How Law's Nature Influences Law's Logic

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Abstract:
Classical logic is based on an underlying view of the world, according to which there are elementary facts and compound facts, which are logical combinations of these elementary facts. Sentences are true if they correspond to, in last instance, the elementary facts in the world. This world view has no place for rules, which exist as individuals in the world, and which create relations between the most elementary facts. As a result, classical logic is not suitable to deal with rules, and is therefore unsuitable to deal with legal reasoning. A logic that is more suitable should take into account that law is a part of social reality, in particular a part that consists of constructivist facts, and that rules play a central role in law. This article gives a superficial description of how social reality exists and of the place of law and legal rules in it. It uses this description to argue that traditional techniques to reason with and about legal rules provide a better logic for law than classical logic. These techniques can be accommodated in a logic that treats rules as logical individuals.
Keywords: classical logic, constructivist facts, rules, social reality.

1. Introduction

The aim of this article is to argue that the nature of law influences the logic of legal reasoning and to give an impression of how this 'works'. The argument consists of three steps. In the first step it is shown how classical logic, which I will take to be first order predicate logic (Priest, 2008, p. xvii), is based on an underlying view of the world. This view has no place for rules and as a result, classical logic wrestles with rules and their role in (legal) reasoning. In the second step, an alternative view of the world is presented. In this view, a central place is taken by social reality and by the role of rules in it. In the third step, it is shown how traditional forms of legal reasoning are better suited than classical logic to deal with legal rules and that these traditional forms better fit the 'social' image of law that was presented in the second step.

2. Classical Logic

A particular version of logic has dominated logical theorizing during the twentieth century and particularly the first half thereof. This version is (first order) predicate logic, or a stripped down

version of it, propositional or sentential logic. Because of its central role, this logic will here be called 'classical logic'. Classical logic is a formal logic, which means that it considers the validity of arguments to depend on the form of arguments only, and not on their substance (what the arguments are about). Although other variants of formal logic were developed – in fact, they blossomed since the 1950s – they typically took classical logic as their starting point.

Let us take a closer look at the world view that underlies classical logic.[1] We can find it in the semantics of the logic, and in particular in the informal interpretation thereof. The starting point of it all is the idea that an argument is deductively valid[2] if and only if it is logically impossible that all the premises of the argument are true, while the argument's conclusion is false. Truth and falsity are in logical theory taken to be semantic notions, and therefore this idea of logical validity is called the semantic notion of validity.

Classical logic uses this semantic notion and therefore relies on the idea of logical (im)possibility: in a valid argument it is logically impossible that the premises are true and the conclusion false. But what does logical possibility mean? To answer this question, the theory of classical logic developed so-called 'model-theoretic semantics'. It is this model-theoretic semantics – from now on 'semantics' – in which the world view (ontology) underlying classical logic is made explicit. I will briefly describe this semantics in the following section, to the extent that is necessary to elucidate the ontological assumptions underlying classical logic.

3. Semantics

The semantics of predicate logic consists of two parts. The first part deals with the truth conditions of elementary sentences, such as 'Four is an even number', 'John is a thief', or 'All thieves ought to be punished'.[3,4] The second part deals with the truth conditions of compound sentences, such as 'John is a thief, and all thieves ought to be punished'.

The world contains zero or more objects, which logicians call 'individuals'. Examples of such individuals are this table (a material object), Iris (a person), the number four (an immaterial individual), or the United Nations (another immaterial individual). The world also contains zero or more sets of individuals. These sets informally stand for classes[5] such as the class of wooden objects, individuals who ought to be punished, even numbers, or governmental organisations. For any individual it holds that it is an element of zero or more of these sets. For instance, this table is an element of the set of wooden objects, Iris and the United Nations are elements of the set of entities which ought to be punished, four is an element of the set of even numbers, and the United Nations are also an element of the set of governmental organisations. Figure 1 gives an impression. In this figure, circles represent sets (thieves and those who ought to be punished), and small letters (a-d) represent individuals.
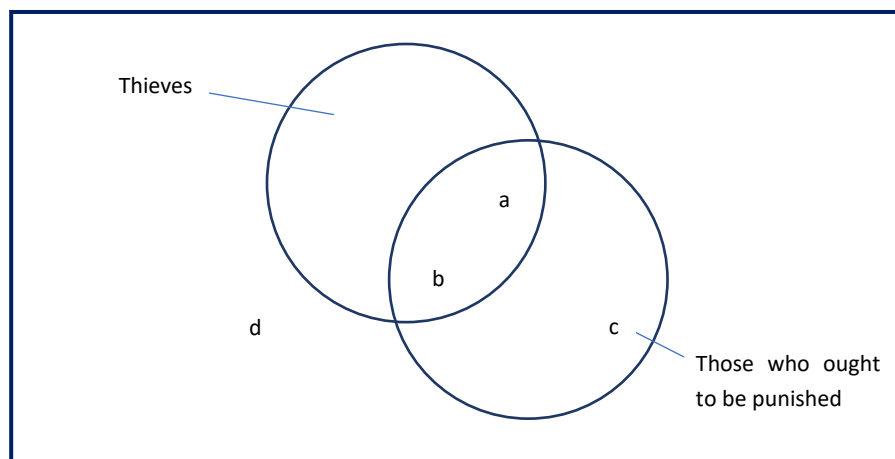

Figure 1. Sets and individuals.

