THERE IS MORE TO LIFE THAN LOGIC

by

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Introduction

We found it very interesting and instructive to read the responses in the last issue of the journal, to the earlier article on logic programming.[3] It was intended to be a constructive contribution to the discussion of an important and developing area of modern technology. The intention was to point to assumptions being made, *about the nature of law*, which were thought to be misguided and to bring about closer co-operation between people engaged in work in this area, to facilitate progress.

However, we have to be very careful to ensure that the language of constructive disagreement does not turn into the language of conflict. A Journal such as this will serve a most useful function, if it enables people working from different intellectual backgrounds to exchange ideas, so that they can narrow down and focus precisely upon points of disagreement. Having done that, they will each be able to work on those problems, and a resolution either way will be of benefit to all. If on the other hand, the people involved become too quickly defensive, then they are more likely to resort to the techniques of confrontational politics. Instead of looking for win-win solutions, we will be locked into a win-lose situation, which will quickly become based upon the techniques of exaggeration and misrepresentation and which will only make confusion worse confounded.

Zeleznikow and Hunter state that Moles "attacked" the Imperial College Team[4] whilst Tyree calls it "Imperial College bashing".[5] In the current climate, these terms have pejorative connotations which are entirely inappropriate in this context, and demonstrate an inadequate understanding of the task in which we are engaged. As academics, it is our *responsibility* to

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3   RN Moles "Logic Programming - An Assessment of its Potential for Artificial Intelligence Applications in Law" (1991) *Journal of Law and Information Science* Vol 2 No 2 pp 137-164.

4   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) Journal of Law and Information Science Vol 3 No 1 pp 94-110 at p 103, at p 105 "Moles then spends considerable time attacking the ICG...", and at p 107 "Moles attacks the ICG's lack of legal knowledge."

5   Alan L. Tyree "The Logic Programming Debate" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 111-115 at p113.

engage in a careful and critical examination of each other's work and to point out where we think there are shortcomings. Such work, when properly executed, is not the manifestation of a *bad attitude* as these authors suggest, but an important obligation arising from our privileged employment.

The reference to Moles's "failure" to discuss other important work "not based upon logic programming" clearly misses the point.[6] Given that one could plainly see from the title that the declared intention was to examine one particular approach, it would have been quite *inappropriate* to engage in some general survey of work based on other approaches. It is to be hoped there is still room in the world for specialist articles as well as for general surveys. One article, or indeed, one book, can only take on a limited number of issues.

If we are going to have any decent exchange of ideas, then we believe that we have to specify precisely *what* was said, *where* it was said and by *whom* it was said - followed by some analysis and evaluation of the assumptions which such views contain. By contrast, Zeleznikow and Hunter make reference in vague and general terms to "a suspicious and ill-informed legal fraternity".[7] They suggest that "most lawyers" are uncomfortable with machines (computers) and fail to understand fundamental concepts. They then go on to point out that the only shortcoming is a possible lack of explanation which they will put right. In the *explanation* which follows, they utilise the terms "artificial intelligence", "expert systems" "human intelligence" and "think" with shifting meanings. AI is referred to in terms which can only be seen to be circular:

> The term "AI" refers to both the field of study and to the systems which the researchers say they will create, the Artificial Intelligences themselves.[8]

Tyree's defensiveness was because he seemed to think that Moles was advocating "a cessation of research into rule-based legal machines"[9] or that:

> The ICG might be forgiven for believing that people with legal training are not going to be too helpful if the only advice is "*give up, the problem is beyond you*".[10]

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6   J Zeleznikow and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 103.

7   J Zeleznikow and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 94.

8   J Zeleznikow and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 95.

9   Alan L. Tyree "The Logic Programming Debate" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 111-115 at p113.

10   Alan L. Tyree "The Logic Programming Debate" (1992) *Journal of Law and Information Science* Vol 3 No 1 p114.

We would not like readers to think that because the italicised words appear within quotation marks in Tyree's article, that they are a direct representation of anything that was said. They are not. Nor would we like the reader to think that they capture the meaning of anything which was said. They do not. Far from saying "give up", the only suggestion was that by working *together*, we can do things rather *better*.

In the first part of this article, we will examine what Zeleznikow, Hunter and Tyree have to say, to find the points of agreement and disagreement between ourselves and them. We hope that this ongoing exchange represents more than a parochial difference of opinion, for the views expressed by these authors are typical of widely held views within the AI and Law community. If we can untangle certain knots in our ways of thinking and communicating we may be able to avoid some unproductive conflicts. It will also prepare the ground for the later discussion of Ronald Stamper's work. Let us see if we can - as with the lawyers' exchange of pleadings - narrow down the *real* issues in dispute:

"Intelligent?", "expert?" or just plain "indexing"?

Zeleznikow and Hunter's discussion of intelligent or expert systems needs to be taken in three stages:

1.   They talk first about the way in which computer systems could "simulate characteristics of human intelligence" - they conclude that no researcher is close to attaining this "ideal."[11] This is one point we would all agree on, even to the extent of perhaps questioning whether it is an *ideal*, which we take them to be doing by placing the word in quotation marks.

2.   They then talk about promising areas of "this incipient research" when they refer to "expert systems" as those which can function at the level of a human expert. The clear implication is that an *expert system* is part of the same research paradigm as the *simulation of human intelligence* (AI) - and by calling it "incipient", they are clearly implying that the current work in expert systems will lead us to *intelligent* systems. We would disagree, and suggest that their discussion does not support this claim. Their linking of "expert" with "intelligent" systems in this way is misleading.

3.   They claim that expert systems exist in geology, medicine and chemistry, and that "a number of ESs exist in the legal domain."[12]

Careful analysis will show us that to categorise *legal expert systems* within *expert systems* which in turn are subsumed within *intelligent systems*

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11   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 95.

12   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 95.

is misleading. The connections are assumed, but not established. If we analyse their discussion of legal expert systems we can see why this is so:

- **the system for lawyers** - they say that it brings the case or statute to the attention of the lawyer, which *"the lawyer is then expected to interpret."* [13] As they say, it is no more than "an interactive legal textbook", "a computer guidebook". This may make it a quick and efficient retrieval or indexing system - but where is the *intelligence* or *expertise?*

- **the system for clerks and paralegals** - they describe this as a computer guidebook to legislation and departmental guidelines. Again, very useful maybe, but is this "performing at the level of a human expert" or the manifestation of intelligence? They add that "the system does not answer complex questions of law". Indeed, we would add, *"the system* does not answer any questions of law", although it may help us to do so. It may be able to call up the answers which others would give in any situation, but this is only indexing materials in a slightly different format - expressed as norms, rather than as descriptions of norms.

- **the system for the general public** - here we are told that there is none. This is because, "the knowledge about the world required to form a legally answerable question is well beyond the limits of existing LESs."[14]

Zeleznikow and Hunter explain that such a system (one for the public) would need to "understand" the expressions being used. To add that "these are extremely difficult problems" which are "virtually intractable", and that these same problems are "concrete and therefore relatively simple", is confusing. They then state that:

> we have not examined any question of abstract thinking, open texture or the philosophical underpinnings of the law.[15]

They may mean that they have not discussed these issues in their article. However, it could also suggest (as Tyree does) that they have not examined these issues at all, as they are not of any great importance. Again, we disagree. These matters are extremely important to the development of both these, and more ambitous systems.

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13   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 96.

14   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at pp 96-97.

15   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 97.

Zeleznikow and Hunter then state that in their view, that the ICG are primarily interested in computer science, not legal research[16] and add, with reference to the previous article that "some legal commentators have ignored this rationale". We can only point out that this is in fact, *precisely* the point which was made in that article:

> there is good evidence to suggest that they [the ICG] do not really have a serious interest in understanding the workings of the law, but that their main focus is to develop computing technology."[17]

We clearly are in agreement on that point.

Law IS rules ("readily understood rules") - or so they SAY

Once we get into the "law is rules" discussion, these authors demonstrate some confusion. On the one hand, they recognise that the matter is of some complexity:

> Some would argue that law is *not* a system of readily understood rules, however this proposition forms the basis for a large and complex jurisprudential debate..[18]

On the other hand, they develop their discussion on the basis of two further unexplained assumptions. Despite what they have just said, they now state that LESs are largely confined to "rule-based" systems - which are "a readily explicable system of rules". They also add something to the discussion which was not included within their previous analysis of LESs. They now claim that such systems can derive answers from rules when faced with given fact situations.[19] We are now told that:

> Law is of particular interest however, since it is a system of readily understood rules (at least to lawyers) with procedures for interpreting these rules.[20]

If this matter really is a complex jurisprudential issue (as it is) these authors seem set to ignore it.

