the first rule?[13] Since roller-skates are objects on wheels meant for transportation and therefore vehicles, somebody roller-skating in the park is violating the prohibition to use vehicles in the park:

As a second example of classification, I discuss the classification of a tort as the cause of damages. In the Netherlands, a tort is classified as the cause of damages if the tort was a necessary condition (conditio sine qua non) for the damages and the damages can reasonably by imputed to the tort. In the present model, imputation is depicted as follows:

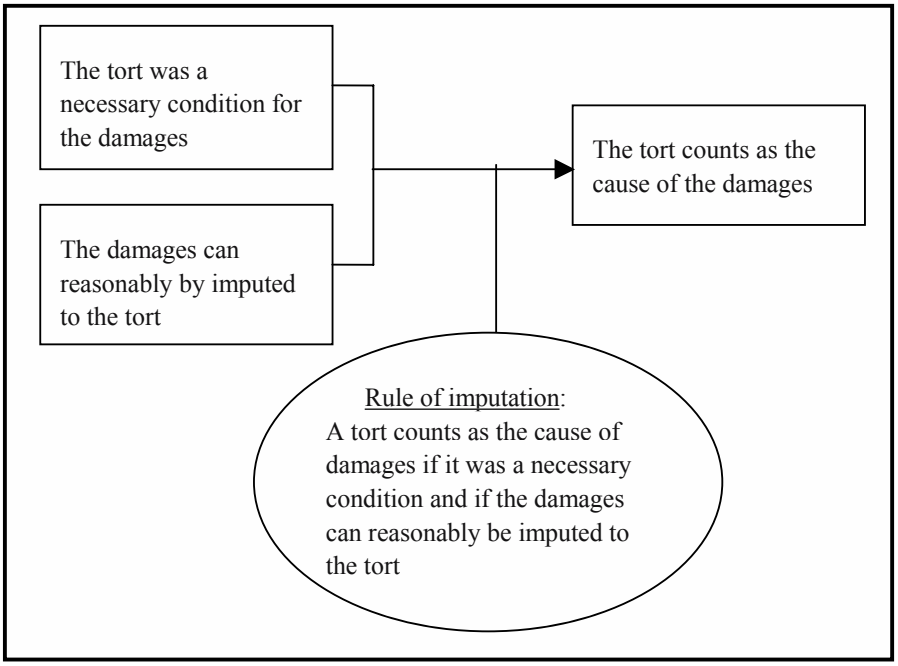

Figure 11: Classification as imputation

8. RIGHTS

I discuss three kinds of rights in terms of my model: claims against some concrete person (iura in personam), property rights (iura in re), and human

[13] In this example I assume that there is no special rule that governs the issue whether roller skates are vehicles.

rights. It turns out that the three kinds of rights can all be considered as *states*, i.e., momentary states of affairs (cf. section 3.1).

8.1 Claims

In his paper Tû-tû, Ross writes:[14]

> 'We find the following phrases, for example, in legal language as used in statutes and the administration of justice:
>
> 1. *If a loan is granted, there comes into being a claim;*
> 2. *If a claim exists, then payment shall be made on the day it falls due;*
>
> which is only a roundabout way of saying:
>
> 3. *If a loan is granted, then payment shall be made on the day it falls due.*
>
> That 'claim' mentioned in (1) and (2), but not in (3), is obviously (...) not a real thing; is nothing at all, merely a word, an empty word devoid of all semantic reference.'

Here Ross provides an account of phenomena like claims as mere intermediaries between facts: the intermediary is only a manner of speaking and does not really exist. While rejecting this reductionist consequence, MacCormick and Weinberger adopt the idea that certain legal states of affairs function as an intermediary between other (legal) states of affairs. They describe a particular category of legal concepts, called *institutional legal facts*, which are in my terminology related to states of affairs that supervene on other states of affairs.[15]

Institutional legal facts have certain features in common. For each of them, the law contains rules which lay down when, e.g., a contract, a corporation, or an obligation of reparation, comes into existence. These rules are called *institutive rules*. The law also contains rules that attach further legal consequences in case these concepts apply (if the concerning institutional legal facts obtain). These rules are called *consequential rules*. And, finally, the law has rules which determine when the phenomena at stake disappear again. These rules are called *terminative rules*. See figure 12.