The individuals a and b are both elements of the sets of thieves and of those who ought to be punished. c is only an element of the latter set and d is not an element of any of these two sets.

An important assumption of the semantics is that the assignment of an individual to a set neither depends on, nor influences, the assignment of other individuals to sets. So, the assignment of b to the set of entities that ought to be punished neither influences the assignment of any other individuals to this set, nor the assignment of b to any other set. Moreover, whether b is assigned to the set of thieves has no influence on whether this individual is also assigned to the set of entities which ought to be punished. As we will see, this independence makes classical logic with its underlying ontological assumptions unsuitable for dealing with rules.

There are three kinds of elementary sentences.

• An elementary sentence stating that an individual is an element of a set (e.g. 'a ought to be punished') is true if and only if that individual actually is an element of this set. This is the case in figure 1. However, according to this figure, the sentence 'd ought to be punished' would be false.

• An elementary sentence stating that a set has elements (e.g. 'There are thieves) is true if the set contains at least one individual. Since the set of thieves in figure 1 contains two individuals, this sentence comes out true.

• An elementary statement that all the individuals are elements of one particular set (e.g. 'Everything ought to be punished') is true if indeed all individuals are elements of this set. In figure 1 no such sentence is true, as there is no set which contains all individuals.

It deserves emphasizing that in the semantics of predicate logic, a sentence is either true or false. It is not possible that a sentence is both true and false if, for instance, there are both good reasons why Iris ought to be punished and good reasons why she ought not to be punished. Neither is it possible that a sentence is neither true nor false. And, finally, a sentence cannot be true to some degree. This may be problematic for characteristics which come in degrees, such as baldness, or for general statements which are for most cases but not for all cases, such as 'Birds can fly'.[6]

The truth or falsity, that is the 'truth value', of compound sentences depends on the truth value(s) of the sentence(s) from which it is composed and on the way these sentences are joined together by a logical operator. A sentence with the structure A&B (informally 'A and B') is true, if and only if both the sentences A and B are true. A sentence with the structure A∨B (informally 'A or B') is true, if and only if at least one of the sentences A or B is true.

For this article it is not important how model-theoretic semantics can be used for defining the validity of an argument, but for the sake of completeness I will say a little about it. A logically possible world is an assignment of individuals to the sets that correspond to the predicates of the logical language. Since there may be many ways to make this assignment, there can be many different logically possible worlds. Together, these worlds define what is logically possible. In some of these possible worlds, all the premises of an argument come out true. These worlds are called 'models' of the premises. An argument is valid if and only if the conclusion of the argument is true in all models of the argument's premises (Smith, 2012, chapter 9).

4. Rules in Predicate Logic

Predicate logic distinguishes in its semantics between sentences which are true or false, and the world, consisting of individuals and sets, which makes the sentences true or false. The relation between the world and the sentences is unidirectional: the world gives the sentences their truth values and the sentences do not influence the world. In this simple picture, there is no place for rules, as rules influence the world. Let me explain.

It is often assumed that rules prescribe behaviour. Only in a benevolent interpretation of prescribing, this is sometimes true.[7] Many rules do not prescribe in any sense. Some rules make that things also count as other things, such as the rule that cars count as vehicles for the purpose of the Traffic Act. Other rules assign competences, such as the rule that makes Parliament competent to create statutes. Still other rules assign legal status, such as the rule stating that if the King dies, his oldest daughter becomes the new Queen. And *some* rules impose duties, such as the duty to halt at

red traffic lights, or obligations such as the obligation to compensate the damage caused by one's negligence. Only duty- and obligation-imposing rules can be said to prescribe behaviour, and then only in the indirect sense that the duties and obligations they create are reasons why an agent ought to do something (Hage, 2022, pp. 111-112).

Rules fulfil many different functions, but there is one thing they have in common and that is that they attach facts to other facts. (More on facts in the next section.) A classificatory rule attaches the fact that something is a vehicle to the fact that it is a car. A competence-conferring rule attaches the fact that something has the competence to create statutes to the fact that this something is Parliament. And a duty-imposing rule attaches the duty to halt for red traffic lights to the fact that somebody is a traffic participant. The core function of rules is to attach new facts to existing ones and the semantics of predicate logic has no place for entities with this function.[8]

As a result, predicate logic has a problem with rules. This problem becomes manifest in, amongst others, the phenomena that rules lack truth values and that reasoning with rules is non-deductive. Admittedly, there have been attempts to modify predicate logic to make it possible to represent rule-based arguments. But, first, these modifications had to abandon the simple semantics of predicate logic, for instance by making the truth value of some sentences dependent on more than one possible world and, second, they still make the mistake to treat rules as *reflecting* the facts in these possible worlds, while they should account for it that rules *influence* the worlds in which they exist.

Having diagnosed what goes wrong in classical logic when it has to deal with rules, it is time to make a new start. In the following sections, I will give a brief account of how social reality exists and of the role that rules play in it. This account will function as a new foundation for the logic of rules.

