ELECTRONIC BRAINS AND THE LEGAL MIND: COMPUTING THE DATA COMPUTER'S COLLISION WITH LAW

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A LOT of wheels have turned since the spokes broke on the MacPhersons' Buick.[1] Indeed, they are spinning faster, and there are more of them. But the wheel is not everything. More and more things happen and things are done with few mechanical movements. To be sure, the spasmodic turning of the magnetic tape reel, an occasional whirling of a random-access magnetic disc ultimately activating a more prosaic type-printer, the rise and fall of keys on the ghost-like console typewriter as it talks back to the operator, may still be seen. But for the most part the marvel of this scientific era—and without which it seems safe to say that few of our spectacular contemporary advances could be made—operates almost silently through the wizardry of electronics. By the combination of transistors, amplifying tubes, and hundreds of small parts, a modern electronic data computer performs hundreds of thousands of operations in a second's time with scarcely a show of discernible motion. Like the wheel and all that runs on, or through, or by the wheel, the law must face this too. And it must face it now. For both in point of time and consequence, the computer as a subject for juridical action collides with law in the immediate, not distant, future. Equally important, it may become an immediate tool in the creative processes of the law and litigation.

Cardozo Yearns For Computer?

This appraisal of contemporary legal developments as a commemoration of Cardozo raises the question: how would he look upon it?

Considering, in an oversimplified way, that data computers operate essentially by mathematical logic, Cardozo's words seem almost a prescient forecast of a welcome aid. In the opening lines of *The Paradoxes of Legal Science*[2] he reveals his yearning for the scientist's certainty:

> "They do things better with logarithms." The wail escapes me now and again when after putting forth the best that is in me, I look upon the finished product, and cannot say that it is good. In these moments of disquietude, I figure to myself the peace of mind that must come, let us say, to the designer of a mighty bridge. The finished product of his work is there before his eyes with all the beauty and simplicity and inevitableness of truth. He is not harrowed by misgivings whether the towers and piers and cables will stand the stress and strain. His business is to know.

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1. MacPherson v. Buick Motor Co., 217 N.Y. 382, 111 N.E. 1050 (1916).
2. CARDOZO, THE PARADOXES OF LEGAL SCIENCE 1 (1927).

> If his bridge were to fall, he would go down with it in disgrace and ruin. Yet withal, he has never a fear. No mere experiment has he wrought, but a highway to carry men and women from shore to shore, to carry them secure and unafraid, though the floods rage and boil below.
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> So I cry out at times in rebellion, "why cannot I do as much, or at least something measurably as much, to bridge with my rules of law the torrents of life?" . . . Code and commentary . . . treatise and law-report, reveal the processes of trial and error by which they struggled to attain the truth, ... All these memorials are mine; yet unwritten is my table of logarithms, the index of the power to which a precedent must be raised to produce the formula of justice. My bridges are experiments. I cannot span the tiniest stream in a region unexplored by judges or lawgivers before me, and go to rest in the secure belief that the span is wisely laid.[3]

But, of course, the concern now is not what Cardozo might have thought of the data computer, or would now think of it, or how, faced with it, he would deal adequately with the problems flowing in its train. The significance of this scientific marvel rests in the immediacy with which law must deal with it—and it, perhaps, may deal with law. Moreover, it is symptomatic of the cyclonic changes which have occurred in the few years since Cardozo's time as the whole world explodes into an ever bigger bigness.

The Computer a Source of Trouble and Help

The data computer is indeed formidable both in its useful potential and in its relation to law. This relation is a triple one. The data computer is the source of legal problems arising from its use or nonuse. The data computer is the source of testimonial evidence for use in court. And, finally, the data computer is the source of legal materials stored and retrieved in the process of legal research.

The Computer Born of Vastness

While these sources are frequently distinct and only occasionally overlap, a common thread runs through all three: the data computer owes its existence to the vastness of today's life. In the design and construction of complex machines engineering calculations are required which, as a matter of sheer time, are beyond the manageable capabilities of humanly performed computations even with the aid of rapid mechanical devices. Delicate, but wide-spread and gigantic industrial processes in actual operations are subject to intermittent variables making quality or quantity control too cumbersome, tardy, and inefficient if dependent upon human responses. Transactions, whether of an industrial, financial, or accounting nature are increasingly of such magnitude as to be beyond the efficient assimilation of manually maintained records or memoranda. And, finally, the law as an institution suffers itself from its growing mountain of legal literature which, at an ever increasing rate, is simply beyond manageable use in terms of money, time, or utility.

3. *Id.* at 1, 2.

What Do Computers Do?

Of course, to speak of the large numbers of different types of these scientific marvels under a single catchall as "computers" is itself a very unscientific thing. But for our purposes, the term is sufficient to describe the various industrial embodiments of systems for processing information in the form of words, numbers, and other symbols.

