ISSA Proceedings 1998 – Abductive Limits To Artificial Intelligence In Adjudication Pervasive Problems Of Analogy, E Contrario And Circumstantial Evidence

1. Introduction

Not that long ago the following thesis was defended (as a more or less funny supplement to a doctoral dissertation, as is usual in The Netherlands): *The best circumstantial evidence for the existence of non-human intelligence is the fact that such intelligence made no attempt to contact us* (Kwint, 1997). It may be left to the reader to decide to what extent this argument is analogous, and/or e contrario, whether it relies on circumstantial evidence and whether it may be salvaged from the pitfalls of such arguments. Anyway, it will be argued here that there are limits to artificial intelligence in adjudication, based on problems pertaining to abductive argument in analogy, e contrario and circumstantial evidence. Such arguments seem to be based upon "original data", like analogata, denial of legal conditions and circumstantial evidence.

But analogy and e contrario cannot be but based upon underlying general rules and principles and the law as some or other kind of coherent whole. In their turn, such general rules, principles and coherent wholes cannot be exclusively based upon any original data. At best, such data play a subordinate role in validation or justification of general rules and coherent wholes. Analogously, the value of circumstantial evidence depends upon wholes of facts possibly related to such evidence. Such wholes may contain factors explaining circumstantial evidence more adequately than the facts for which proof is wanted may do.

If this holds good, no artificial intelligence may be expected to generate the implicit premisses of abductive argumentation in adjudication. Artificial intelligence is expected to proceed from an input consisting of data derived from the law and from facts, ranging from statute law to specific adjudication and

factual evidence, circumstantial or otherwise. Such input appears to be inadequate in principle.

There are quite a few general and abstract arguments against artificial intelligence in the law or at least purporting to show clear-cut limitations to such artificial intelligence. Counter-arguments stressing that the proof of the pudding is in the eating (analogy here too) may not be implausible against such abstractions. However, arguments presented here are to be quite specific, pointing to forms of argument in adjudication which cannot be thought away without completely curbing such adjudication. Analogy, e contrario and circumstantial evidence may seem rather special forms of argumentation, but in fact they are implicitly pervasive in adjudication. Similarity and difference are the life of the law, just as is circumstantial evidence for facts, rarely supported as such facts are by direct and indubitable evidence.
To clarify this particular argument against artificial intelligence in adjudication, the concept of abduction will be explained first. Here, a specific conception of validation of abduction will be proposed, as relying on explication of enthymemes (§ 2). Next, analogy will be explained as abduction of underlying general rules or principles from the original analogon. Analogy will appear to be a particularly weak form of abduction, as the original analogon contributes only a highly marginal part to evidence for analogy. Such evidence consists of implicit general rules and principles, relying upon some or other whole or wholes of the law in their turn (§ 3).

E contrario will be shown to strongly resemble analogy, notwithstanding their standard status as opposites. E contrario is denying the antecedent, equivalent to accepting the consequent, which is indeed abduction. Again, the starting-point of abduction, the legal condition denied, will appear to be only a marginal part of the evidence for the conclusion denied. Some kind of implicit whole or wholes of the law must be invoked here too, in order to exclude alternative sufficient conditions for the legal consequence to be denied (§ 4).
Unjustly neglected in discussion of legal argumentation is the logic of facts. Here the relationships between circumstantial evidence and the facts it purports to ascertain will be discussed. Such relationships appear to be abductive as well. Implicit premisses here amount to exclusion of alternative explanations of circumstantial evidence, validating exclusive explanation by facts for which proof is wanted. The “whole” of the facts possibly having to do with explanation of

circumstantial evidence is invoked here (§ 5).
Indeed, it is wholes of some or other kind that bear the brunt of abductive argumentation here, be it some or other kind of principled whole of the law when analogy and e contrario are concerned, or "the whole of the facts" in the case of circumstantial evidence. Wholes of whatever kind are notoriously problematic. Here it suffices to clarify that such wholes and their constituting principles, general rules etc. may not at all be reduced to the original, "raw" data adjudication starts from. This is clear in the discussion of analogy, e contrario and circumstantial evidence, but in fact this irreducibility has a more general background (§ 6).

