# LEGAL LOGIC
## *Its existence, nature and use*

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Abstract:    This paper argues for the possibility of a dedicated legal logic by attacking the argument against it based on the presupposition that the law provides the content, not the form of arguments. It goes on to discuss two typical topics for legal logic, and to argue for its practical relevance.

## 1.    INTRODUCTION

There is not one kind of formal logic, but there are many different logics. One can distinguish between classical and intuitionist logic, between propositional and predicate logic, between many different systems of alethic modal logic, epistemic logic, deontic logic and of logics of time, and between monotonic and non-monotonic logics. I have seldom seen a dispute concerning the right of existence of any of these logics.[1]

The claim to existence of a special legal logic has run into serious objections, however. It has been argued forcefully that formal logic can play a role in the legal domain, but that there is no need for a special legal logic, in particular when this legal logic would be a 'material' or informal' logic as opposed to formal logic. The specific nature of the legal domain can and should be taken into account in choosing the premises of legal arguments,

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[1]    There are some exceptions, in particular concerning nonmonotonic logic. See for instance Alchourrón 1993, p. 69f. and Israel 1980. Quine is famous for (amongst others) his objections against all kinds of intentional logic. See Quine 1966, the essays 'Three grades of modal involvement', 'Reply to professor Marcus', and 'Quantifiers and propositional attitudes'.

but as soon as these premises have been chosen, 'normal' non-legal logics are all that is needed to evaluate these arguments with regard to their validity.[2]

In this paper I want to argue against this last view, and for the right of existence of the field of legal logic.[3] To this purpose I will try to show how the view that there is no need for a special legal logic may have risen, and also how this view is supported by a too limited view of logic. My argument must go into some details concerning the nature of logic and its object, valid reasoning. Having argued that there is room for a special legal logic, I will say a little about the topics it might address. At the end of this paper I will try to show that the existence of a special legal logic is not merely an issue of academic interest, but that the recognition of, and insight into the nature of such a logic has practical implications for the description and development of legal systems.

## 2.        FORM VERSUS CONTENT

Logic is a theory about the validity of arguments. Validity is in this connection an evaluative notion. An argument that is valid is pro tanto better than an argument that is invalid.[4] In the case of evaluative words, the criteria for their applicability is not given with their word meaning. People who speak the same language and who agree on what 'good' means (it is the most general word of recommendation) need not agree on the standards for a good baseball match. Similarly, people who speak the same language need not agree on the standards for logical validity.

However, one particular standard has gained widespread acceptance amongst logicians, and this is the standard for deductive validity. An argument is said to be deductively valid if and only if it is impossible that the premises of the argument are all true, while the conclusion is false.[5]

The expression 'deductive validity' suggests that there may be other kinds of validity, which are not deductive. Logical practice is different, however.

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[2]   An argument along these lines can be found in the first chapter of Soeteman 1989, section 5f. See also section 5 of this paper.

[3]   A different argument, leading to the same conclusion, that there can be a special legal logic, can be found in Verheij 1999.

[4]   Obviously arguments can be evaluated from other perspectives than the logical one. Other perspectives will normally involve other standards and other good making characteristics. See also Strawson 1952, p. 1.

[5]   This definition of logical validity can be found in slightly different forms in, for instance, Reichenbach 1947, p. 68, Allwood e.a. 1977, p. 15, and Haack 1978, p. 14. It is remarkable, however, that the definitions of deductive validity are seldom completely identical, and that their equivalence often depends on a shared background theory about the nature of deductive logic.

The expression 'validity' is (almost) always used in the sense of deductive validity. For other qualities of arguments, which do not satisfy the standards for deductive validity, other expressions are used.[6]

It is generally taken for granted that the validity of an argument depends on the form of the argument, and not on its contents. For example, according to Strawson (1952, p. 26f.) it is the task of the logician to compile lists of statements which entail each other, and this task is subject to three restrictions.

First the entailments must be general. The statement that John is a bachelor entails that he is unmarried. But logicians should not concern themselves with such specific entailments. General entailments such as between being a bachelor and being unmarried are more in the way of the logician.

The second restriction is that logicians should only concern themselves with general entailments based on the form, as opposed to the content, of the statements that entail each other. The entailment between being a bachelor and being unmarried is for instance based on content, on the subject of the statements involved. The entailment between the statements that all A's are B' and that p is an A on the one hand, and the statement that p is a B on the other hand, would qualify as one relevant for logicians.

The third restriction mentioned by Strawson is that there should be system in the general form-based entailments with which the logician should concern himself. Axiomatization is a way to bring about the system intended by Strawson.

In the present context I am most interested in the issue of form as opposed to content, because it seems to me that this distinction, clear as it may seem at first sight, is somewhat dubious. But let us first see what makes the distinction attractive.

The dependence of validity on form can easily be 'demonstrated' by means of some examples. The arguments

> All judges are lawyers
> Sheila is a judge
> Therefore: Sheila is a lawyer

and

> All human beings are mortal
> Socrates is a human being
> Therefore: Socrates is mortal

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[6]   Strawson 1952, p. 237, for instance, writes about inductive *support* that the premises of an inductive argument lend to its conclusion. In non-monotonic logic, for instance, one can speak about conclusions that are, or are not, justified (by the premises). See for instance Prakken 1997, p. 170.

are taken to be valid for the same reason. They share the logical form

> All A's are B's
> x is an A
> Therefore: x is a B

> and this form is logically valid.[7]
> The arguments

> All judges are lawyers
> Sheila is not a judge
> Therefore: Sheila is not a lawyer

and

> All thieves are punishable
> John is not a thief
> Therefore: John is not punishable

are taken to be invalid for the same reason. They share the logical form

> All A's are B's
> x is not an A
> Therefore: x is not a B

and this form is logically invalid.

This 'demonstration' that the validity of arguments depends on their form is hardly a proof, if only because a specification of what counts as logical form is lacking. It is very difficult to specify the notion of logical form for informal languages. For formal languages, however, it is much easier to show how validity and logical form hang together. I will show this for the language of propositional logic.

The language of propositional logic is quite simple. It has a number of elementary propositions, say p, q, and r, and a number of logical operators: ~, ∧, ∨, and →.[8] The first of these operators is unary, which means that it operates on one proposition, the other ones are binary operators, or connectives, which join two propositions into a compound one.

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[7] That the example about Socrates has this form only becomes clear when 'mortal' is replaced by 'mortal entity'. It is generally assumed that this is allowed, but this allowance is, again, based on a silent (ontological) presumption, such as that having a characteristic is from a logical point of view the same as belonging to the class of entities that share this characteristic. This presupposition already suggests the extensional nature of predicate logic.

[8] There are also parentheses to indicate the order in which operators are to be evaluated, but I leave them out of the discussion for the sake of simplicity.

