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Does C&IT facilitate the Wrong Things?

(Panel session "Beyond Law as a System of Rules: Getting IT Right")

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There is a simple view of the role of C&IT in the legal academy that states, "C&IT is just a tool. Use it or abuse it as you will. It has no ideology. It can no more be a bad thing than can a car or a chisel." It is an additional resource on top of whatever we had before. I want to link that claim to a set of analogous claims about the relationship between law and science and law and mathematics, and subject them to scrutiny. I shall call these claims (that science, mathematics and computers are "just" tools) collectively the "neutrality claim". So far as concerns computers, I shall suggest that C&IT in law has a tendency either towards reaction or towards reductionism in how we understand law in the academy. I will finish by considering an area in which computers have been relatively more successful – chess - and trying to work through the similarities and distinctions.

Science

Whether we wish to consider the interaction between law and science only so far as it affects the quality of the justice which is delivered by our courts, as a microcosm of a larger conflict over poweror, or in terms of a more sophisticated theoretical metanarrative, the significance of science in legal contexts is growing and will continue to grow. It can have variety of impacts. What I want to consider here is the thesis that law *needs science because science has the answers*. This is clearly an appealing thesis. Although science does not have an unequivocal, determinate answer to every question thrown up by criminal proceedings, to law the attraction of science is that it can sometimes offer certainty and authoritative resolutions. Scientific evidence is in the greatest demand in criminal cases where there is least other evidence, for example in crimes where there are no easily identifiable victims or where terrorism is alleged. The introduction of the scientist alters the narrative dynamic of the trial. A category of evidence and a language is introduced which requires the insertion of the expert as interpreter. The appeal of science for law is not unequivocal. There is a prudential factor militating against the "expertisation" of the system. A system of criminal justice will command more widespread support if its procedures, techniques and outcomes are easily and widely comprehensible. Total reliance upon science will represent an abdication of responsibility by law.

The "scientificisation" claim is not novel. The followers both of Pound and Llewellyn enthusiastically rode the same path. Cantor, for example, wrote in 1930:

> The time has arrived when the grim hard facts of modern psychological enquiry must be

> recognised by our lawmakers despite the havoc they may create in established institutions ... Legal definitions are essential but they too must rest on the facts of modern science and not medieval folklore.

Much the early promise of IT for law had exactly this kind of evangelical aspiration.

If law is to rely upon science then it must be clear as to what is to *count* as science. The courts in England and Wales have yet to consider the matter fully, but may be expected to take a lead from the United States. In *Daubert v Merrill Dow* the US Supreme Court held, on the question of the applicable test before a novel scientific test should be admitted in evidence, that the courts should no longer be bound by the test of "general acceptance" among a scientific community (which had been the test in *U.S. v Frye,* and probably remains the test in England and Wales), but rather that the courts should put in place their own test of scientific validity (peer review publications, error rate, theory test, standards, acceptance, motivation (of research). refereeing, error rates and the rest of the Popperian scheme). The U.S. Supreme Court expressly committed itself to Popper. Now the impact of *Daubert* will take some time fully to be felt in the United States. Handwriting evidence has come under serious scrutiny. The evidence of graphologists has been rejected. One of the areas which is thrown into issue is the battered woman's syndrome (BWS) first identified by Walker in the late 1970s, describing a theory of "learned helplessness" and cycles of violence, repentance, forgiveness and more violence. This theory has gained acceptance in the courts in England and Wales. The theory has been said, however, on the basis of the epistemological underpinning of *Daubert*, to be no more scientific than the novels of Dostoevsky.

Conversely, the argument is being made for the admissibility of some novel forms of evidence on the basis of their claimed (and verified) accuracy. This line of argument states that scientific verification is the key, that there is a clear delineation between the scientific and the non-scientific and that the scientific is "right", reliable, authentic and the non-scientific wrong spurious and a wholly inappropriate basis upon which for decision-making in the legal sphere to proceed.