5. Introducing Social Reality

In this section and the following ones, I will attempt to show in some detail how the existence of rules, including legal rules, is *in last instance* a matter of social fact and that the existence of many social facts, including facts about the existence of rules, depends on rules.[9]

In the following, I will use the words 'fact' and 'state of affairs' in a technical sense. My starting point will be the existence of a language which includes statements (descriptive sentences). Statements express states of affairs and are either true or false. For instance, the English language includes the statement 'It is raining'. This statement expresses the state of affairs that it is raining and is true if it is raining and otherwise false. If the sentence is true, the expressed state of affairs is a fact, and otherwise not. In this connection, a fact is an element of the world that makes a declarative sentence (or a proposition) true. The world is then the set of all facts.[10]

People distinguish between what is objective, subjective, and social. The distinction between these three kinds of states of affairs is based on two underlying characteristics which may be present or not. The two characteristics are whether the state of affairs is:
1. mind-dependent; and
2. the same for everybody.

Objective states of affairs are (1) not mind-dependent and (2) the same for everybody. An example would be the state of affairs that Mount Everest is a higher mountain than the Vaalserberg (the highest 'mountain' of the Netherlands).

Subjective states of affairs (1) depend on what individual persons think they are and are mind-dependent, and (2) are therefore not the same for everybody. An example would be the 'fact' that Mozart was a better composer than Brahms. Many people would not call subjective facts 'facts' at all; they reserve the predicate 'fact' for objective and perhaps also social facts.

Social states of affairs are somehow in between objective and subjective: (1) they depend on what the members of a social group recognise and are in that sense mind-dependent, and (2a) they are the same for the members of a group, but (2b) not necessarily the same between groups. One example is the law of a country. The law depends, in a complicated manner, on what the legal

subjects of a country recognise as law, and is the same for these legal subjects. However, different countries may have different laws, and what is the law for a Frenchman may not be the law for somebody in China.

6. Conventional Social Facts

Social facts are either conventional or constructivist. Conventional social facts only (but not always) exist in a group if most members of that group *recognise* that they exist. For instance, Hendrik is the leader of the Maastricht Cycling Club (MCC) if sufficiently many members of that club recognise Hendrik as their leader. A person recognises a fact if she believes that this fact exists and if that person tends to act in accordance with this belief. The simplest case is when recognition is nothing more than mere belief. If Mary believes that yesterday the train to Groningen left at 15h00, she also recognises this fact. However, the recognition of a fact usually involves more than mere belief. To have a leader for a club means that club members believe that some person is the leader, but also that they attach the relevant consequences to this believed leadership. What these consequences are, depends on how the notion of leadership is given content, but there cannot be leadership without any consequences. This means, for instance, that if the leadership of Hendrik involves that club members must do what Hendrik tells them, they will have the disposition to act accordingly.

Sometimes the task of recognition is delegated to one or more specific persons or institutions. A well-known legal example is that the recognition of rules as legal rules is delegated to courts and other 'officials'. Delegated recognition presupposes that the persons to whom the recognition is delegated (the representatives) are recognised as such and that the members of the group tend to recognise what their representatives recognised on their behalf. So, if legal subjects delegated the task to recognise rules as law to the courts, they should recognise courts as their representatives for this purpose and they should normally recognise rules as law for the reason that the courts recognise them.

There is more to the existence of conventional facts than mere recognition. For instance, it should not only be the case that sufficiently many members of MCC recognise Hendrik as their leader; the club members should also believe that sufficiently many other members also recognise Hendrik as leader of the group, and that these other members have the same beliefs about their fellow cyclists. In other words, a group member such as Petra should not only have beliefs about Hendrik, but also about what her fellow group members recognise, including what her fellow group members believe about the beliefs of Petra herself.

A third condition for the existence of conventional social facts is that something can only be a conventional fact if states of affairs of that kind are not considered to be objective, subjective or constructivist. For instance, even if everybody believes that heat consists of calories, and also believes that everybody else believes this, it is still not a social fact. The reason is that the nature of heat is (usually) considered to be an objective state of affairs. For types of states of affairs that are considered to be objective, such as the nature of physical phenomena, the existence of a consensus is not decisive for what the facts are.

To be conventional, a kind of state of affairs should also not be considered as constructivist. For a constructivist in ethics, the mere consensus about a particular moral judgment does not prove the judgment to be correct. Even if 'everybody' agrees that coloured people are inferior, this does not show coloured people to be inferior indeed. Contrast this with being the leader of an informal club, where consensus is decisive.

So, the existence of a conventional social fact requires recognition on two levels: a particular type of state of affairs must be considered social – not objective or subjective – and not constructivist, and a concrete instance of this type must be broadly recognised as existing. For instance, the members of MCC must (1) consider the leadership of their club to be a matter of conventional social fact and (2) they must recognise Hendrik as their leader.

Social facts are the same for all members of a social group, even for those members who do not recognise them. If Petra does not recognise Hendrik as the leader of MCC, she makes a mistake, and other members of MCC may criticise or even sanction her for this mistake.

7. Conventions

Social reality does not only contain facts, but also rules. The most basic form of existence for rules is existence as a convention.[11,12] I will define the existence of conventions as their efficacy. A convention exists in a group if sufficiently many members of the group are disposed to recognise the rule consequence if they believe the facts of the rule conditions and if they tend to justify their recognition by mentioning their belief or the rule.[13] For instance, if most people in Belgium are disposed to recognise the person to whom a property was transferred as the (new) owner of the property and tend to justify their recognition by reference to the transfer or to the rule regulating transfer, then the convention exists in Belgium that the person to whom a property was transferred has become the (new) owner. Notice that legal rules, although they are most often rule-based, can at the same time also be conventions.

