SCIENTIFIC AND LEGAL METHOD

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1 INTRODUCTION

1. Sciences are characterised by the fact that they have a method. As will be argued in section 2.2, a discipline cannot be a science without a method.[1] The legal discipline[2] has a method too, although many lawyers will not be able to specify explicitly what the method of the discipline of law is. However, even though the legal discipline may have a method, it is not obvious that it is also a science.

> It is certainly not a science in the sense in which the term 'science' is used in the Anglo-American literature, because there the term stands primarily for the physical sciences, including astronomy, chemistry, and biology. It is also customary to speak of social sciences, including psychology, sociology and anthropology, but the expressions 'literature science', 'historical science', and 'legal science' are far from customary.

In this text, two questions will be addressed:

1. Is the discipline of law a science?
2. What is the method of the discipline of law?

Although these two questions can in theory be answered without paying attention to other disciplines than the law, it is through the contrast with what goes on 'elsewhere' that the own nature of the legal discipline can be clarified. Therefore this text will for a large part be devoted to the characterisation of other disciplines than the law. These characterisations will necessarily be superficial, but if they make clear how for instance physics and mathematics differ from the law, they will have served their purpose.

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[1] In the following, the word 'discipline' will be used for the systematic pursuit of knowledge, without assuming that this pursuit amounts to science. Some disciplines will be sciences (e.g. physical science), others will not (astrology), while some may fall in the area of doubt (the discipline of law?).

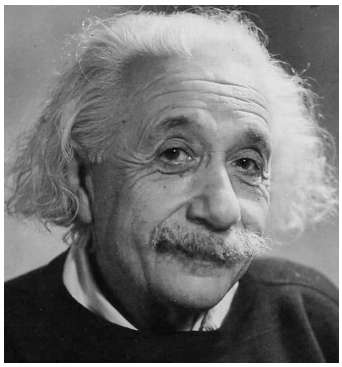
[2] The expression 'discipline of law' is used instead of the more easy expression 'law', in order to distinguish the discipline that studies the law from the object of this study, the law itself.

2. This text is structured as follows:

section number:	topic:
1	Introduction
2	Science and method
2.1	Science as a social enterprise
2.2	What is a 'method'?
2.3	Method and the object of knowledge
3	The covering law model
3.1	Explanation and prediction
3.2	The empirical cycle
3.3	Demarcation, Popper and Kuhn
4	Deductive sciences
5	The social sciences
5.1	Hermeneutics
5.2	Rational choice theory
5.3	Teleological and functional explanation
6	Normative disciplines
6.1	Classic natural law
6.2	Libertarianism
6.3	Constructivism: the rationalist tradition
7	Legal science
7.1	Two functions of the law
7.2	Law as social fact
7.3	Interpretation
7.4	Law as reason
7.5	Legal science?
8	Conclusion

2 SCIENCE AND METHOD

3. Science has to do with the pursuit and accumulation of knowledge, which can be used for explaining, predicting, and possibly also justifying, phenomena such as events in nature, events in history, and judicial decisions. Moreover, it aims to systematise this knowledge. How this systematisation takes shape depends on the object of the knowledge. In case of historical sciences the system derives from the way in which facts and events explain each other. In the case of physical sciences, the system consists in the laws that are formulated and that are used to explain and predict events and facts, and in the way in which laws are derived from each other.



Albert Einstein (1879-1955)

> An example of laws which are derived from each other is that the laws that govern the movement of planets in our solar system can be derived from Newton's laws of gravitation in combination with information about the physical bodies which exist in our solar system and their relative positions. Newton's laws can in turn be derived from Einstein's general theory of relativity in combination with some additional assumptions.

In mathematics the system consists in the axiomatisation of a subdomain and in the derivation of theorems from these axioms.

> An example of such a subdomain would be number theory, which lies at the basis of, amongst others, computation. The knowledge in this subdomain consists of the theorems of number theory. These theorems can be derived on the basis of deductive logic from a relatively small number of axioms. The axioms from which number theory can be derived were formulated by Peano. We will return to this axiomatisation in section 6.

Giuseppe Peano (1858-1932)

2.1 SCIENCE AS A SOCIAL ENTERPRISE

4. A third characteristic of science, which explains important other characteristics, is that science is a social phenomenon. It is impossible to be the only scientist in a field, at least in the long run. Science is a cooperative enterprise aimed at the acquisition, accumulation and systematisation of knowledge. The advantage of science over individual acquisition of knowledge is that scientists can build on the results of their colleagues. To quote Newton: 'If I have seen further it is only by standing on the shoulders of giants.' Let us assume that *science is a way*

Isaac Newton (1643-1727)

in which people collaborate in the pursuit and systematisation of knowledge. If such collaboration is to be possible, several conditions must be met.

5. First it must be assumed that the aspired knowledge is, at least approximately, the same for everybody involved in the cooperation. If everybody would have his own 'truth' it would be impossible for one person to build on the results of other persons. This demand would, in the eyes of many, exclude aesthetics and astrology from the arena of science.

> As we will see in the conclusion, the same demand also makes it dubious whether there can be a *science* of law.

Very often the assumption that truth is the same for everybody is made on basis of another assumption, namely that knowledge describes a world which is mind-independent and therefore the same for everybody.[3] A true description of this independent world would be the same for everybody too.

> The assumption that the world is mind independent may at first sight seem so natural that it would be foolish not to make it. But it takes only a few example to show that at least for some domains ontological realism is not obvious. Which of the following 'things' are mind-independent: calories, real numbers such as π, property rights such my right to my car, trade unions, strikes. See also paragraph 53.

2.2 WHAT IS A 'METHOD'?

6. A second precondition for the possibility of cooperative knowledge pursuit is that there exists at least to a large extent agreement on what count as good reasons for adopting or rejecting a potential piece of knowledge. Here is where method comes into the picture. For what is a scientific method?

In one sense of the word, it is a way of doing science; a kind of procedure that is to be followed if the results are to count as 'scientific'. An example of such a procedure would be the empirical cycle as described by De Groot[4], or the Herculean method described by Dworkin in the chapter 'Hard Cases' from *Taking Rights Seriously*.[5]

7. In another sense, a scientific method indicates what count as good reasons for adopting or rejecting a potential piece of knowledge. Take for instance the mathematical thesis known as the *Goldbach conjecture*, that all even numbers bigger than two can be written as the sum of two prime

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3 This assumption is called 'ontological realism'.
4 A.D. de Groot, *Methodologie*, many editions, 's-Gravenhage, Mouton, chapter 1.
5 See R. Dworkin, *Taking Rights Seriously*, 2nd ed London, Duckworth 1978.

numbers. One mathematician would count on proof to establish the truth of this thesis, while another mathematician would take a large collection of random even numbers, check whether they can be written as the sum of two primes, and decide that from this sample it is clear that the conjecture is almost certainly true . If each considers his own method as the only legitimate one, these two mathematicians cannot cooperate in the pursuit of knowledge on number theory.

The adoption of a particular method in this second sense boils down to agreement on what count as such good reasons. Since such an agreement is a precondition for science as collaborative knowledge acquisition, a shared method is almost by definition a precondition for science.

> That science requires a shared method does not exclude that this method is mostly implicit, or that it changes in the course of time. If such a change is drastic, for instance if physics comes to be based on experiments rather than on interpretation of authoritative texts, the nature of the science changes too. (Or it may change from a non-science into a science.)

8. Reasons in general, and therefore also reasons for accepting or rejecting a particular piece of potential knowledge, are facts that are *relevant* for what they are reasons for or against. The adoption of a method is a choice for what counts as relevant. It is also a choice concerning the kind of data that must be collected in order to argue for or against a potential piece of knowledge. For instance, on a hermeneutic method for legal science, the relevant data for a particular legal conclusion might be that this conclusion is supported by the literal interpretation of a statute, which is adopted as an authoritative text. Therefore a legal researcher should consult this text, and apply, possibly amongst others, a literal interpretation to it. The proper way of going about in legal research, method in the first sense, is to a large extent determined by method in the second sense of the recognition of particular kinds of data as relevant for the issue at stake.

2.3 METHOD AND THE OBJECT OF KNOWLEDGE

9. The idea of a method is often connected to disciplines, such as law, physics, mathematics, biology, medicine, history, sociology, or psychology. In the following I will continue to write about the methods of a discipline, but strictly speaking this is incorrect. Which facts count as reasons for or against a conclusion depends on the type of conclusion and therefore on the research question at issue. One discipline may deal with several kinds of research questions and then different methods are relevant in answering these questions.