Every day some new application is made of data computers in the business world. As more and more commercial use is found, the computer comes closer and closer to the individual member of society as a significant factor. Like hieroglyphics etched upon the walls of some ancient cavern, bank checks and deposit slips now bear weird symbols preprinted in magnetically responsive ink to permit a universally automated system to sort and process checks by the use of bank code numbers, customer account numbers, and check amounts. And with the recent passage of a bill [4] authorizing the Internal Revenue Service to assign identifying numbers to the more than 93 million taxpayers filing returns, the day is already at hand in which the income tax law is largely administered by the computer. Computers are used for processing of customer orders, inventory control, call forward of raw materials, regulation of shipping schedules, continuous accounting in securities transactions, circulation control for periodical publication subscription lists, and the like.

But computers do more than merely receive, assimilate, and digest data. Now computers are more and more the key to complex operational processes. Computers, for example, are being used for running chemical plants, oil refineries, closing and opening valves, terminating or commencing steps in the industrial routine on the basis of information received from measuring devices. Computers are used to land airplanes. Experiments are underway in the use of computers to run suburban trains. Similar developments are unfolding for the use of computers as a constant, continuous check of planes in flight in order to detect and avert potential collisions. And, of course, computers find new and extended uses in the traditional field of mathematical computations, of engineering and design calculations, and those of simulated operational conditions.[5]

4. H.R. 8876, 87th Cong., 1st Sess. (1961). On October 5, 1961 the President signed the Bill as P.L. 87-387. 30 U.S.L. WEEK 2167 (Oct. 10, 1961). A conference to implement this innovation was scheduled for Washington, D.C. on October 23, 1961. See 1961 INT. REV. BULL. No. 37, at 33.

The number of returns filed increased from 5.9 million in 1930 to 93.5 million in 1958, an increase of 1,485%. In addition 300 million information returns were received, more than 10 times the number filed in 1940. 7 CCH 1961 STAND. FED. TAX REP. ¶ 8775.

A diagrammatic flow scheme shows how the ADP (Automatic Data Processing) system will work, including the making of 35 million refunds to taxpayers. CCH 1961 TAXES ON PARADE, No. 23, April 19, 1961, at 6.

5. What is here so briefly summarized is better set forth by Roy N. Freed of the Philadelphia Bar. By all odds, the most indefatigable writer and peripatetic speaker, Freed is an untiring apostle. His mission, an important one, is to create understanding in a well nigh un-understandable area lest the bench and the bar and the public acquire fixations

How The Computer Works

Fortunately, lawyers do not have to be able to build the machine or devise the technical directions for its use. The problems, the limitations, the dangers, the hazards, and the difficulties are better understood, however, with an elemental appreciation of the computer. Broadly stated, the computer has five basic elements: (1) Input means, (2) Program elements, (3) Storage means, (4) Processing means, and (5) Output means. Elements (1) and (5) literally describe how information is fed into the machine and how information after being digested, assimilated, and processed is fed out of the machine. The usual method on input is magnetic tape, although spectacular changes are now in the cards.[6] The problem here is to realize that data fed into the computer inescapably has to be translated from normal words and numbers into machine language[7] expressed in the binary digits "1" and "0." As for element (5),

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which, from such a prejudicial genesis, may soon be articulated into disruptive or frustrating rules. The best overall view of the subject is Freed, *A Lawyer's Guide Through the Computer Maze,* 6 PRAC. LAW. 15 (Nov. 1960). The earth-bound importance of this from a professional point of view is demonstrated by the fact that this is published by the Joint Committee on Continuing Legal Education of the American Law Institute and the American Bar Association. He had earlier written Freed, *The Machine Data Processing Systems for the Trial Lawyer,* 6 PRAC. LAW. 73 (April 1960). More recently, his paper, Freed, *Prepare Now for Machine-Assisted Legal Research,* 47 A.B.A.J. 764 (1961), was the first major article in a publication of such wide circulation on the specific subject of data computers in legal research. In addition, see also Freed, *Push Button Research: Automation in the Law Library,* THE SHINGLE (Jan. 1961) (publication of Phil. Bar Ass'n); and Freed, *Try Suing a Computer! Legal Tangles in EDP,* THE MANAGEMENT REVIEW (August 1961); and Freed, *Some Legal Aspects of Computer Use in Business and Industry,* 12 J. OF INDUS. ENGINEERING 289 (July-August 1961). To selective groups of professional eminence he has carried the message by less widely published papers. See, *e.g., The Judiciary in a Computer-Oriented Society* before the Twenty-fourth Annual Judicial Conference of the Third Judicial Circuit of the United States, September 8, 1961; and *The Importance of a Systems Approach to Mechanized Legal Research* at the Symposium on Information Technology, Section of Patent, Trademark and Copyright Law, American Bar Association Convention, August 6, 1961. In addition he serves as General Chairman in charge of overall planning in the intense 3-day forums sponsored by the Joint Committee on Continuing Legal Education of the ALI and ABA. The first, held March 1961 at Washington, D.C., under the theme of "A Preview of Some Legal Problems Ahead in the Use of Electronic Data Processing in Business, Industry and Law"was followed by the second conference, Chicago October 1961, "Legal and Practical Problems Involved in the Use of Electronic Data Processing in Business, Industry and Law." A third is to be held in Los Angeles in December, 1961.