[14] Ross 1957. Quotation after Lloyd 1979, 625.

[15] MacCormick and Weinberger 1986, 52/3. See also the discussion of reason-based facts in chapter 6, section 6.

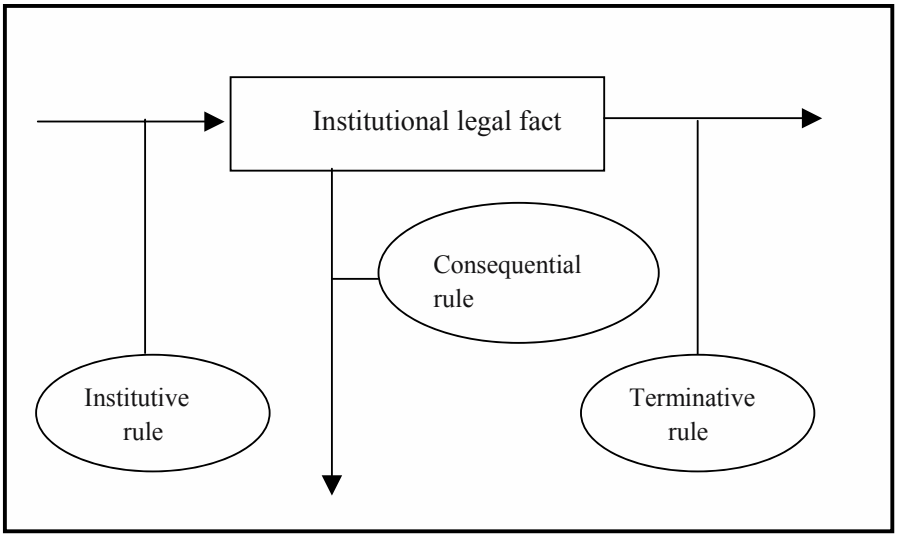

Figure 12: Institutional legal facts

The figure agrees with my model. Institutional legal facts are then states the coming into existence and disappearing of which is regulated by causal rules (institutive and terminative rules). Constitutive rules (consequential rules) deal with the states of affairs which are constituted by states. As Ross' discussion shows, claims fit nicely in this picture.[16]

8.2 Property rights

The next example deals with property rights, such as the ownership of a house. If A owns the house H, A is entitled, with the exclusion of everybody else, to use the house. Moreover, A has the power to transfer the ownership. The law may also attach other legal consequences to the ownership of a house. For instance, in the Netherlands and in Belgium, owners of houses are subject to special taxes. These consequences of ownership are attached to the state of ownership by legal rules. The rules might have been different, which goes to show that the legal consequences of ownership are not part of

[16] This way of looking at the structure of legal systems is also a central theme in Odelstad and Lindahl 2002 and Lindahl and Odelstad 2004.

the ownership itself, but rather states of affairs which are non-causally connected to ownership.[17]

The ownership of a house can be acquired in different ways. A common one is that somebody else was the owner and transferred his ownership to the new owner. Such a transfer is an event which has the direct effects that the original owner loses his property right and that the new owner acquires it. The transfer has also indirect effects, because all legal consequences which are attached to ownership disappear for the original owner and come into existence for the new owner.

Another way to acquire the ownership of a house is to build the house on ground which one owns. This event only causes a new ownership to come into existence, not the disappearance of a previous ownership. The passing away of the original owner is a way for an inheritor to acquire ownership. All these different ways of becoming the owner of a house indirectly lead to the legal consequences attached to ownership.

There are also several ways to lose ownership. Transfer is again the most prominent one, but passing away of the owner, devastation of the property, prescription, and expropriation are other ways to lose ownership.

As this example about the ownership of a house illustrates, property rights can be treated as 'empty' states, the coming into existence, the (legal) consequences, and the disappearance of which is governed by rules. Cf. figure 13.