The legal discipline is a case in point. The question what the criminal law of a jurisdiction is - the traditional doctrinal question - differs, for instance, from the question how the contents of the

criminal law developed in the course of time – the legal historical question. It is improbable that the same kinds of facts would be relevant to answer these two questions. So, if within a discipline different kinds of research questions are being asked, the issue of method should be focused on a type of research question, rather than on the discipline as a whole.

A consequence of this view is that a researcher should be explicit on the kind of research question that (s)he tries to answer, and in particular on the impact which this has for the choice of a method. Especially where different questions within one field require different methods, clarity about the kind of question that is addressed is crucial.

10. The methods of a scientific discipline are normally adopted because the participants in the discipline assume that these methods lead to the kind of knowledge pursued in their discipline. A good example is formal logic. One of the questions with which formal logic deals is what the theorems of a particular logical system are.

A logical system is usually represented as a set of axioms (zero or more), and a set of inference rules (one or more). The theorems are proven by deriving them by means of the inference rules from the axioms.

Logicians believe that this question has one correct answer. Moreover, each potential theorem either is or is not a theorem of the system at issue. Logicians cooperate in identifying the valid theorems and by giving reasons (proofs) why the proposed theorems are valid. Moreover, the alleged theorems and the accompanying proofs are published, to share the results with other logicians who can build upon them and are also enabled to check whether the alleged theorems actually have been proven. Logicians consider proofs to be relevant because they assume that proofs lead to conclusions which are true, not only for the person who gave the proof, but also for all other logicians.

In fact, they even attempt to prove that proofs lead to true results by showing that a particular proof theory is 'sound'. There exists an independent test, so-called model theoretic semantics, which determines whether a particular theorem is true, and a particular logical system is sound (a recommendable characteristic) if its proofs lead to theorems that are true according to the semantics.[6]

11. The point of the previous example is that scientific disciplines tend to assume that there is truth to be had and also that the methods they employ are normally suitable to discover this truth. Formal logicians assume that proofs lead to true theorems; theorists of the physical sciences assume that the cycle of hypothesis formulation, empirical testing of hypotheses, and improving the hypotheses on the basis of the test results, leads to ever better (in the sense of more true) theories, and moral

[6] More on this can be found in text books on mathematical logic such as E. Mendelson, *Introduction to Mathematical Logic*, Belmont: Wadsworth 1987.

philosophers assume that mutual adaption of concrete moral intuitions and general moral principles lead to ever better moral theories.

The methods of the different disciplines are often based on implicit theories concerning the nature of the discipline's objects and the suitability of these methods for obtaining knowledge about objects with that nature. Because mathematical theorems are different from physical laws, it takes different data to argue for the truth of theorems than for the existence of physical laws. Changing insights into the nature of a discipline's knowledge object may lead to changes in method. If, for instance, the law is not (anymore) considered to be an answer to the question what to do, but rather a body of rules, rights and principles that happen to exist at a particular time and place, we might stop arguing about the contents of the law by pointing out the consequences of particular rules, and revert to the study and interpretation of authoritative texts or the behaviour of leading jurists. (These two views on the nature of law and their implications will be discussed in section 6).

2.4 LEGAL 'SCIENCE' AS SYSTEM MAINTENANCE

12. A discipline and its methods are part of a wider body of (hypothetical) knowledge, which includes views on the nature of the discipline's knowledge objects and theories on how and why particular data are relevant to establish knowledge about such objects. In connection with the proper method of legal science this would mean that the view concerning this method hangs together with a view on the nature of the law, and a view on which data are relevant to determine the truth – if there is any to be had – of potential pieces of legal knowledge.

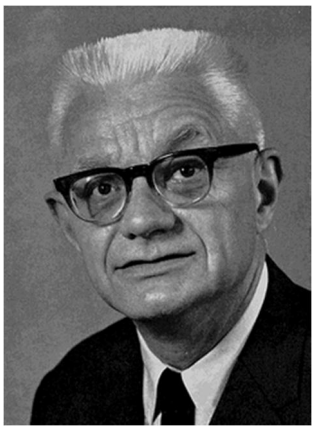
13. At this point I want to mention the possibility that legal 'science' does not aim at the pursuit of knowledge about something at all. Many lawyers are involved in keeping the law of a particular jurisdiction in good shape. This is done by describing the law as it is, incorporating recent changes caused by, for instance, new legislation and case law, into the body of legal knowledge, by evaluating the existing law, and by proposing changes to it or even - if one is the position to do so - by bringing about the desired changes. This is an important task of legal 'science', and it is served by an academic level of dealing with the law, but it is not science in the sense of the word used here of cooperative knowledge acquisition. It is rather a form of highly qualified *maintenance of the legal system*. There may be some overlap in method with 'real' legal science if such a thing exists, but maintenance of the legal system is a different activity than law as a discipline which aims at the acquisition of knowledge, and I will not deal with it here.

3 THE COVERING LAW MODEL

14. The physical sciences such as physics, astronomy, chemistry and biology aim at obtaining and systematising knowledge about physical reality that can be used to *explain* and *predict* natural phenomena. Such knowledge can, for instance, be used to explain why a piece of metal expands, why the sun looks bigger when it is just above the horizon, why flowers grow towards the light, and why litmus paper turns red when exposed to an acid. It can also be used to predict an eclipse of the moon, that a lump of sugar will dissolve when dropped in a cup of coffee, that a computer screen will show the text of a file after a command was given to load this file, and that a specific person will probably answer the phone after a particular number was called.

3.1 EXPLANATION AND PREDICTION

15. An influential view on the nature of both explanation and prediction was developed by two philosophers of science, Hempel and Oppenheim. According to this view, a particular physical phenomenon (the *explanandum*; what is to be explained) is explained by deducing that this phenomenon occurred from a description of the facts which preceded the phenomenon or are simultaneous with it, and one or more laws of nature. These laws are said to cover both the preceding facts and the phenomenon that is to be explained and therefore it is called the 'covering law model' of explanation. The explaining facts together with the laws by means of which the explanandum is derived are called the *explanans* (what explains).



Carl Hempel (1905-1997)

Other fashionable names for the same model are the *Hempel/Oppenheim model*, after the philosophers who developed it, and the *nomologic-deductive model*, after the laws (in Greek *nomoi*) which are used in the explanation and the deductive logic by means of which the explanandum is derived from the explanans.

16. An example of an explanans is that a piece of metal M expanded when it was heated.

This example will be used more often in the next sections, because it is relatively easy to understand. Many phenomena are much harder to explain, but the idea behind the covering law model is that more difficult explanations have to do with more facts and more laws, but that essentially all these explanations are the same.

A covering law explanation of this phenomenon looks as follows:

covering law (part of the explanans)	Metals expand when heated
preceding or simultaneous facts (part of the explanans)	M was heated at time t_0
explanandum	M expanded at time t_1

17. According to the covering law model, prediction is logically the same as explanation, the only difference being that explanation relates to the past or the present, while prediction relates to the future. The following example illustrates this:

covering law (part of the explanans)	Sugar dissolves in water
preceding or simultaneous facts (part of the explanans)	S is put into water at time t_0
explanandum	S will dissolve not too long after time t_0

18. In the ideal case of covering laws, application of the law to case facts precisely explains what happened or predicts what will happen. Reality has it, however, that so much precision is not attainable. It is for instance probable that somebody who is exposed to the influenza virus will be catch influenza. If somebody caught influenza after he was exposed to the virus, the exposition will be seen as the explanation of his falling ill. However, there is no hard law that everybody exposed to the influenza virus will fall ill. There is at best a high probability.

To deal with such cases, a variant on the covering model can be used, which allows that conclusions are drawn with a certain degree of probability. The following would be an example:

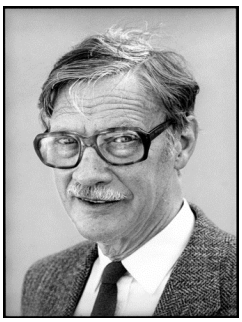
covering law (part of the explanans)	The probability that somebody contracts influenza within 5 days after he was exposed to the influenza virus is 50%.
preceding or simultaneous facts (part of the explanans)	P was exposed to the influenza virus on January 6, 2013
explanandum	There is 50% chance that P will develop influenza in between January 6 and January 11, 2013.