6. See Bello, *How to Cope with Information,* FORTUNE (Sept. 1960). Experiments are now in progress for direct receipt of, and response to, spoken words. Already data computers are used for translation of foreign languages. More recently the Air Force has begun use of a machine which "translates" and then integrates for use by a headquarters master computer system the products of widely scattered and diverse computers.

7. Sometimes called metalanguage and of which one Patent Office Report stated: "This metalanguage is called Ruly English after the terminology of Professor Stuart C. Dodd, who pointed out that English is quite 'unruly.' By the use of Ruly English, it will be possible to convert the many complex and interrelated notions in technical documents

"Output," this generally will be in the form of print-outs at an amazing speed of six to nine hundred lines per minute. But in an automated computer directed control of an operational sequence, it actuates devices to execute required changes. Element (2) under the euphemism of "Program" is an underdescription of the intricate step-by-step directions given to the computer concerning everything the computer is expected to do with respect to the data fed into it. The establishment of a program, Freed tells us, "is the heart of machine data processing and reflects the human anticipation, based upon careful study of the underlying function and goals of each specific system, of the types of situations that will arise and of the courses of action that should be pursued."[8] Without these man-made directions, the computer is inert. Amazingly enough, such man-made directions can now include instructions to the computer on how to devise a program. Consequently, many tedious manual steps formerly necessary in "programming a program" are now automated as well. Element (3) is the so-called "Memory" where data is stored either on magnetic tape, or discs, and in the so-called electronic memory cores. Element (4), "Processing," describes roughly the switching unit components which, acting pursuant to the program, open and close circuits, among other tasks, to perform the functions desired.

Computers and Substantive Law

Once a lawyer realizes that data computers are all about him, it takes no vivid imagination to contemplate the problems in substantive law which are bound to arise. As with any of man's ingenious devices, the existence of the computer spells trouble. And trouble spells litigation. The trouble may arise, and normally would, from a use of a computer where the computer output, whether operational or merely data process, is faulty. On the other hand, trouble might come from a failure to use reasonably available computer facilities.

In the midst of trouble of either sort, the law will somehow have to expose once again its ordinary prudent man to the Toynbeean challenge and response of new stimuli. Will the standard satisfactorily meet the problem? Will there have to be adjustments either in burdens of proof or operative presumptions because of the unavoidable, inescapable, intrinsic complexities of the computing process itself which will effectually resist an intellectually honest inquiry into its performance by the untrained mind of either judge or juror?

Of course, the law does not exact this competence from its votaries. We operate from a sort of informed ignorance. But it seems an arrogant presumption that the Keys to the Kingdom have somehow been committed to the common law from the beginning of time if, before judgment has matured by

into unique forms." *Annual Report of the Commissioner of Patents,* 1959, 42 J. PAT. OFF. Soc'y 147, at 154 (1960).

8. Freed, *A Lawyer's Guide Through the Computer Maze,* 6 PRAC. LAW. 15, 22 (Nov. 1960).

cumulative experience, we uncritically conclude hastily that a principle of law applicable to a simple wheel will afford a satisfactory solution to problems of man's incapacity to cope manually with the vastness of life today.

Law and the Law of Chance

How law develops in relation to this marvel may itself depend on fortuitous events. A simple case of a depository bank making an error in a customer's checking balance from some erratic behavior or infrequent breakdown in the computer process would not subject judge or juror to a discernment beyond that required in assaying performance of other modern mechanical or chemical or industrial operations. Whether either or both rightly understood just what had happened would not be too important. The law could somehow tolerate an intuitive, but inarticulated judgment that this particular error was of the kind that ought reasonably to have been foreseen and prevented. If that is the first case, the traditional principle of the prudent man may be well on its way.

But suppose, however, that the early case involves a disaster resulting from the operational design failure of some machine or device (such as an aircraft) which, from the sheer magnitude of the engineering problems involved, was necessarily designed by computer calculations.[9] Here there will be no simple identifiable failure or malfunctioning in the computer process as an operable device. Here the problem will be more basic: what was wrong with the program directions given to the computer? And if, in that context, it was actually a malfunctioning of the computer as an operable device, the question would be: why did not the program directions anticipate such malfunctioning and provide alternative test procedures?

Trial By Ignorance?

How are these questions going to be answered? The *how* is not in terms of the result. It is in the competence—that is, capability—of the impartial trier of the fact to reach a decision. Although it may sound heretical of one who labors without complaint under the commands of the Seventh Amendment, it is to indulge in sheer fantasy to describe this as a "decision" by a jury. Of course, constitutional and statutory provisions, state and federal, may make jury determinations inescapable. But it is fiction to conclude that their result, whatever it may be, represents an informed judgment.[10]

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9. Less dramatic, but presenting similar considerations, is the reverse situation where a computer has not been used and the contention is made that the reasonably prudent person, although not compelled by statute, ought to have used a computer as a matter of ordinary care. See, *e.g.*, The T.J. Hooper, 60 F.2d 737, 1932 Am. Mar. Cas. 1169 (2d Cir. 1932), requiring the use of radios on coastwise barges; Schlichter v. Port Arthur Towing Co., 288 F.2d 801, 804, 1961 Am. Mar Cas. 1164 (5th Cir. 1961); June T., Inc. v. King, 290 F.2d 404, 406, 1961 Am. Mar. Cas. 1431 (5th Cir. 1961).