The fate of artificial intelligence in adjudication seems sealed by now. Successful artificial intelligence is expected to start from input consisting of original data, in order to produce output sufficiently resembling adjudication produced by judges. It does not matter how artificial intelligence is to reach results, as long as there is acceptable match. But such match is impossible in principle, as justification of adjudication cannot but consist at least in part of appeal to judicial authority deciding on general rules and principles and thus implicitly deciding on underlying wholes not completely determined by original data. It is exactly this underdetermination by original data which creates the need for authoritative decision. This is a matter of principle, apart from the practical inevitability to stick to the authority of the courts (§ 7).
Several objections may be put forward against this. First, analysis in terms of abduction of analogy, e contrario and circumstantial evidence may be questioned. Second, it may be objected that in the practice of adjudication, analogy and e contrario arguments often are no more than repetitions of earlier, comparable arguments, already contained in original data. Third, the conception of "original data" implied here may be too meagre, excluding the interpretative nature of legal data. Fourth, too much may be expected from artificial intelligence here (§ 8).
Of course, artificial intelligence may refute the sceptical view expounded here in at least two ways. It may prove successful in adjudication after all, and/or it may refute the arguments about adjudication expounded here (§ 9).
Though statute law examples are used, it probably goes without saying that arguments concerning legal rules and principles are here to hold good for case law rules and principles too.

2. Abduction

Abductive arguments are endemic in daily life and, as will be shown, in adjudication. More often than not, "the most obvious" explanation of some or other phenomenon is taken to be "the" explanation, excluding other possible and possibly more plausible explanations. Such abduction may be explained and justified in several different ways (Josephson & Josephson ed., 1994, Brewer, 1996). Here it will be explained in terms of necessary and sufficient conditions:

p -> q
q

_____
p

Pirie offers a nice though not very everyday example, although he does not mention the concept of abduction (1985, pp. 7-9):

To those who confuse hopelessly the order of horses and carts, affirming the consequent is a fallacy which comes naturally. An occupational hazard of those who engage in conditional arguments, this particular fallacy fails to recognise that there is more than one way of killing a cat. … This fallacy receives a plentiful airing in our law courts, since it is the basis of circumstantial evidence. … 'She's just a tramp. Girls like that always flaunt themselves before men, and she did appear at the office party wearing a dress that was practically transparent!' (We can all see through this one.)

Are such arguments really fallacious? If so, very many everyday, scholarly and scientific arguments should be disqualified. A slightly disquietening possibility, but not at all to be excluded by logic alone. The example may serve to show the importance of enthymemes in justification here. The argument against the lady (which is of course not to develop in literal abduction) certainly is fallacious at first sight, but may be saved if other sufficient conditions or explanations of her dress may be excluded. Only then the sufficient condition stated in the abduction may be taken to express not just one possible, but the one and only adequate explanation or sufficient condition for what is expressed in the antecedent in the abduction.

To express things in a slightly more formal fashion (though no specific conception of logic is presupposed here):

‘p’ =def ‘The lady is a tramp’
‘q’ =def ‘The lady wears a transparent dress’
p -> q
q

_____
p

is invalid, but may be justified by implicit premises expressing exclusion of alternative sufficient conditions:

r, s, …: alternative sufficient conditions for q

p -> q
q -> [p v r v s v …]
q
¬ r

¬ s
¬ …

____
p

Such exclusion may not always work. Indeed, the lady may answer that she thought the dress to be to most fitting available from a purely esthetical point of view, and so on. Only if such alternative explanations may be discarded, the abduction may be developed into a valid argument, which of course may still be enthymatic in other respects. Also, exclusion of alternative sufficient conditions may be incomplete. There may be one or more alternative sufficient conditions overlooked, rendering abduction doubtful at best. This justification of abduction has indeed been criticised for its presumption that all possible alternative sufficient conditions can be excluded. Such impossibility is taken to impair logical validity, then (Josephson & Josephson ed., 1994). This is a misunderstanding both of abduction and of logic in general. Logical validity has got nothing to do with truth or falsity of premisses, though doubtful status of premisses of course translates to doubtful status of conclusions.
Apart from exclusion of alternative sufficient conditions, a second line of defence against objections of abductive fallaciousness is more pragmatic than logical in nature, but still relevant here. For example: against the transparently dressed