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16   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 98.

17   RN Moles "Logic Programming - An Assessment of its Potential for Artificial Intelligence Applications in Law" (1991) *Journal of Law and Information Science* Vol 2 No 2 pp 137-164 at p 162.

18   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 98.

19   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 100.

20   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 98.

The structure of their discussion has all the appearance of arguing from what computers can do - to what the law must be about. They build up their argument, by claiming that, "*..for the purposes of computer scientists law has more rules and better understood rules than perhaps any other field of human knowledge.* The argumentative technique which they employ here is that which is known as "question-begging". They simply assume, without argument, the correctness of the very view which they purport to be examining and attempt to push the issue through by the use of the worst of all argumentative techniques - bald and unsubstantiated assertion:

> Authors up until this time have written their tomes secure in the knowledge that they are expressing an abstract series of rules, which can be applied to most, if not all, facts situations. If Moles' argument is correct, then their work has all been for nought.[21]

We do not believe for one moment that legal academics do take themselves to be doing as these authors suggest. To explain why this is so, we should have a look at one area of law which is thought of as being as much to do with rules as any other - that of contract law. Anne Gardner selected this area for her work because, perhaps like Zeleznikow and Hunter she thought that "most cases are in fact treated as raising no hard questions of law."[22] Here, we very much disagree. This view is central to the overall view of many people working in this area, and fundamentally influences the nature of their research. This being so, it may be helpful to explore this further. We will look now at some of the basic rules of contract law to see to what extent they are really "readily understood".

A Test Case - Contract - the rules of "offer" and "acceptance"

The "basic rules"of contract law say that an "offer" and an "acceptance" is necessary for the existence of a contract.

In *New Zealand Shipping Co v Satterthwaite*,[23] expensive machinery was to be shipped by sea. The contract between the carrier and the shipper of the goods contained certain exclusion clauses which would protect *a party to the contract* from being liable for damage to the goods. A stevedore is someone taken on by the carrier (on a casual basis) to unload goods at the port of discharge. The machinery was damaged whilst being unloaded by some of these casual stevedores. In the action for damages against them, they claimed the protection of the exclusion clauses. It was argued that when the contract was completed, some months before, the main parties to the contract (the owners and shippers of the goods) did not know what stevedores they would be using. The stevedores clearly could not have been involved in any offering and accepting at the time that the contract was completed, therefore,

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21   J Zeleznikov and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 106.

22   Anne von der Lieth Gardner *An Artificial Intelligence Approach to Legal Reasoning* (1987) The MIT Press, Cambridge, Massachusetts p 3.

23   [1975] AC 154 (Privy Council) UK.

it was argued, they were not a party to the contract. However, the court held that the stevedores *could* be regarded as parties to the contract and thus be protected by the exclusion clauses. Lord Wilberforce, in recognizing that this finding was not really consistent with the "rules" of offer and acceptance said that:

> These are all examples which show that English law, having committed itself to a rather technical and schematic doctrine of contract, in application takes a practical approach, often at the cost of forcing the facts to fit uneasily into the marked slots of offer, acceptance and consideration.[24]

Why would one need to "force the facts" into the categories, if the categories (rules) just determined outcomes in a straighforward manner. This recognises the manipulability of "facts" and that there is another dynamic at work to explain how the categories are to be used. Here, the judge recognised the inconsistency between the rules and the outcome. He pointed out that many modern transactions cannot really be seen in terms of offer and acceptance at all - that their lordships "would not encourage fine distinctions". This was not the only case in which the courts have suggested that even the most basic rules of contract law might be inconvenient for modern day commercial practice.

Gibson v Manchester City Council[25] was perhaps one of the clearest cases in which the whole basis of the doctrine of offer and acceptance was thrown into doubt. Lord Denning said that it is a mistake to think the cases could be analyzed in terms of offer and acceptance at all, and that there was no need even to try to look for those factors. It has to be admitted that the House of Lords did not think much of this statement by Denning, but in the following year, similar views expressed by Denning in *Butler Machine Tools*,[26] met with greater approval. He explained there, that in modern transactions, where a number of forms and documents are exchanged, whilst we could try to utilise traditional categories of offer and acceptance, he thought that it is really very artificial to do so. The better approach, he suggested, was to look at all the forms in a more general way and to glean from them the agreement. This has been referred to by modern writers on contract law as "the global approach". They often fail to emphasize that this approach is not just a *refinement* of the ideas of offer and acceptance, but constitutes a *negation* of them.

The point is well made in the Australian version of *Cheshire and Fifoot*, when the authors say that if the court is sufficiently determined to see relationships in terms of offer and acceptance, it can find them anywhere. Perhaps it would be more appropriate to say that these concepts are part of a framework for interpretation (a perspective) which can be utilised when appropriate. This important difference between *finding* and *using*, is seldom made clear. It indicates the difference between empirical entities (which may be found) and conceptual entities (which may be used). The result, they say,

24   [1975] AC 154 (Privy Council) UK. at 167.

25   [1978] 1 WLR 520 Court of Appeal UK.

26   [1979] 1 WLR 294 Court of Appeal UK.

is that in a number of cases, where the court feels obliged to stick to the traditional analysis, the concepts of offer and acceptance are manipulated to the point of distortion[27] (reflecting the "forcing of facts" referred to by Wilberforce). This is often spoken of in terms of there being a rule which requires "offer and acceptance", and its *exceptions*. To talk of a rule + exceptions in this way gives all the appearance of consistency within a coherent framework. However, we could just as easily talk of "those rules which require offer and acceptance", and "those which do not". In this way, the actual contradictions, or flexibility, within the legal cases becomes more apparent.

Rules as "reasons"

One could say that this only means that the rules will sometimes change. If the people working in this area are not trying to model these *exceptional* cases, then surely they do not have to have regard to them. This is a convenient way in which one can try to maintain the viability of a way of thinking by limiting its range of application. Another way of saying that they are *exceptional* cases, and we are looking at the *standard* case. But this approach quite misses the point. There is always sufficient evidence to support claims for the existence of incompatible and contradictory rules at every level and in every area. In truth, of course, it is the very "rules" which are the object of dispute - which are "up for grabs". It follows then, that disputes about what the rules are, cannot be resolved *by those rules*. Talk of "rules" is like resorting to a form of shorthand.[28] When unsure about what to do we consider many factors - when we have weighed them up, and decided what to do, we attempt to encapsulate the approach in a shortened form which we can remember - and we call that brief account "a rule". If a similar occurrence arises, we can refresh our memory about what to do by looking to "the rule". But if someone else should question the suitability or adequacy of the rule, then we have to put to one side our shorthand form, and reconsider the full range of factors which are pertinent. Paradoxically, the rule only functions so long as it is not brought into question. Once it is, it "disappears" (or we cannot rely upon our shorthand as having any operational force) and we have to consider the matter again. Rules of law, then, are only as good as the reasons which support them. When they are gone, the rule is gone - the rule is only a brief and indirect reference to those reasons. Law is essentially about questioning what those rules are - or should be.

Conflict or consensus?

The suggestion that some, indeed most, researchers in the area are modelling consensus, not conflict has one further dimension to it.[29] What is

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27   N Seddon and MP Ellinghaus *Cheshire and Fifoot* (1992) (5th Australian edition) para 112.

28   See the discussion of this in RN Moles *Definition and Rule in Legal Theory* (1987) Blackwell p 253.

29   This is a central aspect of the work of Richard Susskind *Expert Systems in Law* (1987) Oxford Univeristy Press. The whole of his approach is based on the search for consensus. He points out, for example, that the materials accepted by the experts as formal sources of law, may be accepted by Legal

it that they are modelling? Are they really modelling law, as opposed social practices, or moral or social values? On one view, law only operates where there is conflict. In order to sue someone for the recovery of a debt, I not only have to prove that they do owe the money, and that the repayments are "due and owing", but also that I have asked them for those repayments, and that they have "delayed or unreasonably refused" to make them. I cannot invoke legal process when the other party is ready, willing and able to comply with my wishes. Neither can I invoke it where there is no other party. When people in the U.S. wished to have advance clearance from the court that it was in order to open a fertility clinic, and that legislation which purported to ban such activity was illegal, they were told that there was no justiciable dispute. They had to go off and open the clinic, wait until charged and then argue that the authorities were acting unconstitutionally. So the law, in its dealings, deals with disputes.