10. An interesting exception to this is suggested for a jury which subsequently confesses its absolute ignorance. Under instructions requiring that, to return a verdict for

Considering the episodic nature of a jury trial, the cause would be an ordeal by experts. The print-offs of programs—either in abbreviated symbols or translated into normal English—would be incomprehensible for the untutored then undergoing the citizen's short course on data computers. Experts translating these strange directions into understandable words would, in turn, inevitably be in the middle of the severe, unyielding mathematical logic which is the heart of the machine's ability to discriminate and hence form judgments. Inevitably the breakdown into the minute step-by-step procedures would reveal the use of processes akin to symbolic logic or Boolean Algebra. It is no disrespect to those skilled in this esoteric art for the rest of us who are intertested in data computers and law to acknowledge candidly that this is beyond our understanding.[11]

Despite the actual impossibility of bringing this controversy within the intelligent understanding of a jury, it is not likely that any way will, or could be, found to circumvent a jury trial. The answer undoubtedly will be given that juries have shown a capacity through the ages to adapt themselves to advances

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a plaintiff, the jurors be satisfied by a preponderance of the evidence, their inability to understand growing out of ignorance would justify a Scotch verdict of "not proven" for the defendant.

11. In preparing a paper delivered at West Publishing Company, July, 1960, on *Artzybasheff, Esquire, Machine or Monster—Which is Master? or A Plea For Enthusiastic Support For Serious Study and Experimentation in The Use of Electronic Data Computers For Analysis of Legal Literature,* the author became inspired by the relentless enthusiasm of Professor Layman E. Allen, Yale Law School, to whom so much credit must be given as a driving force in the "early, early" days of this unfolding frontier of EDR. He is a vigorous exponent of symbolic logic in law and a prodigious writer in this field. See Allen, *Symbolic Logic: A Razor-Edged Tool for Drafting and Interpreting Legal Documents,* 66 YALE L.J. 833 (1957); Allen, *Toward More Clarity in Business Communications by Modern Logical Methods,* 5 MANAGEMENT SCIENCE 121 (1958); Allen, *Logic, Law and Dreams,* 52 LAW LIBRARY J. 131 (1959); Allen, *Toward a Procedure for Detecting and Controlling Syntactic Ambiguity in Legal Discourse,* Conference, Sept. 1959, Western Reserve University and Rand Development Corporation at Cleveland; Allen, *Toward a Procedure for Logically Cataloguing Knowledge,* 10 AMERICAN DOCUMENTATION 296 (1959); Allen & Orechkoff, *Toward a More Systematic Drafting and Interpreting of The Internal Revenue Code: Expenses, Losses and Bad Debts,* 25 U. CHI. L. REV. 1 (1957).

An examination of these articles as well as the quarterly issues of MULL is a convincing demonstration that while lawyers (or judges) might somehow master it, the bewilderment of this strange jargon is beyond the ken of a juror. MULL (Modern Uses of Logic and Law) is the quarterly newsletter of the ABA's Special Committee on Electronic Data Retrieval, published at Yale University.

By the use of the same symbolic logic, Reed C. Lawlor, now Chairman of the ABA Committee on EDR, presented to the Patent Trademark and Copyright Law Section of the ABA, August 1961, an *Analysis of Patent Claims by Mathematical Logic.* As a sequel an IBM 7090 with a FORTRAN program produced a print-out in normal English instructions by which a manufacturer could design-around and avoid literal infringement of the four claims of the hypothetical patent.

The untutored must simply take it on faith.

in the arts and that, in any case, someone has to decide, and the jury is probably as capable as the judge. That answer as a constitutional imperative is acceptable. But it is really no answer if urged as a reasoned justification. What is helpful now and then, but what is so rare as judges play out their part in the constitutional drama, is a candid recognition that at times use of a jury as the fact finder is an irrational [12] and unworkable process.[13]

Despite these difficulties, we will have juries. Perhaps the substantive law will be affected so that while the jury speaks, it speaks as a public conscience. And if it is speaking only as the community's conscience and not as an articulate arbiter of a fact, suitable modifications of the substantive principles perhaps must be fashioned to assure that the utility to the public good of this marvelous instrument is not thereby imperiled or frustrated.

No Systematic Development Of Law

This general discussion pinpoints, in relation to computer substantive law, another thing which is at once the weakness and the strength of the common law system. Committed as we are to the "case and controversy" adjudicatory process, there is no way to assure a systematic development of law. It does develop, that we know. Perhaps as it develops, or once developed, it has a certain symmetry which resembles a system. But it is all fortuious, at least in terms of times, places, parties, and setting.

