of ready access is the encouragement of law creation. This danger has led Lawlor to suggest that "perhaps what we need most of all from computers today to aid the legal system, is a computer program which will search our unnecessary and obsolete laws and will repeal them automatically."[147]

The adversary process may be similarly threatened. To the extent that the same information similarly interpreted is available to everyone, and to the extent that detailed rules cover every case (if that is possible), there is no room for legal argument.

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CONCLUSION

The conclusions of our case study of electronic legal retrieval may be listed as follows:

1. retrieval systems have been developed with little regard for how lawyers actually think, and to the extent they reflect those processes, they may do so accidentally;

2. retrieval systems may impose certain alien logical structures on the verbal symbols of law, and thereby affect legal thought and ultimately substantive law;

3. retrieval systems cannot operate by way of analogy, a key feature of legal thought;

4. retrieval systems cannot be used satisfactorily to retrieve legal concepts;

5. retrieval systems (unlike an ordinary library situation) do not allow for random conceptual searching, a creative process meeting a crucial need of both the practising lawyer and the judge;

6. retrieval systems may accentuate existing social inequalities by providing superior legal information for large law firms and government agencies, at the expense of small firms and solo practitioners who normally represent weak clients;

7. retrieval systems may seriously affect the stability of the doctrine of legal precedent by keeping information out of the system and by encouraging through information overload rejection of information as the basis for legal thought; and

8. retrieval systems may destroy the ability of judges to make law by imposing a myriad of specific rules and by filling legal *lacunae*.

These various conclusions can be summarized in this fashion: electronic legal retrieval, if widely embraced, may distort legal thinking, may affect unfavourably important features of the legal system such as the doctrine of precedent and the law-making ability of judges, and may enhance existing social inequalities.

One point is quite clear. Large resources, whether human, financial, or whatever, should *not* be devoted to the maintenance or development of electronic legal retrieval systems of the existing type without further extensive study.

These systems have not been developed with full regard for their implications, and preliminary investigation, such as we have undertaken in this study, suggests that at the very least their contribution to the legal profession is slight, and that quite possibly their effects are decidedly unfavourable. Even the legal information, problem they were originally constructed to solve may not really exist,[148] and if it does exist, the cure may be worse than the disease.[149]

What is needed is a pause in funding and development while emphasis is given to serious study with four objectives:

1. research into the nature of legal thought processes;

2. careful experimentation with operating retrieval systems to determine their exact capabilities and to compare their results with those of manual searching;

3. careful juxtaposition of conclusions concerning thought processes with the constraints imposed by, and the results of, electronic retrieval; and

4. development of the experimentation with advanced artificial intelligence systems (such as the McCarty TAXMAN project) to determine whether and in what respects they constitute a line of development worthier of pursuit than development of established retrieval systems.

I have given, in this report, the reasons why study of this kind is necessary, and I have provided a framework within which such study can be pursued.

One further point must be made. Before government funding of electronic legal retrieval systems is continued, a public interest worthy of promotion must be identified.

If existing or developing systems work, and their general impact is benevolent, what reason is there to justify support from public funds rather than from commercial resources? If existing and developing systems do not work, or work but have a deleterious influence, what reasons might there be for government to support experimentation? Promiscuous spending of public funds should not be permitted.

PRINTOUT EXAMPLES

A. DATUM

1. **DATUM** *demande d'information en jurisprudence*

DATUM®/SEDOJ INC.

C.P. 6128, MONTRÉAL 101, QUÉ. (514/343-7755)

DEMANDE D'INFORMATION EN JURISPRUDENCE

La formule peut être rédigée en français ou en anglais. Répondez le plus complè-
tement possible à toutes les questions. Si l'espace est trop restreint, joignez
un feuillet de votre choix. S.V.P. écrire en lettre moulées.

1- <u>Exposez dans quel contexte</u> se situe votre problème de recherche en jurisprudence.

2- Décrivez le contenu des arrêts qui vous intéressent. Si le problème soulève
plus d'une question de droit et de fait sur lesquelles vous désirez la juris-
prudence, prenez soin de bien distinguer chacune d'entre elles. Au besoin
formulez ainsi: TOUT ARRET OU LE JUGE PARLE DE:............................

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B- _____

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2. DATUM printout

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REQUETE NO.    1
DOC 10739 10822 10975 11029 11033 11101 12147
DOCA 10887 11149 11246 11659 12101
RESUME DOC DOCA
END MT ME SLAYTON

REPONSE: REQUETE NO.    1
       LISTE DOC
       ---------------- D          10739 ----------------------
*DOC 010739. CITY OF             ALBERT (PLAINTIFF) APPELLANT V. UNDERWOOD
MCLELLAN AND ASSOCIATES LIMITED (DEFENDANT) RESPONDENT
     1969 S.C.R. 305-329(M B 964 F 4)
     GUARANTEE AND SURETYSHIP -- SUBROGATION -- RESPONDENT EMPLOYED BY
APPELLANT TO PREPARE PLANS FOR AND SUPERVISE CONSTRUCTION OF
RESERVOIR -- PERFORMANCE BOND BY SURETY COMPANY PROVIDED BY
CONTRACTORS -- COLLAPSE OF RESERVOIR BECAUSE OF FAULTY METHOD OF
BACKFILLING -- FAILURE OF RESPONDENT TO PROPERLY SUPERVISE OPERATION
-- PAYMENT MADE BY CONTRACTORS TO SURETY AND FROM SURETY TO APPELLANT
-- WHETHER ACTION BROUGHT IN NAME OF APPELLANT AGAINST RESPONDENT
CHAMPERTOUS -- WHETHER APPELLANTvS RIGHT TO RECOVER FROM RESPONDENT
EXTINGUISHED.

       ---------------- DOCUMENT 10822 ----------------------
*DOC 010822. F.H.M. FOOT (DEFENDANT), APPELLANT V. LEON H. RAWLINGS
(PLAINTIFF), RESPONDENT
     1963 S.C.R. 197-207 (M B 907 C 10)
     CONTRACTS -- AGREEMENT TO FORBEAR FROM TAKING ACTION ON PROMISSORY
NOTES -- UNDERTAKING BY DEBTOR TO PERFORM CERTAIN OBLIGATIONS -- GOOD
CONSIDERATION -- CREDITORvS RIGHT TO SUE SUSPENDED -- ACTION ON NOTES
PREMATURE.

       ---------------- DOCUMENT 10975 ----------------------
*DOC 010975. DIMENSIONAL INVESTMENTS LIMITED APPELLANT V. HER MAJESTY
THE QUEEN RESPONDENT
     1968 S.C.R. 93-102 (M B 951 B 12)
     CROWN -- SALE OF LAND -- INDIAN LANDS -- CONTRACT FOR SALE BY
CROWN OF INDIAN LANDS -- TIME OF ESSENCE -- PROVISION FOR TERMINATION
OF CONTRACT AND FORFEITURE OF MONEY IN THE EVENT OF DEFAULT --
WHETHER PENALTY CLAUSE OR PRE-ESTIMATE OF DAMAGES -- WHETHER
UNCONSCIONABLE PENALTY -- EXCHEQUER COURT ACT, R.S.C. 1952, C. 98,
S. 48 -- INDIAN ACT, R.S.C. 1952, C. 149, SS. 37 ET SEQ.  (*PAGE 94)
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VENTE PAR LA COURONNE DE TERRES DES INDIENS -- LE TEMPS ETANT DE
LVES ICE DU CONTRAT -- CLAUSE PREVOYANT LA TER NAISON DU CONTRAT ET
LA FORFAITURE DES ARGENTS DANS LE CAS DE DEFAUT -- LA CLAUSE
IMPOSE-T-ELLE UNE PEINE OU EST-ELLE UNE EVALUATION PREALABLE DES
DOMMAGES -- LA PEINE EST-ELLE DERAISONNABLE -- LOI SUR LA COUR DE
LVECHIQUIER, S.R.C. 1952, C. 98, ART. 48 -- LOI SUR LES INDIENS,
S.R.C. 1952, C. 149, ARTS. 37 ET SEQ.