lady it may be put forward that although the “default” explanation chosen may not express a necessary condition, she herself is responsible for such an explanation, as she is expected to know that onlookers will expect in their turn that a dress like that expresses certain intentions toward the other sex.
This may be summarised in terms of responsibility for appearances. In daily life, such communicative, pragmatic justification of abduction may very well do. Such abduction seems inevitable and even indispensable in communication. However, it is precisely this penchant toward taking abduction for granted which may make abduction in the law rather more questionable. Judicial decisions are expected to rely on good argument, as such decisions often concern matters of no small importance and because there is (in general) no controlling and reviewing instance outside the judiciary.
Thus (apart from special cases in civil law, having to do with responsibility for appearances) justification of abduction in adjudication must have to do with exclusion of alternative explanations. Still, the practice of adjudication shows that such exclusion is not always explicated and still worse, that things may go wrong that way. Here this will be explained in some detail in three specific forms of adjudicative argumentation, but this is not to exclude the importance of abduction in other kinds of argumentation in adjudication in the law (and, of course, in other fields).

3. Analogy

The basic problem of analogy probably needs no further explanation here. Analogy does not rely on strict similarity, but on some or other likeness of factors otherwise different. Civil law adjudication would be inconceivable without such explicit and, still more, implicit appeal to likeness. But how is such likeness to be determined?
Anything may resemble anything in any respect, so how to single out relevant similarities? Several analyses have been tried out on this problem, with more or less unsatisfactory results (Kaptein, 1995, White, 1996). Conventional attempts to analyse analogy are hampered by the mistaken idea that the original analogon, that is, the starting point of argument by analogy, must play a major role in justification of results. However, only underlying general rules or principles may determine relevant similarities. Indeed, such general rules or principles bear the brunt of argumentation by analogy (Kaptein, 1995).
This may be clarified by standard examples of analogy in adjudication. Here a less well-known analogy from Supreme Court of The Netherlands adjudication will

figure in explanation of the abductive structure of analogy. Section 276 of the Commercial Code of The Netherlands reads: “No damage caused by a fault of an insured may be paid for by insurance, …” This section is analogously applied to beneficiaries of insurance too (see Supreme Court of The Netherlands, 1976). Behind this is the so-called indemnity principle, determining that insurance is not to lead to enrichment of the insured. This may be formalised as follows, not only clearly showing the main role of underlying rule or principle, but also bringing to light the abductive structure of argument by analogy.
Again, no specific conception of logic is presupposed here.

‘Fault of an insured (etc.) _ no insurance payment’ =def ‘q’
(section 276 of the Commercial Code of The Netherlands)

‘No undue advantage is to be gained through insurance (indemnity principle)’ =def ‘p’

‘Fault of beneficiary _ no insurance payment’ =def ‘r’

[q -> p, q] -> p
p -> r

_____
r

This will not do. Logic is no problem here, but the first premiss of the argument is, as it comes down to a petitio principii. There may be no inference of a general rule from a specific rule. This is a consequence of the problem of relevant similarities noted before. The problem may also be expressed by noting that ‘q’ may be inferred from widely varying general rules or principles. The highly implausible general rule ‘No damage caused by any behaviour of an insured may be paid for by insurance’ will do here too. Not all such general rules or principles may be relevant and/or plausible, but this is not the point here. However:

[p -> q] may hold, so
[p -> q, q] -> p
p -> r

_____
r

Which amounts to abduction: nothing wrong with the premisses now, but

problematic logic this time. The same basic problem props up here too. Almost any general rule or principle may be adduced to infer q. Only by excluding such alternative general rules or principles may the abduction be justified. It would make little sense to formalise this, as there are virtually no limits to such alternative explanations of q.
Here the argument relies not so much upon exclusion of alternatives as upon justification of underlying general rules or principles. Anyway, original analogata play no important role in this respect. Underlying general rules or principles may instead be more or less justified by their proper place in something like the law as a whole, which is of course only marginally determined by original analogata. For example: the indemnity principle may be shown to fit in with the whole of insurance law and civil law, its denial being at odds with other important principles and rules determining insurance law and civil law. The aforementioned section 276, the original analogon, is of course no more than a small detail within these wholes.
On the other hand, the heuristic importance of original analogata may not be underestimated. But as justification of argument they are no good at all. One may even be tempted to deny the existence of argument by analogy altogether. Indeed, analogy may be regarded as pia fraus, or fraudulenta pietas, raising the semblance of solid foundation in specific data of positive law, whereas in fact analogy is not what it claims to be but implicit appeal to wholes underdetermined by original analogata or any specific data.

4. E contrario

Countless anecdotes criticise e contrario, still it is often used, at least in civil law adjudication. Explicit e contrario may be relatively rare, but appeal to some or other kind of difference is the life of the law just as much as appeal to likeness is. The problem of e contrario is obvious: how may it be that the law accepts a kind of argument at odds with simple logic? Starting from the same example again: ‘Fault of an insured _ no insurance payment’ =def ‘a -> b’ But a fault of a life insured person may not lead to exclusion of payment, as life insurance is specifically aimed at insurance of risks for relatives of faults of persons whose lives are insured. This exception to general rules of insurance was probably overlooked by the legislature, so e contrario adjudication was unavoidable here. Or: a fault of a life insured person may not be taken to be a fault of an insured person in this connection, or:

¬a

[a -> b, ¬ a] -> ¬b

Which is no good logic of course and brings to light the basic problem of e contrario. Abduction here again, because denying the antecedent may here be taken to be equivalent to accepting the consequent:

[a -> b]->[¬ b -> ¬ a]

The problem seems to disappear when ‘a -> b’ may be interpreted as a replication or as stating a as a necessary condition for b:

[b -> a, ¬ a] -> ¬ b

But this will not do, as legal consequences are seldom if ever consequences of one specific legal condition only (Kaptein, 1993).

Like in the case of analogy, problems of logic are solved here at the cost of the quality of premisses: *petitio principii* again. Still, e contrario too may be validated by exclusion of alternative sufficient conditions for the legal consequence to be denied, or something like:

c, d, …: alternative sufficient conditions for b

b -> [a v c v d v …]
¬ a
¬ c
¬ d
¬ …

_____
¬ b

Appeal to some or other kind of whole or wholes of the law is just as inevitable here as it is in the case of analogy. Only if no other sufficient condition may be found anywhere in the law, the contested legal consequence may be denied because there is no legal condition for it at all. For example: exclusion of payment by the insurer may also be a legal and/or contractual consequence of the insured not having paid for the insurance. More so than in the case of analogy, relevant legal conditions may be limited by legal procedure. For example: appeal to wholes

is largely irrelevant under procedural rules limiting relevant legal conditions to what is brought forward by parties.
Like analogy, e contrario may be regarded as *pia fraus*, or *fraudulenta pietas*, suggesting that denial of a legal condition will do the work while really relying on some more implicit premisses. Again, original data determine little of the desired result, though probably more so than in analogy. Like analogy, e contrario may do well in contexts of discovery, but as such it is no good as justification.

5. Circumstantial evidence
Though almost all argument in the practice of law and adjudication has to do with disputed facts, little or no attention is paid to facts in jurisprudence and theory of legal argumentation (see also Golding, 1984). Here the specific problem of circumstantial evidence will be discussed, though this problem is only one of many having to do with evidence and proof (Wagenaar, Van Koppen & Crombag, 1993).
Circumstantial evidence does not lead conclusively to proof of the facts in question. Its relationship to the facts in question is more or less indirect in some or other way. Or: possible facts in the past for which proof is sought may be part of a historically adequate explanation of the circumstantial evidence presently available, but they may be not. In that sense, proof of facts from the past on the basis of presently available circumstantial evidence is a kind of archaeology (Kaptein, 1998). The issue here is the logic of the relationships between circumstantial evidence and facts for which proof is wanted. Thus the quality of circumstantial evidence in itself, apart from its qualities as proof for facts in question, is no issue here.