Being efficacious is not the only requirement for the existence of a convention. Group members should also believe that most other members of the group recognise the rule consequence if they believe the rule conditions and that they justify this by reference to the rule. Moreover, the other group members should have the same belief. If sufficiently many members of a social group believe a fact and recognise a convention which attaches consequences to this fact, these members will (1) recognise these consequences, (2) believe that the other group members recognise these consequences, and (3) believe that the other group members believe the same about them. *In other words, the rule consequences will be conventional social facts in the group.*[14]

Rules, including conventions, are not statements, although their formulations may look like statements. 'Cars are vehicles', for instance, may be a descriptive sentence, but also the formulation of a rule. Ontological speaking, rules are individuals, just like persons, organisations, and pieces of furniture. It is possible to create them, to destroy (repeal) them, to count them, or to reason about them. The following argument is for instance valid: 'Rule X was made by the legislator. Rules made by the legislator are valid legal rules. Therefore, rule X is a valid legal rule'. Moreover, the conclusion that rule X is a valid legal rule can be used in an argument that applies rule X.[15]

It is worthwhile to emphasize the difference between a conventional fact and a convention. A conventional fact can be expressed by means of a true description, such as 'There must be a fire'. A convention, in contrast, is not a fact, but a connection between facts (as are other rules). The formulation of a convention, such as 'Smoke means fire', is not a statement, but the formulation of a rule of inference.

8. Constructivist Facts

Not all social facts are conventional. There is a second category, constructivist facts, where an existing broad consensus is not the final word on what the facts are. Suppose that the members of MCC take a vote on what was the best cycling trip they made this year. They decide unanimously that the trip to the castle gardens in Arcen was the best trip. Does this mean that the Arcen trip really was the best trip? No, even if all club members agree on what was the best trip, this does not mean that it *really* was the best trip. It remains possible to raise the question of whether all members of the club were mistaken about the best trip.

There seems to be a difference between what most or even all members of the group recognise as the best trip and what really was the best trip. Facts such as the fact about what was the best cycling trip of the year are not objective, because they depend on how people 'feel' about things. Neither are they merely subjective, as it makes sense to argue about them. And, finally, they

do not seem to be conventional social facts either, because a broadly shared belief about them is not the final word. I will call such facts *constructivist facts*.[16]

Constructivist facts are social facts, which are nevertheless open to serious questioning. This combination is possible if the social practice of a group does not only recognise the existence of these facts, but also the possibility to question them. For instance, *prima facie* it may be a social fact in MCC that the trip to the castle gardens of Arcen was the best trip of the year. However, the members of MCC agree and know that the others also agree that, theoretically speaking, everybody might be mistaken. If somebody came up with convincing reasons that another trip was even better, this other trip would be better. Moreover, it would have been better from the beginning, not merely because the members of MCC changed their minds. If an argument makes people change their minds about constructivist facts, they change their minds about what the facts already were.

Constructivist facts are characterized by the possibility to have a *serious* debate about them. 'Serious' means in this connection that the participants in the debate believe that it is possible to disagree about these facts without thereby showing a misunderstanding of what the debate is about and that there is a correct answer to the question what the facts are, independent of what people actually believe it is. For instance, if Joanna and Frédéric disagree about whether red wine is better or white wine, while they believe it is just a matter of taste, they consider the issue at stake to be a merely subjective one. There is no right answer as to what the best wine is[17] and their disagreement is not serious. If two members of MCC disagree about whether Hendrik is their leader, while both know that practically all members of the club recognise Hendrik as their leader, their disagreement is not serious either. The reason is that not believing that Hendrik is the leader while also believing that 'everybody' recognises Hendrik as the leader, shows misunderstanding of the conditions for leadership, which is a matter of convention.[18] The example about the best cycling trip of the year illustrates that it is possible to disagree seriously about what was the best trip. The seriousness of the debate becomes manifest in the assumption of all participants that there is a right answer to some question, even though it is not a matter of objective fact, and that this right answer does not change if people merely disagree about what the answer is.

Which social facts are constructivist, and which ones are conventional? It is impossible to give this question a general answer. The social practice of a group determines which social facts count as constructivist and which ones as conventional. If a broadly shared recognition may seriously be questioned, the social fact is considered to be constructivist; if not, it is conventional. Moreover, it seems that this categorization as conventional or constructivist is itself a matter of constructivist, and therefore also social, fact. People can seriously disagree on whether a particular kind of fact is conventional or constructivist. In legal philosophy, for example, there is a serious debate between hard legal positivists and non-positivists on whether law is conventional or constructivist (cf. Gardner, 2001 and Dworkin, 1986). In ethical theory, there is a similar debate between conventionalists (relativists) and constructivists (Gowans, 1997 and Bagnoli, 2021).

A constructivist fact is a fact that is recognised as a result of the rational reconstruction of the set of objective facts and social facts that are recognised in a social group.[19] Such a reconstruction will often consist of a debate. The debate may be casual, as amongst the members of MCC about the best cycling trip. It may also be more formal, as a debate in science about the best explanation of a newly discovered phenomenon. Rational reconstruction may involve no change for a particular social fact, and then that fact continues to exist as a social fact in the group because it was already recognised. An example would be that the members of MCC group believe that the cycling trip to the castle gardens of Arcen was the best trip of 2020 and that this belief survives a rational reconstruction of their belief set. Then the belief that the cycling trip to the castle gardens of Arcen was the best trip is an element of the rationally reconstructed belief set, because it was already in the original belief set and nothing changed in this respect.