------------------ DOCUMENT 11029 -------------------
#DOC 011029. LEON EVERETT CHAPMAN AND ROBERT JORDAN KEEN (DEFENDANTS)
APPELLANTS V. BENJAMIN GEORGE GINTER (PLAINTIFF) RESPONDENT
    1968 S.C.R. 560-569. (M B 956 B 1)
    CONTRACTS -- WRONGFUL ATTEMPT BY ONE PARTY TO REPUDIATE AGREEMENT
-- FAILURE OF OTHER PARTY TO ELECT TO ACCEPT REPUDIATION AND
COMMUNICATE ACCEPTANCE WITHIN REASONABLE TIME -- AGREEMENT ABANDONED
BY BOTH PARTIES.

------------------ DOCUMENT 11033 -------------------
#DOC 011033. JOHN BURROWS LTD. (PLAINTIFF), APPELLANT V. SUBSURFACE
SURVEYS LTD. AND G. MURDOCH WHITCOMB (DEFENDANTS), RESPONDENTS
    1968 S.C.R. 607-617 (M B 956 E 6)
    BILLS AND NOTES -- UNCONDITIONAL PROMISE IN WRITING TO PAY
PRINCIPAL AT FIXED AND DETERMINABLE FUTURE TIME -- OPTION TO MAKE
EARLIER PAYMENTS FROM TIME TO TIME -- WHETHER PROMISSORY NOTE --
ACCELERATION CLAUSE ON DEFAULT OF INTEREST PAYMENTS -- NUMBER OF LATE
PAYMENTS ACCEPTED WITHOUT PENALTY OF DEFAULT -- WHETHER DEFENCE OF
EQUITABLE ESTOPPEL APPLICABLE -- BILLS OF EXCHANGE ACT, R.S.C. 1952,
C. 15, S. 176(1).

------------------ DOCUMENT 11101 -------------------
#DOC 011101. PERINI PACIFIC LIMITED (PLAINTIFF) APPELLANT V. GREATER
VANCOUVER SEWERAGE AND DRAINAGE DISTRICT (DEFENDANT) RESPONDENT
    1967 S.C.R. 189-195 (M B 942 B 10)
    CONTRACTS -- BUILDING CONTRACT -- ACTION FOR DAMAGES BROUGHT BY
CONTRACTOR -- LOSS BY WAY OF OVERHEAD ALLEGED TO HAVE BEEN SUSTAINED
BECAUSE CONTRACT COMPLETION DATE EXTENDED BY DELAYS ON PART OF OWNER
-- CLAIM PREVENTED BY CLAUSE IN CONTRACT.

------------------ DOCUMENT 12147 -------------------
#DOC 012147. ANNA PINSKY AND WILLIAM PINSKY (PLAINTIFFS) APPELLANTS
V. ELLA WASS AND THOMAS WASS (DEFENDANTS) RESPONDENTS
    1953 1 S.C.R. 399-410 (M B 808 C 3)
    VENDOR AND PURCHASER -- AGREEMENT FOR SALE AND EXCHANGE OF
PROPERTY -- ESCAPE CLAUSE -- NO TIME MENTIONED -- POSSESSION
EXCHANGED -- WHETHER WITHDRAWAL FROM AGREEMENT PERMITTED --
HOMESTEADS -- DOWER ACT. S. OF A. 1948, C. 7 -- WHETHER REQUIREMENTS
COMPLIED WITH -- WHETHER AGREEMENT VOID -- ESTOPPEL.

        7 DOC. MENT.. 7 SANS. 0 AVEC VERIF. POS.
        7 DOCUMENTS ACCEPTES

------------------ DOCUMENT 10887 ------------------
*D 010887. WILLIAM H. COTTER (PLAINTIFF) AP LANT V. GENERAL
PET LEUMS LIMITED AND SUPERIOR OILS, LIMITED (DEFENDANTS)
RESPONDENTS
    1951 S.C.R. 154-176 (M B 780 F 9)
    CONTRACT -- CONFLICTING TERMS -- AGREEMENT PROVIDING OPTION
EXERCISABLE WITHIN SPECIFIED TIME FOLLOWED BY COVENANT FAILURE TO
EXERCISE OPTION RENDERED OPTIONEE LIABLE -- RULE OF CONSTRUCTION --
MEASURE OF DAMAGES FOR BREACH OF COVENANT.

------------------ DOCUMENT 11149 ------------------
*DOC 011149. HER MAJESTY THE QUEEN (DEFENDANT) APPELLANT V. EDWIN
J. PERSONS (PLAINTIFF) RESPONDENT
    1967 S.C.R. 649-663 (M B 947 A 4)
    CROWN -- CONTRACT -- CONSTRUCTION OF LANDING STRIP FOR AIRPORT --
WORK TO BE COMPLETED BY CERTAIN DATE -- CLAUSE IN CONTRACT PROVIDING
FOR THE CANCELLATION -- WHETHER CANCELLATION JUSTIFIED. COURONNE --
CONTRAT -- CONSTRUCTION DvUN TERRAIN DvATTERRISSAGE POUR AEROPORT --
LES TRAVAUX DEVANT ETRE TERMINES A UNE CERTAINE DATE -- CLAUSE DANS
LE CONTRAT PREVOYANT LA RESILIATION -- LA RESILIATION ETAIT-ELLE
JUSTIFEE.

------------------ DOCUMENT 11246 ------------------
*DOC 011246. CONWEST EXPLORATION COMPANY LIMITED, CASSIAR ASBESTOS
CORPORATION LIMITED, KUTCHO CREEK ASBESTOS COMPANY LIMITED
(DEFENDANTS) APPELLANTS V. FELIX LETAIN (PLAINTIFF) RESPONDENT AND
CASSIAR ASBESTOS CORPORATION LIMITED, AND KUTCHO CREEK ASBESTOS
COMPANY LIMITED (DEFENDANTS) APPELLANTS V. FELIX LETAIN (PLAINTIFF)
RESPONDENT CONWEST EXPLORATION COMPANY LIMITED AND CASSIAR ASBESTOS
CORPORATION LIMITED (PLAINTIFFS) APPELLANTS V. FELIX LETAIN
(DEFENDANT) RESPONDENT
    1964 S.C.R. 20-40 (M B 913 D 5)
    CONTRACTS -- OPTION AGREEMENT -- OBLIGATION ON PART OF OPTIONEE TO
CAUSE COMPANY TO BE INCORPORATED BY FIXED DATE TO HOLD CLAIMS UNDER
OPTION -- LETTERS PATENT SEALED AND ISSUED AFTER FIXED DATE BUT
BEARING EARLIER DATE -- WHETHER TERMS OF OPTION COMPLIED WITH --
WHETHER DEFENCE OF EQUITABLE ESTOPPEL AVAILABLE TO OPTIONEE.