But are there not many cases where disputes do not arise because the law is sufficiently clear that you cannot have a good dispute? It is said that people are all the time influenced in their dealings with each other by their knowledge of what the law is. I demand that the shop take back goods which I have purchased - "I know my rights". The shop does take them back. Isn't this a good example of the law in action? There are two aspects to this "modelling of consensus" view which are questionable:

- It would have to show that the people involved in this consensual practice actually knew what the law was.

- Then they would have to show that the consensual practice was based on that knowledge.

The truth is, of course, that people have very little understanding of the law and how it works. We delight in explaining to incredulous students at the beginning of each year that each time they step on a bus, or buy a newpaper they are really completing a contract. It would not be fun at all if they already knew that. And as John Austin said, not one in a thousand people has any real appreciation of the legal implications of buying a piece of property, or completing a valid marriage. Perhaps "the law" does not require the shop to take back the goods unless I can establish that they are defective in some way. But I was very insistent, the shop manager was not sure what to do, and consented to maintain good will and avoid a fuss. If the expert systems people are modelling "consensus" as the basis for their systems, then we would suggest that they should carry out some real investigation of what it is, and what it is based on. The suggestion that they are modelling the consensual knowledge of experts merely shifts the

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Knowledge Engineers without further question. In accordance with the consensus approach, they will be valid in most of the accepted senses. However, where there is expert doubt with regard to any sources, this means that they would not be suitable for representation, within an expert system. If the argument which I put forward here is accepted, then virtually none of the legal materials would meet his criteria for inclusion.

problem, rather than answering it. Which experts? Solicitors in general practice? Specialist solicitors, or barristers?

Also, the causal connection between knowledge and action has not been established, and the people who take this view attribute too great an understanding of the law to people engaged in those consensual social practices. We will show later, that whilst unhelpful in this unspecified sense, if we can determine more precisely the group whose informal knowledge we are concerned with, and make genuine enquiries as to their understanding, then we may be able to model that. Whilst this may not be "law" in the conventional sense, we will argue that it may well be an important component of what we need to do.

Perhaps we can see now that any attempt by us to formulate some shorthand expression as to the rule in any case, will depend on the matter we are trying to deal with - *and* who we are trying to do it for. Obviously, if you are involved in a chat with a friend in a pub you might want to keep it simple. "Murdering people is wrong - the law says so" might do quite nicely. But the point is, of course, that practicing lawyers are never concerned with what the law is in that abstract way (and academic lawyers and students, should not be so either). They will have a client who is not the least bit interested in reading a thesis on "murder" but will be concerned to prosecute or defend an action. In knowing how to advise a client, a knowledge of what has happened in previous cases will of course be relevant, but will never be conclusive. In making a judgement about whether the particular situation we are looking at is similar to some other situation which has occurred previously, we have to engage in a very creative exercise - and one which is unavoidable - it has to be done *in every case*. With regard to "the law" on any matter, we are never faced with just one "shorthand expression" or rule but with a great many - and they will frequently say different things. In evaluating questons as to "similarity", we will inevitably be influenced by our view of its "acceptability". When deciding not to follow a previous decision but to "distinguish" it, the judge only has to find *some* difference between the two cases which the judge regards as being relevant. Let's just say that this is more likely to happen where the judge disapproves of that previous decision. In judging whether any particular formulation is suitable, for the case in hand, we are involved in another complex process of selection and formulation. It is this process which is central to the task of lawyering, and which is so little understood by some of the people involved in this debate.

"Rules", "Categories" and "Consensus" as constructs

What we are, in effect, talking about, are not rules which direct behaviour; rules which will direct us to a single, simple answer in the "clear" cases; rules simply derived from a literary source. Instead, we are looking at discussions of possible frameworks or categories for a satisfactory interpretation of the circumstances with which the judges are faced. It is not as though the "offer and acceptance" approach has been replaced by the

"global approach" - the two co-exist.[30] If formulated into a single rule it would have to read, "offer and acceptance is necessary - except when it isn't". We now need to bear in mind three important points:

* The judges, in referring to the categories which they use, are not able to give an extended discourse concerning them. Their primary obligation is to determine the dispute before them - not to write a thesis. So what we see in the judgments are small glimpses of something which is always more extensive - the tips of icebergs, as it were.

* Judges will have different views as to how that framework of categories should be constructed. The placing of divisions and the level of the analysis will differ from one case to another and from one judge to another in the same area of law. This is where the partnership between judges and legal academics should work more effectively.

* There is always an important relationship between *facts* and *frameworks*. Any assumption that the facts of the case can be found, and then the law applied to them, is incorrect. The finding of facts is, in itself, a reflection of the frameworks which are being employed. Just as the frameworks themselves presuppose some understanding of the facts which they are employed to organise.

This means then, that "the facts" are no more - just there - than "the rules" are. Any assertion with regard to what the facts are, is a creative re-construction, based on available information, social pressures and how that information is regarded by the person making that assertion. The same is true with regard to any assertion as to what the rules (or the frameworks) are. Now, of course, it makes sense in dealing with any problem to have regard to the way in which other people may have dealt with the issue on some previous occasion. Thus it makes sense to keep a written record of decisions, and of the reasons for them. But the suggestion that it is the written record which actually determines the outcome of future cases is contrary to our observations and to sound reason. It elevates the record from its proper status as a factor to be taken into account, to its being the determinative factor - which it clearly is not. It also blinds us to the obvious; that the record is the record of differences of opinion - manifestations of different frameworks - not of a single sweet melodious voice.[31] It is also sufficiently varied so as to be able to support almost any opinion which one could care to mention - pro or con. The record requires some social context to enable it to be "decoded", and it is sometimes the case that some of the most important reasons are not

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30   As KR Popper has pointed out in the field of science - the Newtonian ideas were not displaced by post-Newtonian theories. The latter marks the limits of effectiveness of the former KR Popper *Conjectures and Refutations* (1972) 4th ed Routledge and Kegan Paul.

31   Ronald Dworkin has suggested that we should see the legal record as something which fits together - as if written by a single author or judge (Hercules). But then, he was also the person who approves of "acontextual" meaning see *Law's Empire* (1986) Fontana.

even mentioned in the record - deliberately so.[32] Sometimes "the record" is simply disregarded, or overridden by other factors.[33]

Take, for example, the rule of precedent within the UK jurisdiction. If the Court of Appeal comes across a previous decision of the Court of Appeal of which it approves, then it may say that it is *bound* by the decison in that case. They may give as the reason that such a rule derives from the case of *Young v Bristol Aeroplane Co Ltd*[34] where there was a very clear statement that the Court of Appeal is bound by its own precedents. What happens then when the Court of Appeal is not happy to follow its own precedents? Resort "to the rule?" Not at all. Just go back another hundred years, count up the cases which said that the Court of Appeal is *not* bound by its own precedents, and then claim that *Young's* case is the odd one out, as Denning did in *Gallie v Lee*[35]. Or change the status of the rule by saying that it is a rule of practice, not a rule of law, or say that precedents do not have to be followed if they are wrong (which makes a nonsense of the whole idea of precedent) which Denning and other judges did in *Davis v Johnson.*[36] It is in this sense that the interpretive framework determines what we see.

As a lawyer, one of the most important things you will probably want to know, before you engage in this process, is how much money your potential client has. If none (and legal aid is available) or a great deal, then we may be in business. If on an average salary, and without accumulated wealth, then it would be virtually impossible for them to either pursue or defend an action to any significant extent and they would find it hard to get past the "I'll set my lawyer on you" stage. They would be best advised to negotiate the best settlement they can with the other party - plea bargain in criminal cases, or some form of settlement in civil cases. Either way, abstract questions about "what the law is" are of little importance, although they will be much bandied about, because the party cannot afford to get the matter heard by a judge. However, if one can obtain a legal aid certificate, or can fund the action oneself, then it is a different story. Why is it that this aspect of the informal knowledge system is known by all those who have been involved with the legal process, but is so often ignored by others. Yet it is an

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32   I have discussed a number of these issues in "The Decline and Fall of Dworkin's Empire" in *Reading Dworkin Critically* (ed A Hunt) Berg Publishers (1992).For a case which does not mention the most important factor, see the discussion of *The Norman, op cit.*

33   See RN Moles *Definition and Rule in Legal Theory* (1987) Blackwell and the discussion of *Schorsch Meier GmbH v Hennin* [1975] 1 All E R 152, *Ramsay W T Ltd v Inland Revenue Commissioners* [1981] 1 All E R 865 and *Vestey v Inland Revenue Commissioners (Nos 1 and 2)* [1979] 3 All E R 976, for examples. See also the Australian cases of *Waltons Stores v Maher* (1988) 164 CLR 387; 76 ALR 513; 62 ALJR 110 of which *Cheshire and Fifoot* said, "The seminal case of *Waltons Stores (Interstate) Ltd v Maher* has transformed the law of contract", op cit para 243., and the more recent *Mabo v State of Queensland* (1992) 107 ALR 1, where the doctrine of *terra nullius* was discarded, to allow for the recognition of Aboriginal land rights.