Reconstruction may also involve the inclusion of a particular social fact, and then that fact exists as a social fact in the group because it ought to be recognised according to the rational reconstruction. An example would be that the members of MCC initially did not have the rule that members of all religious convictions should be treated equally, but that the existence of this rule is

included in the rationally reconstructed set and the rule therefore already existed as a matter of constructivist fact.

Finally, reconstruction may involve the removal of a particular social fact, and then that fact did not exist as a constructivist fact in the group because it ought not to be recognised according to the rational reconstruction. An example would be that the members of MCC group ought not to have recognised the trip to Arcen as the best one. Then the belief that the cycling trip to the castle gardens of Arcen was the best trip is not part of the rationally reconstructed belief set and the trip to Arcen was, all things considered, not the best trip.

Rationally reconstructing a set of recognitions or beliefs leads to a judgement on what ought to be recognised, given the original beliefs. The recognitions in the reconstructed set are what the believer of the original set ought to recognise. Moreover, as the example of the best cycling trip illustrates, the facts that rationally ought to be recognised are also the 'real' facts, because we are speaking of constructivist social facts. The members of MCC who argue about what was really the best cycling trip argue about what really was the case. Constructivist facts are the conclusions of the best possible arguments. These arguments determine what ought to be recognised, but *ipso facto* they also determine that part of social reality. Perhaps this is the most important thing to remember about constructivist facts: *constructivist reality is what rationally ought to be recognised as real*.

What counts in this connection as rational? Is there an objective, mind-independent standard for rationality, identical or analogous to the standard of classical logic? The proliferation of logical systems in the last, say, 70 years, suggests the opposite (Priest, 2008 and Walton, 2008). To cut a potentially long argument short, I will assume here that rationality is a matter of constructivist fact. Social conventions form the starting point in determining the standards of rationality, but they are not the last word. The debate on what counts as rational is to be conducted at the hand of standards which are themselves subject to debate.

9. Why Legal Facts Are Constructivist

Let us assume that law is a part of social reality and that this also holds for legal facts such as the fact that Iris is punishable, that John must stop for the red traffic light, or that this statutory rule is valid law. Then the question arises of whether these social facts are constructivist or conventional. Assuming, for the sake of argument, that the answer is the same for all legal facts, the best view seems that legal facts are constructivist.

Remember that whether a kind of state of affairs is conventional or constructivist depends on whether a broadly shared view is the last word, both in the sense that conventional facts are what 'everybody' recognises them to be and in the sense that if there is no broad consensus, there is no conventional fact. If legal facts were conventional, this would mean that where there is a lack of consensus on what the law is there is no law. Hard cases would be cases where there is a gap in the law because of a lack of consensus. If the conventional view of law would be correct for legal facts, gaps would be a common phenomenon. In contrast, if the constructivist view would be correct, gaps would only occur if a rational reconstruction of what is broadly recognised would not give an answer. If this could occur at all[20], it would happen only occasionally. Legal decision-makers seldom seem to assume that there is a gap in the law and to decide a case on the basis of moral or policy considerations only. So, it seems that these officials recognise more law than the conventional view claims there are. Since the views of these officials are decisive for whether legal facts are conventional or constructivist, it would seem that they are constructivist.

A similar argument starts from the observation that even if there is a broad consensus on what the law is, lawyers sometimes continue to argue as if this consensus is wrong. Such arguments can only be taken seriously if law is considered to be constructivist. This also pleads for the view that legal facts are constructivist.

A third argument is that the idea of legal sources only makes sense on a constructivist view of law. The idea of legal sources is that rules that can be traced back to a source of law are for that reason valid legal rules and – a less convincing addition – that rules that cannot be traced back to

some legal source, are for that reason not legal rules. On a conventional view of law, the only reason why a rule is a valid legal rule is that it is broadly recognised as such. If a legal source plays a role in this connection, that maybe an interesting observation, but the source does not make a legal rule valid. On a constructivist view, on the contrary, sources can be crucially important, because legal rules are valid if and only if they rationally ought to be recognised as such. If a rule rationally ought to be recognised as valid law, it is valid law, even if it is not (yet) broadly recognised as such. This makes sense on a constructivist view of law.

A fourth argument is the argument from legal interpretation. Legal debates on the correct interpretation of a legal source are debates on whether a rule can be traced to this source. Such debates are broadly recognised in legal practice as making sense. This is another argument why legal practice treats legal facts – this time facts about what are valid legal rules – as constructivist. And if legal practice treats these legal facts as constructivist, they are *prima facie* constructivist.[21] Even on the constructivist view of law, the starting point of legal debates in which views on the content of the law are rationally reconstructed are the rules that are broadly recognised as law and the conclusions these rules attach to facts situations (cases). Therefore I will take this rule-centred approach to law as the starting point for an overview of techniques of legal reasoning. Together, these techniques are the best possible view of the logic of legal reasoning.

10. Contributory Reasons

Even though rules take a central place in the most frequent forms of legal reasoning, I will start my description of legal reasoning techniques with contributory reasons. Reasoning with rules cannot be fully understood without an understanding of how contributory reasons 'work'.