3.2 THE EMPIRICAL CYCLE

19. The physical sciences are usually considered to be empirical, meaning that they treat knowledge based on sensory perception as the basic building blocks of science. Sensory perception can only give us knowledge about particulars, though, while the really interesting scientific knowledge is law-like. We can measure that piece of metal M expanded at t1 after it was heated at t0, but it is much more interesting to know in general that metals expand when heated. Somehow the step must be made from the observation about a particular physical object and its circumstances to a law of nature. The process in which this step is taken is sometimes describes as the 'empirical cycle'. It consists of five sub-steps:

1. Observation
2. Induction
3. Deduction
4. Testing
5. Evaluation

The term 'empirical cycle' and the sub-steps distinguished within it were coined, respectively identified by the Dutch psychologist Adriaan de Groot, in his book 'Methodologie'. It is interesting to note that these steps were primarily formulated with social science research in mind[7], but that they can be applied well within the physical sciences. The underlying idea is that empirical research in the social sciences is not fundamentally different from empirical research in the social sciences.



Adriaan de Groot
(1914-2006)

20. The first step, observation, marks the empirical nature of the cycle. Observation is the starting point for obtaining empirical knowledge. It should be noted that the observation in question will seldom be purely random. Observations in scientific research are often made in the context of an experiment in which a researcher looks for specific information. However, it is also possible that somebody just notices a seeming regularity in nature, or a coincidence of events, which gives rise to the formulation of an hypothesis.

[7] To avoid awkward formulations such as 'social and human sciences', I assume here that psychology is a social science.

21. Induction is the step from particular to general. If it was observed that several pieces of metal at different occasions expanded after being heated, one can formulate the general law (or – for those who like precision - a 'law-like generalisation') that metals expand when heated.

> Generalisations are statements about all members of a class, for instance about all human beings of a particular age, about all rocks, or about all pieces of metal. Law-like generalisations differ from other generalisations in the fact that they support hypothetical and counterfactual judgments. If it was observed that all the chairs in the class room happen to be red, this observation can be rendered in the form of the true generalisation 'All chairs in the class room are red'. This generalisation does not support the hypothetical judgment 'If this were a chair in this class room, it would have been red', however. The law that metals expand when heated does support the hypothetical judgement 'If this were a piece of metal, it would expand when heated'. It would also support the counterfactual judgement 'If this piece of wood would have been a metal, it would not have burned when it was heated, but it would have expanded.' Sciences aim at law-like generalisations, and not merely at generalisations that happen to be true.

This step from particular to a law-like generalisation is called *induction*, and it leads to the *hypothesis* that the law-like generalisation is true.

In connection with induction several things should be noted:

a. In formulating a law, one must abstract from the details of particular observations. One must for instance notice that the heated things were all *pieces of metal*, and not - for instance- small objects in a particular laboratory office. And it should be noted that they were all *heated*, and not – for instance- physically held above a particular Bunsen burner. If the abstractions are made in the wrong way, the 'law' that is found will turn out not to be lawful at all. Pieces of metal will not expand if held above a Bunsen burner that is off, and pieces of paper held above the burner will end in flames, rather than expand.
b. The step from the observations to the general law is not valid in the sense of deductive logic.[8] It is possible that all observations are correct, while the general law does not hold. One possible explanation is that the observations were wrongly abstracted, but it is also possible that the observed regularities were merely accidental. Somebody who arrives in Ireland after having stayed in the Sahara desert for many years may after a few days of rain induce that it rains every day in Ireland.

22. Precisely because inductive arguments cannot guarantee the truth of their conclusions, it is necessary to test the law-like generalisations that were found by means of induction. To do so, it is

[8] An argument is valid according to deductive logic, if and only if it is not possible that all the premises are true while the conclusion is false. More on deductive validity in, for instance, I.M. Copi and C. Cohen, *Introduction to Logic*, 14th edition, Upper Saddle River: Pearson 2011.

necessary to apply the 'law' to new facts in order to make predictions. This application takes the form of a deductively valid argument. The example of the covering law model above, in which sugar was dissolved in water, illustrates the point. From the fact that sugar was put into water and the 'law' that sugar dissolves in water, the conclusion can be deduced that the sugar will dissolve.

23. The deduced conclusion should be testable, which means in practice that it should concern an observable fact. The test consists in making the observation which shows whether the deduced conclusion is true indeed. Depending on the outcome, the hypothesis will be evaluated in the final step.

If the deduced fact is actually observed, the hypothesis is *confirmed*; if the deduced and predicted fact is not observed, this suggests that the hypothesis is *falsified* (but see paragraph 27).

A confirmatory observation does *not prove* that the law-like generalisation is true. It only adds one more observation to the already existing body of observations that supports the theory. Even from the thus expanded body of observations, it is still not possible to deduce the truth of the law-like generalisation.

> Suppose that five observations of heated pieces of metal led to the formulation of the hypothesis that metals expand when heated. This hypothesis is used to deduce the prediction that a sixth piece of metal M will expand when heated. This turns out to be the case. Now we have six observations of pieces of metal which expanded when heated, but that still does not prove that *all* pieces of metal expand when heated.

24. If the prediction turns out to be wrong, the seemingly obvious conclusion is that the law-like generalisation was false. That may very well be the conclusion, but there are several other possibilities. One is that the yard stick with which the piece of metal was measured has expanded too, or something else may have happened to it. Then the observation itself was incorrect, and the hypothesis may still be correct.

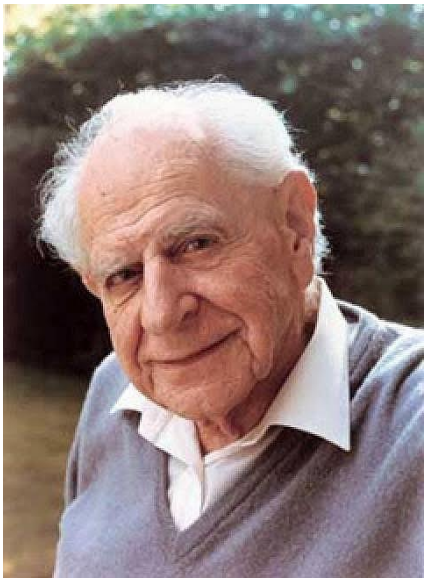
> Although the idea that it is possible to test a theory by means of observation is intuitively simple, practice turns out to be much more complicated. A recent example can illustrate this point. One of the implications of Einstein's general theory of relativity is that nothing can travel faster than light in vacuum. Recent experiments at the CERN research in statute suggested that neutrino's travel faster than light in vacuum. So it seems that the general theory of relativity has been refuted. However, the observation that neutrinos travel faster than light in vacuum is based on the outcome of an experiment which made us of complex machinery and how this machinery works is also based on a theory. So the outcome of the experiment might also be interpreted as stating that the theories about particle accelerators are false. (In fact, several months later, the refutation of the theory of relativity turned out to be based on a measurement error.)

More in general, observations are often performed by means of instruments and the operation of the instruments depends on law itself. If a prediction does not come out true, something was false, but it may just as well be the law on which the instrument was based instead of the law that was officially tested.

Still more in general, if a prediction does not come out, a decision must be taken about what went wrong. This decision may be that the law-like generalisation should not be outright rejected but that it should be reformulated a little. For instance, it might become that pieces of metal expand when heated, unless the air pressure is very high. This new formulation is an improved hypothesis which may be tested in a new experiment. Then the test of the one cycle has become the observation of the next cycle, and that justifies the idea that the empirical cycle is a cycle indeed.

3.3 DEMARCATION, POPPER AND KUHN

25. During the twenties of the 20th century, a young man who later became a famed philosopher, Karl Popper, was tormented by doubts about the 'scientific' works of famous scientists of his time, such as Gustav Jung, Sigmund Freud and Karl Marx. Somehow he had the feeling that there was something wrong with their theories about psychology (Jung and Freud) and history (Marx), but adherents of these theories were always capable to fit all the available evidence into the theoretical framework of psycho-analysis, respectively historical materialism. In short, the theories of these scientific giants seemed so good that they could not be refuted. And yet, Popper thought that they were wrong.