34   [1944] 2 All E R 293.

35   [1967] 1 All E R 1062.

36   [1978] 1 All E R 841.

important factor in the shaping of our legal knowlege base. Large corporations, through the carrot and stick of damages and costs, can buy off unwelcome precedents, and help to stabilise those more to their liking.

Provided my client has money, I cannot think of a circumstance in which a decent argument could not be put forward on that client's behalf. Suppose the other side has two recent judgments in their favour thus constituting powerful precedents - I can still succesfully argue that they are wrong and should be decided differently (*Davis v Johnson*)[37]. Suppose the other side has 100 judgments over a 50 year period, to support their view, many from the highest court in the land - and not one to support my clients view. Well, if they have all the precedents and I have none, then I just have to be that bit smarter. I now argue that the line taken by the court up until now is "arbitrary unjust and fundamentally unconstitutional" and the court approves (*Vestey*)[38] - or I just argue that they are wrong and that the court should take a different tack - (*Ramsey v Inland Revenue Commissoners UK*)[39] (*Mabo* case) or that social conditions have changed:

> ... it has always been accepted that an English Court can only give judgment in sterling. Judges and textwriters have treated it as a self-evident proposition. No advocate has ever submitted the contrary.[40]

That did not prevent the court from doing differently in that case. I could succesfully argue for legal remedies which have never been allowed before - and which offend against most basic liberties (*Anton Piller*[41] - *Mareva*[42]), for civil remedies to be used in criminal cases - which offends against the basic rules of procedure (*B & Q Retail*)[43] or for a defence to be used as a basis for an action, despite every assurance by the courts that this would not be done (*Waltons Stores*).[44]

Even in murder cases, I can succesfully argue for a defence which has previously been consistently refused (*Lynch v DPP for NI*)[45] after which I can succesfully argue that the defence ought not to be allowed any more (*R v Howe*).[46]

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37   [1978] 1 All E R 841

38   [1979] 3 All E R 976

39   [1981] 1 All E R 865.

40   *Schorsch Meier GmbH v Hennin* [1975] 1 All E R 152 at 155.

41   *Anton Piller KG v Manufacturing Processes* [1976] 1 All E R 779. In fact, it was the very barrister who obtained this new remedy, who subsequently led the campaign against it - Mr Laddie.

42   *Mareva Compania Naviera S A v International Bulkcarriers S A* [1980] 1 All E R 213.

43   *Stoke-on-Trent City Council v B & Q (Retail) Ltd* [1984] 2 All E R 332.

44   *Waltons Stores (Interstate) v Maher* (1988) 164 CLR 387; 76 ALR 513; 62 ALJR 110

45   *Lynch v Director of Public Prosecutions for Northern Ireland* [1975] 1 All E R 913.

46   *R v Howe* [1987] 1 All E R 771.

The idea that one can formulate commonsense propositions in the abstract, and then put them into a database ready for use, is really very little different from the idea criticised by Karl Popper.[47] Science is built on observations, he said to his students, so observe, and when I return in a few minutes we will write them all down, and build some knowledge from it. "But what do you want us to observe?" said one concerned student. "Precisely!" said Popper - you don't look unless you are looking *for* something. The question that your looking is in response to, is a reflection of you and your concerns - for it is always the case that part of the knower is unexpressed in knowledge.[48] That big old book is a source of knowledge to one, a doorstop to another, and an inexhaustible supply of food for a silverfish.

> language, which is nothing apart from meaning, is the product of human creativity, and therefore meaning is equally the product of human creativity. Unless someone means and someone else takes the meaning, there is no meaning.[49]

The belief, or the absence of it, in "knowledge in the abstract" appears to be an important distinction between approaches in this area, as we will see shortly.

The only way in which we can talk about "clear rules" (or cases) as some do, of a "core of certainty" as HLA Hart did, or of "consensus" as Richard Susskind did, is by adopting the Nelson touch - turning a blind eye to the obvious. We only have a "clear rule" where we cannot bother to look for arguments or reasons which would support another point of view, or because we can't afford to get the lawyer to do that for us. Where there is the money, and the will to do so, arguments pro and con can *always* be made, and there is nothing "in the texts" which could rule out that possibility. Talk of "clear rules" is merely a rhetorical device which attempts to convince the listener not to go to the trouble of putting forward contrary arguments, or that if they do, they will not be listened to. Just as Richard Susskind said that he "found consensus", the truth is that he did no such thing - he *made* it, by carefully selecting the material which he knew to support one viewpoint, and ignoring the rest. To assert the existence of a consensus can be a powerful rhetorical device, to discourage people from expressing, or paying attention to, "dissenting views" - who wants to be the odd one out? That there is no consensus as to whether law is a system of rules (or as to what those rules are) can be easily proven by reference to a vast literature which expresses those contrary views. The existence of a "clear rule" can always be displaced by an argument against it. If rules are only reasons, then the existence of reasons for doing something else can be a negation of the rule. Nothing can be done to provide us with the core of certainty of which Hart spoke, even in

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47   See for example, K R Popper *Conjectures and Refutations* (4th ed 1972) p 46.

48   See Robert Moles *Definition and Rule in Legal Theory* (1987) Blackwell , chap 6 where it is argued that this is a theme common to many writers from Aquinas to modern theorists of science.

49   F R Leavis - *Valuation in Criticism and Other Essays* (1986) Cambridge University Press p 285.

respect of his most basic "rule of recognition".[50] As Stanley Fish has pointed out:

> The question is not whether there are in fact plain cases - there surely are - but, rather, of what is their plainness a condition and a property? Hart's answer must be that a plain case is inherently plain, plain in and of itself, plain independently of the interpretive activities it can then be said to direct. But it takes only a little reflection to see that the truth is exactly the reverse. A plain case is a case that was once *argued*: that is, its configurations were once in dispute; at a certain point one characterization of its meaning and significance - of its *rule* - was found to be more persuasive than its rivals; and at *that* point the case became settled, became perspicuous, became undoubted, became plain. Plainness, in short, is not a property of the case itself - there is no case itself - but of an interpretive history in the course of which one interpretive agenda.. has subdued another. That history is then closed, *but it can always be reopened.*[51]

In other words, the rule is expressive of the point at which compromise is reached by agreement or by authority. But an agreement which underlies the compromise between those parties does not ensure that other people will see it like that - or even that those parties will continue to see it like that.[52] Frequently, cases do not even have the appearance of settling anything. In many of the reported cases, there will be more than one judgment which will contain interpretive variants to a greater or lesser degree. Even a single judgement will often canvass a number of possibilities, which even the judge may not try to resolve. We often forget that the main task of the judge is to *resolve a dispute*, not to write a thesis on some aspect of law.

The judgment will be as good as you can get in the time available. They may be rambling, or direct - take a clear stand on an issue or prevaricate - be consistent or inconsistent with others. How the lawyer sorts all this out will depend on the task in hand. Any assertion with regard to the "existence of a rule" is a struggle for meaning, and will depend upon the context in which that is being done. Are you for the plaintiff or for the defendant? Is your client (or the other party) solely interested in the outcome of this one case, or do they have an interest in other similar cases - a bank or an insurance company for example? In deciding whether or not to appeal, many clients (individual litigants) are only concerned about whether they might have to pay damages or not, and may well not even read the judgment of the case. Insurance companies, or others with a long term interest in the field, might be much more inclined to appeal if they do not like the tone of the judgment. Whether there is a clear rule or not might also depend on how

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50   Robert Moles *Definition and Rule in Legal Theory* Blackwell (1987) chap 3 and Peter Fitzpatrick *The Mythology of Modern Law* Routledge (1992) Chap 6 appropriately titled "The Law as Myth".