The great advantage, of course, is that this system—or the lack of a system—overcomes any temptation for any organized group, whether governmental or private, somehow to direct the development of law along "sound" or "correct" or "wise" channels. One sees this vividly at work in income tax cases where for taxpayer and government alike, the position asserted is normally what the exigencies require to save one's pocketbook or to augment the Treasurer's storehouse.

The great drawback, however, is that so much is left to chance. Not the least of these important factors is the competence, resourcefulness, and facilities of counsel. Akin, if not more paramount, is the identity, solvency, size and interest of the litigants and their continued future relation to the instrumentality then in controversy. Is the instant litigation a "one shot" affair? Or is it one in which there is a genuine desire to advance or resist a development for the general good of an industry or specialized activity? The composition of the

12. See Cole v. Usry, 294 F.2d 426, 430 (5th Cir. 1961) (dissent), where Judge Wisdom, perhaps more uninhibited by reason of his civil law background, said that

> . . . the only thing clearly irrational about this case is that the law compels a jury of laymen to function as a court in deciding a doubtful, unsettled, legal question that would be a toss-up if it were submitted to a court composed of tax experts.

13. See Thurber Corp. v. Fairchild Motor Corp., 269 F.2d 841, 851-52 (5th Cir. 1959), which portrays the unrealistic impracticality of a jury trial in an intricate patent case.

courts, appellate and trial, and the general attitude of the particular jurisdiction are likewise relevant. Finally, the setting of the case may be overpowering. Judges, trial or appellate, are humans—or they are not judges—and the development of new doctrines cannot escape the impact of the situation in which the controversy is presented.

Wanted: A Computer's Advocate

A recognition of this unavoidable aspect of our advocative system may, in this specialized field, lead to the development of a new approach. In place of outsiders manifesting a formalized immediate interest in pending litigation merely as friends of the court, those allied generally on one or the other side of the controversy might find it advisable to become actively associated not as a party, but *for* a party. Though this must be done in full keeping with all professional ethical requirements, it would nonetheless go a long way in assuring that as computer law is developed the maturing process is not thwarted or frustrated by the lack or inadequacy of professional and scientific resources.[14]

To ameliorate the laws of chance, the computer—whose great virtue is its very certainty—must have its ardent, informed spokesman. The time to speak is always *now*. The computer must actively help make good law.[15] It cannot pin its hopes on unscrambling the bad.

Computers and Evidence

While the consequences of substantive computer law may be more spectacularly awesome, it is likely that the law will have its closest contact with computer technology in the field of evidence.[16] This covers the use and availability of the computer-product either in pretrial discovery or as evidence on trial. It includes as well the use of the data computer in the assimilation and handling of masses of evidence.

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14. This is a common and legitimate practice in patent infringement situations, tort suits against agents, etc.

15. Ironically, it might have to decide its own case. There are some who reflect great optimism in the ultimate use of computers in predicting judicial decisions. This was explored by Lee Loevinger (then a Justice of the Supreme Court of Minnesota) in his paper, "The Element of Predicability in Judicial Decision Making," delivered at the National Conference on Law and Electronics, University of California, October 1960. See Chasalow, *The UCLA National Law and Electronics Conference,* MULL 60Sle, at 107. Reed Lawlor, Chairman of EDR, is currently making specific experiments for a FORTRAN program for predicting probable votes of individual Justices of the Supreme Court in certain types of recurring constitutional cases.

16. Freed, *A Lawyer's Guide Through the Computer Maze,* 6 PRAC. LAW. 15, 27-32 (Nov. 1960), under the general heading of Computers and Problems of Evidence discusses in more detail these points: hearsay problems, retention of original papers, best evidence rule, microfilm analogy, determinations made by computers, translations, discovery and computer analysis of masses of data as evidence.

Computers and The Paper Glut

It is at this point that law should be the most cordial in its reception of this new facility. Data processing machines came into being primarily as an indispensable response to the growing masses of business records, memoranda, papers, and accounts. Commercial concerns doing a worldwide business, with sales in excess of one billion dollars, with employees numbering one hundred thousand or more, can no longer operate with competitive efficiency on manually prepared, kept, processed, and stored writings. Payrolls with their numerous deductions, tax withholding, dues check-offs, variable straight and overtime rates, vacational allowances; routine preparation and distribution of voucher payments for oil and gas royalties and purchases with their unavoidable variations in tank and pressure gauges, monthly well production, withdrawals and previous payments; regular routine processing of marketing gasoline and hotel credit cards, and a host of similar applications have proved the computer to be a reliable and reasonably efficient means to bring these thousands and millions of minute, routine transactions within manageable capabilities.

The Law Has Obligations Too

It is not an overstatement to suggest that law has a positive duty to accommodate itself somehow to this irrepressible demand of the economic and social world in which we now live. Law has done it before, though sometimes begrudgingly, and occasionally only by legislation which sweeps aside the accumulated hostility of judges to the changes which the business world has long since found reliable and safe. For a machine now capable of making 240,000 additions per second, reading magnetic tape containing 4½ million digits of information on a single reel at a breath-taking speed, to speak of the shop book rule is, indeed, an anachronism. But we operate more comfortably with familiar concepts. Just as that rule dispensed with the necessity of producing the person who made the entry, the law must find a means of giving judicial currency to that which is reliable and acceptable in the market place. The Federal Business Records Act [17] and the Uniform Business Records As Evidence Act [18] certainly have sufficient intrinsic flexibility to permit their adaptation to this new form and type of business records.