The logical form of a *proposition* is determined by the nature and the place of logical operators occurring in it, and by the occurrence of different elementary propositions in it. Let me give some examples:

1. `p ∧ p`          2. `p ∧ ~q ∨ ~r`          3. `p ∧ q`
4. `q ∧ q`          5. `r ∧ ~p ∨ ~q`          6. `q ∧ q`

The propositions 1 and 4 have the same logical form, because they have the same operator in the same place and the two elementary propositions are in both cases identical.

The propositions 2 and 5 also have the same logical form, because they have the same operators in the same places and the three elementary propositions contained in them are different from each other in both cases.

The propositions 3 and 6 do not have the same logical form. They have the same operator in the same place, but in 3 the elementary propositions differ from each other, while in 6 they are identical.

Given the notion of identical logical form of a *proposition*¸ it is possible to characterise identical logical form of arguments too. Two *arguments* have the same logical form if and only if

-   they have the same number of premises,
-   the premises of the two arguments can be ordered such that the corresponding premises and the conclusions of the arguments pairwise have the same logical form, and
-   the identical elementary propositions in the two arguments match in the sense that the one argument has identical elementary propositions where the other argument has them.

The intuitive notion of deductive validity, that it is impossible that the premises of a valid argument are all true while the conclusion is false, can be given a more precise rendering by means of the notions of an interpretation and a truth value. In propositional logic, every proposition is either true or false, *true* and *false* being called the *truth values* which a proposition can take.

The logical operators of propositional logic are defined in such a way that the truth value of a compound proposition, that is a proposition which contains one or more logical operators, depends solely on the truth values of the elementary propositions contained in it, and on the nature and the place of the operators that occur in it. For instance, the operator ~ is defined such that the proposition `~p` is true if and only if the proposition `p` is false. The proposition `p ∨ q` is true if and only if either `p` is true, or `q` is true, or both are true.

The truth values of propositions depend on an interpretation. By means of an interpretation a truth value is assigned to every elementary proposition.

Since the truth value of a compound proposition is determined by its logical form and the truth values of the elementary propositions contained in it, an assignment of truth values to elementary propositions automatically assigns truth values to compound propositions too. For instance, if the propositions p and q are respectively assigned the truth values true and false, this assignment assigns the truth value true to ~q, and, as a consequence, the truth value true to ~p ∨ ~q.

Given this notion of an interpretation, it is easy to give a precise definition of the deductive validity of an argument:

*An argument is deductively valid, if and only if every interpretation that makes all the premises of the argument true, also makes the conclusion of the argument true.*

Another way to say the same is:

*An argument is deductively valid, if and only there is no interpretation that makes all the premises of the argument true, and that also makes the conclusion of the argument false.*

Now it is easy to see why the validity of an argument depends on its logical form. Given the above definitions of logical form and validity, it is necessarily the case that arguments with the same logical form are all valid or all invalid. Instead of proving this finding, I will illustrate it by means of two examples, one of a valid, and one of an invalid argument.

Let us take the following as an example of a *valid* argument:

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~p ∨ q
p
therefore: q
```

This argument contains two different elementary propositions, and since every proposition has one out of two truth values, there are four different assignments of truth values to the propositions, represented in the following table:

| | **p** | **q** | **~p** | **~p ∨ q** |
|---|---|---|---|---|
| **1** | t | t | f | t |
| **2** | t | f | f | f |
| **3** | f | t | t | t |
| **4** | f | f | t | t |

The rows 1 to 4 of this table represent the four different interpretations that are possible for two elementary propositions. The first premise, ~p ∨ q, is true in the interpretations 1, 3, and 4. The second premise, p, is true under the first two interpretations. It turns out that only in the first interpretation

both premises are true, and on this interpretation, the conclusion, `q`, is also true. In other words, the conclusion is true under all interpretations that make all the premises true, and therefore the argument is deductively valid.

It is important to notice that the meanings of the propositions p and q are irrelevant for the validity of the argument. The only property of the proposition that seems to play a role, is whether it is true or false. It does not matter which facts make it true or false. Moreover, even the truth value of p and q turns in the end out to be irrelevant, because the validity of an argument depends on *all* interpretations, that is on all combinations of truth values of the propositions. Which assignment of truth values corresponds to the real world is irrelevant. This goes to show that the validity of arguments in the language of propositional logic does not depend on the content of these arguments, as reflected in the meanings or the truth values of the propositions involved in the arguments. By considering *all* assignments of truth values, it is investigated whether it is *possible* that true premises go together with a false conclusion. If there is *no* interpretation of the propositions that lead to true premises and a false conclusion, it is *impossible* that this combination occurs. And this is precisely what is meant with the validity of the argument.

Let us take the following as an example of an *invalid* argument:

    p ∨ q
    p
    therefore: q

This argument contains two different elementary propositions, and since every proposition has one out of two truth values, there are four different assignments of truth values to the propositions, represented in the following table:

|   | p | q | p ∨ q |
|---|---|---|-------|
| 1 | t | t | t |
| 2 | t | f | t |
| 3 | f | t | t |
| 4 | f | f | f |

Again, the rows 1 to 4 of this table represent the four different interpretations that are possible for two elementary propositions. The first premise of the argument, `p ∨ q`, is true in the interpretations 1, 2, and 3. The second premise, `p`, is true under the first two interpretations. It turns out that both premises are true in the first and the second interpretation. In the first interpretation, the conclusion, `q`, is also true. In the second interpretation, however, the conclusion is false. In other words, there exists an interpretation, namely the

second one, that makes all the premises true, and the conclusion false. Therefore the argument is not deductively valid.

The same can also be said in somewhat different words. It is *possible*, namely if p is true and q is false, that both premises of the argument are true, while its conclusion is false. Therefore the argument is deductively invalid. Notice that the notion of possibility is made precise by translating it into the existence of an interpretation. Something is possible if there exists an interpretation on which it is the case. Again, the validity of the argument has nothing to do with the subject of the propositions involved in it. Only the form, exemplified in the nature and positioning of the logical operators and the identity of the propositions occurring in the argument determine the argument's validity.

The observation that the validity of an argument is, in the end, a matter of logical form, does not answer the question what makes it impossible that the premises of a valid argument are true, while its conclusion is false. The traditional answer to this question is that this necessity rests on the meanings of the logical operators (Haack 1978, p. 30). These meanings consist in the ways in which the truth value of compound sentences is determined by the truth values of the components, ultimately of the elementary propositions. For instance, it is the meaning of the operator `&` that the compound proposition `P & Q` is true if and only if both the propositions `P` and `Q` are true.

The basis of logical validity in the meanings of the logical operators explains the importance of semantics, the theory of meaning, for logic. The semantics of the logical operators determines how the truth values of the propositions in an argument are related to each other and in this way also which argument forms are valid.

## 3.        FORMAL VERSUS INFORMAL LOGIC

It has sometimes been argued that in the law formal logic is not sufficient and that formal logic needs to be supplemented with an informal, or material logic that takes the peculiarities of the legal domain into account. In the law it should, for instance, be possible to derive that somebody is not liable to be punished, since she did not commit a crime forbidden by written law. The argument

> A did not commit a crime forbidden by written law
> Therefore: A is not liable to be punished

has the logical form a, therefore b, and this is not a valid form. So according to formal logic, this argument is invalid, while most lawyers would have little objections against it. It might therefore seem that such arguments should

be declared valid by some other logic, which takes characteristics of the legal domain, in this case of the principle of the rule of law, into account.

Soeteman (1989, p. 18) has launched a powerful attack against this line of reasoning, however. His argument runs, briefly stated as follows. Either such an informal argument can be made formally valid by adding an acceptable premise to it, or it cannot. If it can be made valid, the best thing to do is to add this acceptable premise and remain satisfied with the resulting validity according to formal logic. If the argument cannot be made formally valid by adding an acceptable premise, it should be discarded as an invalid argument.

Our example argument can be made formally valid by adding the premise that only those who committed a crime forbidden by written law are liable to be punished. This premise reflects the acceptability of the inference step from the other premise to the conclusion. If such an acceptable additional premise cannot be found, this goes to show that the inference step was not acceptable after all, and it should not be declared valid by an informal logic either. The argument

A is innocent of any crime.
Therefore: A is liable to be punished

needs the additional premise that those who are innocent of crimes are liable to be punished. This premise is not acceptable and therefore the argument cannot be made formally valid by adding an acceptable premise. And rightly so, because it is a bad argument.

Summarised, Soeteman's attack against informal logic which makes use of domain knowledge, comes down to the following. Either the domain knowledge can be made into an acceptable additional premise which makes the argument formally valid. In this case formal logic suffices to show the argument's validity. Or this is not possible, and the verdict of formal logic that the argument is invalid turns out to be the correct one. Also in this case formal logic suffices to show the argument 's invalidity. In other words, as long as one is prepared to change domain related information into additional premises, logic can remain formal in the sense of domain independent. The conclusion that seems to follow immediately is that there is no need for a logic based on special information concerning the legal domain: Legal logic seems superfluous.


## 4.        THE RELATIVITY OF LOGICAL FORM

The attack against domain related logic, and in particular against legal logic launched by Soeteman presupposes the distinction between the form and the content of arguments. My aim in this section is to argue that this distinction

is much less clear than was suggested above. For formal languages, the notion of logical form can be defined in a precise way. With respect to arguments in natural language, the opposite seems to be the case. Take for instance the following argument:

> All thieves are punishable
> John is a thief
> Therefore: John is punishable

If we translate this argument into the language of propositional logic, it receives the following logical form:

> p
> q
> Therefore: r

That arguments of this form are invalid is immediately clear from the interpretation on which p and q are both true, while r is false. Should we therefore conclude that the original argument is invalid? That would be too hasty, because the same argument can also be translated in the formal language of predicate logic. Then it receives the following logical form, which is a valid argument form under predicate logic:

> $\forall$x(Thieve($x$) $\rightarrow$ Punishable($x$))
> Thief(john)
> Therefore: Punishable(john)

It turns out that an argument which has an invalid form under one logic has a valid form under some other logic. In other words, the logical form of an argument seems not to be something that is independently given, but something that it relative to the formalism in which the argument is expressed. By choosing for a particular formalism, one implicitly also chooses along which lines one wants to distinguish form from content. Strawson (1952, p. 52) goes so far as to characterise logical form of statements, and consequently also of informal arguments, by reference to systems of formal logic:

> *'We may say that two statements are of the same logical form when they could correctly be made by the use of sentences which exemplify the same logical formula and in which logical constants have the same logical use which is the standard use for the given system of rules.'*