------------------ DOCUMENT 11659 ------------------
*DOC 011659. FROBISHER LIMITED (PLAINTIFF) APPELLANT V. CANADIAN
PIPELINES AND PETROLEUMS LIMITED, LAWRENCE C. MORRISROE, E. GEORGE
MESCHI, A. OAK, A. AMREN, S. DAIGLE, JOCK MACKINNON AND D.J. SHERIDAN
(DEFENDANTS) RESPONDENTS
    1960 S.C.R. 126-174 (M B 877 G 1)
    REAL PROPERTY -- MINES AND MINERALS -- OPTION TO PURCHASE MINERAL
CLAIMS -- SECOND OPTION GIVEN TO DIFFERENT COMPANY -- SPECIFIC
PERFORMANCE OF FIRST OPTION SOUGHT -- WHETHER OPTION CREATED
EQUITABLE INTEREST IN LAND -- FAILURE OF OPTIONEE TO COMPLY WITH
STATUTORY REQUIREMENT TO HOLD LICENCE -- PLEADINGS -- AMENDMENTS AT
TRIAL -- REGULATIONS 8(1), 9(1), 124 OF THE MINERAL RESOURCES ACT,

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----------------- DOCUMENT  12101  ---------------
*DOC  12101. THE CANADIAN INDEMNITY COMPANY (DEFENDANT) APPELLANT
V. EVELYN DORIS ERICKSON AND ALFRED S. COEY (PLAINTIFFS)
RESPONDENTS.
    1959 S.C.R. 672-677 (M B 873 B 13)
    INSURANCE -- AUTOMOBILE -- POLICY PROVIDING FOR EXTENDED COVERAGE
-- CLAIM BY INJURED PASSENGER AGAINST INSURER -- RIGHT OF INSURER TO
SET UP DEFENCES AVAILABLE AGAINST INSURED -- BREACH OF STATUTORY
CONDITION BY INSURED -WHETHER FORFEITURE -- WHETHER PASSENGER
ENTITLED TO RELIEF DENIED TO INSURED -- THE INSURANCE ACT,
R.S.M. 1954, C. 126, SS. 6, 123, 215, 227 -- STATUTORY CONDITION 6.
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        5 DOC. MENT.,   5 SANS,   0 AVEC VERIF. POS.
        5 DOCUMENTS ACCEPTES