The Computer Needs A Lawyer

But here again, both the development of sound law and the reception as evidence in a specific case depend so much on how well counsel do their job. Clearly, a thing as mystifying and bewildering to the average judge as a data computer

17. 28 U.S.C. § 1732 (1958).

18. See McCormick, Evidence § 289, at 607 (1954). It should be helpful that this Act refers only to records and does not use terms such as "writings" and "books" which might be more limiting.

is going to be viewed with an intuitive apprehension born of ignorance. The judge is uncertain. Evidence, data, records, and memoranda of doubtful reliability ought properly to be kept out. Both in the psychology of inducing a favorable fact finding and establishing admissibility as a legal proposition, it is therefore more than ordinarily incumbent upon counsel to demonstrate so much of the procedure followed by the computer as will give the trier the assurance that the result is safe and reliable and is depended on in the important financial affairs of the business world. Failure in the early stages to do that carefully cannot but work great harm. Each niggardly or adverse decision represents the threat that all will expand cumulatively into a hostile rule from which legislation, years later, will be the only escape. On the other hand, carefully prepared presentations in the early cases can, out of the assurance of inherent reliability of the data proffered, be the source itself of favorable and practicable rules.[19]

Obviously, some unique situations are bound to arise which will test the ingenuity of the law. It will not be surprising to see courts fall back on convenient analogies within their understanding, even though they are quite imperfect. Obviously, some adaptation will be essential. For example, as more and more written, stored records are eliminated in the routine process of recording transactions and as more of them are routinely stored only in magnetic tapes, the occurrence of an event may have to be proved circumstantially by considering the input, the output, and the program by which one ultimately became the other. Similarly, data permanently stored as "real-time" continuously up-dated records are unusable in litigation in the form of magnetic tapes. A print-out from the tape would, however, be relevant and probative. If an adequate evidential trial record demonstrating the general reliability of the whole process is carefully constructed, courts will, through appropriate means,[20] undoubtedly take practical and liberal views to assure that information stored in an illegible form is made legible and understandable to the trier.[21]

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19. Most often the so-called business records are held inadmissible not because they are outside the rule, but because the authenticating predicate of reliability is not adequately established. See, *e.g.*, Missouri Pac. R.R. v. Austin, 292 F.2d 415 (5th Cir. 1961). Rejection of the punch card in Sunset Motor Lines, Inc. v. Lu-Tex Packing Co., 256 F.2d 495 (5th Cir. 1958), forecasts no difficulty. There a punch card with neither essential information nor official certification was rejected as inadmissible.

20. Both in pretrial discovery and for court production, some genuine problems arise from the computer system. For example, stored on the same reel will be numerous other transactions properly regarded as confidential business secrets. Likewise tapes are valuable and irreplaceable records of cumulative information. All may be lost if accidentally demagnetized. Security is, therfore, a proper concern for the court.

21. By the Federal Business Records Act, as amended in 1951, original records, if "recorded, copied, or reproduced by any photographic, photostatic, microfilm, micro-card, minature photographic, or other process which accurately reproduces or forms a durable medium for so reproducing the original . . ." may be destroyed, with such "reproductions" as admissible as the originals. 28 U.S.C. § 1732(b) (1958).

Computers and Mass Evidence

Here, as perhaps equitable compensation for the troubles which the computer begets in substantive and evidentiary law, the computer offers a boon to the judicial machinery itself. All are conscious today of the so-called "big case." It is generally big in money, big in the number of lawyers involved, big in the number of parties to it, and big in terms of economic importance. With all such bigness, it is invariably big in a big and almost unmanageable record. Antitrust cases, civil and criminal, minority stockholders suits, and the like are vivid examples.[22]

It is here in bringing order out of chaos that a data computer can be of great help in the manageable assimilation of the ever growing mountain of evidence.[23]

The Data Computer in Legal Research

The law needs help. The law needs help from the mass of evidence now being offered in the big case. More than that, it needs help to manage the ever-growing mass of legal literature which contains "the law." The law has not escaped this "monster of literacy which is sort of engulfing us."[24]

Lawyers (Judges) Talk A Lot

With words our principal tool, the law is adding its fair share to this vast bulk of learning. The American Digest System with its 235 volumes and

22. The Judiciary as a governmental institution has taken official action respecting this phenomenon of modern day life. Judge Murrah's monumental efforts as Chairman led to the adoption by the Judicial Conference in 1960 of the *Handbook of Recommended Procedures for the Trial of Protracted Cases,* 25 F.R.D. 351 (1960). This was the culmination of long labors by the committee and the bench and bar. The "big case" was itself a big case. See also 24 F.R.D. 235 (1960); 23 F.R.D. 319 (1959); 21 F.R.D. 395 (1958).