It is, however, possible to make the example argument valid under propositional logic too. This can be done by adding a premise, namely (p $\wedge$ q) $\rightarrow$ r. This premise might be read as 'If p and q are both true, then r is true'. In the present example it should be read as 'If both all thieves are punishable and John is a thief, then John is punishable'. Clearly this is a true proposition. Therefore we should not make an objection against adding it.

It should be noted, however, that this additional proposition is true, if the conclusion of the argument is true, in case the premises are true. In other words, the truth of the additional premise depends on the intuitive validity of the argument.[9] If we consider the argument to be valid, it can be made valid under propositional logic by adding a premise that expresses this intuitive validity.

The argument adduced by Soeteman against special legal logics can therefore also be adduced against predicate logic. It is superfluous next to propositional logic. If one wants to construct an informal argument as logically valid, one can do so in propositional logic by adding the necessary premise. If this premise is unacceptable, this goes to show that the informal argument in question was invalid after all.

That this approach to predicate logic has not received wide acceptance goes to show that there are no fundamental objections against adopting a more powerful logic, that recognises more logical form, where a weaker logic might have sufficed. This line of argument, replacing form in a more powerful logic by content in a weaker logic, is generally not followed in the relation between predicate logic and propositional logic.

There is no need to follow it in the relation between special legal logics and predicate logic either. It more or less a matter of logical taste whether one works with a more powerful logic, which recognises more logical form, or whether one prefers a weaker logic, which recognises less form and consequently demands more premises to recognise an argument's validity. Logical form is not something that is given with an argument, independent of what one intuitively considers to be form.[10] On beforehand there is no objection against taking elements from the legal domain and incorporating them in a special legal logic, which recognises more logical form than, for instance, predicate logic.

## 5.      A HOLISTIC THEORY OF LOGIC

It would be too hasty, however, to draw the conclusion that there are no objections against allowing any kind of legal 'knowledge' to be part of a system of logic. Some logics are better than some other logics. Good logics characterise precisely those arguments as logically valid which are intui-

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[9]   This is not fully precise, because the additional premise is also true if the conclusion of the argument is true without the argument being valid. For the present purposes this is not relevant, however.

[10]   See on this point also Quine 1986, p. 96. Verheij 1999 argues that validity is relativised to the context of a particular logic (see also Haack 1978, p. 13f.) and uses this conclusion to argue why a dedicated legal logic is possible.

tively considered to be valid. If a logic characterises an intuitively valid argument as invalid this merely shows that the logic in question is not a good one.

The observation that intuitive judgements concerning the validity of arguments can be used to judge the quality of logics, while logics can be used to judge the validity of arguments suggests a parallel to a familiar theme from the philosophy of science which I will exploit here. Let me start with a real life example, stemming from the time when I received some elementary education in chemistry. My teacher wanted to demonstrate that if two substances, say A and B, were put together, some specific chemical reaction would take place, with the effect that a new substance, say C, would result. This new substance C would be recognisable by its colour, which was different from the colours of A and B. The teacher took the substances A and B from two jars labelled 'A' and 'B'. He put them together in a third jar and shook it. However, instead of exhibiting the colour of the substance C, nothing special happened, even after shaking the jar for the second time. Somewhat frustrated my teacher then gave as his explanation of this happening that one of the substances was probably spoiled by the long time that it had been kept in the school.

'Logical' as this explanation may sound at first hearing, it is not so obvious from a more philosophical perspective. Why not assume that this experiment tested the chemical theory that putting together A and B results in a reaction in which C is generated and that the outcome of the experiment falsified this theory? Or that in fact C was generated, but that on this particular occasion C did not have its normal colour? Or that somebody put a different substance in the jar labelled 'A'? Or that there were some exceptional circumstances in the school room which made that the general chemical law was not applicable? Or why not assume in general (rather than only under exceptional circumstances) that the truth (or validity?) of the chemical theory is logically compatible with cases in which the law does not hold?

It turns out that there are many different ways to account for the outcome of the experiment, which are from a logical perspective very different in nature. The experiment might be represented logically as follows:

| | |
|---|---|
| Law 1: | If A and B are put together, C results |
| Facts: | A and B are put together |
| Therefore: | C results |
| | |
| Law 2: | If C results, the resulting colour is X |
| Intermediate conclusion: | C results |
| Therefore: | The resulting colour is X |
| | |
| Actual outcome: | The resulting colour is not X. |

The strategy taken by the teacher (one of the substances was spoiled) was to make an exception to the first law. Apparently this law does not hold if one of the substances is spoiled. Another interpretation would be that the spoiling of one of the substances implied that the substance in question was not really substance A or substance B anymore. Under this interpretation the premise Facts would be false. Again another solution would be to assume that law 2, about the colour of substance C, was wrong, or amenable to exceptions. And the most drastic way out would be to assume that the logic in which the experiment was described is wrong. All the premises are true and nevertheless the conclusion is false, so the logic must be incorrect.[11]

All that the experiment shows is that either not all the premises are true, or that the outcome was described wrongly, or that the logic is incorrect. Somehow one must make a choice from these options in order to account for the outcome of the experiment. The point of this is that such an experiment has no unequivocal outcome. It does not show that either chemical law 1, or chemical law 2 is false. Neither does it show that the substances in the jars were not A and B. And it also does not show that the logic used to describe the argument is incorrect. But the experiment does show that at least one of these elements of the experiment must be revised.[12] Quine (1953, p. 41), following Duhem, observed in this connection

> *'that our statements about the external world face the tribunal of sense experience not individually but as a corporate body'.*

I would like to add that the corporate body is not juxtaposed to our sense experience, but includes the propositional expressions of our sense experience. Experience adds propositions to the complex whole of our presumed knowledge, and if the results are unacceptable the totality of the presumed knowledge must be made acceptable again, by modifying it.[13] The modifications can take place on any level of the whole, from removing of modifying the sentences that express sense experiences, via removing or modifying laws that generalise connections between types of facts, to adopting a different logic. Even the standards by means of which we evaluate a whole of pre-

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[11] Since the logic involved is unspecified, it is not clear what would be the proof that the logic is incorrect. The occurrence of exceptions to laws, for instance, might also prove the logic to be incorrect. This would for instance be the case if predicate logic, or any other monotonic logic, were used.

[12] Obviously one can add even more elements of the experiment which might be in need of revision, such as the assumption that the colours of the substance were correctly observed, etc. But this does not subtract from the point that I want to make.

[13] It would beg the question to use the expression 'inconsistent' instead of the more neutral 'unacceptable' in this connection, because it presupposes an independent logic by means of which consistency can be established.

sumed knowledge as acceptable, and the standards of rationality that should guide the process of adaptation are part of the whole that is the object of mutual adaptation. As becomes clear from these examples, the notion of knowledge at stake here is rather comprehensive, and includes not only traditional empirical knowledge, but also constraints on worlds which we consider to be possible and standards for rationality.

As a matter of empirical fact, it turns out that we are more inclined to modify or throw away some parts of this complex whole than to throw away or modify other parts. Those parts which we are least inclined to change, we call 'logic'.[14] On this view, logic is not opposed to domain knowledge, as it is on the traditional view. There is a continuum in our presumed knowledge, ranging from accidental beliefs which we are willing to revise on the slightest evidence that they are false, through firm beliefs which we only prepared to give up on the basis of strong counter evidence, corroborated laws which we use to derive beliefs from other beliefs and which we only give up if we can find better ones, to 'logical' laws, of which we cannot even imagine circumstances under which we are prepared to give them up. And yet, even some logical laws have become the object of discussion, such as the law of the excluded middle, which is not accepted in so-called constructive or intuitionist logics.