B. QUIC/LAW printout

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IEF374I STEP /E        / STOP  72160.1907 CPU    0MIN 16.77SEC MAIN 100K LCS   OK
IEF375I JOB /QLF2SIMU/ START 72160.1904
IEF376I JOB /QLF2SIMU/ STOP  72160.1907 CPU    0MIN 16.77SEC
 YOUR TERMINAL IS NOW ACTIVE.
 QUIC/LAW,  PLEASE SIGN ON:
*TEST,SCR/
 ENTER QUERY
*CASES WHICH DISCUSS THE DIFFERENCE BETWEEN PENALTY CLAUSES AND
*LIQUIDATED DAMAGE CLAUSES /
 YOUR SEARCH TERMS AREN
DISCUSS        DIFFERENCE      PENALTY        CLAUSES         LIQUIDATED
DAMAGE         N
 DO YOU WISH TO CONTINUE SEARCH? IF NOT, ENTER N
*/
 YOUR SEARCH IS PROCEEDING.N
 1624 DOCUMENTS FOUNDN
 ENTER SOME OF THE FOLLOWING ITEM NUMBERS, SEPARATED BY COMMAS.
   1 CASENAME        2 CITATION        3 HEARING-DATES    4 NATURE-OF-CASE
   5 SCOPENOTE       6 HEADNOTE        7 PREVIOUS-COURT    8 TEXT
*1,2,3,4,5,6,7/
        DOCUMENT NO.  1608           P=   1              RANK IS    1 (  71)
JAMES STEPHENSON WAUGH (DEFENDANT) APPELLANT V. PIONEER LOGGING CO. LIMITED
(PLAINTIFF) RESPONDENT
_1949' S.C.R. 299-328
1948 *OCT.21, 22  1949 *MAR.18
ON APPEAL FROM THE COURT OF APPEAL FOR BRITISH
COLUMBIA
CONTRACT -- LOGGING -- INTERPRETATION -- TRUST FUND SET UP TO GUARANTY
PERFORMANCE -- TO BE FORFEITED IF COVENANTS NOT CARRIED OUT -- WHETHER
PROVISION IS PENALTY, LIQUIDATED DAMAGES OR DEPOSIT.
HELD:  TASCHEREAU AND LOCKE JJ. DISSENTING, THAT THE PROVISION OF AN AGREEMENT
TO THE EFFECT THAT A SPECIAL TRUST ACCOUNT SET UP BY THE PURCHASER OUT OF THE
SALE PRICE OF THE TIMBER, ACCUMULATING AS THE LOGGING PROGRESSED BUT NOT TO
EXCEED $14,000, "TO GUARANTY THE DUE AND PROPER LOGGING BY THE PURCHASER",
SHALL BE FORFEITED BY THE DEFAULT OF THE PURCHASER TO CARRY OU THE COVENANTS,
IS A PENALTY AND NOT LIQUIDATED DAMAGES.  (JUDGMENT OF THE COURT OF APPEAL
(1948) 1 W.W.R. 929 MAINTAINED).
PUBLIC WORKS COMMISSIONERS V. HILLS _1906' A.C. 368; DUNLOP PNEUMATIC  TYRE CO.
V. NEW GARAGE _1915' A.C. 79 AND MAYSON V. CLOUET _1924' A.C. 980 REFERRED TO.
PER TASCHEREAU, ESTEY AND LOCKE JJ.: --  THE CLAUSE IN THE AGREEMENT PROVIDING
THAT THE LOGGING WAS TO BE CARRIED ON "EXCEPT IN PERIODS WHEN THE PRICE AND
MARKET FOR LOGS IS SUCH THAT LOGS CANNOT BE SOLD WITHOUT LOSS" OPERATED ONLY
WHEN MARKET CONDITIONS WERE SUCH THAT LOGGING OPERATIONS ON THE PACIFIC COAST
*LIST/
    1608 71   2180 56    231 55   3083 55   1673 54   2369 54   2354 49   2411 48
    2963 48     20 47     23 47    546 46     25 45    344 45    977 45   1165 45
    1450 45   1693 45    459 44   1003 44   1011 44   1012 44   1267 44   1447 44
    1579 44   1719 44   1887 44   2220 44   2282 44   1799 43    518 42   1314 42
     120 39   1839 39   1483 38   1866 38   1691 37   1863 37   2429 37   2712 37
    1218 36   1759 36   2059 36   2063 36   2401 36    255 35    455 35    874 35
     882 35   1005 35   1390 35   1413 35   1611 35   2085 35   2355 35   2907 35
    3057 35    151 34    333 34    427 34    548 34    918 34    932 34    961 34
    1186 34   1202 34   1235 34   1364 34   1469 34   1551 34   1584 34   1734 34
    1805 34   1979 34   2347 34   2763 34   2819 34   3150 34    661 33    663 33
     860 33    861 33    878 33    914 33    990 33   1000 33   1029 33   1074 33
    1258 33   1310 33   1420 33   1423 33   1493 33   1699 33   1710 33   1740 33
    1804 33   1843 33   1992 33   2097 33   2102 33   2192 33   2543 33   2683 33
    2845 33   3212 33   3222 33   3278 33   3280 33     61 32     82 32    171 32
     494 32    578 32    581 32    586 32    590 32    602 32    634 32    635 32
     811 32   1002 32   1137 32   1221 32   1279 32   1366 32   1460 32   1532 32
    1593 32   1665 32   1753 32   1783 32   1795 32   1875 32   1980 32   2062 32
    2177 32   2230 32   2251 32   2511 32   2610 32   2894 32   2996 32   3300 32
     112 31    492 31    837 31    926 31   1145 31   1657 31   1953 31   2186 31
    2310 31   3090 31   3284 31   2335 30   2891 30   1311 29   1859 29   1890 29
     129 28    134 28    520 28   1219 28   1650 28    525 27   1161 27   1518 27
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      1022 25    1157 25    1477 25    2122 25    2582 25       8 24      19 24     119 24
*/
       373 24     580 24     591 24     982 24    1042 24    1500 24    1571 24    1728 24
      1742 24    1831 24    2037 24    2279 24    2301 24    2327 24    2343 24    2614 24
      2637 24    2731 24    2962 24    3146 24    3290 24       2 23      65 23     142 23
       232 23     301 23     307 23     464 23     593 23     598 23     720 23     721 23
       725 23     829 23     873 23     987 23    1009 23    1019 23    1027 23    1079 23
      1125 23    1175 23    1209 23    1275 23    1359 23    1455 23    1466 23    1476 23
      1494 23    1499 23    1522 23    1564 23    1576 23    1589 23    1686 23    1692 23
      1723 23    1751 23    1755 23    1760 23    1808 23    1811 23    1847 23    2002 23
      2013 23    2099 23    2130 23    2272 23    2320 23    2333 23    2334 23    2421 23
      2613 23    2636 23    2741 23    2800 23    2859 23    2896 23    3067 23    3136 23
         3 22      18 22      28 22      29 22      34 22      80 22      86 22     101 22
       105 22     141 22     168 22     199 22     257 22     275 22     276 22     314 22
       331 22     425 22     448 22     462 22     482 22     486 22     572 22     573 22
       596 22     613 22     619 22     649 22     722 22     740 22     801 22     815 22
       823 22     825 22     831 22     836 22     851 22     912 22     917 22     933 22
       935 22     940 22     941 22     979 22     988 22    1020 22    1028 22    1033 22
      1069 22    1084 22    1197 22    1217 22    1238 22    1270 22    1282 22    1304 22
      1307 22    1389 22    1405 22    1412 22    1435 22    1444 22    1472 22    1473 22
      1486 22    1489 22    1502 22    1529 22    1536 22    1537 22    1559 22    1581 22
      1623 22    1634 22    1679 22    1695 22    1700 22    1709 22    1726 22    1756 22
      1792 22    1810 22    1816 22    1848 22    1850 22    1868 22    1872 22    1905 22
      1911 22    1912 22    1919 22    1928 22    1948 22    1975 22    2006 22    2074 22
      2077 22    2094 22    2104 22    2109 22    2124 22    2191 22    2268 22    2292 22
*/
      2305 22    2414 22    2473 22    2535 22    2545 22    2594 22    2633 22    2661 22
      2706 22    2746 22    2783 22    2809 22    2864 22    3015 22    3066 22    3168 22
      3184 22    3186 22    3192 22    3198 22    3238 22    3258 22    3294 22      39 21
        42 21      57 21      66 21      77 21      83 21     103 21     122 21     128 21
       138 21     210 21     233 21     269 21     351 21     397 21     432 21     445 21
       490 21     691 21     717 21     730 21     747 21     756 21     779 21     780 21
       782 21     814 21     846 21     868 21     870 21     877 21     883 21     893 21
       902 21     903 21     919 21     949 21     958 21    1004 21    1025 21    1056 21
      1064 21    1082 21    1106 21    1159 21    1166 21    1205 21    1227 21    1248 21
      1284 21    1296 21    1330 21    1331 21    1332 21    1350 21    1355 21    1376 21
      1409 21    1422 21    1433 21    1441 21    1442 21    1501 21    1539 21    1554 21
      1578 21    1605 21    1636 21    1643 21    1649 21    1653 21    1672 21    1678 21
      1688 21    1694 21    1698 21    1729 21    1743 21    1764 21    1766 21    1791 21
      1809 21    1825 21    1888 21    1891 21    1900 21    1936 21    1981 21    1988 21
      2022 21    2028 21    2036 21    2055 21    2072 21    2107 21    2114 21    2126 21
      2128 21    2140 21    2149 21    2153 21    2203 21    2213 21    2229 21    2316 21
      2349 21    2378 21    2379 21    2384 21    2406 21    2412 21    2427 21    2447 21
      2465 21    2469 21    2471 21    2514 21N
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END OF LIST : ENTER DOCUMENT REQUESTS
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       DOCUMENT NO. 1608   P=   1   RANK IS   1 (71)
JAMES STEPHENSON WAUGH (DEFENDANT) APPELLANT V. PIONEER LOGGING CO. LIMITED
(PLAINTIFF) RESPONDENT
_1949' S.C.R. 299-328
1948 *OCT.21, 22 1949 *MAR.18
ON APPEAL FROM THE COURT OF APPEAL FOR BRITISH
COLUMBIA
CONTRACT — LOGGING — INTERPRETATION — TRUST FUND SET UP TO GUARANTY
PERFORMANCE — TO BE FORFEITED IF COVENANTS NOT CARRIED OUT — WHETHER
PROVISION IS PENALTY, LIQUIDATED DAMAGES OR DEPOSIT.
HELD: TASCHEREAU AND LOCKE JJ. DISSENTING, THAT THE PROVISION OF AN AGREEMENT
TO THE EFFECT THAT A SPECIAL TRUST ACCOUNT SET UP BY THE PURCHASER OUT OF THE
SALE PRICE OF THE TIMBER, ACCUMULATING AS THE LOGGING PROGRESSED BUT NOT TO
EXCEED $14,000, "TO GUARANTY THE DUE AND PROPER LOGGING BY THE PURCHASER",
SHALL BE FORFEITED BY THE DEFAULT OF THE PURCHASER TO CARRY OU THE COVENANTS,
IS A PENALTY AND NOT LIQUIDATED DAMAGES. (JUDGMENT OF THE COURT OF APPEAL
(1948) 1 W.W.R. 929 MAINTAINED).
PUBLIC WORKS COMMISSIONERS V. HILLS _1906' A.C. 368; DUNLOP PNEUMATIC TYRE CO.
V. NEW GARAGE _1915' A.C. 79 AND MAYSON V. CLOUET _1924' A.C. 980 REFERRED TO.