23. Freed, *Machine Data Processing Systems for the Trial Lawyer,* 6 PRAC. LAW. 73, 75 (April 1960), discusses a typical use in great detail. He points to United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 299 (D. Mass. 1953), as a typical big case with its transcript of 14,194 pages, 5,512 exhibits totaling 26,474 pages, approximately 150,000 card reports, 6,000 patents, 47 depositions comprising 2.122 pages of the transcript.

This record is small compared to many administrative proceedings. Only in awe can one contemplate the proceedings about to commence before the Federal Power Commission in the area-wide pricing hearings under the Natural Gas Act. There hundreds of independent natural gas producers, big, medium, and small selling gas under thousands of individually certificated contracts are interested parties to an omnibus proceeding which may ultimately fix individualized private rights. At least one judge doubts that bigness necessarily guarantees real information. See, *e.g.,* United Gas Improvement Co. v. FPC, 290 F.2d 133, 138, 147 (5th Cir. 1961) (Brown, J., dissenting).

24. Testimony of W. O. Baker, Vice President—Research, Bell Telephone Laboratories, Inc., in the hearings before a subcommittee of the Committee on Government Operations of the United States Senate. See *Hearings on S. 3126 (and S. 4039),* 85th Cong., 2d Sess. 236 (1958), a bill to create a Department of Science and Technology, in two parts. The two parts are paged consecutively and will be referred to as *Hearings, S. 3126.* He had earlier described it as "this self-suffocation of scientific literature." Still another called

500,000 pages (to 1956) contains over 7¾ millions of digest paragraphs. Appellate opinions are added yearly in staggering amounts. The National Reporter System for state and federal courts added to the shelves in 1958 more than 108,000 pages. Since 1916 alone, state, federal, and National Reporter volumes total 10,408 volumes. The flood of words is almost unbelievable—over 57 million in 1958 for state courts, another 18 million for the lower federal courts, and another million and a half or so for the Supreme Court.[25] It is getting worse, not better, and is aggravated in the exploding metropolitan population centers.[26]

But this is not all. Complex legislation and authoritative administrative rules and regulations add greatly to it. It is estimated that state legislation exceeds 125 million words. We begin to sense the size of this mountain when we realize that in the Library of Congress nearly one million volumes (including pamphlets after 1900) relating to law have been collected in the brief span of 125 years.

The Bar has long been concerned with this.[27] And well they might. For it is bound to get worse, not better, as our population mushrooms to 230 million

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it "a paralyzing glut." See the draft program for a National Technical Information Center prepared by Stanford Research Institute, January 1958, incorporated in the statement of Merritt L. Kastens, Assistant Director, Stanford Research Institute, *Hearings, S. 3126,* p. 122, at 130.

These hearings led to the establishment of the Science Information Service, 72 Stat. 1601, 42 U.S.C. § 1876 (1958), enacted as a part of the National Defense Education Act of 1958.

25. The historical statistical average was undoubtedly shattered this past term. Four Sunday closing cases cover pages 393 through 574 and the Communist Party case covers pages 625 through 750 in the Lawyer's Edition. 6 L. Ed. 2d (1961).

26. In California, for example, according to the estimates of Professor Layman E. Allen, Yale Law School, over 5 million words annually flow in all appellate decisions. Texas, with its 11 Courts of Civil Appeals, Court of Criminal Appeals and Supreme Court, has added volumes 44 S.W.2d through 346 S.W.2d in the author's brief span from 1932 to date. This is not a "state" shortcoming. The "Federals" are not free of volubility as witness the volumes 226 F.2d to 290 F.2d in the even briefer span as judge (1955).

27. Ralph M. Carson of the New York Bar in "The Prospect of Liberty: Or the View from Saint-Remy," an address at the Centennial of the University of Michigan Law School, October 1959, described it.

> In 1916 John W. Davis as Solicitor-General remonstrated on this subject with the Judicial Section of the American Bar Association. In his paper "The Case for the Case Lawyer"* he pointed to the multiplication of precedents in that day. Citing the early complaints of Coke, Bacon and Montaigne, he quoted Mr. Justice Buller in 1786 on the "Herculean labour" of wading through the cases in Comyns' Digest;** and then came to 1886 and a report for the American Bar Association signed by David Dudley Field and others which described the condition at that time as "chaos." Taking a census as of 1916 Mr. Davis found things infinitely worse. He counted 6,836 volumes of British reports (including the Empire); 9,621 volumes of American reports, official and semi-official, both State and Federal; together with 1,015 volumes of the Reporter system and 914 books of selected cases—a total of

in 20 more years and over 300 million by the year 2000, and more and more courts are established.

Thus it is that the law has its own vastness. And, as did the business world, facing its vastness, lawyers see at least a ray of hope in the data computer in the storing (recording) and recovery (retrieval) of legal literature in the course of legal research.