Karl Popper (1902-1994)

In 1934 Popper published a book, *Logik der Forschung* (The Logic of Scientific Discovery), in which he explained what was wrong in the theories of Freud, Jung and Marx. The fact that these theories could not be refuted was not a strength, but rather a weakness. Take for instance the following sentence:

Either it is raining, or it is not raining.

This sentence is true, and its truth cannot be refuted by any experiment. However, this only means that the sentence does not give any information. Precisely because it does not offer any information, the sentence cannot be refuted. This insight led Popper to formulate a criterion to demarcate science from non-science: Scientific theories can be refuted, while non-scientific theories cannot. A good

theory is a theory which excludes many facts. If these facts nevertheless turn out to be the case, the theory is falsified and has to be replaced by another theory. If the theory is not falsified by the facts, although it excluded many facts, it proved to be a relatively strong one.

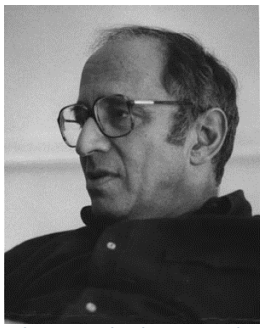
26. It is, according to Popper, the task of scientists to hypothesise bold theories, which exclude as many as possible facts. The more facts a theory excludes, the higher its predictive power. Moreover, the higher a theory's predictive power, the easier it is refuted. If such a bold theory is nevertheless not refuted, it has proven to be very valuable. However, a theory which contains law-like generalisations cannot be *proven* to be true, because any finite set of confirming observations is compatible with the existence of a piece of decisive counter-evidence.

> The classic example in this connection is that no amount of white swans proves that all swans are white. It always remains possible to discover a black swan which shows that not all swans are white.

Scientist should certainly not look for confirmation of their theories. In the first place because confirmatory evidence cannot prove a theory to be correct. And in the second place, because the search for confirmation does not lead to additional knowledge. It is precisely in the test in which a theory runs the most risk of refutation that the support for a theory lies.

Therefore, according to Popper, the progress of science lies in a continuous cycle of conjectures and refutations.[9] Scientists hypothesise bold theories, think of experiments to put them to the test, and if a test is negative they should formulate a new, improved theory, which they will put to the test in the same way. This is essentially the empirical cycle which was described in the section above.

27. The idea that scientist operate in the fashion described by Popper has been severely criticised by a contemporary of Popper, Thomas Kuhn. Kuhn made extensive studies of the history of science, which led him to the view that science does not primarily operate with theories which are tested, falsified and replaced by better ones. According to Kuhn, so-called *paradigms* take a central place in science.


Thomas Kuhn (1922-1996)

What precisely is such a paradigm? Basically it is a way of looking at a particular phenomenon. An example would be to see light as a bundle of tiny particles, so-called 'photons', which travel in straight lines. Given this way of looking at light, it becomes relatively easy to explain that there are shadows (the bundle of photons is interrupted), that light can be reflected by a mirror (the photons bounce back when they collide with a mirror), and that rays of

[9] *Conjectures and Refutations* is actually the title of one of Popper's books.

light are bend in water (photons travel slower in water). So, given the particle-paradigm of light, it is possible to formulate laws by means of which phenomena related to light can be explained and predicted. The existence of these laws, which have been tested and survived the tests, provides strong support for the particles-paradigm of light. So strong that if there is counter-evidence, the paradigm is not easily abandoned.

And counter-evidence there was, because light also exhibits a number of characteristics which do not fit at all in the particles-paradigm. One such a phenomenon is that rays of light can extinguish each other. If light is a bundle of particles, such bundles cannot extinguish each other. If extinction happens nevertheless, the paradigm that light is a bundle of particles is not immediately given up. That would be a shame, because the paradigm also contains the explanations of shadows, reflection and the bending of light. So what happens is that scientists try to stick with the paradigm, and try to find solutions for the extinction problem within the framework of this paradigm.[10]

Only when the counter-evidence against a paradigm is so strong that the paradigm cannot be upheld anymore, or if for some other reason the paradigm loses its popularity, the paradigm is replaced by a new one. So, according to Kuhn, the picture that theories are put to the test and are given up when the test provides counter-evidence is too simple. Theories, especially if they fit in a popular paradigm, can be much stickier than Popper would want us to believe.

4 DEDUCTIVE SCIENCES

28. We have already seen some examples of sciences which do not deal with the 'world outside', but with can be known purely by thinking. The paramount examples of these sciences are mathematics and (mathematical) logic.

> Some might want to include philosophy too, but arguably philosophy is not a science.

Because both mathematics and formal logic make heavily use of deductive reasoning, they can both be characterised as *deductive sciences*.

> Deductive reasoning is a kind of reasoning which guarantees that if the premises of an argument are true, the conclusion will also be true. It does neither guarantee that the premises are true, nor that the conclusion is true. Contrary to what is sometimes stated, deductive reasoning is *not* reasoning from general to specific, although the latter type of reasoning may be deductively valid.

[10] In the case of light actually two incompatible seeming paradigms are simultaneously adhered to. The one is the described particle paradigm; the other is that light consists of electro-magnetic 'waves'.

The constant 0 is assumed to be a natural number:

1. 0 is a natural number.

The next four axioms describe the equality relation.

2. For every natural number x, $x = x$. That is, equality is reflexive.
3. For all natural numbers x and y, if $x = y$, then $y = x$. That is, equality is symmetric.
4. For all natural numbers x, y and z, if $x = y$ and $y = z$, then $x = z$. That is, equality is transitive.
5. For all a and b, if a is a natural number and $a = b$, then b is also a natural number. That is, the natural numbers are closed under equality.

The remaining axioms define the arithmetical properties of the natural numbers. The natural numbers are assumed to be closed under a single-valued 'successor' function S.

6. For every natural number n, $S(n)$ is a natural number.

… The next two axioms define the properties of this representation.

7. For every natural number n, $S(n) = 0$ is False. That is, there is no natural number whose successor is 0.
8. For all natural numbers m and n, if $S(m) = S(n)$, then $m = n$. That is, S is an injection.

… To show that every natural number is included in this set requires an additional axiom, which is sometimes called the *axiom of induction*. This axiom provides a method for reasoning about the set of all natural numbers.

9. If K is a set such that:
   - 0 is in K, and
   - for every natural number n, if n is in K, then $S(n)$ is in K,

then K contains every natural number.

The induction axiom is sometimes stated in the following form:

9. If ϕ is a unary predicate such that:
   - $\phi(0)$ is true, and
   - for every natural number n, if $\phi(n)$ is true, then $\phi(S(n))$ is true,

then $\phi(n)$ is true for every natural number n.

Text Box 1

29. Any deductive science must work with *inference rules* which state what can be derived from a set of premises. These rules will be very 'logical' and therefore not very surprising.

One example of such an inference rule is that from the two premises A and B the conclusion A&B may be derived.

The inference rules belong to logic. For a mathematical theory it is necessary to add axioms to the theory, which give information about a particular subdomain of mathematics. To give an impression of how such an axiom set may look like, the axioms that Peano gave for number theory are listed in text box 1.[11]

30. The axioms form the starting point of a deductive science. By means of the inference rules, so-called *theorems* can be derived from the axioms.

> An example of such a theorem, that can be derived from Peano's axioms, is that 1+1 equals 2. More technically stated; the successor of 0 plus the successor of zero is identical to the successor of the successor of zero.

These theorems can in turn be used to derive additional theorems. A deductive theory, such as number theory, consists of the inference rules, the axioms, and all the theorems than can be derived from the axioms by means of the inference rules.

31. Some have noticed a parallel between the law and deductive sciences, namely if the rules made by the legislator are taken as axioms. The statements that describe the law of a jurisdiction then consist of these axioms and everything that can be derived from them (the 'theorems') . Most lawyers consider this view of the law to be too 'mechanical' however.

> Nevertheless this style of thinking about the law becomes more relevant with the use of computer programs that take simple legal decisions, such as the height of study grants, or grant building permits in easy cases.

5 THE SOCIAL SCIENCES

32. It is possible to conduct social science research in precisely the same way as one conducts research in the physical sciences. Human beings are part of nature, and why should they be studied in a different way than other parts of nature? If somebody commits a murder, this may for instance be explained from the fact that his brains physically operated differently than humans brains usually operate. Such an explanation would probably have to be based on a statistic law (see paragraph 18), but that does not detract from the fact that human behaviour is treated in the same way as other natural phenomena.