51   Stanley Fish *Doing What Comes Naturally: Change, Rhetoric, and the Practice of Theory in Literary and Legal Studies* (1989) Oxford: Clarendon Press p 523 cited in Fitzpatrick op cit p 208 (emphasis added).

52   Although the principle of *res judicata* may mean that the particular case itself cannot be re-opened.

important the case is to you. After all, people were taxed for over 50 years on the basis of a ruling by the Inland Revenue - presumably they thought there was a clear rule in the Revenue's favour. But the Vestey family, when faced with a tax bill of several million pounds, had a very strong incentive to make the position look less clear. Without any precedents on their side, they nevertheless came up with some very good arguments.

Any proper understanding of the lawyer's job will appreciate that to a large extent it is concerned not to "find rules" but to create arguments. The more the merrier. In *Carlill v Carbolic Smokeball Company*[53] a person had bought and used an influenza remedy which it was claimed had not worked properly. It had been sold through a newspaper advertisement which had said that if anyone used the remedy and then caught influenza, the company would pay them £100-00. The purchaser claimed that sum from them. In demonstrating the versatility of good counsel, the barrister for the company argued that the transaction was:

1.   a bet under the *Gaming Act* and therefore, not enforceable

2.   an illegal policy of insurance

3.   a mere "puff" - and therefore never intended to create legal relations

4.   that there was no consideration

5.   that there was no offer to a particular person - you cannot contract with everyone

6.   that if there was an offer, then the other person failed to notify the acceptance.

This illustrates the fact that people do not walk into the lawyers office and say, "I'm a contract case" - they turn up with a story to tell - the lawyer decides how best to categorise the case, and if astute enough, can come up with a number of different possibilities. It's not just that we are unclear about what the basic rules are, we are even unclear about the basic categories of the law itself.

> In fact, as already argued the law of contract may now embrace a
> more general law of obligations so that it is no longer realistic to talk
> of "contract" cases as distinct from non-contract cases.[54]

In many recent cases, the view has been taken that we do not really know whether the facts would better be seen as a matter of contract, or of tort. In such cases, the lawyer argues *in the alternative* - that most enjoyable of legal pastimes which appears perfectly sensible to a lawyer, but which makes no sense to anyone else. Suppose that Mr Zeleznikow arrives at his computer laboratory to find his "expert system" on fire. He asks Mr Hunter

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53   (1893) 1 QB 256 Court of Appeal.

54   Seddon and Ellinghaus op cit para 243. See also Grant Gilmore *The Death of Contract* (1974) Ohio State University Press.

(who happened to be in the room) if he had anything to do with it - Mr Hunter explains (arguing like a lawyer) that:

1.   he wasn't even there at the time, but

2.   if he was there, then he didn't even touch it, but

3.   if he did touch it, his touching it didn't cause the fire, but

4.   if his touching the machine did cause the fire then Zeleznikow should be held partly responsible for programming the machine to look for "rules", or that

5.   Hunter should not be found responsible because of some defect of reason, but

6.   if that was not accepted, then he would throw himself upon the mercy of the court.

It can be seen that an argument such as this can move through the stages of denial of liability, based on arguments about the evidence or the law, to claims that the liability is joint, to admissions of liability and pleas concerning appropriate outcomes.

The unfortunate thing is that the technical view, apart from being myth-guided, is often thought to support the prestige and status of the legal profession, and is based on a view of the desirability of the objectivity of knowledge which has long since been abandoned in other areas.[55] It supports the view of experts (and their expertise) as being rational detached and uninvolved. Surprisingly, although they call the officials "judges", and what they produce "judgments", they still claim that their task does not involve the making of judgements, and that advocates (as they are still called in Scotland) are mere presenters of facts, not people engaged professionally to persuade. Of course, things were not always like this. At other times there has been more open acknowlegement, and greater appreciation of the skill of rhetoric and persuasion. But just like the confidence trickster, a sign of good persuasion might be that we do not know that we are being subjected to it. To dress it all up as science might simply be part of the rhetorical tool kit. Our only defence against it might be that very philosophy or jurisprudence which Zeleznikow, Hunter and Tyree say that they have no need for.

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55   L Fleck *Genesis and Development of a Scientific Fact* (1979) University of Chicago Press (see Philip Leith for more on this in *Formalism in AI and Computer Science* Ellis Horwood (1990)) EH Carr *What is History* (1964) Penguin, KR Popper *Conjectures and Refutations* (1972) 4th ed Routledge and Kegan Paul, Michael Polanyi *Personal Knowledge* (1962) Routledge & Kegan Paul, Peter Berger and Thomas Luckman *The Social Construction of Reality* (1979) Penguin.

SEMIOTICS - INFORMATION SYSTEMS METHODOLOGY

The major factor which distinguishes the researchers which I will deal with in this section, and those of the previous section, is not so much the computational aspects of their system, but their overall relationship to, and understanding of, the application domain. The researchers in the previous section clearly have a certain mind-set or paradigm within which they work, and are looking for an information system to fit it. The researchers in this section are much more aware of the environment within which their computers have to operate. Even in their earlier work they pointed out, for example, that whilst classical logic serves the mathematicians pretty well, it does so by simplifying problems - by putting the observer out of the picture.[56] They also indicated early in their work, their awareness of the complementary relationship between statute law and case law in the sense that each provides a commentary on the other.[57] They point to the creative aspects of categorisation - something which we see as an essential aspect of rule creation and application. They also acknowledged the fact that deductive reasoning is entirely peripheral to the work of the judges - all of which is in stark contrast to the claims of the previous theorists we have looked at.

The most significant challenge provided from this perspective is upon the idea that words themselves can have meaning without reference to the social framework within which that meaning is developed. This is referred to as a naive assumption which begs all the important questions:

> The semantic theories that rely upon the unwarranted metaphysical assumptions of mathematics can be superseded by a new approach better suited to the domain of information systems.[58]

The main deficiencies with the classical (symbolic) logics used to represent law stem from the fact that they do not have the richness of natural language:

> One deficiency of these classical logics is that they are still capable of giving only a crude approximation to the syntactic richness of natural language. A more serious criticism... is that they do not handle satisfactorily the problems of semantics.[59]

Most logical formalisms do not afford the developer of the system any way of determining the meaning of the concepts which the formalism is attempting to capture. The prime example is Prolog and its representation of

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56   We should bear in mind that both Tyree and Zeleznikow's earlier work was in mathematics.

57   Jacob, J and R Stamper (1985) *"Lawyers: The Meaning of Logic and the Logic of Meaning"* London School of Economics.

58   Stamper, R (1987) "Semantics" Chapter 2 of *Critical Issues in Information Systems Research* (1987) ed Boland and Hirscheim.

59   R Stamper "The Logic of Meaning and the Meaning of Logic in the Context of a Lawyer's Work" (1987) Proceedings of the Council of Europe Conference on Computers in Legal Education, Rome 1985 pp 1-19 at p4.

law in terms of horn clause predicates (discussed in the earlier article). As Stamper has pointed out, "the Achilles heel of [the Prolog] language [is] its lack of support in the area of semantics."[60]

With the standard approach to representing law (and other forms of social knowledge) the semantic link from the computer code representing the law to the law being modelled may be seen as follows:

Object language	-	A	-	Logical Formalism
Logical Formalism	-	B	-	Set-theoretic model
Set-theoretic model	-	C	-	Reality

* The analyst has to capture essential features of a complex reality in the form of a conceptual model which is then transformed into a logical formalism. These steps are the instantiation of some theory (step C)

* Once the structures from the real world have been represented in the formalism, it can be entered into a computer as object code. The computer can then operate on those structures to determine logical inferences based upon them.

The semantic link from the object language to the logical formalism (A) determines what the actual formalism means to the computer. In a representation like Prolog, the step from the object language to the logical formalism is very small. This is because expressions in Prolog are exactly the same as expressions of first order logic. This is a purely syntactic link and establishes an equivalence of meaning between the logical formalism and the object code. Similarly, when using predicate logic to represent legal rules, the link from the formalism to the set-theoretic model (B) is very small. This is because the formalism used (that of predicate logic) is consistent with traditional mathematical views of sets.[61]

Some feel that rules of inference and axiom should suffice. Kowalski, for example, takes the view that "It is unnecessary to talk about meaning at all. All talk about meaning can be re-expressed in terms of logical implication."[62] But series of logical relationships will not enable us to appreciate the links which give the system meaning to the developer - the links which take us from the formalism and set-theoretic model to reality. This is, of course, the most difficult stage and will depend, in some respects on an informal and intuitive process - any formalism is necessarily selective and can only deal with significant features of the complex reality with which

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60   R Stamper "The Processing of Business Semantics: Necessity and Tools" in Meersman and Sernadas (eds) *Data and knowledge* (1988) North Holland Proceedings IFIP TC2 WG2.6 Working Conference "Knowledge and Data" pp 1-20 at p 4.