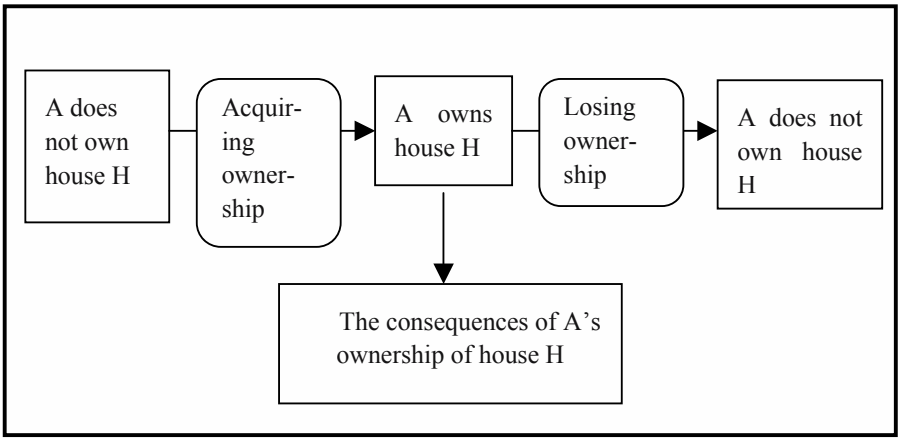

Figure 13: Acquisition, consequences, and loss of ownership

[17] It may plausibly be argued that some consequences of ownership are so essential that if they would not exist, the underlying state would not be ownership anymore, but rather some other state. The discussion of this view falls outside the scope of this paper.

8.3 Human rights

Human rights, such as the right of freedom of expression, differ in nature from property rights. Nevertheless, having a human right is also a state, and is in that respect very similar to having a property right. We take a closer look at the freedom of expression.

If P has the freedom of expression, this has several consequences. The first and foremost consequence is that P is in principle permitted to express his opinion about any issue. If we follow Dworkin, having a human right also involves that regulations that infringe these rights are invalid.[18] In other words, for regulations that infringe these rights, the rule that regulations which were validly made contain valid law, is not applicable.[19]

Legal systems usually attribute human rights to all persons on the basis of their being humans. This means that (instances of) human rights come into existence as soon as a human being comes into existence, and end when human beings pass away.

The important thing to the note about rights is that, in spite of the different nature of claims, property rights and human rights, the same scheme applies: there are events by which these rights come into existence and other events by which they disappear again and there are rules of law which determine the legal consequences of having these rights. In other words, rights are legal states on which legal consequences supervene (in the sense of the sections 3.1 and 3.2).

9. JURIDICAL ACTS

Juridical acts are acts to which the law assigns consequences because of the intention to invoke these consequences by means of the act. For instance, engaging into a contract is a juridical act, to which the law assigns the consequence that a contract exists.

A juridical act supervenes on another act which legally counts as a juridical act. To count as a juridical act, the underlying act must satisfy a number of conditions, such as the condition that the actor is competent to perform the juridical act in question. For instance, to be able to engage into a

[18] Cf. Dworkin 1978, 184f.
[19] Cf. Hage 1997, 173.

contract, both parties must have the competence to do so. To make legislation, the actor must have the competence to legislate.

Being competent is a kind of anankastic state of affairs (cf. section 3.3), which must supervene on another states of affairs. For instance, one must be of age to be competent to engage into a contract.

The following figure (from which the rules are left out) depicts a typical juridical act with its preconditions and its consequences. It is an adaptation of a part of figure 9.