A simple example may clarify these abstractions:
If the landlady killed the boy, then a corpse must be found in the
closet (etc.)
A corpse was in the closet (etc.)

The landlady killed the boy (etc.)

The corpse in the closet here figures as circumstantial evidence for the killing of the boy by the landlady. The premisses of this highly simplified argument may be more or less plausible, as the killing by the landlady may well do as an explanation of the corpse in the closet. Also, it may be taken for granted that there was in fact a corpse in the closet. But the logic of the argument is no good,

or at best abductive. Again, things may be turned round: no more problems of logic then, but at the price of a highly implausible premiss:

If a corpse was found in the closet, then the landlady killed the boy (etc.)
A corpse was found in the closet (etc.)

_____
The landlady killed the boy (etc.)

The second argument is a *petitio principii* again, steering round the principal problem of circumstantial evidence. The killing may be a plausible explanation of the corpse in the closet, but it remains to be ascertained that it actually is the historically adequate explanation. Again, abduction is here to be validated by exclusion of alternative explanations or sufficient conditions for the circumstantial evidence available:

'The landlady killed the boy' = def 'e'

'A corpse was found in the closet' = def 'f'

g, h, … : alternative explanations for the corpse in the closet

e -> f
f -> [e v g v h v …]
f
¬ g
¬ h
¬ …

_____
e

A difference, at least in degree, with analogy and to a lesser extent with e contrario here is that specific circumstantial evidence may well play a major role in a fully explicit argument validating abduction. Circumstantial evidence may indeed vary from a tiny trace not having any obvious connection to the facts in question to evidence so overwhelming that scarcely any room is left for alternative explanations and thus for doubt concerning the facts for which proof is wanted. However, the basic problem remains the same. As long as there is no direct evidence, alternative explanations of circumstantial evidence cannot be excluded.

Analogy and e contrario may be regarded as more or less innocent varieties of *pia fraus*, or *fraudulenta pietas*. Circumstantial evidence however may well lead to really fraudulent conviction of the innocent, if insufficient attention is paid to the possibility of alternative explanations. This possibility points to the importance of something like "the whole of the facts" having to do in some or other way with circumstantial evidence available.

6. (Principled) wholes

Wholes are notoriously difficult to grasp and this has not just to do with their size. Here, the whole of the law may be understood as relying on notions of consistency and coherence. Consistency as such will not do, though it is an important quality of any set of rules and principles. Coherence goes much further and can only be understood as determined by general rules and principles allowing for the inference of more specific rules (Kaptein, 1996).

In the preceding discussion of analogy and e contrario it already became clear that specific legal rules cannot completely determine underlying general rules and principles. This may be generalised by noting that any set of specific legal rules may be organised in terms of alternative general rules and principles. Not all of such general rules and principles may be equally plausible. However, such plausibility cannot completely depend upon any original data given within a legal order.

This excludes the possibility that analogy and e contrario, though not to be based upon original data specific to them like analogata or legal conditions denied, may still be indirectly based upon any set of original data constituting the law as a whole. General rules and principles cannot be reduced to any set of original data, though their plausibility does of course depend in great part upon their capacity to better organise the manifold of data of the law than alternative general rules and principles do. So anything like the whole of the law must depend on general rules and principles. Such general rules and principles cannot in their turn be completely determined by any kind of whole or wholes in their turn. What then may be underlying wholes in argument from circumstantial evidence to establishment of facts? This is a still more difficult question than it is in the case of analogy and e contrario, relying as they do on law as a principled whole. What may be "the whole of the facts", if this is a sensible concept at all? Of course it cannot mean: "everything in the world". At best, it may mean something like: everything possibly causally connected to the facts in question. Problems of causation here point to the importance of rules of thumb and other often implicit

expectations concerning explanations of occurrences (Wagenaar, Van Koppen & Crombag, 1993, Kaptein, 1999). Such implicit expectations and explanations may seem to render irrelevant many factors in history preceding the facts in question. Their role may be more or less analogous to general rules and principles organising the whole of the law.