The question which remains is whether results in battered women results are best generated using the theory of BWS, or simply in terms of arguments about the uselessness and injustice of punishing, deploying BWS, if at all for its rhetorical effect. It is hardly surprising, given the alignment of factors, that the claims of neutrality and monopoly access to truth that arise from the claim of "scientificity" should generate a response from feminist legal scholars. Catharine Mackinnon's observation "When [the law] is most ruthlessly neutral, it will be most male; when it is most sex blind, it will be most blind to the sex of the standard being applied" has been invoked by those who want to put into question the bald uncomplicated distinction which the neutrality argument presupposes. An argument has been made for a "feminist epistemology" which rejects the dualism of science and non-science (which might regard, for example, Stanley Milgram's famous experiments on obedience to authority as science but not Walker's theory of BWS). On this account:

> Feminism rejects, as well, the dualism of patriarchal science: the policing of a sharp boundary between privileged "science" and unworthy "non-science." Feminists do not see the distinctions as so clear, nor do feminists necessarily privilege one side of the boundary over the other in all contexts. There is instead a continuum, band, or loop linking shades of science and shades of non-science, and different points on the continuum might be appropriate for different purposes. Some practices generally denominated "scientific" involve reasoning more similar to that of historians than physicists, yet the historical mode of reasoning may be closer to the task at trial - recreating and understanding a past event - and more useful and "scientific" for evidentiary purposes than any model based on laboratory physics. Feminists will generally prefer solutions that maximize communal and contextual decision-making and, therefore, favor increasing the quantity and quality of scientific evidence, rather than its exclusion, as a goal of evidence law. Given the interpretive and social nature of mental-state determinations, feminists recognize the inherently political nature of the relevant evidence

> rules and view political considerations, broadly defined, as unavoidably tied to epistemological ones

At least when mental states are in point, exclusiveness is not a good approach, nor is a mechanistic approach to scientific evidence that states that if the behaviour is the result of a particular *stimulus* (rather than choice) then there can be no liability, and that otherwise the evidence is irrelevant. The broadening of the timeframe for moral evaluation generated by BWS evidence is welcome even if doubts can be cast upon the "science" itself.

Let me be clear. I am in favour of science in the legal process: I am in favour, usually, of the kinds of authentication by attempted falsification which is the centrepiece of the decision in *Daubert*, and I have no doubt that the adoption of the *Daubert* rule would be better than the existing English position. I also have no doubt, however, that the transfer of the function of deciding upon the admissibility of novel forms of scientific evidence from the courts to an executive agency would be a very welcome move. The reason for introducing issues as to mental state is to show that the Popperian version of science and its version of truth cannot be the only versions which law adopts. In particular, there are some things which law needs to know that can only be established very differently. Mental states are among them. The mere fact that there are some issues which are not susceptible of decision according to a unitary view of the scientific enterprise means that the anterior epistemological questions require attention. What is not acceptable is the view that there is only and only one acceptable way of generating scientific evidence and that that evidence is privileged as against other evidence, "because that's the way things are."

Mathematics

The neutrality thesis about science is that law needs information derived from science, and needs to privilege it, because that is the best quality, least "biased", information to which access is possible. The neutrality thesis in respect of mathematics is similar. It states that law needs the techniques and results of mathematics - that lawyers need to think as mathematicians, and that by doing so they will generate better (meaning more accurate) results. This kind of argument has arisen in various areas of the law of evidence. It is generally that wherever probabilities can be expressed mathematically, they should be. This includes the probability of individual items of evidence proving reliable, of the relationship between items of corroborative evidence, and dealing with coincidence.

An article was recently published in *Legal Studies* arguing that the innumeracy of law students was a problem, in particular because of their inability to make properly informed probabilistic judgements. The argument, as I understand it, is that law students need to be able to appreciate probabilities in order to make informed decisions in advising clients. They also, so it was argued, need to appreciate the differing probabilities that various juries attribute to expressions like "beyond reasonable doubt" and "balance of probabilities". It turns out that juries tend to take "beyond reasonable doubt" to mean a higher standard of proof in, say, murder than assault, and, so the argument goes, lawyers need to have regard to these numbers, rather than their accumulated wisdom and experience expressed in non-numerical terms, in advising clients.