Contributory reasons are either constitutive or epistemic. A contributory reason for a conclusion c is a fact r (or a combination of facts) which pleads for the existence of c, in which case it is a constitutive reason. Or it is a reason for believing that c, in which case it is an epistemic reason. For example, the facts that some object has a flat surface and one or more legs supporting this surface are together a constitutive reason why this object is a table. The fact that the rooster is crowing is an epistemic reason to believe that soon the day will begin. Both constitutive reasons and epistemic reasons are important for law, but here I will only focus on constitutive reasons.[22] In the following, when I write about 'reasons', I mean 'constitutive contributory reasons'.

There can not only be reasons pleading for a conclusion, but also reasons pleading against a conclusion. For example, the fact that the surface of an object cannot support other objects is a reason why the object is not a table. A conclusion based on reasons is always a conclusion on the basis of balancing all the reasons for and against this conclusion. Often the set of reasons against a conclusion will be empty and then the conclusion 'follows' – that is: the fact of the conclusion exists – if there is at least one reason pleading for it. Suppose that an object has a surface supported by legs and there are no reasons why this object is not a table, then the object is a table.
If there are both reasons for and against a conclusion, additional information about the relative weight of these reasons is necessary. This weighing knowledge is ordinary knowledge (not meta-knowledge) which can be the conclusion of another argument. For instance, the fact that something is a caravan is a reason why it is movable. The fact that it is attached to the sewage system is a reason why it is immovable. These two reasons need to be weighed (or balanced) to determine whether the object is movable. For example, if there is a court decision that such a caravan is immovable, this decision is a reason why being attached to the sewage system outweighs being a caravan with regard to the issue of movability (Hage , 2005, pp.101-134).

This example is also an example of how legal reasoning works if there are no rules. Prior to an eventual court decision, there is no rule that determines whether caravans attached to the sewage system are movable or immovable. Let us assume that it is broadly recognised that being a caravan is a reason for being movable and that being attached to the sewage system is a reason against being movable (for being immovable). These are colliding reasons with regard to the potential conclusion that the caravan is movable and to deal with this collision weighing knowledge is required. Assume

that there is no broadly recognised view about this weighing knowledge. Then it is necessary to produce reasons with regard to the issue which of the reasons for and against movability outweighs its competitor. If such reasons cannot be found, the weighing knowledge must be introduced by cutting the knot and will become an unfounded premise of the argument.

11. Reasoning With Rules: Applicability, Application, Classification and Interpretation[23]

The most common case of reasoning with legal rules is when a case satisfies the conditions of a legal rule, and the rule attaches its conclusion to the case. This kind of reasoning resembles an argument of the form Modus Ponens and that explains the misguided attempt to model rule-applying arguments as arguments of this form. In this subsection I will pay attention to some details of simple rule-applying arguments and show why the Modus Ponens analysis does not even fit these simple cases.

It is convenient to have a technical term to express that the facts of a case match the conditions of a rule. I will use the term 'applicable' to this purpose. A rule is said to be applicable to a case if and only if the rule exists as a legal rule (is valid) and if the facts of the case satisfy the conditions of the rule. Take for instance the rule that immovable goods can be the objects of a mortgage. We have an object that is immovable and this object therefore *prima* facie satisfies the condition of the rule. Therefore, *prima facie*, the rule is applicable to this case.

Why only *prima facie*? Because a rule has not only conditions that are mentioned in the rule formulation, but also 'scope conditions'. If the mentioned rule is a rule of Belgian law, most likely it can only be applicable to immovables in Belgium. This is an example of territorial scope. Rules also have a temporal scope, determining during the time span during which the rule can be applicable. This time span typically more or less coincides in time with the validity of the rule, but the operation of rules may be retro-active or postponed to cases in the future. And then there are rules with a personal scope, such as rules of religious law which only apply to adherents of the religion, or to persons of a particular nationality. And there are rules which have a scope determined by their subject, such as rules of contract law that only apply to international trade contracts.

Hopefully, the readers have already noticed that both speaking about the applicability of a rule and speaking about ordinary and scope conditions of a rule and the division of the burden of proof with regard to the rule conditions does not treat rules as descriptive sentences. Logically speaking, rules are individuals rather than descriptive sentences or propositions. Since objects cannot function as premises of arguments, the Modus Ponens analysis of rule-applying arguments does not work, not even for the simplest of cases. From here on, I will not even mention the relevance of classical logic for rule-applying or reason-based arguments anymore; this relevance is non-existent.

Even if a rule is applicable to a case, this does not guarantee that the rule conclusion is attached to the case. It remains possible to make an exception to a rule, for instance if application of the rule would be against the rule's purpose, if the rule conclusion would for some other reason be unacceptable, or if the rule conflicts with another rule.[24]
Before continuing the argument, it is easy to have another technical term available. If a rule attaches its conclusion to a case, I will say that the rule *applies* to the case. If we have an immovable object and there are no special circumstances, the rule that immovables are susceptible to a mortgage applies to this case and attaches its conclusion – that the object is susceptible to a mortgage – to the case. Through its application, the rule creates a 'new' fact, namely that the object can be mortgaged. Notice that this operation of the rule is on the level of facts, not only on the level of language. It is rational to conclude that the object is susceptible to a mortgage and since – we assume – this kind of fact is constructivist, it is also the case that the object is susceptible to a mortgage.