61   Even though this entails assuming many things about the nature of sets. See Stamper, "The Logic of Meaning and the Meaning of Logic in the Context of a Lawyer's Work" (1987) Proceedings of the Council of Europe Conference on Computers in Legal Education, Rome 1985 pp 1-19 at pp 4-5.

62   R Kowalski *Logic for Problem Solving* (1979) North Holland p 30.

it engages. The reader of the computer code has to look at the predicates and work out their meaning.

> This simple change emphasises that we should not forget the fact that the analyst invents a new, artificial language when he creates an expert system using language such as Prolog.[63]

The only place where the real meaning of the predicates is captured is in the mind of the analyst. The difficulty arises from two fundamental problems with the symbolic logic approach to knowledge representation, neither of which have been adequately dealt with by the proponents of predicate logic:

1. The ontological assumptions entailed by the prolog set-theoretic model. This is much more a problem of methodology than the actual language ultimately used to represent knowledge. Stamper has considered these issues carefully, and his contribution to the literature is the focus of the rest of this paper.

2. The practical difficulties which will inevitably arise when any symbolic form of knowledge representation is used. These practical difficulties stem from an inadequate link from the model created by the analyst to reality. We will look at this aspect further in a forthcoming paper in which we will show how some of these problems have been dealt with in the development of applications.[64]

Stamper rightly emphasises that legal disputation is not a case of applying settled meanings, but of disputation and negotiation as to what those meanings should be. This is in accordance with what we have called the "rules as shorthand" view. Rules may represent the point at which we end up, but cannot represent the means by which we get there or the point at which we start. Wherever there is a dispute, we have by definition alternative formulations of a rule - and the same applies for any other rule which we put forward in an attempt to resolve that dispute. Rules must always look beyond themselves for further and better particulars. This might appear to suggest that there is no room for the machines which are essentially rule-guided. Neither ourselves, nor Stamper, would wish to embrace such a view. We would claim simply that a naive rule-functionalism conceals more than it reveals - that a more informed view would allow for bureaucratic functioning, but that this depends on correctly locating such a system within its appropriate social context.

Rules as symbols

Rules may be the manifestation of a consensus, but even then they are only an abstract and symbolic shorthand for more complex reasoning - in that event they cannot be the *explanation* for that consensus. All of this accords with the view taken by Leith and with the very constructive use he makes of

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63   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 227.

64   This will appear in the next issue of this Journal, Vol 4, No 1.

the views of Ludwig Fleck.[65] It also helps us to appreciate a neglected aspect of Austin's work - unlike the legal theorist HLA Hart who explained rules in terms of prior rules, Austin explained the stability of rules in terms of social attitudes and pressures.[66] Some of the logic programmers have been misled by the Hartian, oversimplified legal philosophy. Whilst Leith is clearly correct in his view that the logic programmers he looked at were engaged in a more simplified project than that of Stamper's, he did not really spell out in what way Stamper was trying to adapt to complexity.

It follows from what we have just said, that the recognition of the abstract and symbolic nature of language and of the need for a theory of signs (semiotics) is important, in that it has correspondence with sociological insights, whilst at the same time having theoretical depth which can serve to link jurisprudence with the theoretical contributions of other disciplines. For some years now, Stamper has been critical of the theorists represented in the previous section. He argued then, as we have done now, that they assume too much and work within a formalism as if nothing existed beyond it, and that they take as primitive concepts, those which need to be explained:

> For the analysis of business information, a semantic theory should explain such notions as truth, individuation, identity, time, space and so on, instead of adopting them as primitive concepts.[67]

Stamper suggests that the problem can, of course, be avoided by:

1.   pretending that knowledge can be detached from its social context,

2.   assuming that signs (or "rules") carry this expert substance,

3.   and that the human process of interpreting signs is not essential to the knowledge represented.

The price to be paid is in the avoidance of responsibility, and hiding behind a false and misleading technicalism. If the role of the law is to establish boundaries and maintain them, even to allow them to move gradually in a controlled manner, then to assume that all kinds of boundaries are fixed, and fixed in an objective way, independently of any human agency, is to evade the central issues with which the law is concerned. Stamper uses the metaphors of bottling and transmitting knowledge as compared to the social construction of reality[68] to which I have already referred and in support of which I have argued in detail elsewhere.[69]

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65   Leith, P (1990) *Formalism in AI and Computer Science* Ellis Horwood.

66   RN Moles *Definition and Rule in Legal Theory* (1987) Blackwell pp 228-234.

67   Stamper, R (1985) "A Logic of Social Norms and Individual Affordances" Norwegian Centre for Computers and Law, Oslo University, Complex Series No 8/85 1985.

68   Stamper, R (1991) "Expert Systems Lawyers Beware" in *Law, Decision-Making and Microcomputers*, S Nagel (ed). Quorum Books, New York, 1991.

69   RN Moles *Definition and Rule in Legal Theory* (1987) Blackwell.

The ontological assumptions involved in that mistaken view can be seen as follows:

> Sibling(X,Y) :- Father (Z,X), Father(Z,Y) is the actual code form of a Prolog predicate. It also represents a statement in the logical formalism which the code represents - predicate logic. There is also an almost direct link (a syntactic equivalence) between this and the set-theoretic model:

X and Y are in the set sibling if

> Z and X are in the set Father, and

> Z and Y are in the set Father.

Equally, the segment of Prolog code which provided

british_citizen(X,Y) :- Acquires_citizenship_by_section 1(1)(X,Y), could easily be seen to represent the concept:

X and Y are members of the set british_citizen

> if

> X and Y are members of the set Acquires_citizenship_by_section1 (1)

As Stamper points out,[70] the basic structure of the logic is a predicate which relates a number of subjects. Thus we *could* say "X and Y are siblings", or "X acquires citizenship by section 1(1) on date Y". However, in order to make this link to the real world (the link C from above), some semantics must be provided. This depends on the developer (the person who wrote the code) assuming the semantics of the predicates. The developer, and any who follow them to maintain the code, must make some assumptions about what the predicates are supposed to mean in the real world. One possible semantic model could result in the following interpretation:

- if Z is a father of X and Z is a father of Y, then it follows that X is a sibling of Y, and

- if X acquires citizenship by section 1(1) as of date Y, then it follows that X is a british citizen as of date Y.

However, this mapping to the world of practical affairs is not a *necessary* link. Just because we have written the predicates in Prolog as shown above, does not provide an automatic meaning for them. Information cannot be bottled as a commodity. As Stamper has said, "we should not forget the fact that the analyst invents a new, artificial language when he

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70   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 223.

creates an expert system using a language such as Prolog."[71] Just because the person who wrote the predicates knows what they mean to him/herself, does not mean someone else who comes along and looks at them will derive the same meaning.

In the relationship of symbolic logic to the world of practical affairs, two basic assumptions need to be made:

* The world is composed of individuals each of which can be identified

* We can know to which individual each name applies.[72]

Stamper's primary thesis is that the concept of an individual is quite complex.[73] In order to escape from limiting the meaning of any predicate to very closed situations, we must conceive the set as being independent of the membership. The only other "escape" is to ignore semantics as not a real problem, in the way of the ICG and the others who follow the logic programming approach. This would require us to place our trust in a purely syntactic approach and to say:

> The logic contains rules of inference. These enable us, given that we accept as true a set of propositions (premises) to deduce, by mechanical operations on those premises, any number of conclusions (theorems) that are also true. To bother with what lies outside the system is simply regarded as irelevant.[74]

The only way then to apply rules of inference to an unequivocal set of facts, is to assume either an objective view of reality, or dismiss alternative interpretations as irrelevant (either by assuming "consensus" or trying to establish it with questionnaires). The key is that all of these interpretive processes must be performed outside the rules of inference. If logic has a role to play, it is only after a great many other important decisions have been taken. Although we will expand on this in the forthcoming article on natural language, we should point out here, an important distinction between a bureaucratic system and one which contains true legal intelligence. Deductive reasoning is the characteristic of the ideal Weberian bureaucracy, in which:

> A bureaucrat administering some set of complex rules will ascertain the facts and apply the rules to them in order to discover their consequences for the case in hand.[75]

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71   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 227.