The argument need not only apply, of course, to law students. Numeracy is indeed a valuable asset in many walks of life. There will be cases where the accuracy of a decision is may well be enhanced by reference to mathematics. In *People v Collins* a case in which statistical evidence was famously misused statistical experts were produced who made mistakes in giving evidence, those mistakes going uncontraverted. The wrong question was asked. The advent of the Bayesians, dominating the "new evidence scholarship", has raised a whole series of questions in the law of evidence. A simple case on mathematicization that raises the issues clearly is *The Brimnes* and another the classic current problem cases, *Adams (No 2)*, arose recently. What happened was that there was DNA evidence that placed the defendant at the scene of a crime, and a witness who gave the defendant an alibi. Now any DNA evidence relies for its value upon a probability, usually the probability that the

DNA evidence be found given that the defendant is innocent. The question was - how is the jury to make sense of the conflict between the "scientific", statistically informed evidence and the witness before it. There are a number of possible approaches, but the choice fell for the court between (a) the position which had been taken at the trial, of attempting to educate a jury in Bayesian reasoning, supplying worked examples according to hypothetical values which they ascribe to the alibi evidence. There is some evidence suggests that introducing juries to this kind of evidence doesn't significantly alter the decisions which are made; or (b) telling the jury not to bother too much about the mathematics but to take a broad view of the evidence and do their best. Now, as it happens, in *Adams(No 2)* the Court held that it was unwise to start trying to lecture the jury about how to compute probabilities.

The case against the computational method in law was first clearly made some years ago by Laurence Tribe, who argued famously that there are certain propositions about the legal system "whose truth virtually all might already suspect, but whose explicit and repeated expression may interfere" with important aspects of the legal process. And here is the nub: that the kinds of epistemological methods to which the realist version of science and a mathematical notion of probability want to commit us will, consistently applied, necessitate such profound reconsideration of the way in which facts are found as radically to alter the system. Those who defend the jury (I am by no means a wholly committed fan) do so on the basis that it can exercise the function of generating acceptable decisions extra-rationally. The "neutrality" argument seems to commit itself to the removal of any procedures that do not satisfy its own test of rationality. Numbers are not neutral: they are a means of securing distance, they make and remake the world and they are a site wherein rationality is contested, not simply applied *ex cathedra*.

The rigour to which the approach to science in *Daubert* and a commitment to mathematicization aspire carries some danger, principally of getting fixed into the mindset of believing that the chosen way is the only way to truth. The reason why the law is looking around for epistemological theories to borrow may be that it lacks itself the any fundamental apparatus of its own.

Computers

What do the move towards more "rigorously" tested scientific evidence and the argument for the introduction for a higher degree of mathematical learning in law have to do with computers in the legal academy? Social science evidence can only be tested by reference to the kinds of statistical techniques (multiple regression analysis &c) to perform which without tears require a computer. The sorts of computations which Bayesian theorists require that we should perform are seldom sufficiently complex to require recourse to electronic means, but there are doubtless programs which work with Bayes' theorem. So is some possibility of contagion between the respective areas of activities. But that is not my claim, and it would not make an independent "neutrality" thesis for computers. What I do suggest is that the "law and computers" movement creates a tendency to ask us to think about law in the same "black-and-white", "one way to truth" way as do science and mathematics, by making easier that kind of approach to law.

In a couple of papers, one with a co-author years ago which saw the light of day in a couple of forms. The thesis was that in conjunction with modern developments in C&IT in legal contexts were two views of what law is. One was just a reactionary, doctrinal positivism.