The Active Interest of the Organized Bar

Now but a few years old, the EDR—Committee on Electronic Data Retrieval—of the American Bar Association is stimulating a nationwide interest in this new application. More and more articles are now appearing, speeches are being made, and intensive institutes are being held.[28]

The Computer Really Works

Much progress is being made. But it is progress for the long haul with an evident recognition of the difficulties inherent in the translation from lawyer-language to machine language. The limited experiments reflect some uncertainty as to the indexing techniques which will ultimately best serve, whether by natural language text, key words, or some modification. But two of the projects have shown spectacular promise. One is at the Health Law Center, University of Pittsburgh, under the direction of John F. Horty. This extensive project demonstrates that multi-state statutory material is susceptible of data storage for effective and rapid retrieval in the course of research on specific pinpoint problems. The other is the continuous experimentation in the data computer indexing of a limited field of patents in the United States Patent Office.[29] This experimentation of machine indexing and searching in the

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11,650 volumes of American reports alone in the year 1916. But the fact of largest import, said he, was that of the total American volumes over 6,000, or more than one-half, came from the presses in the 30 years since Field's report in 1885.***

Since Mr. Davis spoke, the accumulation of precedents has continued with that increasing velocity so familiar in every aspect of American life.

* 41 American Bar Assn. Proceedings 757-69 (1916).

** Birch v. Wright, 1 T.R. 378, 383 (1786).

*** Note 42 p. 761.

Carson, *The Prospect of Liberty: or the View from Saint-Remy,* in FRONTIERS IN LAW AND LEGAL EDUCATION (U. of Mich. Law School 1961).

28. Freed, *Prepare Now for Machine-Assisted Legal Research,* 47 A.B.A.J. 764 (1961), was immediately followed by Dickerson, *The Electronic Searching of Law,* 47 A.B.A.J. 902 (1961). Notes 1 and 6-10 of Freed's article summarize this activity. See also note 5 *supra.* In addition to the institutes and seminars elsewhere listed, acknowledgment should be made also of the strenuous work being done at the Southwestern Legal Foundation (Dallas, Texas) under the direction of Robert Wilson.

29. Citation to Patent Office publications tracing these activities is set forth in note 11. Thermo-King Corp. v. White's Trucking Serv., Inc., 292 F.2d 668, 677 (5th Cir. 1961). Since that time Commissioner of Patents Ladd in his review of the future of the Patent

field of steroids is remarkable since a patent is a legal instrument. It deals with legal as well as physical (or chemical) concepts. And patent soliciting (drafting) is a process of putting a mechanical, physical, or chemical concept normally conveyed by drawings, formulae, or symbols into normal language. The data computer merely extends this process.

No Machine Practice of Law

The earnest search for machine methods to facilitate legal research is not to do away with books or with lawyers. Both are essential. With printed materials growing year by year, the population explosion which may see us a nation of 300 million by the year 2000 makes certain that we cannot continue on with our present tools alone. The lawyers' problem is becoming increasingly like that of the scientists: It is not that we do not know; rather, we do not *know* what we know.

What we are trying to save is precious professional time in the routine low-order search which finally uncovers the few pieces calling for close study and lawyer-like judgment. Marvelous as is the modern key numbered digest system developed to a high state in the United States—and the envy of many scientific professions whose abstracts are both recent and inadequate—the stratification into separate, recognizable categories of substantive and procedural law makes search a time-consuming and expensive proposition. And modern billion dollar commercial corporations with businesses spread over the face of the world and all 50 states illustrate the need for a ready and simultaneous workable index of statutory materials as they undertake to comply with the diverse laws in areas of operation.

The Computer Has Not Told Us When

Just how it will be done, or when it will be done, or how it will be put to use is not yet known. It is certain, however, that a way will be found to put into the data computer the literature of the law—statutes, regulations, appellate opinions, and scholars' texts. That will include a means of storing by which carefully predetermined selective material can be extracted almost simultaneously. Relieved of so much of the wasteful unproductive time laboriously spent in plodding through the growing mass, the lawyer, at that stage, will then be free to think as a lawyer on the materials thus supplied.

Office to the Patent Trademark and Copyright Section of the American Bar Association, August 9, 1961, dwelt at great length on the efforts to use data computers in patent searches. With patent applications exceeding 75,000 per year, an accumulative total of approximately three million patents already issued, and a backlog of several years due primarily to the impossiblity of manual human search, the Commissioner was emphatic: "In my judgment the Patent Office must accept the challenge [to make data computers work]. It must do so, for the very survival of the examining system as we have it is at stake. . . ."

Now Back to Cardozo

Cardozo never saw a computer. He would undoubtedly share the awe and incredulity of today's untutored in the face of this uncanny machine. But for one who saw law as a constant undulation [30] between rest and motion he would sense its presence.

Life has moved so fast, so far, that it needs the computer. What life needs the law must reckon with. The motion which brought with it the computer is the living force of law. By it the law too moves, and moving, lives.

30. "The problem is laid bare, and at its core are the ancient mysteries crying out for understanding—rest and motion . . . the absolute and the relative. . . . I start with the antithesis between rest and motion, stability and progress." CARDOZO, THE PARADOXES OF LEGAL SCIENCE 4, 7 (1927).