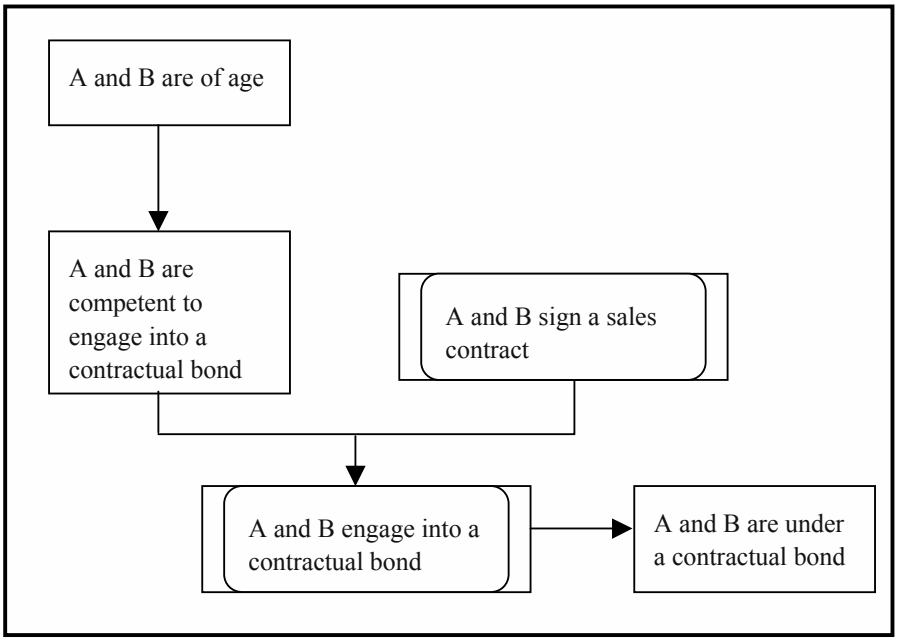

Figure 14: A juridical act and its consequences

Notice that this figure contains two actions, namely signing the sales contract and engaging into a contractual bond. The former counts as a juridical act, because the actor was competent to perform that juridical act. Notice moreover that the competence to engage into contracts is itself a state of affairs that supervenes on another state of affairs, namely being of age.

10. VALIDITY

In the law, the notion of validity is used for acts, for products, and for rules. If an act satisfies all the conditions that hold for a juridical act, the act is valid as a juridical act. Juridical acts can aim at the creation of a particular

product, such as a contract, a license, or legislation. If the juridical act is valid, its product is also said to be valid: contracts, licenses and legislation are valid if the acts from which they result are valid as juridical acts.

In the case of legislation, there is still another form of validity. The rules which are created through valid legislation are said to be valid too. This validity is nothing else than the rule's mode of existence.[20] So, in the case of rules based on legislation, we can distinguish three kinds of validity which supervene on each other:

- validity of the legislative act as a juridical act;
- validity of the legislative product (e.g. the statute);
- validity of the rules created by means of the legislative product.