> Why is this view of law one which sits well with the movement for computers and law? Conceiving law as rules of the form *if p then q* ("legal reductionism" as shorthand) is something which is enormously constraining. Even for those interested in teaching or writing doctrinal law, you might well be more interested in questioning whether q is invariably an appropriate sequitur to p, or whether a particular set of circumstances should actually be classified as p, than with the mechanics of rule application. But the advantage in computers and law is that as soon as the "legal" operation *is* characterised as an *if p then q* operation, then

> it becomes easy to perform it with a computer. At least in computing *if p then q* can be an enormously complicated operation. In the sphere of law even relatively complicated statutes (those which expressed algorithmically would have a good many junctions) the application (failing logical inconsistency) of clear rules to clear facts is a relatively mundane, mechanistic operation. If you are going to use computers in legal contexts, the pressure which computers generate is towards a rule-bound framework, because it is what they do best. There does seem to be a link, if not a logical one then a practical one, between technological innovation and jurisprudential reaction. It is no coincidence, for example, that the IOLIS disk has yet to engage with sociology of law or socio-legal studies. Marginal attempts on it at "law in context" have fallen pretty flat.

That is, the computers and law movement fits best with a version of law which is antithetical to much which has been introduced into the legal academy in the last fifty years. The danger here is of reaction posing as innovation.

The other version of law to be found within the "law and computers" movement was a view of "law as information". This is still a notion of law which is highly textual, and whose major task is the identification and deployment of "the law". It does raise a further question, which is whether there is anything specifically "legal" about law either inside or outside the legal academy. Most of the conspicuous successes of C&IT in law have come as a consequence of the materials in point being information, not laws, and the fact that they happened to be laws or in some sense legal added little or nothing to the achievement. That is, the "law as information" version of the legal theory of C&IT "delaws" law. It might be unexceptionable to describe the significance of C&IT for the practitioner of law, but the question which remains is whether this position can be adopted consistently with holding law to be an academic discipline.

But if the "law as information" thesis is to govern instead, then law as an academic subject would lack many of the usual identifying criteria of a discipline. It would have no core objects of study, no canon, and no set of techniques by which distinguish the discipline. Very frequently, all a person will be interested in is one rule or part of a rule. The "high priest" notion of the practising lawyer holds that a familiarity with an overarching structure is necessary to be able to work with the rule, or to prhrase the right question that frequently is manifestly false (as natural language searching is now showing).

If law is nothing more than a huge number of isolated items of disparate information without organising principles or shared techniques then the entire edifice is built upon sand. Need that make any difference, and if so to whom? Politically, law schools are no longer sufficiently weak within their institutions as to need the colour of science to maintain their place. "Vocational" subjects have proliferated and the distinctions between those and "traditional" subjects have been broken down. Established subjects have either changed themselves or generated offspring, like the non-canonical Cultural Studies branching off English. Practically, if law is little more than the assembly information, then this should impact upon the skills which law students acquire. Legal education must direct itself towards instilling non-redundant skills. Some skills have been made redundant through C&IT. One of the earliest introductions of the electronic into education was the electronic calculator: what this did was to render redundant the use of logarithms as a means of multiplying and dividing quantities with more than 2 or 3 digits. Logarithms were used as a quicker and more accurate way of long multiplication or long division. Schoolchildren used them before we understood how they worked. Because log tables are not perfectly accurate, long multiplication or division by using logs is not itself perfectly accurate. Electronic calculators are faster and more accurate. Are there any tasks in the legal academy which have been overtaken by the technology in this way? At the moment there are some, but my impression is that the Internet will make a vast number more.

An example of a "legal" skill which used to be taught and which is now as useless as logs for long

division is finding out from paper sources whether or not a statute is in force. Of course whether or not legislation is in force is frequently a crucial question. There is a good deal of important Legislation which, for whatever reasons, is not brought into force. Part I of the Criminal Justice Act 1993 (which deals with the extension of jurisdiction abroad in the case of some property offences) and Schedule 11 of the Local Government and Housing Act 1989 (which deals with the extension of the liability of organs of local government in respect of limited companies within their *aegis*. There is before Parliament at the moment a (mischievous) Bill whose effect would be to bring into effect the Easter Act 1928 (which has never been brought into force and which would fix Easter on a basis other than that laid down in the Book of Common Prayer). It used to be difficult to ascertain with accuracy whether or not a particular piece of legislation was or was not in force. Students used to be set exercises involving generating this information from paper forms of the data. Now any paper-based method of checking whether a given piece of legislation is or is not in force needs to be stamped out. Going to the library and checking statutory instruments is a skill like using logarithms to divide.