72   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 223.

73   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 224.

74   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 224-5.

75   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 219.

Bureaucrats work within a limited decision-making environment and depend upon someone else to make high level policy decisions for the organisational framework within which they work. Decisions on interpretive strategy are provided to them, usually with the ability to closely monitor outcomes. By working within what we might call a "single client environment" in this way, one can see the possibility for narrowing down the range of interpretive strategies and maximising the possibility of using the "expert system". In this situation, one is not just modelling knowledge from the source documents, but using the interpretive strategy of the client organisation as the key to de-coding their meaning. One can see that this is not going to give a necessarily "right" answer, but it may well give "their" answer.

Signs and Interpretive Communities

Stamper clearly acknowledges the consequences of this line of thought. If we adopt it, he suggests, then certain implications would seem to follow. First, we regard reality as subjective and constructed by users within their informal, culture-based information systems, knowledge of which is transmitted through abstract signs whose *meaning* can only be recognised by appreciating the purpose and context within which those abstractions are formulated. To speak of "meaning", he says, raises the issue of semantics which many writers prefer to reduce to a problem within the technical platform. This may not be unreasonable, where boundaries reflect a well established consensus - but it fails when that consensus breaks down and negotiations are needed to re-draw or re-establish the boundaries. This is why we have to see the resolution of legal disputes as being in the nature of performative utterances - as creating the rule (the boundary). For use, a sign (or rule) must always have an intention imputed to it by its creator and interpreter and this can only be understood in its context -

> signs used for action often have little syntax when taken out of context...without the token fitting into a resonant social context, it could not function fully as a sign.[76]

This emphasises the view that "context" means not just the relationship to other texts, but an understanding of the social framework within which those texts have meaning. It is this frame of reference, by its very nature, which is unexpressed or incompletely articulated within the texts themselves, yet which gives shape and meaning to them. "The frame of reference determines what you see and what remains invisible", says Stamper.

The analogy which is most appropriate to law is Stamper's use of the idea of information as "giving form" to something, as a potter *informs* the clay. The common view, especially prevalent in the discussions we have looked at, is that "the system" takes raw data and converts it into information. The information plumbing metaphor has no room for the people who give meaning and intention to the signs nor about the relationships

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76   Stamper, R (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992.

between people which are created, sustained and exploited through signs. Technical questions, he claims, are secondary to the organisational needs and dynamics. The new power which our computers give us, to create and handle different kinds of signs, may be as important as the development of writing itself, but of itself, it does no more to create intelligence that did the creation of writing. The formal system must be correctly located within the necessarily more complex social system if it is to be of use.

The legal system may well present particular obstacles in the way of obtaining the knowledge required. Judges, and particularly British judges, have been notoriously reticent to give access to the informal knowledge which structures their performance in court. Although the Kilmuir Rules, which forbade judges to speak publicly about their judicial role without the permission of the Lord Chancellor, have now been done away with, we still have to live with unwarranted aspects of this secrecy. Alan Paterson's thesis, being the research for his book *The Law Lords*, is not available for consultation until after the year 2000.[77]

We now have to allow for, rather than ignore, those matters which Leith takes up in his discussion of Fleck - the importance of informal tacit knowledge. Indeed, says Stamper, this informal system is not something to be minimised or dismissed - *it matters most*. It is the concept of the norm which, he suggests, can be the link between the formal and informal systems. This requires us to map communication of the organisation in terms of its norms and responsible agents. The rules, or norms, being social constructs, must always be constructed by someone *for some purpose*. It follows then that there is no knowledge without a knower. If this is so, then the knowledge, to be meaningful, has to be linked to those whose knowledge it is. This requires us to tie every item of knowledge to the agent responsible for it. Truth, then, is something which agents have to decide upon and the consequences for which they have to accept responsibility. *Responsibility*, here, plays the same role as truth in classical logic. Truth is not a primitive concept but a derived one, which is explained in terms of agreement among agents.[78]

We can now see the distinctiveness of this approach. Instead of trying to model meanings in the abstract, we can, in utilising the bureaucratic method, model the meanings of different thought communities, as Fleck would put it. This is why the earlier implemented systems are for "single client communities". I can avoid asking what is "the" meaning of the *Social Security Act*, by asking how the Social Security Department interprets it. By linking notions of bureaucracy and responsibility, Stamper gives us an insight into the way in which we can utilise rule-driven computers in a context which is not itself rule-driven. He appreciates that:

77   A Paterson *The Law Lords* (1982) MacMillan p 216. For difficulties which other researchers have faced, see further p 215 note 26 and RN Moles *Definition and Rule in Legal Theory* (1987) Blackwell p 239.

78   Stamper, R (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992.

bureaucratic regulation and law are interdependent - meanings are established by use in and out of the courts and the courts are concerned with regulatory systems.[79]

He also appreciates that:

> The lawyer is not concerned with well understood regulations but with the processes of resolving disputes (that is, the judicial process)... The lawyer's problem is not concerned with the preoccupation of classical logic which is that of inferring the validity of some formula or sentence from the validity of others, rather his problem is with the form of the underlying universe of discourse so that the outcome of the whole decision-making process accords with notions of legal validity.[80]

The resolution of the tension between these factors is in the acknowledgement that we can develop systems to support the lawyer in that:

> ..we can support the person engaged in reasoning about meaning or responsibility if we use a logic that deals with the semantic elements of natural language and which does so by clarifying who has the authority to convert words into actions either directly (the hangman) or at several removes (the clerk of the court).[81]

Underlying this approach is a theory which may allow us to develop appropriate decisions support tools. However, he always limits the role of the computer to a subservient one, driven by the analysis of the users.[82]

Ontological dependencies

It is through the use of "norms" that Stamper hopes to capture enough of the informal business knowledge (inherent in any large system) to allow a meaning and context to be provided for the formal system. Stamper's hope is that by specifying the organisational norms, we should be able to provide a speficication of exactly what information systems the organisation needs.This context-sensitive approach, which involves the adaptation of the tools to fit the domain, may be contrasted with the previous approach where the domain is either manipulated or ignored to fit the perceived functionality of the tools. The difference is apparent from the way Stamper goes about the modelling of knowledge:

> A rule-base is a kind of knowledge-base and highly relevant to the study of norms. Norms are the implicit, sometimes explicit rules that

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79   Stamper, "The Logic of Meaning and the Meaning of Logic in the Context of a Lawyer's Work" (1987) Proceedings of the Council of Europe Conference on Computers in Legal Education, Rome 1985 pp 1-19 at p8.

80   Stamper, "The Logic of Meaning and the Meaning of Logic in the Context of a Lawyer's Work" (1987) Proceedings of the Council of Europe Conference on Computers in Legal Education, Rome 1985 pp 1-19 at p9.

81   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 237.

82   R Stamper (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992 p 14.

govern the behaviour of groups of people. The methods of logic have speeded up our progress in the development of rule-base systems. Unfortunately, our logics have several defects from the point of view of anyone trying to account for social behaviour, rather than machine behaviour, and, of course, a normbase is pre-eminently an account of social behaviour.[83]

Every norm has the structure:

if <condition> then <some agent> is permitted / forbidden/ obliged to do <action>

To appreciate the lower level details of NORMA, we must then factor in the theory upon which all of Stamper's work is based. The only way to cope with differences of opinion and meaning inherent in any situation where there are competing points of view (which will be true whenever social knowledge is being modelled) is by accounting for them. He puts the agent at the centre of the picture, and bases the system on much firmer theoretical foundations. It accepts that:

• all knowledge entails a knowing agent

• the agent only gains knowledge through action.[84]

For practical purposes this can be reformulated as:

• there is no reality without an agent

• the agent constructs reality through action.[85]

Given these two premises on which to build a language, Stamper proposes a syntax for a language in which to express "knowledge about the business world and other social systems."[86]

<agent term> <action term>

From this basis, he can construct the norms outlined above, which he feels will bridge the gap from informal knowledge to formal knowledge. From this basis, a language can be constructed which enables us to map the relationships involved in this understanding. To do so we need to appreciate the ontological dependencies (the way in which one type of behaviour depends upon another), and the ontological antecedents (the way in which an invariant cannot be realised without its antecedent). If we can bring into the

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83   Stamper, Liu, Kolkman, Llarenberg, F van Slooten, Ades and C van Slooten, "From Database to Normbase" (1991) 11 *International Journal of Information Management*, pp 67-84, at p 70.