[11] Based on http://en.wikipedia.org/wiki/Peano_axioms . Another example of an axiom set is Euclid's axiomatisation of geometry. See: http://en.wikipedia.org/wiki/Euclidean_geometry#Axioms

33. Many researchers think that is more fruitful to explain and predict human behaviour differently than other phenomena, however. A major reason to treat the social sciences different than the physical sciences is that the social sciences deal with human behaviour. Arguably, understanding and predicting human behaviour presupposes that one takes into account that humans are rational beings who often have reasons for what they are doing. In the case of the physical sciences, this need to take reasons for behaviour into account is absent.

5.1 HERMENEUTICS

34. There are at least two major traditions in the social sciences. The one is *hermeneutic* and aims at *understanding* events by means of interpretation (discover the meaning of the events). An example would be that the fact that people wear black clothes when they visit a cemetery is explained by pointing out that wearing black clothes is a way to express mourning. The most elaborated version of this approach is developed in the theory of legal interpretation, and it is under the heading of legal science that this approach will receive more attention.

Notice that this hermeneutic tradition not only treats human beings differently than the rest of nature, but that it also has other research questions. The aim is not anymore to predict, but rather to understand. Such understanding may also lead to a kind of explanation, but it is an explanation without underlying law-like generalisations.

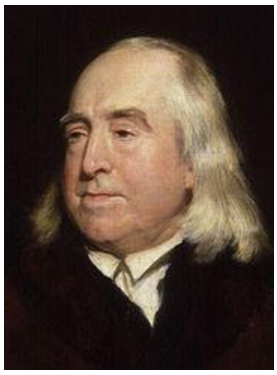
> For instance, if we know that a person is engaged in a very painful divorce, this makes it – to some extent – 'understandable' that he or she killed her children and committed suicide thereafter. Such understanding also amounts to a kind of explanation. But few persons would see this in the light of a covering law, not even a statistic one.

5.2 RATIONAL CHOICE THEORY

35. The other tradition aims at explaining and predicting human behaviour by means of *covering laws*, but makes use of the insight that humans are rational to hypothesise what these laws are. *Rational choice theory* aims to explain human behaviour on the assumption that what humans do must be rational, at least in their own eyes

An example of rational choice theory that is particularly interesting for lawyers is Jeremy Bentham's view on punishment. Bentham saw potential criminals as rational beings who balance the expected advantages of a crime against the expected disadvantages. A monetary example may clarify this.

Suppose that somebody considers to rob a bank. The chance that the robbery will be successful is 80% and then the robber will gain an amount of €125.000. So the expected gain of the robbery is 80% of €125.000, that is €100.000.



Jeremy Bentham (1748-1832)

The expected loss is the chance that the robber will be caught, multiplied by the height of the fine.[12] Suppose that the chance to be caught is 25%. Then the fine needs to be €400.000 to balance the expected gain. If the fine is higher than that, it becomes irrational to rob the bank; if it is lower than that it is rational to rob the bank. Bentham's proposal would therefore be to set the fine in such cases slightly above €400.000 in order to deter the potential criminal, but at the same time not to punish him more severely than necessary.

36. On the assumption that a potential criminal is rational, it can therefore be computed how high a fine should be in order to withhold potential criminals from robbing the bank. At least so it seems, because there is a complication. A criminal can misestimate the gain of the robbery, or the chance to be caught. His behaviour will be determined by what he *thinks* about these topics, not about the 'real' truth. So a rational criminal will reason from his own beliefs and estimations, rather than from the true ones. (But his beliefs may be true, of course.) So if we want to explain or predict the behaviour of the potential criminal, we must reason from his beliefs and estimations, not from the facts. This does not withhold us from giving good explanations and correct predictions, on the assumption that the potential criminal is rational. This is the rational choice approach to the explanation and prediction of human behaviour.

37. Rational choice theory aims to explain or predict human behaviour on the assumption that humans act rationally. This assumption is not always correct, though. One rationality assumption that has been challenged is that the worth of a good for a person does not depend on whether this person owns this good or not. And yet this seems not always to be the case. The so-called *endowment effect* is the phenomenon that people value something more if they already have it, than if they are still to acquire it. For example, a person would ask more for a car he owns from a potential buyer than he himself would be prepared to pay for the car in case he wanted to acquire it. Things seem to become more valuable for those who own them.

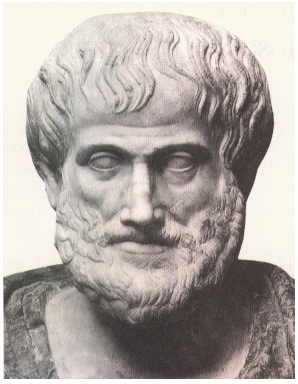
[12] It is assumed that there will be a fine instead of imprisonment, to keep the example in the monetary sphere.

A practical application of this endowment effect is that somebody would make a greater sacrifice to stay out of prison (to keep the freedom he already has) than to get out of prison if he is already detained (to gain freedom that he does not have yet).

Whether this example of the endowment effect actually occurs in practice has to my knowledge not been tested yet.

5.3 TELEOLOGICAL AND FUNCTIONAL EXPLANATION

38. In the physical sciences, teleological explanations have become a little suspect and have largely been replaced by causal explanations. A causal explanation explains an event or fact from events and/or facts in the past, or at best the present. A teleological explanation refers to some future or intended state of affairs to explain the presence or the past. An example of such a teleological explanation is that flowers bend towards the sun in order to capture more light. Aristotle would have applauded such explanations, because he assumed that nature as a whole is goal-directed. However, most present day biologists would prefer an explanation of 'positive phototropism' in terms chemical processes within the plant.[13]



Aristotle (384-322 BC)

In case of the social sciences, teleological explanations have remained more popular, and the reason is obvious: human beings often act in a goal-directed way and pointing out what an actor intended to achieve by means of an act can very well serve as an explanation of that act. It is not a good explanation in the sense of the covering law model, however. If the fact that I sit before my computer screen is – correctly - explained by the fact that I want to prepare a lecture, this does not mean that a general law holds that each time I want to prepare a lecture, I sit before my computer screen. A teleological explanation does give us insight in the why of this behaviour, but is not suitable to predict future behaviour.

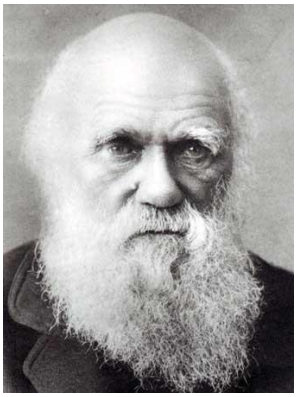
There is a close connection between this kind of teleological explanation of human behaviour and the hermeneutic way of understanding behaviour that was briefly discussed in paragraph 34. In both cases a satisfactory explanation of some behaviour can be achieved, but not a reliable prediction.

39. A special case of teleological explanations are functional explanations. Where 'standard' teleological explanations deal with intentional behaviour and explain acts from the intentions with

[13] See for instance http://en.wikipedia.org/wiki/Phototropism. (downloaded on December 14th, 2011)

which they were performed, functional explanations are teleological without the need to refer to intentions. Phenomena, including human behaviour, are explained by means of the function they fulfil. For example the existence of parliaments is explained from their function to control the government or to provide democratic input into legislation.

Functional explanation also plays a role in biology, the evolution theory being the primordial example. The long necks of giraffes can for instance be explained from the fact that they enable giraffes to eat high growing leafs from trees. The existence of eyes can be explained from the fact that they allow individuals to see and that being able to see has survival value for the species with eyes.


Charles Darwin (1809-1882)

Also the existence of legal rules can be explained functionally. For instance, the high penalty on murder can be explained from its function to withhold people from committing murders. As is well-known, this function also plays a role in the interpretation of legal rules: choose the interpretation which allows to rule to fulfil its function optimally.

What holds for teleological explanations in general, namely that they do not allow prediction, also holds for functional explanations. For instance, not everywhere where democratic input in legislation is wanted, parliaments exist. Direct democracy can fulfil the same function.

6 NORMATIVE DISCIPLINES

40. The physical and the social sciences have in common that there are facts and phenomena 'out there' which call for explanation and prediction. The phenomena do not depend on the theories which aim to explain or predict them (*ontological realism*), and this makes it possible to test the theories against sensory perceptions of the phenomena. In other words, both physical and social sciences can be *empirical*.