This is a pretty workaday example. Far more important is the changes which will be made to reading skills. The reading skill of lawyers is not like the reading skills of e.g. English undergraduates. It is a skill of skimming and selectivity. It is a skill if sieving and locating pieces of information, none of which in itself requires a great deal of other learning to grasp. My guess is that in the next two or three years the enormously valuable skill which will replace almost any information location skill will be the skill in conducting searches.

Law and Chess

The failures and disappointments which are mentioned in Cyrus' prospectus lead me to consider areas in which C&IT has been successful, and to consider whether there is anything which can be learnt, either as to why it is that C&IT has not been successful, or why it cannot be successful. Overwhelmingly the most significant popular triumph for C&IT was when Deep Blue beat Gary Kasparov at chess. It did not do it in such a manner as to pass the "Turing test". An observer who knew something about chess would have known in at least a couple of the games which was the computer and which the human. It did it with a curious blend of calculating ability, accuracy in avoiding tactical blunders and what in a human player would have been called tenacity. So my question is, "If an algorithm can be devised which can beat the best player in the world at chess, why has it proved so difficult to put one together which will write a brief arguing for a particular position, or deliver a lecture, or compile a book?" Is it simply that chess is so much unlike law as for no sensible comparison to be made? Or is it that chess is so much simpler than life and law that the algorithm cannot be introduced without oversimplification.

There are, I suggest, significant analogies between law and chess. In a brilliant article that places in issue the authenticity of law as a discipline, Schlag shows that law has credentials as a discipline strikingly similar to phrenology, in the sense that it empowers a particular group to engage in discourse one with another about a set of beliefs (in the case of phrenology, faculties, and in the case of law, doctrines and principles). It is possible to imagine how chess could have been an academic discipline. The imagery of chess is quite frequently used in legal discourse. Courts talk of stalemates, gambits, pawns and chess itself as though the metaphors convey a particular meaning understandable beyond the chess community. Chess does have a body of "theory" in which people publish in journals analyses of the various possibilities in a given position, and refute each others' analyses. How does C&IT impact upon chess, how do chess algorithms work, and what can they tell us about the tasks that can well be performed in legal contexts? Typically a chess program will have a calculating function and an evaluative function. In the early days it was possible to beat computer programmes fairly easily by creating positions in which the killing move was over its horizon (because the number of positions it needs to consider rises exponentially with the number of half-moves it looks ahead). The ability to focus thoughts (and consequently to avoid wasted analysis) remains one of the areas in which humans outperform the machine. Also programs still tend to

overvalue material, to be consequently vulnerable to positional sacrifices, and to play silly moves to postpone some inevitable undesirable event beyond their horizon. Styles of play have been developed specifically for use against computers.

Now all that is happens in a game involving the placing of 32 pieces on 64 squares. We know from the fable with the grains of rice on the chess board that the numbers of possibilities is very large. But it is finite. What chess programs have been able to do in positions with a limited of amount of material on the board is to revise (slightly, but revise) what is known in chess theory. Endgames, that is positions with very few pieces on the board can be analysed exhaustively. Of course, the complexity of the computation increases exponentially with every additional piece, but in principle the numbers involved are large but not infinite. The truth about a chess position with, say, six pieces on the board is clearly knowable. In principle, there is no difference between calculating for six or sixteen, or thirty-two pieces. Top-level chess has now had to be reorganised to exclude adjournments because of the assistance that could frequently be gained. In chess theory - discussion in the journals about who stands better in a given position - judgement about positions is less valuable. What judgement means, in these contexts, is an educated guess, which becomes useless as soon as there is a facility available that just knows, or can calculate the answer. There is little value in a grandmaster say that in view of a number of structural and dynamic features about a given chess position in his view the position favours white and that white should win with best play if the computer has worked out the answer and it is in the public domain. Computers have changed the boundaries between the unknown and the known. There are some positions that used to be thought to be drawn with best play and are now known to be won for the side having more material. They have also allowed the assembly of formidable datasets of games which allow better preparation to be done on individual opponents (what does x play in this position?). Such datasets are on websites and frequently the moves from major tournaments are placed on the web live.