84   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at p 232.

85   R Stamper (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992 p 17.

86   R Stamper (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992 p 17.

picture the issue of time constraints (when each of these operative factors begins and ends) and complications such as group agents and an agent with many parts or roles to play, then we are approaching a degree of complexity which may best be mapped by what Stamper calls an ontology chart. To do so we need to take it in three stages:

1.   A methodolgy which allows user requirements t be elicited, analysed and specified. The methodology is based partially on traditional concepts of computer systems specification, and partially on the theory outlined above, which Stamper states "enables us to express the norms of any team or community, each of which is an information field.[87] The methodolgy he calls MEASUR

2.   A formalism for representing knowledge about social behaviour. This formalism attempts to allow for allocations of responsibility, norms and meanings to be specified in a consistent manner. This is NORMA.

3.   LEGOL, a formalism for manipulating a knowledge base specificid in NORMA. Because the specification is in NORMA, any "hidden" (in the sense of unarticulated) meaning in the knowledge base will always be directed to the responsible agent.

The key to the whole approach is the middle step of specification. In NORMA, Stamper is hoping to capture the codified rules, as well as the often unarticulated norms and knowledge which really drive the organisation. He is hoping to represent this knowledge in a way which is meaningful, both to the client organisation and the developer of the system. Finally he is hoping to capture this knowledge in a way in which it can easily be coverted into actual code on a machine:

> We can forget the technology, we can even forget the messages, the dataflows and all the usual ways of focussing on the information. Instead we deal with the business problem and the policy we need to solve it. [88]

In a sense, the two phases of specification and design of a system move towards becoming the same thing. This has never really been possible in the past, since the gap between the representation of the knowledge which is going into the system, has been too large to bridge. The three main techniques which make the leap possible (and which will have supporting tools) are:

1.   Problem articulation. This phase is designed to reach enough agreement on the problem domain to allow "problem statements" to be formed concerning the desired system.

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87   R Stamper (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992 p 26.

88   R Stamper (1992) "Signs Organisations and Norms" Keynote Address: Australian National Information Systems Conference October 1992 p 26. See also Stamper, Liu, Kolkman, Llarenberg, F van Slooten, Ades and C van Slooten, "From Database to Normbase" (1991) 11 *International Journal of Information Management*, pp 67-84, at p 76.

2.   Semantic Analysis. The end product of this process is a "semantic schema" for the normbase. In other words, some data schema for the normbase which captures not only the required data items, but the meanings behind them. The process of deriving this schema involves clarifying the problem statements to the point where the operations based on those problems could be performed.[89]

3.   Norm analysis. The end product of the norma analysis is actually a prototype information system, based on the business analysis which has gone before. In order to arrive at this stage, the "social norms" of the organisation must be specified and built into the system.[90]

Even though it is unarticulated, underlying all of the tools provided is a much more datacentric view of the world. While predicate logicians concentrate on the logic linking *statements* together, Stamper concentrates on the logic linking *elements* together. Into this logic he tries to incorporate all of the complex notions of truth, individuation, identity, space and time.

The goal it seems is to provide meaningful databases which have a real place in the organisation, rather than increasing the complexity which is already there. Through modelling relationships in NORMA, Stamper's goal is to provide for Normbases which provide another layer of meaning over and above the meaning contained in the average relational database. This is an admirable goal as many of the confusions and problems surrounding the use of information technology stem from the ambiguity inherent in any relational database.

THE ROLE OF THEORY

If this represents an accurate portrayal of this approach, then it presents us with much greater potential for a way forward. In essence, it appears that this perspective requires us to model the social understanding of a group, rather than to think that we can crank anything of significance out of a text - without this. Bringing this dimension - the aspects of conceptual modelling - into the picture, is in our view essential from a theoretical perspective. We would want to argue that we should strive to ensure that theory and practice are not in tension or conflict - merely two different ways of looking at the same thing. Better theories will give us fresh insights and maybe raise issues which have to be seriously tackled if progress is to be made. Tyree, in suggesting that theoretical objections are *a priori* and irrelevant, is missing out on a rich source of possible insights for

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89   For a detailed description of the process, see R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at pp 240-242. Also, Stamper, Liu, Kolkman, Llarenberg, F van Slooten, Ades and C van Slooten, "From Database to Normbase" (1991) 11 *International Journal of Information Management*, pp 67-84, at pp 77-81.

90   R Stamper "The Role of Semantics in Legal Expert Systems and Legal Expert Reasoning" (1991) 115 *Ratio Juris* Vol 4 No 2 pp 219-244 at pp 242-243 and Stamper, Liu, Kolkman, Llarenberg, F van Slooten, Ades and C van Slooten, "From Database to Normbase" (1991) 11 *International Journal of Information Management*, pp 67-84, at pp 80-81.

development.[91] His only concern is whether or not the system works. The evidence so far, from those pursuing the logic programming paradigm, is that their approach does *not* work within the legal domain - and they are no closer now to understanding why that is so than they were several years ago. From the perspective of legal theory, and epistemology in a wider sense, we would offer the opinion that this latter approach has real potential which is lacking in the former.

Zeleznikow and Hunter were happy to accept that whilst recognising that there are other schools of thought which challenge the views which they accept, "it is irrelevant for the purpose of this article whether or not they are correct," adding,

> It seems to the authors to be somewhat disingenuous to argue the correctness or otherwise of one particular jurisprudential model... it would in the author's opinion, be foolish to claim that there is one correct answer. Many answers may exist depending on one's world view. Many of these may conflict but it is possible that they can co-exist.[92]

Unfortunately, the principle of non-contradiction no longer has the appeal that it used to. Although they say that they want to avoid making choices, it is clear from what we have seen that they do not do this. Their position, the technical (or "law is rules") view of law, involves important theoretical assumptions. They cannot be criticised for adopting theoretical assumptions - they can be criticised for adopting the wrong ones.

Tyree says that the objections previously raised are based on "theory" which amounts to "*a priori* arguments" which are irrelevant.[93] The only significant question is whether or not the system "works" and "the performance or non-performance of a legal expert system is an empirical fact." It takes a bold person these days to assert that observations and empirical facts are not themselves the products of theoretical frameworks. Much work has been done in science, history, sociology, philosophy, linguistics, psychology, politics and women's studies to demonstrate that point. The suggestion that theory and practice are separate and that theory is *a priori* and therefore irrelevant makes no sense at all. Irrelevant to what? Presumably to the evaluation of the practical claims which have to be evaluated. What is it for a system "to work"? Many systems have lights that flash and obviously "do" many things, but whether or not they "work" depends on the evaluation of the observations one makes about the machine in the light of certain standards or goals which it is claimed that the machine is designed to achieve. One has to relate what is essentially the symbolic output of computers to the world in which we live. Those transformations

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91   Tyree, Alan L (1992) "The Logic Programming Debate" *Journal of Law and Information Science* Vol 3 No 1.

92   J Zeleznikow and D Hunter "Rationales For the Continued Development of Legal Expert Systems" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 94-110 at p 99.

93   Alan L. Tyree "The Logic Programming Debate" (1992) *Journal of Law and Information Science* Vol 3 No 1 pp 111-115 p111.

involve many theoretical assumptions. At both the levels of observation and evaluation, theoretical factors are both necessary and unavoidable.

> 'Tis true in *theory*; but then 'tis false in *practice*.' Such is a common talk. This says Noodle; propounding it with a look of the most ludicrous profundity.

> But with due and discreet deference to this worshipful and weighty personage, *that* which is true in theory is *also* true in *practice*.[94]

So before we can get to Tyree's problem of "does it work?" we must answer the logically prior question of what we mean by that. We need a *specification* of a working system. It seems to us that this could either be based on guesswork, or on a sound theoretical understanding. To try to demonstrate the significance of theory, to practically minded people, we hope to have shown how one's practice may be altered by a well-informed theory. We will develop the discussion further in the forthcoming article on problems of implementation.[95]

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94   John Austin *Lectures on Jurisprudence or the Philosophy of Positive Law* 5th ed (1885) Vol II p 115.

95   In the next issue of this Journal, Vol 4 No 1.