This may do in everyday or even not so everyday life, like in Pirie's transparent dress case (§ 2). However, it cannot lead to acceptable certainty on disputed facts in the law. In civil cases, facts may be established by rules of procedure like the absence of any disproof put forward by other parties. In criminal procedure this is of course out of the question. Criminal courts have special responsibilities concerning circumstantial evidence and impression has it that such responsibilities are not always taken seriously (Wagenaar, Van Koppen & Crombag, 1993). Miraculous things may have happened, even if everything seems to plead against a criminal defendant.
That is: things miraculous from the point of view of standard explicit and implicit expectations and rules of thumb on "how things normally happen" but still imaginable in the sense of not to be excluded on the basis of convincing evidence. Not a few convictions are based upon all too common assumptions on how things are happening in the world.
Artificial intelligence may not be expected to do better than humans here. Still, some courts in so-called civilised legal orders have been doing so badly in reasoning about facts that they may be better replaced by a simple kind of artificial intelligence letting all criminal defendants go free when there is no more than circumstantial evidence against them.

7. Abduction of artificial intelligence
Analogata, legal conditions denied, or pieces of circumstantial evidence as such offer no good reasons for the conclusions purportedly to be inferred from them. So the question concerning the feasibility of artificial intelligence in adjudication is: may artificial intelligence conceivably supply the enthymemes in abduction, as exemplified in analogy, e contrario and argument from circumstantial evidence? For three distinct but related reasons this is highly unlikely.
The first reason already emerged from preceding discussion. Analogy, e contrario and argument from circumstantial evidence depend upon wholes which cannot be completely reduced to any original data. Analogy presupposes principles which presuppose wholes, e contrario presupposes wholes ascertaining that there are no

alternative sufficient conditions. Analogously, circumstantial evidence may be useful only if alternative explanations may be excluded. Again, such exclusion presupposes something like a whole of relevant facts. How is any artificial intelligence fed with original data supposed to reconstruct such wholes?
Second, a principled whole or wholes in the law or in the realm of facts may even be impossible in principle, even apart from irreducibility to original data. Well-known criticisms of Dworkin's Herculean conception of law come to mind here (Kaptein, 1996). And even if such a principled whole would be possible in principle, in practice there could be no reasoned consensus on it.
Which leads to the third reason: adjudicative decisions may be more or less justified by reasoned recourse to general rules and principles, referring to something like the whole of the law, but then the question remains how to justify such general rules and principles and wholes in their turn. This is a notoriously difficult question, having inspired countless legal scholars to most impressive or at least more or less mind-boggling intellectual exercises.
Probably the most interesting, though rather theoretical contribution to this is the notion of reflective equilibrium (Rawls, 1971, Dworkin, 1986).

In practice however a very simple principle takes pride of place here. Notwithstanding Hart's principled distinction between finality and infallibility of adjudicative decisions, legal scholars, practitioners and laymen alike take it for granted that law is what judges do (Hart, 1994). How could it be otherwise? Such legal realism may be fatally flawed in as far as it is thought to apply to decisions as such, but something like it seems unavoidable even after rational reconstruction of principled reasons behind adjudicative decisions.
This means that justification of adjudicative decisions cannot but partly rely on authoritative decision at least concerning underlying general rules, principles and wholes. Of course, judicial authority in its turn ought to rely on the authority of argument, but then it is impossible in principle to completely reduce such authority to argument.
Judicial authority is a most complex phenomenon, having to do with tradition and many more factors outside the spheres of argumentation, logic and principle. It is inconceivable that any kind of artificial intelligence is to take over such a role. Nobody in her right mind would accept adjudicative decisions created by artificial intelligence (though some judges do so badly that one might wish artificial intelligence to step in).
The same holds good for argument from circumstantial evidence. Doubts on

uncertain facts have to be settled in the end and again it is up to the judiciary to do so. Still there remains the uncertain feeling that there may be something like objective truth on the past after all. If so, the practical necessity of judicial determination of uncertain facts cannot escape principled criticism of arbitrariness. Which may indeed reduce the difference with artificial intelligence arbitrariness.