There are, then, two major differences that the advent of computers has made in the field of chess theory. First, as to technique, there are more positions (particularly endgame positions) which now form part of an immutable corpus of learning, rather than discussion and speculation. This disciplinary ossification is similar to the development of inorganic chemistry before and after all the elements were identified. Second as to preparation, there is now far more information available and it is more easily available. No more is it necessary for top players avidly to pore over *Shakmatny Bulletin* for the latest opening theory, perhaps in the hope of catching the opponent out.

How does the analogy between law and chess work out? The answer has two parts, one to do with the algorithm, and one to the dataset. There are doubtless statutes whose interpretation sets up many sets of possible trees. I have always imagined that the tax statute is the paradigm. In that case the analytical tree may be set out and it is perfectly simple to write a little program to "apply" the statute to a given set of facts. Once the algorithm is in place, whether operating electronically (as a program) or graphically (as a flow diagram) it does make use of statutes a good deal easier. There are other purposes to which algorithms can be put in law and legal education. One is simply to show what a mess a particular area of law is. Will algorithms change the way in which we assess the formal results achieved by particular laws, in the way that there has been a reappraisal of queen-and-pawn endings as a result of chess playing algorithms? Will they show us that correct application of the law (in an algorithm with many lines) will generate different results in a given set of facts than we thought? There are actually very few rules of law which are sufficiently complex that we have to think about their application for more than a few seconds. An algorithm with correct input can apply a statute more quickly and accurately than a human, but there are none where the task of application is simply too difficult for a human. Law - in the sense of the series of normative statements that compose it - can be mechanised, but evaluations will not be altered. Law – the application of rules - is not *that* difficult. What make the problems are the indeterminacies and uncertainties and the number of rules, hardly ever the operation *if p then q*. The actual working out in chess, from the rules and the objectives of the game, of what should be done in a given position is significantly more difficult than in given fact-pattern in law. It is identifying the applicable rule which is the important

thing in the doctrinal study of law, and that is a searching function, not a deductive one.

Conclusions

The movement of law into the Universities, both in this country and the U.S. was in part linked to the presentation of the University study of law as being a science many miles removed from the workaday office life from which Langdell thought law needed to be distanced in order to command acceptance. The search for the answers to day-to-day problems remains a long way from the scientific search for doctrine and principle which was the origin of the idea that law was an intellectual endeavour with a separate identity. This is a view which has little favour in contemporary jurisprudence. The conception of law which the neutrality thesis implies searches for "one right answer" on matters of law or fact, and erects a monistic edifice. It is radically different in its epistemology from the kinds of pluralism and non-foundationalism which dominate much contemporary jurisprudence.

Does that mean that the position for which I am arguing is an extra-rational or an irrational position? So far as concerns scientific evidence, I am suggesting that *Daubert* should have limits, and that at least when considering mental states a different approach to science is required. So far as concerns mathematics, I suggest that the law should adopt a preference against, if only because the jury is more important than the sums. The assumption which the neutrality thesis has of the rigid demarcation between the admissible and the non-admissible method should be challenged. So far as concerns computers and law in the academy, I think that we might do well to expect that they will remain a conservative force. It may just be that the ultimate effect of C&IT in law will be to show what some of us have suspected, that law is not a proper academic discipline, and that "doing law" is not very clever.