Having the notion of rule application available, we can indicate what the relevance of a rule's applicability is: if a rule is applicable to a case, this is a reason why the rule should apply to this case, that is: why the rule attaches its conclusion to the case.[25] The applicability of a rule as reason for its application is in itself decisive if there are no reasons against application. However, if

there are also reasons against application, it is necessary to balance the reasons to determine whether the rule applies. The usual story about weighing knowledge is relevant here.

Before moving to non-standard cases of reasoning with rules, I need to say something about classification. A rule can only be applicable to a case if the facts of the case satisfy the rule conditions. To determine whether this is so, the facts need to be classified in terms of the rule conditions. For instance, if the rule is that thieves can be punished, the facts of the case must mention a thief. If John took away Jane's car without permission, this event can be classified as theft and John as a thief. Classification is just another form of legal reasoning, and all the theory of legal reasoning is relevant for it. It is worthwhile to notice that classification of case facts can be distinguished from the interpretation of a legal source. Interpretation plays a role in the step from legal sources to the legal validity of a rule in some formulation. Classification, in contrast plays a role in the step from one description of case facts to another description that matches the conditions of some rule.

12. The Legal Validity of Rules

A rule can only be applicable to a case if it exists; in traditional legal terminology: if it is valid. Moreover, it must exist as a legal rule, not 'merely' as, for instance, a moral rule. Most legal rules are considered valid because they can be traced back to a broadly recognised source of law, such as a statute, a treaty or convention, or a court decision. Most rules that have this pedigree will also be broadly recognised, directly – by the officials – or indirectly – by those who recognise the officials and the division of recognition labour. For instance, a rule that was adopted in an earlier court decision because it underlies the *ratio decidendi* of the earlier case will directly be recognised as a valid legal rule by courts to the extent that they feel bound by precedents, and indirectly by legal subjects who recognise courts as experts on what the law is.

A rule that can be traced to a source of law will normally be considered a valid legal rule. However, if legal facts are seen as constructivist, the source is not the final word even if it is the first word. It is possible to defend the view that a rule that is based on a source of law is nevertheless not valid law. Possible reasons are that the rule is highly unjust (Radbruch, 1945, Alexy, 1992 and Alexy, 2002), or that the rule systematically[26] conflicts with a 'higher' or more recent rule, or with a human right. Other possible reasons are that the alleged rule is not the proper interpretation of the text of the source, that the author of the statute, treaty of judicial decision was incompetent to make this rule, or that the source was created in an invalid manner.

Not only rules that can be traced back to a source can count as valid legal rules. It is also possible that some rule is broadly recognised as a legal rule without a recognised legal source to support this. Customary law is a case in point, as is 'unwritten law' such as the standards for the lawfulness of behaviour that are used in liability law.[27] If one adopts the constructivist view on law, such rules will exist as a matter of constructivist fact. They exist prima facie if they are broadly recognised as existing, but it is possible to have a serious disagreement on whether such a rule was rightly recognised.

13. Analogy, and Arguments *a Fortiori* and *e Contrario*

If a rule is not applicable to a case, this is a reason why the rule does not apply to the case. However, sometimes a case to which the rule is strictly speaking not applicable resembles cases to which the rule is applicable to such an extent that it is within the purpose of the rule that it should apply. In such a case the purpose of the rule provides a reason why the rule should apply. This reason may outweigh the non-applicability of the rule and if it does, the rule applies. Because of the resemblance to cases in which the rule applies because of its applicability, application because of similarity is called *analogous rule application*. For example, there is a rule that owners of a home are not allowed to have a tree on less than two meters distance from the garden of a neighbour.

There is good reason to also apply this rule to people who lease their home, rather than own it. So, in cases of analogous rule application, the rule actually applies to a case, even though it is not applicable.

An argument *a fortiori* is a special case of analogous rule application: the facts of the case resemble the facts of cases to which the rule is applicable but provide even more reason to apply the rule than the latter facts. If a rule that allows pretrial detention is applicable to cases of involuntary manslaughter, this *may* be a reason to apply it *a fortiori* to cases of intentional manslaughter. Whether it actually applies to such cases may depend on whether there are also rules for detention in cases of intentional manslaughter.

Normally, if a rule is not applicable to a case, this is only a reason not to apply the rule. If there are no reasons for application – and this will normally be the case – the rule does not apply and does not attach its conclusion to the case. However, sometimes the facts of a case which make the rule inapplicable provide a reason why the opposite of the rule conclusion should be attached to the case. If this reason leads to this opposite conclusion, it is sometimes said that the rule is applied *e contrario*. Take for instance the scope-defining rule that criminal law for minors, rather than ordinary criminal law, should be used for criminal suspects younger than 16 years. Then, arguably, the fact that some criminal suspect is 16 years or older is a reason why this special branch of criminal law should *not* be used.

14. Conclusion

Classical logic is based on an underlying view of the world, according to which there are elementary facts belonging to one of three types and compound facts, which are logical combinations of these elementary facts. Sentences are true if they correspond to, in last instance, the elementary facts in the world. The elementary facts, which hold that an individual has a particular characteristic, are independent of each other. This world view has no place for rules, which exist as individuals in the world, and which create relations between the most elementary facts. As a result, classical logic is not suitable to deal with rules, which manifests itself in several phenomena, including that:
- Rules lack a truth value and can therefore not be premises or conclusions in valid arguments.
- Classical logic cannot deal with exceptions to rules, or with rules about rules.
- Classical logic has no way to deal with analogous rule application, or arguments in which rules play an unusual role, such as arguments *per analogiam* or *e contrario.*

A logic that is more suitable for legal reasoning should take into account that law is a part of social reality, in particular a part that consists of constructivist facts, and that rules play a central role in law. This article has given a superficial description of how social reality exists and of the place of law and legal rules in it. It used this description to argue that traditional techniques to reason with and about legal rules provide a better logic for law than classical logic. These techniques can be accommodated in a logic that treats rules as logical individuals.