-THAT THE LOGGING WAS TO BE CARRIED ON "EXCEPT IN PERIODS WHEN THE PRICE AND
MARKET FOR LOGS IS SUCH THAT LOGS CANNOT BE SOLD WITHOUT LOSS" OPERATED ONLY
WHEN MARKET CONDITIONS WERE SUCH THAT LOGGING OPERATIONS ON THE PACIFIC COAST
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      DOCUMENT NO. 1608   P= 2   RANK IS   1 (71)
COULD NOT BE CARRIED ON WITHOUT LOSS.
*PRESENT: KERWIN, TASCHEREAU, RAND, ESTEY AND LOCKE JJ.
_300'
PER TASCHEREAU AND LOCKE JJ. (DISSENTING): THE PURCHASER OF THE TIMBER WAS NOT
ENTITLED TO RECOVER THE MONEYS PAID BY IT INTO THE SPECIAL TRUST ACCOUNT WHICH
WERE IN THE NATURE OF A DEPOSIT AND IN THE TERMS OF THE AGREEMENT INTENDED AS A
GUARANTEE OF THE COMPLETE LOGGING OF THE SAID LANDS. THE EVIDENCE DISCLOSED
THAT THE LANDS HAD NOT BEEN COMPLETELY LOGGED AND THAT THE PURCHASER HAD
REPUDIATED ITS OBLIGATIONS UNDER THE CONTRACT BEFORE THE EXPIRATION OF THE TIME
FIXED FOR PERFORMANCE. (WALLIS V. SMITH (1882) 21 CH. DIV. 243; HOWE V. SMITH
(1884) 27 CH. DIV. 89 AND SPRAGUE V. BOOTH 1909 A.C. 576 REFERRED TO).
    APPEAL FROM THE JUDGMENT OF THE COURT OF APPEAL FOR BRITISH COLUMBIA (1)
ALLOWING THE APPEAL FROM THE DECISION OF WILSON J.
END OF DOCUMENT.
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      DOCUMENT NO. 2180   P= 1   RANK IS   2 (56)
R.N. CARRISS (DEFENDANT) APPELLANT V. EVELYN BUXTON (PLAINTIFF) RESPONDENT
_1958' S.C.R. 441-472
1958 *JAN.30,31 JUN.3
ON APPEAL FROM THE COURT OF APPEAL FOR BRITISH COLUMBIA
NEGLIGENCE -- DANGEROUS PREMISES -- LIABILITY AS BETWEEN INVITOR AND INVITEE --
CHARGE TO JURY.
HOTELS AND HOTELKEEPERS -- DUTY OF KEEPER TO QUEST -- NATURE OF DUTY TO MAKE
PREMISES SAFE -- "WARRANTY" -- WHETHER DUTY RELEVANT ON PLEADINGS AND CHARGE TO
JURY.
MUNICIPAL CORPORATIONS -- BY-LAWS -- EFFECT OF BY-LAW PRESCRIBING DUTIES IN
RESPECT OF GAS-BURNING APPLICANCES -- WHETHER BREACH OF BY-LAW GIVES RISE TO
CIVIL LIABILITY.
THE PLAINTIFF'S HUSBAND, WHILE A LODGE IN THE DEFENDANT'S HOTEL, DIED OF
ASPHYXIA CAUSED BY INHALING GAS THAT ESCAPED FROM A DEFECTIVE STOVE IN THE ROOM
OCCUPIED BY HIM. THE PLAINTIFF SUED FOR DAMAGES ON HER OWN BEHALF AND ON
BEHALF OF HER INFANT CHILDREN, AND THE TRIAL JUDGE CHARGED THE JURY THAT THE
DEFENDANT OWED TWO DUTIES TO HIS LODGER: (1) HIS DUTY AS INVITOR TO INVITEE TO
USE REASONABLE CARE TO PREVENT
*PRESENT: RAND, LOCKE, CARTWRIGHT, FAUTEUX AND ABBOTT JJ.
_442'
DAMAGE FROM UNUSUAL DANGER OF WHICH THE DEFENDANT KNEW OR OUGHT TO HAVE KNOWN,
AND (2) A DUTY UNDER A MUNICIPAL BY-LAW REQUIRING OWNERS OF BUILDINGS TO
*2/

II. SOURCES

A. Books, articles, government reports

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B. Interviews

1. Interviewees

Jack Alpert, Mead Data Central, New York.

Page Basheer, JURIS, United States Department of Justice, Washington, D.C.

Robert P. Bigelow, Member of the American Bar Association Standing Committee on Law and Technology, and Editor of *Jurimetrics Journal,* Boston.

Roy Cobb, OBAR user, of Jones, Cockley and Reavis, Cleveland.

William B. Eldridge, Director of Research, the Federal Judicial Center, Washington, D.C.

Claude Fabien, DATUM Consultant, Montreal.

Roy N. Freed, Chairman of the Advisory Committee on Substantive Law of the American Bar Association's Standing Committee on Law and Technology, Boston.

Morty Freiheit, of Stikeman, Elliot, Tamaki, Mercier and Robb, Montreal.

Michael Garonce, of Garonce, Garonce and Costin, Montreal.

R.S. Gottlieb, DATUM user, of Gottlieb and Agard, Montreal.

François de Grandpré, DATUM user, of Tansay, de Grandpré, Bergeron, Lavery, O'Donnell and Clark, Montreal.

Derek Guthrie, DATUM user, of Ogilvy, Cope, Porteous, Hansard, Montgomery and Renault, Montreal.

Tom Hermann, OBAR user, of Squire, Sanders and Dempsey, Cleveland.

Susan Kolasa, Law and Computer Fellow, Faculty of Law, Stanford University.

George S. Kondos, Deputy Director, Office of Management Support, United States Department of Justice, and Director of JURIS.

James A. Laurenson, OBAR user, Chief of Consumer Frauds and Crimes Division, Office of the Attorney General of Ohio, Columbus.

Hugh Lawford, Director of QUIC/LAW, Kingston.

Michael Lesage, DATUM user, of de Grandpré, Colas, Deschenes, Godin and Lapointe, Montreal.

Ejan Mackaay, Assistant Director, DATUM, Montreal.

L. Thorne McCarty, Law and Computer Fellow, Faculty of Law, Stanford University.

Jean-Claude Pothier, DATUM user, of Geoffrion and Prud'homme, Montreal.

Colin Tapper, Fellow of Magdalen College, Oxford, England.

Fred Puckett, OBAR user, Chief of Code Revision, Ohio Legislative Service Commission, Columbus.

John F. Shampton, OBAR user, of Wright, Harbor, Morris and Arnold, Columbus.

Barry H. Smith, OBAR user, Office of the Assistant Attorney-General, Columbus.

Serge Tremblay, DATUM user, of Martineau, Walker, Allison, Beaulieu, Phelan and Mackell, Montreal.

Weston Vernon Jr., Chairman of the Board of the National Center for Automated Information Retrieval, of Milbank, Tweed, Hadley and McClor, New York.

2. System user questionnaire

[This questionnaire was given to OBAR users. A similar format was used for interviews of DATUM users.]

Note: These questions are intended to provide a framework for discussion only.