The same thing can be formulated in a different way. Our beliefs and standards are all part of an interconnected whole, which we attempt to make as 'coherent' as possible, where the standards for coherence are part of the system we try to make coherent.[15] Let us call this whole a 'world view'. Logic is by definition that part of a world view which we are least prepared to give up if the world view is less coherent than we find acceptable. Obviously, the borderline between logic and other parts of a world view is not sharply defined. There is no clear demarcation between logic and other beliefs or standards. Moreover, there is no reason why we should create such a clear demarcation, because there is no fundamental difference between logical and other 'knowledge' which could serve as the basis for a demarcation. Even logic is in principle amenable to revision, even though it will not be revised easily. In particular it is not prone to be corrected merely on the basis of empirical evidence. Making changes in one's logic implies making changes in one's overall world view[16], and this is not something which is done on the basis of mere observational knowledge.

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[14] See Quine 1986, p. 100.

[15] This way of dealing with coherence, makes the notion of coherence practically empty. In particular it does not provide any standards for judging coherence. See also note 13. What is retained from classical coherence theories of knowledge is the idea that, at least theoretically, all elements of a believed theory can be supported by, or revised in the light of, other elements of this theory.

[16] See, again, Quine 1986, p. 100.

## 6.  THE POSSIBILITY OF A SPECIAL LEGAL LOGIC

The picture sketched of the nature of logic in the previous section is much more liberal than that sketched in the sections before. Logic is not anymore confined to propositions that stand in necessary truth value based relations because of the meanings of the logical operators that occur within them. It deals with all connections between propositions which we hold to be 'necessary' because we are not prepared to change them in the case of incompatible beliefs. Such necessary connections may be based on the meanings of logical operators, and therefore logic in the traditional sense is part of the holistic logic proposed here. But other necessary connections than those based on the meanings of logical operators fall under the scope of logic too. The relations between what is permitted and what is forbidden, between what is possible and what is impossible, and between what will always be the case and what is the case tomorrow are examples of logical relations which cannot be based on the meanings of logical operators only. Not coincidentally these relations are already the object of logical research, in particular of deontic, modal, and temporal logic respectively. The practice of logic has sometimes been stronger than its theoretical foundations. [17]

The more liberal picture of logic proposed here leaves room for a special legal logic. The task of such a logic would be to explore (semi-)necessary relations that belong specifically to the domain of law. Obviously it is not certain on beforehand that there are such special legal necessary relations, and if there are none, legal logic has no object. Such a conclusion would be the result of logical research in the legal domain, however, and even this might be called research in legal logic.

But there is stronger evidence that legal logic has an object. There is a long standing tradition of logical research concerning the relations between central legal concepts such as rights, obligations, permissions, prohibitions, liabilities, responsibilities, powers, validity, etc.[18] Much of this research deserves to be called logical research. And the last decade there has been a flowering in the research of legal logic inspired by results in the more general field of defeasible reasoning.[19] In combination with the jurisprudential work of Dworkin (1978) and Alexy (1979 and 1985) about the relation be-

[17] Obviously it is possible to define new, more powerful logics with new operators. These operators can be *given* the meanings which make that the relations between the mentioned notions become merely semantic. This does not show that the relations were meaning relations from the beginning, but merely that it is possible to introduce words the meanings of which exhibit relations that were independently necessary.

[18] To mention only a small part of the relevant literature: Hohfeld 1913, Von Wright 1963, Hilpinen 1971 and 1981, and Allen and Saxon 1993.

[19] A good impression of the results can be found in Prakken and Sartor eds. 1997.

tween legal rules and legal principles this has resulted in refined theories about the logic of rules and principles.[20] The same research on defeasible reasoning also promises to contribute to a topic which stands in the centre of recent jurisprudential discussion, that is the possibility to 'weigh' seemingly incommensurable principles and goals.[21] Since my own work in the field of legal logic (in particular Hage 1996 and 1997) has mainly been in the field of defeasible legal reasoning, I will use examples in this sphere to give an impression of what legal logic may count to its domain.

## 7.        OF RULES AND PRINCIPLES

As the first example of typical research in the domain of legal logic I will deal with the relatively recent discussion about the similarities and differences between legal rules and legal principles.

### 7.1        Predecessors

The discussion was started by the almost casual remark of *Dworkin* (1978, p. 24) that rules apply in an all or nothing fashion, while principles contribute to their conclusions, without guaranteeing them. Assuming for a while that this remark was correct, at least one difference between legal rules and legal principles is a logical difference.[22]

 A related topic was addressed by *Raz* (1975, p. 35; 1978, p. 128) in his discussion of exclusionary reasons. Exclusionary reasons are, according to Raz, reasons to act and also reasons not to act on other reasons.[23] Raz uses this notion of an exclusionary reason to analyse mandatory rules. Mandatory rules are in this view exclusionary reasons. They not only provide us with reasons to act in a particular way, but also with reasons not to act on reasons that plead for different behaviour. Again, the view that mandatory (legal)

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[20]  See for instance Verheij e.a. 1998.
[21]  See for instance Chang (ed.) 1997 and Burg 2000.
[22]  It is not a purely empirical issue whether rules and principles differ in the way indicated by Dworkin. If something which is allegedly a principle behaves as if it were a rule, the conclusion should not be that apparently the distinction between rules and principles is not as indicated, but rather that this entity turns out to be a rule after all. On the other hand, the issue is not purely a priori either. If it turns out that in the law there are no rules in the indicated sense, the distinction between principles and rules should not be made as indicated. The legal domain determines how the distinctions of legal logic should be made, but the logical distinctions made on the basis of domain knowledge have a privileged status and are only to a limited extent liable to falsification.
[23]  I doubt whether this is the most attractive analysis of exclusionary reasons, but this is not relevant here. See Hage 1997, p. 19.

rules are exclusionary reasons is a view about the logical behaviour of legal rules and belongs as such to legal logic.

*Alexy* (1979, 1985) elaborated the Dworkinian view by explaining legal principles as 'Optimierungsgebote'. Legally recognised goals would be a more general description in the same spirit. Since there may be several goals involved in choosing what to do, where optimisation of one goal leads to suboptimal result concerning another goal, reasoning with goals, and if Alexy is correct, with legal principles, demands for balancing the different goals. This is in line with, and explains the Dworkinian intuition that legal principles are factors that contribute to legal decisions, without necessarily determining them. Needless to say that Alexy's analysis of the functioning of legal principles is a logical one, and moreover a logical analysis specifically devoted to the legal domain (or maybe more generally to the domain of practical reasoning).

## 7.2 Legal logical analysis

The theories of Dworkin, Raz and Alexy can be treated as the intuitions that form the starting point for a coherent reconstruction. Such a reconstruction can start from the basic notions of reasons. I will distinguish two types of reasons, that is *contributive reasons* and *decisive reasons*.[24] Both kinds of reasons consist of one or more facts that plead for a particular conclusion. A decisive reason guarantees its conclusion, while a contributive reason merely is a factor that contributes to its conclusion. For example:

| The fact that | John and Peter are brothers | is a | decisive reason for the conclusion that | John and Peter are siblings |
|---|---|---|---|---|
| The facts that | the thief was a man and that the only man who had the occasion to steal was Michael | are a | decisive reason for the conclusion that | Michael was the thief |
| The fact that | Michael is a thief | is a | contributive reason for the conclusion that | Michael ought to be punished |

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[24]   See also Hage and Peczenik 2000.

| The facts that | there should be less murders and that adopting a prohibition to murder diminishes the number of murders | are a | contributive reason for the conclusion that | a prohibition against murdering should be adopted |
|---|---|---|---|---|