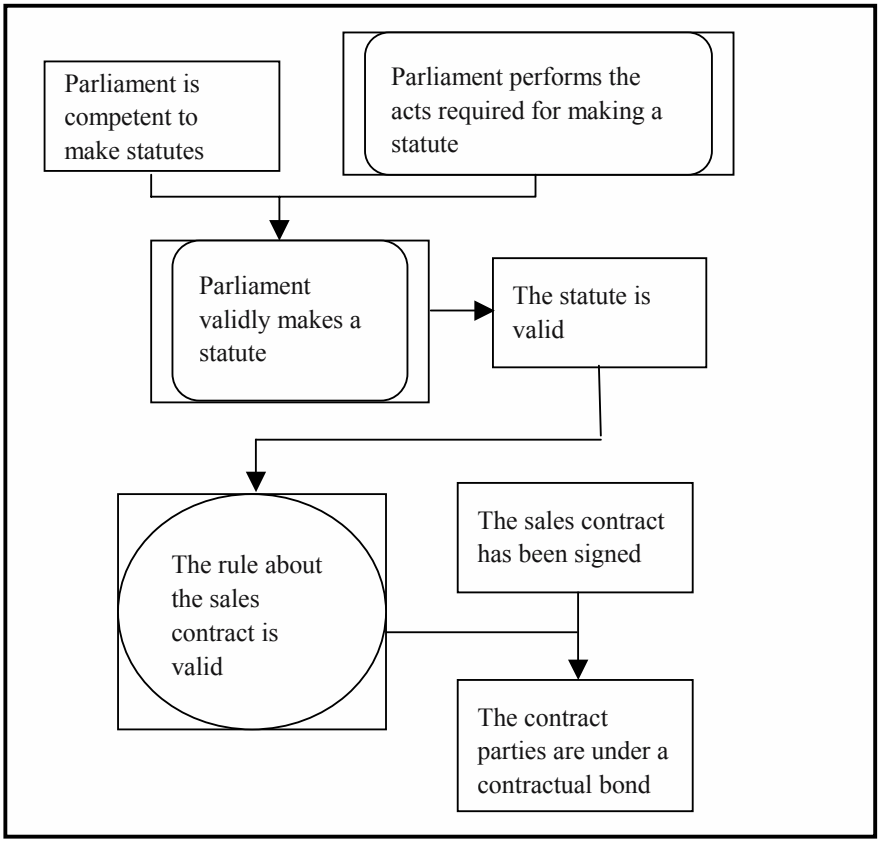

Figure 15: The validity of acts, products and rules

[20] Cf. Kelsen 1979, 136.

For instance, since Parliament is competent to make statutes, the acts Parliament performs to make a statute lead to the valid making of a statute. The resulting valid statute leads to the validity of some rule, say about sale contracts. The validity of the rule gives rise to a connection between states of affairs by constitution. Figure 15 gives an example containing the three kinds of validity. Notice that the rule and its validity (i.e., the state of affairs that the rule is valid) are shown in the figure in a dual way similar to the way in which an event and its occurrence are shown.

11. JURISTIC FACTS

Traditionally, continental jurisprudence distinguishes the notions of 'juristic fact', 'act', 'bare juristic fact', 'juridical act', and 'factual act', which seem to be closely connected to the primitives of my abstract model.

Juristic facts are facts to which the law attaches consequences. Examples of juristic facts are sale, theft, death and lapse of time. Possible legal consequences of these examples include the coming into existence of the vendor's right to be paid, the liability of the thief to be punished, inheritance and the preclusion of criminal proceedings, respectively. Juristic facts are divided into *acts* (that in the law cannot only be performed by humans, but also, more generally, by juristic persons), such as sale and theft and *bare juristic facts*, such as death and the passing of time.

Acts are divided in *juridical acts* and *factual acts*. Juridical acts require an intention aimed at legal consequences as manifested by a declaration and the competence to perform them. Examples of juridical acts are buying a house and recognizing a child. Factual acts are those acts that have legal consequences, but are not meant as such. Examples of factual acts are torts and undue payment.

The traditional categories and their relations are summarized in the following figure:

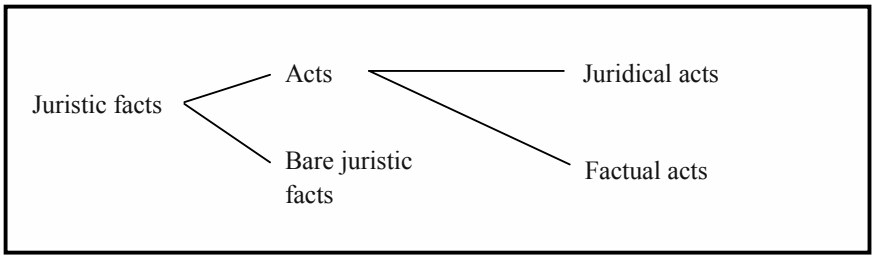

Figure 16: Traditional categories of juristic facts and their relations

How do these traditional categories fit in the model? The first thing to notice is that the notion of a state of affairs is preferable as element of the model to the notion of a fact. The choice for states of affairs has the advantage that it becomes possible to distinguish between obtaining and non-obtaining states of affairs. This is useful if one wants to deal with connections between hypothetical states of affairs, as in 'If the state of affairs that John has stolen obtains, then the state of affairs that John is punishable obtains', or - in more normal terminology - 'If John has stolen, then John is punishable'.

Second, it should be noticed that the model distinguishes acts (as a kind of events) from the occurrence of acts (as states of affairs). This has the advantages that the changes in the obtaining states of affairs which are caused by acts are appreciated and that the difference between causation and constitution can be made explicit. In the traditional model sketched above, acts are treated as a subcategory of facts, which seems to be a category mistake. It is therefore better to read 'act' in the traditional model as 'the fact that some act took place'.