1. How significant is research to your work? About what percentage of your time is spent on research? (Research is broadly defined and includes library work, conferences, informal discussions, etc.)

2. What kind of questions does your research attempt to answer? Are you generally seeking specific information (e.g., the name of a case, or a case to support a particular proposition), or are you looking for general statements of law?

3. Do you normally know exactly where the information you want is located?

4. Before electronic legal retrieval became available, were you aware of particular deficiencies in manual retrieval?

5. What first attracted you to electronic retrieval? What potential did you first see in the system?

6. How long did it take you to become proficient in the use of the system?

7. What part does electronic retrieval now play in your overall research program? Has it completely replaced other forms of research, or does it play a supplementary role only?

8. What search strategy do you employ? E.g., do you begin with broad search parameters which are then narrowed by asking progressively more specific questions?

9. What is the approximate percentage of relevant information you receive from electronic retrieval?

10. How confident are you that *all* relevant information is obtained by use of electronic retrieval?

11. Does use of electronic retrieval affect your office organization in any significant way? E.g., do more senior people now spend time on research? Have the tasks of junior people changed?

12. Does electronic retrieval make your work easier or more interesting?

13. How does the cost of electronic retrieval compare with that of manual retrieval? Does electronic retrieval make good economic sense in your office?

14. Is the organization and administration of OBAR satisfactory? Is OBAR a suitable vehicle for the development of an electronic retrieval system?

15. Do you find in any significant respects your way of thinking about the law has changed as a result of your use of electronic retrieval? E.g., has use of the system forced you to think specifically rather than generally?

16. Do electronic retrieval systems downgrade the practice of law as an art?

17. What are the general merits of electronic legal retrieval as compared to manual retrieval?

18. What would be the general impact on the legal profession of widespread use of electronic legal retrieval systems?

JOURNAL ABBREVIATIONS

A.B.A.J.	American Bar Association Journal
Calif. L. Rev.	California Law Review
Can. B. Rev.	Canadian Bar Review
Dalhousie L.J.	Dalhousie Law Journal
Geo. Wash. L. Rev.	George Washington Law Review
Harv. L. Rev.	Harvard Law Review
Iowa L. Rev.	Iowa Law Review
J.A.M.A.	Journal of the American Medical Association
J. Legal Ed.	Journal of Legal Education
Jurimetrics J.	Jurimetrics Journal
Law & Comp. Tech.	Law and Computer Technology
Law & Contemp. Prob.	Law and Contemporary Problems
McGill L.J.	McGill Law Journal
Minn. L. Rev.	Minnesota Law Review
Modern L. Rev.	Modern Law Review
M.U.L.L.	Modern Uses of Logic in the Law
Ore. L. Rev.	Oregon Law Review
Osgoode Hall L.J.	Osgoode Hall Law Journal
Prac. Law.	Practical Lawyer
R.J.T.	Revue Juridique Thémis
Rutgers L. Rev.	Rutgers Law Review
Stan. L. Rev.	Stanford Law Review
U. Pa. L. Rev.	University of Pennsylvania Law Review
U. Toronto L.J.	University of Toronto Law Journal
Yale L.J.	Yale Law Journal

NOTES

[1] J. Roger Hamilton, "Computer-Assisted Legal Research", p. 665.

[2] R.M. Hutchins, in *The Law School of Tomorrow*, edited by David Haber and Julius Cohen, p. 23.

[3] A.N. Whitehead, *Adventures of Ideas*, New York, Macmillan, 1933, p. 72.

[4] Government of Quebec, Commission of Inquiry on Health and Social Welfare, *The Professions and Society*, p. 16.

[5] Eliot Friedson, *Profession of Medicine*, pp. 3-4.

[6] See "The MEDLARS System"; E.C. Greanias, *The Computer in Medicine*, cited by C.A. Myers, *Computers in Knowledge-Based Fields*, p. 83; G. Anthony Gorry and G. Octo Barnett, "Sequential Diagnosis by Computer". For a popular account, see Michael Crichton, *Five Patients*, pp. 101-106.

[7] Erwin O. Smigel, *The Wall Street Lawyer*, pp. 172-173.

[8] Ibid., p. 141.

[9] Carl F. Stover, "Technology and the Law — A Look Ahead", p. 7.

[10] Lee Loevinger, "Jurimetrics — The Next Step Forward", p. 472.

[11] An important early discussion of this subject is E. Levi, *An Introduction to Legal Reasoning*. An interesting recent article, as yet unpublished in English, is H.F.M. Crombag, J.L. de Wijkerslooth, and E.H. van Scrooskerken, *On Solving Legal Problems*, issued by the Educational Research Center, University of Leyden, the Netherlands. I am indebted to L. Thorne McCarty of the Faculty of Law, Stanford University, for bringing this manuscript to my attention. See also Kent Sinclair, "Legal Reasoning: In Search of an Adequate Theory of Argument" (1971) 59 *Calif. L. Rev.* 821, and "Le raisonnement juridique / Legal Reasoning / Die juristische Argumentation", *Actes du congrès mondial de philosophie du droit et de philosophie sociale* , Brussels, Bruylant, 1971.

[12] Bruce G. Buchanan and Thomas E. Headrick, "Some Speculation about Artificial Intelligence and Legal Reasoning".

[13] Ibid., p. 47.

[14] Ibid., pp. 47-48.

[15] Ibid., p. 47.

[16] Ibid., pp. 49-50. Eldridge and Dennis have described essentially the same process as envisaged in the Buchanan-and Headrick Model II. See William B. Eldridge and Sally F. Dennis, "The Computer as a Tool for Legal Research", p. 79. A somewhat similar though cruder analysis is given by Paul S. Hoffman,

"Lawtomation in Legal Research: Some Indexing Problems", p. 22.

[17] Buchanan and Headrick, p. 51.

[18] Ibid.

[19] Ibid., p. 52.

[20] Ibid.

[21] Some of the better known writings include Benjamin N. Cardozo, *The Nature of the Judicial Process*, New Haven, Yale University Press, 1921; Edward H. Levi, *An Introduction to Legal Reasoning*; Richard A. Wasserstrom, *The Judicial Decision*, Stanford, Stanford University Press, 1961; and Louis L. Jaffe, *English and American Judges as Lawmakers*, Oxford, The Clarendon Press, 1969. For an interesting Canadian account, see Paul Weiler, "Legal Values and Judicial Decision Making" (1970) 48 *Can. B. Rev.* 1.

[22] Rupert Cross, *Precedent in English Law*, Chap. VI. The Cross analysis appears to be based to some extent on that of Levi (see note 21).

[23] An interesting philosophical analysis of legal argument is given by O.C. Jensen, *The Nature of Legal Argument*, p. 8. Jensen suggests that the conventional view that the law follows a logical method is based "both on an inadequate analysis of legal reasoning and on an imperfect knowledge of deduction and induction".

[24] Rupert Cross, p. 176.

[25] Ibid., p. 178.

[26] Ibid., p. 180.

[27] John Dickinson, "Legal Rules: Their Function in the Process of Decision" (1931) 79 *U. Pa. L. Rev.* 833, at p. 861.

[28] Rupert Cross, p. 182.

[29] Ibid., p. 186.

[30] Cross addresses himself to some of the realist claims: ibid., pp. 47-51.