The notion of a contributive reason can be used to define goals. A state of affairs is a *goal* (for somebody) if the fact that some action contributes to this state of affairs is normally a contributive reason (for this person) to perform this action.

For instance, being secretary of the IVR is a goal (for Madeleine) if the fact that some action contributes to becoming (or remaining) secretary of the IVR is normally a reason (for Madeleine) to perform this action.

If principles are defined as goals, as Alexy does, this same definition can also be used for (legal) principles. The relation between principles and goals on the one hand, and contributive reasons on the other hand, is a technical rendering of Dworkin's and Alexy's view that principles contribute to their conclusions, without guaranteeing them.

The notion of a decisive reason can be used to define (legal) rules. A (legal) rule connects two states of affairs. One of them is mentioned in the condition part of the rule; the other one in the conclusion part of the rule. If the state of affairs in the condition part of a rule obtains, this is normally a *contributive* reason why the rule applies to this state of affairs. If a rule applies, this is a *decisive* reason for the rule's conclusion. Entities which exhibit this logical behaviour are (legal) rules.

Take for instance the rule that thieves are liable to be punished. The condition part of this rule refers to the state of affairs that somebody is a thief; the conclusion part refers to the state of affairs that this person is liable to be punished. If Michael is a thief, this is normally a contributive reason why this rule applies to Michael. (There may also be contributive reasons against applying the rule to Michael, for instance, that application would be against the rule's purpose.) If the rule actually – that is, on the balance of reasons - applies to Michael's case, this is a decisive reason for the conclusion that Michael is liable to be punished. This is a more technical rendering of Dworkin's view that rules apply in an all-or-nothing fashion.

To account for Raz's analysis of exclusionary reasons, we must expand our analysis. In the definition of goals and rules, I wrote that the fact that some action contributes to a goal is *normally* a reason to perform this action, and that if the state of affairs in the condition part of a rule obtains, this is *normally* a contributive reason why the rule applies to this state of affairs.

The word 'normally' was included, because there may be exceptions, not mentioned in the rule conditions or in the formulation of the goal.

For instance, if a rule is in conflict with a more specific rule, there is normally an exception to the more general rule. This exception means that the fact that the rule conditions are satisfied is not a reason anymore to apply the rule.

If a principle seems to apply in a particular situation, but a rule with an incompatible conclusion is applicable in this situation, this normally (if there is no exception to the rule) means that the principle does not apply, and that the principle does not lead to a contributive reason for its conclusion. Assume for instance that the government has enacted a particular law in which ecological and economical considerations are balanced. This law allows building a nuclear plant in a certain location. The goal to safeguard the environment would normally lead to a reason not to allow the plant, but since this goal was taken into account in the law, it is 'put out of action' by the applicability of the rule. It does not generate a reason for its conclusion (disallow the plant) anymore. This example illustrates Raz's view that mandatory rules are exclusionary reasons. The applicability of the rule puts conflicting principles out of operation.

The analysis of contributive reasons, decisive reasons, goals, principles and rules that I described informally in the previous paragraphs can be given a precise, formal description.[25] The result belongs to a branch of formal legal logic.


## 8.　　　　BALANCING CONTRIBUTIVE REASONS

A much-discussed topic in the recent literature on legal theory is how to balance values that seem to be incompatible. The basic insight behind this discussion is that is impossible, at least practically, to treat all values as subvalues of one overarching one, such as the maximisation of happiness. As a consequence there seems to be no rational way to deal with a conflict of such incommensurable values.

It is a task of legal logic, or at least the logic of practical reasoning, to contribute to this discussion of comparing the seemingly incomparable. A beginning of such a contribution can be found by treating values as a kind of goals. We then arrive at the valuable insight that conflicting values lead to contributive reasons for complementary actions, or – which comes down to the same thing - contributive reasons for and against the same action.

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[25]　I have attempted to do so in my 1997. See also Verheij 1996.

Take again the decision whether to allow a nuclear plant. At least the value of a healthy environment and the value of a prospering economy conflict in this case. This conflict can be depicted as a collision of contributive reasons. The fact that allowing a nuclear plant contributes to a prospering economy is a contributive reason for the conclusion that the plant should be allowed. The fact that the same action detracts from the value of a healthy environment is a contributive reason against the same conclusion. The conflict of values can thus be treated as a collision of contributive reasons. It is possible to deal with such collisions by means of a logic for reasons.

## 8.1 Degrees of relevance

A contributive reason for a conclusion is a fact, that is: a state of affairs that actually obtains, which is relevant for a particular conclusion, without guaranteeing the truth of this conclusion. Relevance comes in degrees. Some facts are highly relevant for a conclusion, while other have only little relevance. For instance, the fact that Mary was the only person who had the opportunity to steal the bracelet is highly relevant for the conclusion that Mary stole the bracelet. (It might even have been a decisive reason, if there had not been the possibility that the bracelet was lost instead of stolen.) On the other hand, the fact that John has recently visited the house where the victim was murdered is only a weak reason for the conclusion that John murdered the victim.

The relevance of reasons for a conclusion may be increased by facts that are not reasons for the same conclusion themselves. If, for instance, the house was locked after John left it, the relevance of the fact that John visited the house increases substantially.

If there is both a contributive reason for a conclusion, and a contributive reason against the same conclusion, and no other relevant information is available, there are no rational means to decide which conclusion, if any, should be drawn. Such a situation would occur if Mary was the only person who had the occasion to steal the bracelet while at the same time there is a witness providing Mary with an alibi. If there is no information regarding the relative importance of these reasons, the conflict of the two reasons cannot be solved rationally.

If, however, it is somehow given that the reason for the conclusion is substantially more relevant than the reason against it, the rational thing to do is to draw the conclusion. If it is somehow given that the fact that Mary was the only person with an opportunity outweighs the declaration of the witness, it can rationally (but without a guarantee of truth) be concluded that Mary stole the bracelet. Notice in this connection that the question which reason is the more relevant one is in general not a matter of logic. It is a premise of the

argument, just like there are premises stating that there is a contributive reason for the conclusion and a contributive reason against it.

The premise that one reason is more relevant for a conclusion than another reason can be stated by saying that the former reason outweighs the latter reason (with respect to this conclusion). Such a statement can be treated as any ordinary statement, which means amongst others that it may be the outcome of an argument. It is possible to reason about the relative weight of reasons for and against a conclusion. The premises of such arguments are in general not a matter of logic, but it is possible to formulate logical insights in this connection.

Suppose that it is given that reason consisting of Mary's opportunity normally outweighs the reason consisting of the alibi. In the presence of these two reasons it is therefore rational to conclude that Mary stole the bracelet. Suppose moreover that next to these two reasons there are additional circumstances that increase the relevance of the reason concerning Mary's opportunity. One might in this connection think of the fact that it is impossible that the bracelet was merely lost. By means of an a fortiori argument one can then forcefully argue that in the presence of this additional information, the reason concerning Mary's opportunity certainly outweighs the reason based on the alibi.

If however, there are circumstances that increase the relevance of the alibi, instead of the opportunity, the original premise that the opportunity outweighs the alibi looses its plausibility. It is not rational anymore to assume that the opportunity outweighs the alibi, and therefore the conclusion that Mary stole the bracelet cannot reasonably be drawn anymore.

Without additional information, it is not possible either to draw the opposite conclusion, that Mary did not steal the bracelet, either, because it is not given how much the relevance of the alibi in relation to the opportunity was increased. The additional information that increases the relevance of the alibi only makes it impossible to draw the conclusion that Mary stole the bracelet.