It cannot be excluded beforehand that artificial intelligence may reach adjudicative decisions in ways completely different from human heuristics. That is not the problem here. What counts is the quality of conclusions and arguments produced, not the ways in which such conclusions and arguments are produced. This quality cannot but partly depend on judicial authority, not to be replaced by artificial intelligence, however intelligent, in any way.

8. Objections

Several objections may be put forward against this criticism of artificial inteligence in adjudication. First, analysis in terms of abduction of analogy, e contrario and circumstantial evidence may be questioned. Second, it may be objected that in the practice of adjudication, analogy and e contrario arguments often are no more than repetitions of earlier, comparable arguments, already contained within original data. Third, the conception of "original data" implied here may be too meagre, excluding the elementary interpretative nature of legal data. Fourth, too much may be expected from artificial intelligence here.

The first objection cannot be conclusively answered here. Still it remains to be seen whether more plausible explanations of analogy, e contrario and circumstantial evidence are available or even conceivable. Also, such alternative explanations may well bring to light the very same problems. At least abductive explanations put forward here have the edge over alternatives in at least two respects.

First, such explanations lead to logically valid inference (a problem in alternative explanations) and second, they bring to light hidden backgrounds of analogy, e contrario and circumstantial evidence. The second objection starts from an indubitable fact of adjudication, but is in fact irrelevant. Surely many analogous and e contrario arguments are no more than repetitions of precedents. But this is not the point here. Time and again analogies and e contrario arguments prop up which cannot be derived from adjudication in the past. Adjudication in modern legal orders is full of examples of this, indeed often setting the lead for future adjudication. What matters here is the importance of analogy etc. not featured in

adjudication
before.
This objection fails completely in the case of circumstantial evidence. In practice, no two cases of circumstantial evidence are exactly identical and it may even be doubted whether this is a theoretical possibility. To the contrary, it may be most dangerous to take it that circumstantial evidence is identical in consequences for facts of charges (or for contested facts in civil or administrative cases) to consequences decided upon in earlier cases of more or less identical circumstantial evidence.
Third, the conception of original data expounded here may wrongly leave out of account that such data mean nothing without interpretation and that within such interpretation general rules and principles already go hidden. No doubt this objection has some truth in it. However, it is especially in analogy, e contrario and circumstantial evidence arguments that such interpretative loading of original data won't do the work or may even dangerously develop into uncritical preconceptions.

Analogy cannot be based upon interpretation indeed. One more example: according to section 7a: 1612 of the Civil Code of The Netherlands, selling a house is of no consequence for renters of the house (to simplify things a bit). Analogy here has it that donating a house will have the same consequences for renters, based on the underlying principle that renters are to be protected against any such changes of ownership. Of course there is no sensible interpretation of the concept of sale including the concept of gift. It is the same with e contrario. Interpretation of a legal condition in such a way that it may lead to a valid e contrario conclusion by itself cannot be plausible, as such interpretation would amount to unacceptable replication (§ 4).
It probably goes without saying that interpretative loading of circumstantial evidence is not only implausible but even downright dangerous. Such interpretation would amount to implicit recourse to normal expectations and everyday rules of thumb, not just leading to abductive failure in argument but to abduction to jail or other undeserved punishment of the innocent as well.
Against the fourth objection it may be conceded that artificial intelligence in adjudication may make sense without going all the way. Artificial intelligence may be much more successful in procedural law and/or in other areas of legal argumentation in which argumentation appealing to undetermined wholes is largely irrelevant. On the other hand the question arises whether such artificial

intelligence is really more than advanced data retrieval. The argument expounded here claims no more than that artificial intelligence cannot go all the way.

9. Conclusion

If any artificial intelligence would come up with anything like a refutation of this sceptical view of artificial intelligence in adjudication, the main contention of this article must of course be abandoned.

Such a refutation may take two different forms: artificial intelligence does the job, or artificial intelligence refutes the arguments expounded here. Anyway, who does not like results argued for here may well skip the artificial intelligence part and restrict attention to the abductive logic of analogy, e contrario and circumstantial evidence. Even these abductive results may be abducted by artificial intelligence. However, it is to be expected that before any such intelligence is to be taken seriously, the humane intelligence of artificial intelligence and argumentation specialists will step in.

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