[31] Jerome Frank, *Law and the Modern Mind*, New York, Brentano's Publishers, 1930, p. 101. For an analysis of other statements expressing a similar point of view, see Philip Slayton, "A Critical Comment on Scalogram Analysis of Supreme Court of Canada Cases", pp. 393-395.

[32] Loevinger, "Jurimetrics — The Next Step Forward", pp. 471-472.

[33] Slayton, "Scalogram Analysis", p. 395.

[34] Ibid., and see Slayton, "Quantitative Methods and Supreme Court Cases".

[35] Slayton, "Scalogram Analysis", pp. 399-400.

See pp. 399-401 for an elucidation of these two criticisms of realists and behaviouralists.

36 Government of Canada, Department of Justice, *Operation Compulex: Information Needs of the Practising Lawyer,* p. 25. For an early study of legal research in Canada, see "Report of the Committee on Legal Research".

37 Government of Canada, *Operation Compulex,* p. 18.

38 Massachusetts Bar Association, *Economic Survey,* p. 2. For an interesting account of research by American practising lawyers, see Morris L. Cohen, "Research Habits of Lawyers".

39 Jerome E. Carlin, *Lawyers on Their Own,* New Brunswick, N.J., Rutgers University Press, 1962, p. 41.

40 See, for example, Harold Leventhal, "A Judge Muses on Research Aids and Data Retrieval".

41 For an interesting and very specific analysis of how this may be so, see P.S. Atiyah, *Consideration in Contract: A Fundamental Restatement,* Canberra, Australian National University Press, 1971.

42 "Any systematic work, performed by a person alone or by a team, sponsored or not, theoretical or practical, concentrated on the in-depth study of a problem and the search for new solutions", Hubert Reid, "Le professeur de droit en 1968-1969", p. 737.

43 Ibid., table 2.2 "Répartition par catégories du temps des professeurs", p. 747. For some indication of research trends among law professors in the United States, see David F. Cavers, "Non-Traditional Research", and Manfred Rehbinder, "The Development and Present State of Fact Research in Law in the United States".

44 "Sources" of law probably include statutes, judicial precedents, opinions of experts, custom, morality, and equity. See, for example, J.C. Grey, *The Nature and Sources of Law,* New York, Columbia University Press, 1909; and Helen Silving, *Sources of Law,* Buffalo, William Hein, 1968.

45 Rupert Cross, p. 6, defines the English doctrine of precedent in this way: "Every court is bound to follow any case decided above it in the hierarchy, and appellate courts (other than the House of Lords) are bound by their previous decisions." The position in the common law provinces of Canada is much the same as the English position, and Quebec is much closer to the English system than it is to the French. See Wolfgang Friedmann, "Stare Decisis at Common Law and Under the Civil Code of Quebec" (1953) 31 *Can. B. Rev.* 723.

46 See Louisell and Williams, *The Parenchyma of Law,* 1960, pp. 403-404, cited by Albert Ehrenzweig, *Psychoanalytic Jurisprudence,* Dobbs Ferry, Oceana, 1971, p. 262; and John Thibaut,

Laurens Walker, and E. Allan Lind, "Adversary Presentation and Bias in Legal Decision Making" (1972) 86 *Harv. L. Rev.* 386.

47 Irving Kayton, "Retrieving Case Law by Computer: Fact, Fiction and Future", p. 5.

48 Ibid., p. 6.

49 Hamilton, p. 666.

50 Colin Tapper, "World Cooperation in the Mechanisation of Legal Information Retrieval", p. 2. I am grateful to Dr. Tapper for taking time to discuss this and other problems with me (Oxford, England, July 28, 1972).

51 Felix Stumpf, "Some Economic and Professional Implications of Electronic Legal Research for the American Bar" in *Law and Electronics: The Challenge of a New Era,* p. 62.

52 On this point, see Tapper, *World Cooperation,* p. 3.

53 Ibid.

54 Ibid., pp. 3-4.

55 Eugene V. Rostow, Lee Loevinger and Frederick Bernays Wiener, "Panel Discussion: The Computer in Law, Yes or No?", p. 100.

56 Leventhal, p. 214.

57 Government of Canada, *Operation Compulex,* p. 3.

58 Tapper, *World Cooperation,* p. 3.

59 This point was emphasized to me by William B. Eldridge, Director of Research, the Federal Judicial Center, Washington, D.C. (in an interview on June 14, 1972), and by Roy N. Freed, partner in the Boston law firm of Widett and Widett, and writer on the law and computers (interview on June 13, 1972).

60 Government of Canada, *Operation Compulex,* p. 13.

61 Kayton, "Retrieving Case Law by Computer", pp. 5-6.

62 Eldridge and Dennis, "The Computer as a Tool for Legal Research", p. 80.

63 Ibid., p. 79.

64 F. Reed Dickerson, "Electronic Computers and the Practical Lawyer", p. 489.

65 Kayton, "Retrieving Case Law by Computer", p. 5.

66 Loevinger, "Jurimetrics: Science and Prediction in the Field of Law", p. 202.

67 Dickerson, "Electronic Computers", p. 489.

68 Loevinger, "Jurimetrics: Science and Prediction", p. 203.

69 Davis, "Automatic Data Processing and the Judge Advocate General's Corps", (1964) 23 *Military Law Review* 117, at p. 123, quoted by Kayton, "Retrieving Case Law by Computer", p. 5.

70 Loevinger, "Jurimetrics: Science and Prediction", p. 203.

71 For an account of this project, see John Horty, "The 'Key Words in Combination' Approach".

72 Hamilton, p. 674.

73 For example, MODUL (Medium Ordinateurs et Droit) of Laval University. See Jean Goulet, Sylvain Houle, and Jeanne Leclerc-Houde, "Jurimétrie et loi: MODUL". A large number of European systems exist. For a comprehensive listing, see "Computerized Research in Countries outside North America".

74 I adopt here the division devised by Kayton, "Retrieving Case Law by Computer", p. 14.

75 Ibid., p. 19. The original distribution rules were devised by Sally Dennis; see Eldridge and Dennis, "The Computer as a Tool for Legal Research", p. 88.

76 Kayton, "Retrieving Case Law by Computer", p. 21.

77 Hamilton, p. 671.

78 My discussion of the QUIC/LAW, DATUM and OBAR systems draws on research papers written for me by Eric Nadler, my research assistant; I would like gratefully to acknowledge his contribution to this part of the study. In connection with QUIC/LAW, I would also like to thank Professor Hugh Lawford, of the Faculty of Law, Queen's University, Director of QUIC/LAW, who took much time to explain QUIC/LAW to me and to demonstrate the system's operation.

79 "QUIC/LAW System", p. 2.

80 Ibid.

81 From the beginning, IBM advised QUIC/LAW against use of INFORM/360. It has been suggested that QUIC/LAW's decision to use INFORM/360 hampered development, since it required allocation of resources to systems problems rather than to user problems.

82 As of December, 1972.

83 *QUIC/LAW Newsletter,* p. 10.

84 Special thanks must go to Ejan Mackaav, Assistant Director of DATUM, and Professor Claude

Fabien, formerly a Consultant to DATUM and now of the Faculty of Law, University of Sherbrooke, who spent many hours with Mr. Nadler and myself discussing legal retrieval and DATUM.