Just like the traditional view, the model treats juridical acts as a kind of acts. It is interesting that (intended or unintended) legal consequences of juristic facts are central in the traditional categories. In the model, these correspond to the consequences that supervene on a state of affairs because of legal rules.

From this brief comparison, it will be clear that the model of the law presented in this chapter is richer than the traditional model, while remaining on a similar level of abstraction.

Chapter 8

DIALECTICAL MODELS IN ARTIFICIAL INTELLIGENCE AND LAW

1. INTRODUCTION

Dialectics and dialogues[1] play an important role in the field of Artificial Intelligence and Law.[2] There seem to be two major grounds for this popularity of dialectics and dialogues, corresponding to both form and content of legal reasoning. Legal reasoning is centered round the application of rules and principles and this kind of reasoning is defeasible. Dialectics provides a suitable tool to analyze and model this defeasibility.

Moreover, the law is an open system. As a consequence, there may be disagreement about the starting points of legal arguments, which in turn makes uncertain which legal conclusions are justified. Dialogues provide a

[1] The difference between dialectics and dialogues, as I use these terms, is explained in section 5. Ahead of this explanation, dialogues can be taken to be real dialogues governed by a dialogue protocol. Dialectics is the more general category, which also includes dialog-like presentations of logical systems.

[2] The three-ply arguments in the HYPO-system (Ashley 1991) can be seen as a kind of dialogues between hypothetical adversaries. This line is continued in later work building on the HYPO-foundations (e.g. Skalak and Rissland 1991 and 1992; Rissland, Skalak and Friedman 1996; Aleven 1997. More explicitly dialectical is the work of Gordon (1994 and 1995; Gordon and Karacapilidis 1997), Nitta et al. (1993 and 1995), Prakken and Sartor (e.g. Prakken 1995; Prakken and Sartor 1996), Loui et al. (1995 and 1997), Freeman and Farley (1996) and the former research group at Maastricht University and the University of Twente (Hage et al.1992 and 1994; Leenes et al. 1994; Lodder and Herczog 1995; Verheij 1996, 2003 (both DL and AAA) and 2004; Lodder 1997, 1998 and 1999).

means to overcome the foundational difficulties that plague (legal) justification.[3] The open nature of the law makes the outcomes of legal procedures indeterminate. I will argue in section 7 that, as a consequence, the law in concrete cases depends on the decision making procedure, without an independent standard for the correctness of this outcome. In other words, the law is the result of a procedure and dialogues are a promising way to model such a procedure.

My purpose in this chapter is to give an overview of dialectical models as they are used in the field of Artificial Intelligence and Law and the closely related fields of logic and legal theory and to distinguish between the different functions that these systems fulfill.[4] I will distinguish between three main functions, which will be discussed in turn. In the sections 2 to 4 I discuss dialectical garbs for what is essentially a definition of logical validity. In the sections 5 and 6 the topic is dialogical approaches to the establishment of the premises of arguments. The sections 7 to 11 deal with the dialogical, or, more generally, procedural, determination of the law in concrete cases. This chapter is summarized in section 12.

2. THE PIONEERING WORK OF LORENZEN AND LORENZ

In their *From Axiom to Dialogue*, Barth and Krabbe distinguish three dimensions of logic systems.[5] One is the dimension of *syntax*. Important characteristics of a logic are the number and nature of the logical constants, the way in which the lexicon is divided into categories, such as terms and relations and the ways in which sentences are constructed from elements of the lexicon.

The second dimension is the dimension of logical strength. Even given a fixed syntax, a logic may have more or less derivational power. Barth and Krabbe distinguish between (in increasing power) minimal, constructive (intuitionistic) and classical (propositional) logic, but for the purpose of Law and AI, non-monotonic logics are relevant too, as even stronger than classical logic.[6]

[3] Alexy 1978, 221f.

[4] Dialectical approaches are also important in other fields. See e.g. Hamblin 1970, 253f. and Bench-Capon et al. 1992.

[5] Barth and Krabbe 1982, 3-13.

[6] Non-monotonic logics will usually have a different syntax than propositional logic and in this respect, the comparison is not fully correct.