It is highly doubtful whether there can exist an empirical normative science. If there are normative facts – and this is already doubtful – we have no senses to perceive them.

> Some might argue that our conscience is the sense with which we perceive moral facts. This is not a widely accepted view, though.

Many have seen the absence of normative facts, or the impossibility to perceive them, as reasons why a normative science is impossible. Those who assume that in the normative sphere there is nothing to be known are called *non-cognitivists*.

6.1 CLASSIC NATURAL LAW

41. *Moral realism* is the view that there are moral facts, which exist in a different way than, but nevertheless analogously to, 'ordinary' physical facts. According to a *natural law* tradition which goes back to Aristotle, human beings have an inherent purpose and this purpose determines what they should do. Normative facts then follow from man's nature. Because the nature of things, including human beings, is objectively given, their purposes can, at least in principle, be established scientifically.

> There is also a rationalist natural law tradition which claims not to make any assumptions about human nature. This rationalist tradition will be discussed in section 5.3.

42. A modern version of this style of thinking which aims to extract norms from human nature is a form of *utilitarianism* which aims at maximising long term human happiness. Happiness is then taken to be a mental characteristic of humans and it is assumed that human nature as laid down in the genome of humans to a large extent determines what makes human beings happy. Sciences such as biology, psychology , sociology and economy can elaborate guidelines how human happiness can be maximised and these guidelines would have normative force because the strive for happiness follows from human nature.

> This form of utilitarianism might very well be dubbed *Aristotelian utilitarianism*, because it combines the strive for the maximisation of happiness from utilitarianism with the Aristotelian assumptions that things have a nature and that this nature determines what is good for these things.

43. Natural law theories which aim to derive norms from human nature have come under suspicion since the late Middle Ages, because the view that things have an intrinsic nature has lost popularity. The Aristotelian metaphysics, according to which the whole nature is goal-directed and the goals are given with the essences of things, was replaced by a mechanistic-causal world view, according to which all events are determined by means of causal laws and the facts that preceded them in time. Causal laws operate on characteristics of things, such as their having a volume, and mass, but none of these characteristics determines the essence of things. What, if anything, is counted as the essence of a thing is on this view a matter of choice, and can be dealt with in an opportunistic way. If things have no inherent essences and do not share goals that follow from these essences, the objective basis for norms according to this natural law style of thinking is lacking.

6.2 LIBERTARIANISM

44. Another version of moral realism, the view that there exist objective moral norms or values, is libertarianism. Libertarianism is a version of liberalism which starts from the assumption that human beings 'own' themselves. This self-ownership, a right which human beings have in themselves, would be an objective fact. Libertarianism assumes the existence of this right preceding any legal order; self-ownership would be a *natural right*.

From this self-ownership, libertarians derive many norms, mainly of the type that humans are free to live as they like, if only they do not infringe upon the self-ownership of others. In particular, governments are not allowed to curb human liberties, unless the persons whose liberties are curbed have consented to it. This disallows all taxes, except those with which the tax-payers have agreed.

45. Libertarianism provides a solid basis for the 'classic' human rights which aim at protecting citizens against their governments. They are at the same time an impediment to those rights which require governments to interfere with the life of people in order to safeguard some important interests, such as the provision of food, shelter, jobs, and education.

The scope of the rights which libertarianism protects is not given on beforehand, but must be determined by means of interpretation.

6.3 CONSTRUCTIVISM: THE RATIONALIST TRADITION

46. Moral realism assumes that there exist moral norms 'out there' which merely need to be discovered. The way to discover these norms is through science (Aristotelian utilitarianism) or through interpretation (of natural rights), but the norms are assumed to exist independent of their discovery or their acceptance by human beings.

Constructivism also assumes that norms can be found through science or other forms of *reasoning*, but differs from moral realism in that it does not assume that the norms that are found in this way existed independently. The reasons why something is good are not a means to discover what was already good, but *make* that something is good. What is good and what ought to be done is *constructed* by means of reasoning, not discovered.

> To give a simple example: John should give Mary a book because he promised to do so. What John should do is the *result* of the promise. It is not so that from the fact that John made the promise we can infer that

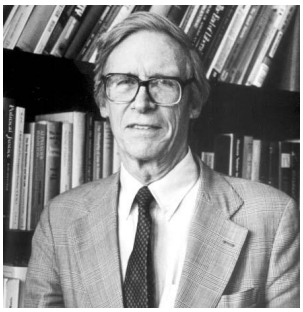
there must also be another fact, namely that John ought to give the book to Mary. The promise is not evidence of the obligation, but the cause of it.

Immanuel Kant
(1724-1804)

47. One major representative of the rationalist tradition which seeks to determine purely by mean of reason what we ought to do was the German philosopher *Kant*. According to Kant, moral norms tell us what we ought to do unconditionally, that is what we ought to do, not merely to achieve some goal which we happen to pursue, but as representatives of humanity in general. By abstracting from all goals which individuals happen to have we can determine what we ought to do from the moral point of view. In this connection Kant formulated the following test:

Of which norms can we want that they should be adopted by everybody?

The norms which pass this test, and no other norms, qualify as moral norms.



John Rawls (1921-2002)

48. In the 20th century John Rawls formulated a modern equivalent of the Kantian test for moral norms. In his book *A Theory of Justice* he introduced the so-called *veil of ignorance*, a hypothetical device that can be used to determine which norms would be just. The idea is that those norms are just which would be chosen by people as norms to govern the society they will live in. However, people should not chose these norms as real life persons, but as hypothetical actors who do not know as which persons they will be in the society for which they have chosen the rules. For instance, an actor must chose the rules which govern the division of wealth over society without knowing whether he will be rich or poor, talented or not, handicapped or not, etc. The veil of ignorance keeps all knowledge of these kinds away from the actors which must decide over the rules. It also withholds from the actors knowledge about their life plans, their ideals, their type of personality, and their religious convictions (or the lack thereof). In this way the hypothetical actors can act as representatives of humanity in general.

The test on the moral quality of a rule would then become:

Which rules would be chosen from behind the veil of ignorance?

This test is very similar to the test that was formulated by Kant two centuries earlier.

49. Rawls did not only formulate a modern version of the Kantian test on moral quality; he also devised a test criterion of his own. This criterion has become known as *reflective equilibrium*. The idea behind reflective equilibrium is that we both entertain abstract ideas about justice and on what we should do, and intuitions about what would be the proper line of conduct in particular cases.

For instance, we may hold the opinion that nobody deserves the physical and mental capacities with which he is born but that these capacities, or the lack thereof, are merely things which happened to a person. Therefore nobody should benefit from, or suffer under, the capacities which were purely by coincidence bestowed upon her. Other persons should benefit from them just as much and therefore wealth should be distributed over society with as little regard as possible to the persons whose capacities led to this wealth.

At the same time we may intuitively object against the fact that somebody who is not prepared to work and therefore threatens to become poor will benefit from social security to such an extent that his income equals that of working people.

This abstract idea and this concrete intuition conflict with each other, because somebody's unwillingness to work just happened to this person, while other persons are blessed with zeal. The abstract idea of justice requires that 'lazy' persons enjoy in principle the same income as zealous ones, while intuitively many people would think otherwise.

The idea of reflective equilibrium is that the abstract ideas and the concrete intuitions are to be harmonised, so that they do not conflict anymore. By thinking about both the abstract ideas and the concrete intuitions and about the reasons why these may conflict in concrete situations, one should adapt either the ones, or the others, or both, until the conflict has disappeared. Such a state without conflicts, arrived at through deliberation, is called reflective equilibrium.

> *Those moral judgments are justified which belong to a set of abstract ideas and concrete intuitions which is in reflective equilibrium.*

7 LEGAL SCIENCE

7.1 TWO FUNCTIONS OF THE LAW

50. The law has a remarkable double function. On the one hand it aims to answer normative questions, such as:

- Should the child take the family name of the mother or of the father (or both)?
- Should de debtor in default compensate for purely economic losses?

- Should somebody who merely assisted in the preparation of a crime be punishable?

In this respect, the law resembles morality, and one might take it that legal reasoning is rather similar to moral reasoning.

51. Another function of the law is to provide certainty about the behaviour that is expected from actors. There can be serious disagreements about the proper answer to some normative question and if answering these question were left to moral reasoning, the resulting uncertainty and the quarrels that might flow from it may be even worse than the original problem. By providing clarity about what people may expect from each other, the law fulfils an additional function next to providing the answers to normative questions.