[85] Several options were considered before adopting full text; see Jacques Boucher, "Le projet DATUM: Recherche sur un instrument de recherche", pp. 32-33.

[86] Kayton, "Retrieving Case Law by Computer", pp. 24-25.

[87] Ibid., p. 28.

[88] Ibid., pp. 28-29.

[89] Ibid., pp. 29-31.

[90] For details of the complex SYNDIG thesaurus, see ibid., pp. 31-42.

[91] "It will be remembered that, according to this principle, two words are considered as synonymous if they can be substituted one for the other in a given context without changing its meaning. If such an approach must call on the human judgement . . . it has the advantage of restricting it to well-defined decisions rather than calling on the 'concept itself', as is the case of the 'classic' dictionaries." Mackaay, "La création d'un thésaurus bilingue pour DATUM", p. 56. This article contains a detailed account of the actual process whereby DATUM created their thesaurus. For further details, see Wallace J. Schwab, "La réalisation du thésaurus-s et du thésaurus-g".

[92] Pierre Stewart, *DATUM System: Summary Introduction*, p. 18.

[93] The DATUM request sheet is reproduced in Appendix I.A.I.

[94] I wish to thank Jack Alpert, of Mead Data Central, New York, for discussing LEXIS with me (June 16, 1972).

[95] *LEXIS: A Computer-Based Legal Research Service*, p. 3.

[96] Remarks by Jerome S. Rubin, President of Mead Data Central, Inc. at the Annual Meeting of the New York State Bar Association, January 29, 1971, p. 4. Italics mine.

[97] Frank J. Troy, "Ohio Bar Automated Research — A Practical System of Computerized Legal Research", pp. 65-66.

[98] I must thank George S. Kondos, Deputy Director of the Office of Management Support, United States Department of Justice, and Director of the JURIS project, and Page Basheer, of JURIS, for spending time with me discussing and demonstrating the JURIS system (Washington, June 15, 1972). My account of JURIS is based largely on Kondos,

"JURIS: Remote Terminal Legal Information Retrieval at the United States Department of Justice".

[99] Ibid., p. 154.

[100] Ibid., p. 150.

[101] Kayton, "Retrieving Case Law by Computer", p. 12.

[102] *Table of Cases Judicially Considered in Canadian Reports,* 1958-1968, Toronto, Carswell, 1969.

[103] Toronto, Carswell, 1969.

[104] Toronto, Butterworths, 1969.

[105] See Appendix I.A.1.

[106] The DATUM printout is reproduced in Appendix I.A.2.

[107] The first three pages of the printout of the response to QUIC/LAW search (1) are reproduced as Appendix I.B. The request was for the headnote only, but because of a mechanical defect the system operated on the "text" option. In an attempt to catch the headnote but eliminate most of the judgment, QUIC/LAW personnel restricted the text printout to three pages per case.

[108] My thanks again to Professor Lawford and other members of the QUIC/LAW staff for assistance given during this visit.

[109] Slayton, "The Supreme Court of Canada and the Common Law of Contract".

[110] Eldridge and Dennis, "The Computer as a Tool for Legal Research", p. 83.

[111] Ibid., p. 81.

[112] Michael J. Apter, *The Computer Simulation of Behaviour*, p. 118.

[113] Michael Scriven, "The Compleat Robot: A Prolegomena to Androidology", in *Dimensions of Mind,* pp. 121-122.

[114] Apter, p. 98.

[115] Buchanan and Headrick, "Some Speculation About Artificial Intelligence and Legal Reasoning".

[116] For an extensive description of this program, see Bruce Buchanan, Georgia Sutherland, and Edward Feigenbaum, "Rediscovering Some Problems of Artificial Intelligence in the Context of Organic Chemistry" (1970) 5 *Machine Intelligence* 253; for a brief description of the program, see Buchanan and Headrick, n. 20.

[117] Buchanan and Headrick, p. 53.

[118] Ibid., p. 55.

[119] I must express my appreciation to Mr. McCarty for spending the best part of a day discussing his work with me (Stanford, October 13, 1972). My thanks as well to Susan Kolasa, Law and Computer Fellow, and Associate Dean Joe Leininger, both of Stanford University's Faculty of Law, for talking to me about various aspects of computers and the law. My account of TAXMAN is largely taken from McCarty, "Interim Report on the TAXMAN Project: An Experiment in Artificial Intelligence and Legal Reasoning".

[120] Ibid., p. 2.

[121] Ibid., pp. 2-3.

[122] R.E. Kling, *Reasoning by Analogy with Applications to Heuristic Problem Solving: A Case Study,* Ph.D. Thesis, Stanford Computer Science Department, Report No. CS-216, August, 1971.

[123] McCarty, p. 5.

[124] Ibid.

[125] James S. Winston, "The Law and Legal Education in the Computer Age", p. 159.

[126] Joseph Spengler, "Machine-Made Justice: Some Implications", p. 43.

[127] Ibid., pp. 40-41.

[128] Dickerson, "Some Jurisprudential Implications of Electronic Data Processing", p. 56.

[129] Ibid., pp. 62-63.

[130] Buchanan and Headrick, pp. 51-52.

[131] Grasp of this difficulty has been demonstrated by McCarty (see Chapter Two, Section D). Systems such as QUIC/LAW or DATUM mechanically produce data which may only accidentally reflect some of the more sophisticated research needs of users. By contrast, McCarty in his TAXMAN project is facing up to the problem of that reasoning by analogy which is a central feature of legal thought.

[132] Eldridge and Dennis, "The Computer as a Tool for Legal Research", p. 89: ". . . its chief difficulty is that the questioner must know what it is that he does not know."

[133] Sally F. Dennis, "Shall We Put the Law into the Computer?", p. 26.

[134] Rupert Cross, p. 182.

[135] Slayton, "A Critical Comment on Scalogram Analysis of Supreme Court of Canada Cases", p. 399.

[136] Dennis, p. 27.

[137] Ibid.

[138] Ibid.

[139] D.F. McCabe, "Automated Legal Research", p. 35.

[140] On this point, see Hans Baade, "Forword", p. 2.

[141] Ibid.

[142] Carl F. Stover, "Technology and Law — A Look Ahead", p. 6.

[143] Dickerson, "Computers and the Law: Developments in the United States", in *Proceedings of the Computers and the Law Conference*, p. 24. The identical point was made by Dickerson in almost identical language some five years earlier: "Is it possible that the great generality of our specific legal rules has not resulted entirely from considerations of equity and justice, but partly from the accident of our previous inability to cope with greater degrees of doctrinal specificity?" ("Some Jurisprudential Implications of Electronic Data Processing", p. 67).

[144] Dickerson, "Some Jurisprudential Implications of Electronic Data Processing", p. 67.

[145] Stover, pp. 4-5.

[146] Rostow, Loevinger and Wiener, p. 102.

[147] Reed C. Lawlor, "Computers, Law and Society — Where Do We Go from Here?", p. 55.

[148] See Chapter Two, Section A. It will be remembered that *Operation Compulex* said of legal information that "lawyers do not perceive this as a problem." (Government of Canada, *Operation Compulex*, p. 13.)

[149] Because of the effects of information "overload". See Chapter Three, Section B.