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Notes

1. I will focus on the semantics of first order predicate logic only. For propositional logic, the story is different, but not in a manner that influences the argument of this article.

2. Classical logic focuses on deductive validity and in that connection 'valid' therefore means the same as 'deductively valid'.

3. I assume here that 'ought to be punished' is an ordinary predicate, different from, but just like, 'is punished'. This means that I assume no logical relation between, for instance, the sentences that John ought to be punished and that John is punished.

4. To keep the argument as compact as possible, I will focus on sentences with an object-predicate structure and ignore sentences which describe relations, such as 'James is the father of Mary', or 'feature-placing' sentences such as 'It's raining'. This focus does, in my opinion, not misrepresent the ontological assumptions of predicate logic.

5. I mention the ugly construction of sets representing classes because sets are defined by their members (that is: extensionally) and not by a characterising property such as being a governmental organisation.

Nevertheless, informally the sets do stand for classes of things which are defined by a common characteristic. Therefore, from here on, I will write about the set of governmental organisations, and so on …

6. These problems have all been addressed, often in dedicated logics such as quantum logic, paraconsistent logic, fuzzy logic, or nonmonotonic logic. However, these logics have in common that their underlying ontology is not the ontology that underlies predicate logic.

7. A more extensive discussion of this topic can be found in (Hage, 2018, Chapter V, Hage, 2022 and Hage, 2022).

8. If rules would have to be represented in the semantics of predicate logic, they should be individuals which influence the assignment of individuals to sets. However, this would be such a gross violation of the assumptions underlying traditional model-theoretic semantics that it would not be the same semantics anymore.

9. Because of space limitations, this section and the following ones are highly condensed. Interested readers can find more extensive accounts of how social reality exists in (Hage, 2022 and Hage, 2022).

10. These definitions make facts and the world dependent on, amongst others, a language, and the descriptive sentences it can express. For a discussion, see (Hage, 2018, pp. 32-34).

11. Here I use the notion of a convention in a way that is close to conventional facts. A convention in this sense is related to, but not identical to the Lewisian (Lewis, 1969) notion of a convention as a solution to a coordination problem. See also (Rescorla, 2011).

12. Another mode of existence is as a rule-based rule. It is more convenient to explain this after the introduction of constructivist facts. See section 9.

13. Notice that the efficacy of social rules is *not* defined in terms of compliance. The definition should apply to *all* rules and not only to rules that impose duties or obligations and can therefore be complied with.

14. Strictly speaking, the group members should also recognise that the rule conclusion is a conventional type of fact.

15. Notice that according to this account, a statement about a rule – that the rule is valid, or that it exists – and not merely the rule formulation, is used in a rule-applying argument This has everything to do with the assumption that rules are not statements, but logical individuals. An advantage of this approach is that there is no issue (confusion of object- and metalanguage) with argument chains that combine reasoning about rules and reasoning with these same rules.

16. There are close connections between these constructivist facts and constructivism (intuitionism) in the philosophy of mathematics (Iemhoff, 2020) and constructivism in moral philosophy (Rawls, 1980, Bagnoli, 2021).

17. An Italian friend of mine, who is more knowledgeable about wines than me, seriously disagrees.

18. Of course, it is possible to have serious discussions on the issues of whether Hendrik is a good leader or whether Hendrik ought to be the leader. However, these discussions would address another issue than whether Hendrik *is* the leader.

19. There is no room in this article to further develop the notion of a rational reconstruction. As a very short alternative, I suggest that rational reconstruction of a set of beliefs and recognitions is making the set integratedly coherent (Hage, 2005, pp. 33-68; Hage, 2013 and Hage, 2016).

20. Early in his career, Dworkin (Dworkin, 1986) claimed that it would not occur. Legal questions would have one right answer.

21. It is only *prima facie* because the issue of whether legal facts are constructivist is itself a matter of constructivist fact.

22. The 'logic' of epistemic reasons is not unlike the logic of constitutive reasons, and much that is written below about reasoning with constitutive reasons also applies to epistemic reasons.

23. The content of this section is an adaptation of the theory of (Hage, 1997, chapter III). It was strongly influenced by discussions with Henrique Marcos and Antonia Waltermann.

24. This brief list of cases in which an applicable rule may not apply seems to cover the most important situations but is not intended to be exhaustive.

25. Notice the identification of the facts that a rule *should* apply to a case and that the rule actually applies to the case. This identification is possible because the application of a rule is a constructivist fact. See section 8.

26. If a rule systematically conflicts with a higher, or otherwise superior, rule, this is a reason against the validity of the former rule. If the conflict is only incidental, this is only a reason not to apply the rule in the specific case.

27. An example of such a standard is the 'Learned Hand rule' that was formulated in *U.S. v. Carroll Towing*, 159 F.2d 169 (2d Cir. 1947).