## 8.2    The accrual of reasons

A second example of reasoning about the relative weight of sets of reasons has to do with what has been called the 'accrual of reasons'.[26] Until now I have tacitly assumed that reasons are weighed one by one. Often this assumption is correct, but sometimes it is not. To return to our example of the nuclear plant, there may be other considerations than economic and ecological ones that influence the decision whether to allow the plant. To take the possibility of more than two reasons into account, the balancing of reasons

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[26]   A discussion of this phenomenon can be found in Hage 1997, p. 203/4.

can be treated on the level of *sets* of contributive reasons. A conclusion can rationally be drawn if the set of contributive reasons that plead for it outweighs the set of contributive reasons that plead against it. The simplest case, in which there is one reason for the conclusion and one reason against it, is then treated as a collision of sets of reasons, where each set contains exactly one reason.

This extension of the 'logic of reasons' makes it possible to say a little more about the relative weight of sets of reasons. Suppose that the government decided that the economic considerations for allowing the nuclear plant outweigh the ecological ones. We then have the weighing information that the fact that allowing the plant contributes to economic prospering outweighs the fact that this detracts from a healthy environment. Let us now add an additional reason for allowing the plant, namely that the former president of the country would be pleased if the plant were allowed. Admittedly this is not a very strong reason, but it is added to the economic reason. Now we have two reasons for allowing the plant, and one against it. Since the economic reason by itself already outweighed the ecological one, it may be concluded a fortiori that the two pro-reasons together certainly outweigh the one reason against allowing the plant.

If we change the case a little bit, to the effect that allowing the plant would very much displease the former president, this would give an additional reason against allowing the plant. There are two reasons against allowing the plant, and only one for allowing it. The mere number of reasons does not determine which set of reasons wins; it is a combination of number and relevance. The economic reason outweighs the ecological reason taken by itself, but it is not certain that it also outweighs the combination of the ecological reason and the reason that the former president would be displeased. The available information does not allow to draw a conclusion rationally.

## 8.3    Alternative actions

The above examples give an impression of some lines along which a logic of contributive reasons might be developed. Before concluding this section I will add one more example. Until now I assumed that there are contributive reasons for and against *one particular action*. The power plant should be allowed, or it should not be allowed. Legal reality is often more complicated. We must make a choice between several lines of action, each with its own advantages and disadvantages, where the choice for one line of action excludes the choice for the other lines. The problem is to find the best line of

action, and if we find one line to be the best one, this is a decisive reason against adopting any one of the others.[27]

Also in this connection the logic of reasons can be helpful. Let me again add to the example of the power plant. Suppose that power plants come in two types, A and B. Type A has all the economic advantages of type B, but less ecological disadvantages. Assuming moreover that there are no other relevant considerations such as cost aspects, it is obvious that building a plant of type A is to be preferred to building a plant of type B.

This example can be generalised as follows. If action A has all the pro-reasons of B and maybe even more, while it has less of the con-reasons than B. A is to be preferred to B. The same counts if A has all the pro-reasons of B and more, while it has not more con-reasons.

An analogous construction can be made for the case that the reasons are the same, but their relevance is different. If the pro- and con-reasons of actions A and B are the same, but one or more of the pro-reasons weigh more heavily in the case of A than in the case of B, while no of the con-reasons weighs more heavily in the case of A, action A is to be preferred to action B. The same counts if the con-reasons in the case of A weigh less heavily than in the case of B.

Finally, the arguments based on the number and relevance of the reasons can be combined. To avoid cumbersome formulations I will refrain from spelling this out, but the underlying ideas are the same as in the former two cases.[28]

## 8.4    Concluding remarks on the balancing of reasons.

Logic cannot give an absolute answer to the question which reasons are the most important. But I hope to have shown that it can give relative answers in the sense that it is possible to determine which set of reasons outweighs which other set on the basis of already available weighing information. The same technique can be used to make rational choices between competing lines of action.

It may be questioned whether this type of logic, that deals with balancing colliding reasons, is typically legal. But it is certain that it is highly relevant for legal reasoning[29] and that it deals with notions that take a central place in legal reasoning. Moreover, the logic that deals with the balancing of reasons

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[27] If the differences in value between alternatives are small, this last statement might be overdone.

[28] The theory described above was formalised in Hage 2000.

[29] This is, amongst others, illustrated by the thesis of Burg 2000, who employs some of the ideas of the logic of balancing reasons to explicate and further develop Dworkin's coherence theory of the law.

nicely integrates with the logic of rules and principles discussed in the previous section.[30] Together they illustrate how there can be a logic that takes its starting point in intuitions from practical reasoning in general and legal reasoning in particular.

## 9. THE PRACTICAL RELEVANCE OF LEGAL LOGIC

A misunderstanding about logic that arises with a certain regularity is that logic by itself can solve problems. In connection with the law, this misunderstanding would amount to the view that the solution to particular legal cases is merely a matter of logic. The misunderstanding seldom arises in this particular form. The more frequent variant comes in the form of criticism: logic has little use in the law, because legal issues are never merely logical ones. One part of the criticism is correct: The solution of a legal issue is never merely a matter of logic. The second, crucial, part is incorrect. That logic by itself cannot solve legal issues is not a deficiency of logic. Next to logic, the solution of legal cases calls for premises to which the logic can be applied. It is to some extent comparable to cars, which cannot drive by themselves, but need fuel. That cars cannot ride by themselves is hardly reason to criticise them.

When we look at the legal relevance of logic in general, and legal logic in particular, we should therefore not look at cases which can be solved by means of legal logic alone. Nevertheless legal logic has practical relevance, because it provides the framework that must be filled by legal premises to determine which conclusions follow. The framework does not provide us with the premises, but it does specify the nature of the premises. I will discuss two examples to illustrate how legal logic, in combination with material law, influences both legal dogmatics and the outcome of legal cases.

## 9.1 The scope of interpretation

If legal rules had the same logic as 'normal' conditional sentences, their conclusions would follow with logical necessity if their conditions are satisfied. Take for instance the rule that thieves are liable to be punished and let us assume that this rule can be analysed logically as the sentence:

For everybody holds that if (s)he is a thief, (s)he is liable to be punished. Under this analysis it follows from this rule and the premise that John is a thief with logical necessity that John is liable to be punished. There is no

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[30]  In fact, the two were developed in combination in my 1996 and 1997.

exception possible, because the presence of an exception would imply that the rule in its present formulation is not valid. If the formulation of a rule has a clear basis in the text of a statute, it is not very viable to argue that the rule actually runs differently than the text of the statute strongly suggests. Somebody who wants to argue that the rule should not be applied to a particular case has then only one option left, namely to argue that the case does not satisfy the conditions of the rule. The rule should be interpreted such, and the case should be classified such, that the case as classified does not fall under the rule conditions as interpreted. (John is not a thief in the sense of the rule.)

One of the main reasons why the law has developed such a vast apparatus to deal with rule interpretation is that this apparatus must provide the lawyer with means to adapt the conditions of rules to the needs of legal practice. If it is desirable that a rule should be applied to a case, there should be means to interpret the rule conditions in order to make the case fall under these conditions. If it is undesirable that a rule is applied to a case, it should be possible to interpret the conditions in such a way that the case does not satisfy them.

This practice, useful as it may be, has sometimes forced lawyers into interpretations that are a bit farfetched given the normal meaning of the rule formulation. The Dutch law, for example, has a statutory rule that says that an infringement of a property right is a tort. Sometimes this led to the conclusion that an act was to be considered tortuous when it seemed undesirable to do so. Both legal doctrine and judge made law came therefore with restrictive interpretations of this statutory provision. Only intentional infringements or direct infringements should be considered as infringements in the sense of this provision (Spier e.a. 1997, p. 31f. ). Attractive as the outcomes of these interpretations may have been, they are certainly not in agreement with the text of the statute, which just speaks of infringements, without any restrictions. It would be better if the desired outcomes for the cases in question could be reached without taking recourse to such 'strange' interpretations.