In order to provide the much wanted certainty, the contents of the law must be clear. That explains the importance of positive law, which exists as a matter of social fact. That also explains the tendency amongst many lawyers to identify the law with the positive law. If one allows the existence of non-positive law next to the positive law, the gain in legal certainty threatens to be lost again.

52. We have encountered two functions of the law. On the one hand it must provide answers to normative questions, and from this perspective legal method should be a special case of the methods of the normative sciences. On the other hand, the law must provide (legal) certainty. From that perspective, the law must exist as a matter of social fact. The scientific study of the law would then be a form of social science.

In this section, both perspectives on the law will be discussed briefly.

7.2 LAW AS SOCIAL FACT

53. There are at least three kinds of facts.

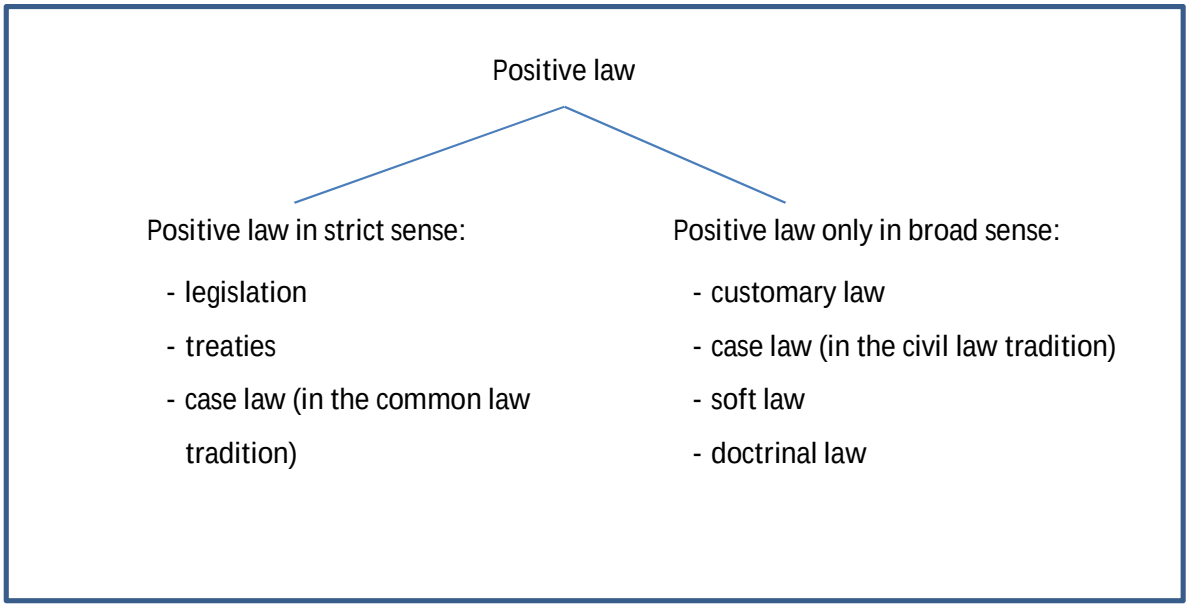
First there are facts which are *true by convention*. Examples are the facts that bachelors are not married and that 5 is the sum of 2 and 3. It is not necessary to take a look 'outside' to know that these are real facts.

Second there are facts that are true because they belong to a reality which exists *independent of human beliefs or acceptance*. These facts include the existence of mountains, that the seas are filled with salty water, and that light diffracts when it falls through a prism. They are associated with the physical aspects of reality and the traditional way to obtain knowledge of them is through sensory perception.

And third there are facts which *depend for their existence on the human mind*.[14] They include heterogeneous facts such as the facts that the Belgian flag includes the colour black[15], that many people suffer from headaches, that it is indecent for adults to be naked in public places, that Belgian citizens legally ought to make a tax declaration each year, and that Kris Peters is the prime minister of Flanders.

Some of these facts depend on individual minds (experience of colours and of headaches), others on what the public at large thinks of a matter (being naked in public), and again others on rules (duty to make tax declarations), sometimes in combination with events (being the prime minister).

54. Positive law belongs to the third category. Legal rules can exist in two different ways. Most of them exist because they were explicitly created according to some existing rule, by means of legislation or treaties, or – in the common law tradition – case law. These rules are positive law in a strict sense, because they were laid down (*positus*). Some others exist because they are accepted as legal rules by the public at large, or – even more importantly – by the officials of a legal system, such as the judges. Customary law is the primary example of this category, but also case law (in the civil law tradition), soft law (to the extent that it is considered to be law at all), and (other) rules which were developed in legal doctrine. The rules that exist purely because they are accepted as law are only positive law in a broad sense of the expression.



[14] It might be argued that the facts that are true by convention fall within this category. It leads to an interesting philosophical discussion whether that is the case or not, and that discussion will not be held here.

[15] Colours depend on how human beings experience exposure to electro-magnetic waves within a certain frequency range.

55. The existence of most positive law can be established by reading texts; texts of legislation, of treaties, of judicial decisions, and of doctrinal documents such as books and journal articles. Even if it is necessary to find out whether particular rules exist through being accepted, the evidence for the acceptance can usually be found in texts (accounts of what is commonly accepted).

In the case of positive law in the strict sense, the reader can be almost certain that the text reflects the contents of the law, because the law was created by means of the text. In the case of positive law in the broad sense only, texts are evidence for the existence of a social practice, but the reader must take an additional step.

> For instance, if one handbook on criminal law states one thing, and another handbook another thing, what is then the positive law?

The precise nature of this step is not very clear. Lawyers tend to call it *interpretation*; they tend to call almost everything interpretation where a decision must be based on one or more texts.

7.3 INTERPRETATION

56. Another form of interpretation is required if it is unclear whether a particular kind of case falls under the scope of a rule, if it is unclear what the scope of a right is, or whether an exception should be made to a rule. Then the content of the rule or the nature of the right is known, but there remains a lack of clarity about the scope of their application. The texts themselves cannot help answering this question, and some additional argumentation is necessary to 'interpret' the rule, the right, or the law in general. What are good arguments in this connection?

57. Lawyers dispose of a set of tools that help them in finding arguments for the interpretation of the law. These tools are the so-called *canons of interpretation* and the *legal argument forms*.

The canons are being taught to beginning law students, and include literal interpretation, interpretation based on the intention of the legislator (the mischief rule), systematic interpretation, and interpretation based on the purpose of the rule (the golden rule).

Legal argument forms (the use of which is - by the way – not confined to the law) are the argument by analogy, the a fortiori argument, and the e contrario argument.

The relative importance of these forms of interpretation and argumentation is disputed, and some argue that the priority should be determined by the desirability of the result that is achieved by them.

58. A special form of interpretation has been popularised by Dworkin. It focuses on the construction of a theory about the law from case law and possibly also legislation.[16] The basic idea is that there is a number of legal principles underlying the decisions that are taken by judges in the cases they have to decide. These principles should be induced from the cases in which they were used, and be brought in harmony (reflective equilibrium) with ideas about justice and the relation between law and politics. The resulting theory should then be applied to new cases.

As can be seen from the used terminology, this view which Dworkin himself calls *constructive interpretation*, is a mixture of inductivism as used in the physical sciences and reflective equilibrium as used in the normative sciences.[17]

59. With the use of interpretation, the law as social fact view has reached its boundaries. Social reality is characterised by the fact that it exists either through being accepted, or through the application of rules which exist in social reality. The legal conclusions that are reached by means of interpretation are not law because they were already accepted, because in that case interpretation would not have been necessary. Therefore, if the legal conclusions are still to count as conclusions about an already existing social reality, they must be true as the result of the application of rules. However, given the fact that these rules apparently needed additional interpretation and that this interpretation could not be read of univocally anymore from a pre-existing social reality, it may be doubted whether legal conclusions based on the interpretation of rules, rights, or the law in general, are still true as a matter of social fact.

> Most cases of sexual abuse by members of the Roman Catholic Church are prescribed now, at least according to the literal texts of the criminal laws of Belgium and the Netherlands. Nevertheless the question is raised whether the suspects of these crimes should not be punished nevertheless. Suppose that such a case is brought before a judge. The decision would then not be an easy one. If the judge nevertheless takes a decision, reasoning from the existing statutes and case law, can it then be said that he applied law that existed as a social phenomenon?[18]

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16 The emphasis on case law can be explained from the fact that Dworkin works in the common law tradition.