In fact this is possible. What is needed for the right solution for the cases in question is that an infringement to a property right is not considered as tortuous. The rule that infringements on property rights are considered to be tortuous should not be applied to these cases. Under traditional logic this is only possible by assuming that the conditions of this rule are not satisfied and this led to the forced interpretations mentioned above. Recent work on legal logic has shown us the possibility to make exceptions to legal rules without changing the rule conditions by means of interpretation. If there are good reasons not to apply a rule to a case, although the conditions of the rule are at first sight satisfied, we can say that the reasons against applying the rule outweigh the fact that the rule conditions are satisfied as a reason to apply the rule. The logical conclusion is then that the rule should not be ap-

plied, although its conditions are satisfied, and that the conclusion of the rule does not follow. It is then logically possible that an act infringes a property right, that we have a valid legal rule to the effect that such infringements are tortuous, and that this act is nevertheless not tortuous. Having this logical possibility takes away the necessity to obtain desirable legal outcomes for cases by interpreting rules in farfetched ways. Improvement in logical insight can improve legal doctrine and legal practice.

## 9.2　Review of statutory rules

Suppose that we have a legal issue, for instance whether religious processions are allowed. There are both reasons for and against an allowance. Considerations concerning the free flow of traffic plead against, while considerations concerning the freedom of religion plead for allowing processions. If a legislator wants to regulate the subject matter of religious processions, he will consider all reasons that he deems relevant for making a legislative decision. The legislator is free (subject to some political constraints) to decide which reasons will be taken into account and which will not. On the basis of these reasons, the legislator takes a decision, that will be the result of weighing the reasons that are deemed relevant by the legislator.

The result of this decision making process is laid down in a legal rule, which in its turn identifies the facts that from now on are relevant in determining whether processions are allowed or not. For instance, processions will only be allowed on Sundays. This condition is the result of weighing the reasons that were involved in the legislative decision making process. Whether this condition is satisfied is now the reason why a particular procession is allowed or not. This reason *replaces* the reasons that originally determined whether a procession was allowed or not, or - better - they replace the reasons that went into the legislative decision making process. The legal rule as the outcome of legislative decision making determines which reasons are from then on legally relevant, and excludes all the reasons that were taken into account in drafting the rule (reasons based on the freedom of religion, and on the interests of the traffic). The reasons based on legal rules may therefore be called *replacing reasons*.

What does it mean for legal decision making, if the reasons identified by a rule of law replace the political reasons that were involved in drafting the law? If a rule of law is applied to a particular case, it generates a decisive reason to decide this case in a particular way. But this is not the whole story. If the rule is applied, it also generates exclusionary reasons that prevent other potential reasons to be taken into account. In particular, those principles and goals that were taken into account in drafting the legal rule will now be left out of consideration. Indeed, if the legislator has taken a decision about their

role while drafting the legal rule, it is not the task of the judiciary to redo the job of the legislator and give its own opinion about the role of these principles and goals. The reasons identified by the rule replace the reasons that already were involved in drafting the rule.

However, if there still are legally relevant facts that were not taken into account by the legislator, not even in the sense that they were discarded as irrelevant, these facts are not excluded by the reasons generated by the legal rule. A legal decision maker must still take these facts into account as legal reasons next to the reason identified by the legal rule. For instance, if the prohibition on legal processions infringes the right of every citizen to move where he or she wants, and this right was not taken into account in making the rule about processions, this right to move still generates a reason that must be taken into account.[31]

The Dutch Supreme Court (Hoge Raad) has actually given a decision that seems to confirm this theory about the relation between legal rules and principles (HR 4 april 1989, NJ 1989, 469, Harmonisatiewetarrest). By means of the so-called 'Harmonisatiewet' the Dutch legislator changed (shortened) the period during which a student who started a second study is entitled to financial support. The transitional rules for those who had already started a second study were few. Some of these students claimed in law that the Dutch government would not apply the Harmonisatiewet to them. One of the reasons underlying this claim was based on the principle of legal security: the government should not violate expectations which it had given rise to itself.

To judge the claim of the students, the Dutch Supreme Court addressed, amongst others, the question whether it was possible to review the Harmonisatiewet against the principle of legal security. In this connection, the Supreme Court remarked that two situations must be distinguished. On the one hand there is the situation in which the legislator has taken into account the factors, made relevant by the principle, that plead against the legislation. In this situation, there is no room to review the statutory rule against the principle. On the other hand, there is the situation in which the legislator did *not* take these factors into account. In that situation, the rule may be left out of application if, in a concrete case, it conflicts with a fundamental legal principle.

Notice that the Supreme Court distinguishes between reasons that were taken into account in making the legislation and reasons that were not taken into account. If the reasons were taken into account, the rule may, in my terminology, be said to replace the principles on which these reasons were based. In that case, there is no room for reviewing the rule against the principle. The applicability of the rule excludes the application of the principle.

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[31] It should be taken into account as a reason not to apply the rule about processions; see section 7.

If the reasons based on the principle were not taken into account, the rule does not replace the principle, and the application of the principle is not excluded. In this case, the rule must be reviewed against the principle. This review is, according to the Dutch Supreme Court, confined to concrete cases. In my terminology this boils down to it that the review concerns the application, not the validity of the rule.

Obviously, the decision of the Dutch Supreme Court was not dictated by legal logic alone. But in my opinion equally obvious, it is made highly plausible by a combination of jurisprudential and logical considerations. The issue at stake was one of constitutional law and dealt with the position of the legislator with respect to legal principles and the goals underlying the law. It is not a matter of logic that political decisions made by the legislator overrule pre-existing goals and principles. But the relation between rules and their underlying principles and goals can be seen as a matter of logic. Legal logic can tell us that the applicability of a rule can under certain circumstances block the application of goals and principles which are at first sight relevant. It is a matter of positive law what these circumstances are.

Legal logic can also tell us that it is possible to make exceptions to rules. Again it is a matter of positive law under which circumstances these exceptions are to be made. An analysis as the one given above, according to which legal rules are seen as a kind of summaries of their underlying goals and principles, is not a purely logical analysis. It requires some understanding of constitutional law and the relation between law and politics in our society. However, the analysis gains much in plausibility on the basis of a logical theory according to which the applicability of rules can exclude the application of principles and goals. The insights with which legal logic provides us draws, so to speak, our attention to possible constructions. Jurisprudential theory and positive law then determine whether we should use these constructions. Legal logic creates the possibilities and positive law makes use of them. Neither one of them can be missed.

## 10.    CONCLUSION

In this paper I have argued for the possibility of legal logic, by attacking the argument based on the opposition of form and content. I have shown that there are legitimate topics for legal logic, in the form of the study of the logical relations between central legal concepts. And I hope to have shown that legal logic is relevant for legal practice by influencing the way we conceptualise this practice. Probably none of these observations is completely original, but I hope that in combination they can serve as a motivation to pay serious attention to legal logic. The subject deserves it.

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