17 See R. Dworkin, *Law's empire*, London: Fontana 1986, chapter 7.

18 Hage has argued that this is a reason why in hard cases, legal interpretation does not lead to conclusions about what the law is and that therefore the role of hermeneutics in legal reasoning should be (very) limited. See Jaap Hage, 'Weg met de hermeneutiek in het recht! Beschouwingen over de beperkte rol van interpretatie in de rechtsgeleerdheid.' in E.T. Feteris e.a. (red.), *Gewogen oordelen. Essays over argumentatie en recht*, Den Haag: BJu 2012, 41-54

7.4 LAW AS REASON

60. We have seen that there are at least two perspectives on the law, connected to two functions that the law must fulfil. On the one hand, the law must provide certainty, in order to allow people to tell what is expected from them and to predict the behaviour of others. This requires the law to be knowable for and to be known by most (of the relevant) participants in society. The law must be positive law, and the method of legal science is aimed at giving a reliable description of this social phenomenon. The legal discipline is then essentially similar to social science. Moreover, since the main way to obtain the relevant knowledge is through reading texts, legal science is essentially an interpretive version of social science.

On the other hand, the law must provide people with answers to their normative questions: the law must tell us what to do under which circumstances. Given this function, the law is an essentially normative discipline.

61. As a normative discipline, the law must answer the question what we should do under which circumstances. That is the same question as the one that must be answered by morality, and this raises the additional questions what the difference is between law and morality, and what the implications of this difference are for the method of legal science.

There are several differences between law and morality, but here we will focus on two of them. The one is that the law is usually enforced by collective means. The other one is that there is only law next to morality if there is positive law and if the content of the law is to a large extent determined by this positive law.

62. Legal norms can usually be enforced by means of government agencies, such as the police or judges and bailiffs. If a sufficiently strong government is lacking or if the government does not devote itself to maintaining the law, other public means of pressure must be available to enforce legal rules. If such public enforcement is lacking, it does not make much sense to distinguish between law and (positive) morality.

Given that law will normally be enforced by collective means, the normative question which the law aims to answer is not merely ‘What should we do (under which circumstances)? ‘ but rather ‘Which norms should be enforced by collective means?’. For not all norms that should be complied with are norms that should be enforced by collective means.

> An example would be the norm that prohibits gossiping in the sense of providing information, correct or incorrect, about other humans beings, in their absence, just for the fun of doing so. To gossip is a natural

phenomenon, which nevertheless causes human sorrow and which should therefore be avoided. However, it is undesirable to transform the moral prohibition of gossiping into a legal one, because the use of collective means to ban gossiping from human society seems a too heavy, and therefore undesirable means.

As this example illustrates, the questions what should be done from the legal point of view and what should morally be done do not coincide. However, this has no implications for legal *method*, because the mentioned difference between morality and law only concerns the content of the normative question that must be answered ('What must we enforce by collective means?' rather than 'What must we do?') , but not the reasoning techniques that should be used to answer the question.

63. That the content of law is mostly determined by positive law influences the reasoning techniques that should be used to answer the question which norms should be enforced by collective means. Most of the times the answer will be: the norms of the positive law. And the next question then is what the norms of the positive law are.

This last question has already been addressed briefly from a methodological point of view and there is little need to repeat what was said there. Remains the issue how the existence and relevance of positive law influences the way in which the normative question which norms should be enforced by collective means will have to be answered.

If the law is seen as the answer to a normative question, legal method is essentially the method of a normative science. The existence and relevance of positive law does not change that. How, then should the positive law be taken into account, if it does not by definition determine the law? Positive law provides us with facts which play a role in normative reasoning. That positive law exists is a fact which is relevant for what we should do. Positive law has often been created in a democratic way and deserves for that reason to be obeyed. Positive law also creates expectations amongst people, expectations which are necessary to facilitate mutual adaptation of behaviour. Normally it is then wise to honour these expectations and to profit from the benefits that they bring.

64. In the previous paragraph it was shown how positive law plays a role in legal reasoning, even if the law is not primarily seen as a social phenomenon, but rather as the answer to a normative question. If the law is seen as the answer to a normative question, and if legal science is therefore a normative science, the precise role of positive law is somewhat different from what it would have been if the law were seen as a social phenomenon. The positive law plays a role in the law, but not because it *is* the law, but because it is an important factor in determining what the law is, in determining which norms we should enforce by collective means. To state it in a simple way:

Positive law is important because and to the extent that it is rational to have positive law.

This last sentence immediately places legal science in the rationalist tradition of the normative sciences. Legal reasoning is a way to construct the answer to a normative question. The use of reason is the means by which this answer is constructed, and positive law provides us with factual information that is relevant for determining what is reasonable.

65. This leaves the question open what reason requires. Is reason more than a pretentious term for following ones intuitions? The answer to this question is positive, but its elaboration and justification requires much more space than is available here. An indication of where this answer may lead us can be found in Rawls' theory of reflective equilibrium, which was discussed in paragraph 5.3 above. [19]

7.5 LEGAL SCIENCE?

66. We have taken a brief look at two different ways of looking at the law and the way to obtain knowledge about the law. On the law as social fact view, the law must be found by reading texts. (The law is 'found' because the positive law is already there to be discovered.)

If the texts only give an ambiguous answer to a legal question, 'interpretation' is required. There is no guarantee that the interpretation of the one legal scientist coincides with the interpretation of another scientist. Moreover, it is not likely that there exists some law 'out there' which only needs to be discovered by means of interpretation.

One way to characterise this situation is by saying that the law is what the best interpretation says it is.[20] A standard for evaluating interpretations seems to be lacking though. There are only a set of canons of interpretation, without a fixed order, and some legal inference rules, also without a fixed order. Therefore we cannot assume that the law that must be 'found', or – better – constructed by means of interpretation is approximately the same for everybody.[21] On this view of the law, legal science seems to be impossible, because there is no good reason to assume that the law is the same for everybody.

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19 A more extensive answer can be found in J.C. Hage, 'The Method of a Truly Normative Legal Science', in M. van Hoecke (ed.), *Methodologies of Legal Research*, Oxford: Hart Publishing, 19-44.

20 This version of 'legal constructivism' is elaborated in Jaap Hage, 'Construction or reconstruction? On the function of argumentation in the law', in C. Dahlman and E. Feteris (eds.), *Legal Argumentation Theory: Cross-Disciplinary Perspectives*, Dordrecht: Springer 2012, 125-144 and in Jaap Hage, 'Legal Reasoning and the Construction of Law'. *i-Lex*, vol. 7, issue 16, 81-105, http://www.i-lex.it/us/previous-issues/volume-7/issue-16/103-legal-reasoning-and-the-construction-of-law.html.

21 Cf. the criterion formulated in paragraph 5.

67. The other view of the law is that the law consists of those norms of which we can reasonably hold that they should be enforced by collective means. The existence and the content of positive law are in this connection factors which should be taken into account. Can we reasonably assume that on this interpretation, there exists law which is approximately the same for everybody?

The first thing to notice is that on this constructivist view of the law, there is no law 'out there' to be discovered. In this respect, the law as reason view is on a par with the law as social fact view for cases in which interpretation is needed.

There is also a difference, however. Where the law as social fact view only recognises some canons of interpretation and inference rules without a fixed order, the law as reason approach does have a standard by means of which competing theories about the content of the law can be evaluated. This is the standard of reason. Whether this standard suffices to make sure that the law, the outcome of the construction, is more or less the same for everybody, remains to be seen.

8 CONCLUSION

There are many different disciplines and it is far from certain that they can all be called sciences. In the introduction, some conditions were mentioned that must be satisfied for something to classify as a science. One such condition is the existence of a broadly accepted method. If such a method is lacking, the participants in a discipline will disagree about what are good reasons to support or to attack a potential result. That makes cooperation impossible, and without cooperation between scientists there is no science.

However, cooperation and a shared method do not suffice. What is also needed is the assumption that if the shared method is applied, the outcomes will be the same for (almost) everybody. For some domains it is assumed that there exists a mind-independent reality which is the same for everybody (ontological realism). The method of the discipline that studies such a domain is aimed at collecting knowledge about these independent facts. It is questionable whether such mind-independent facts exist in the case of law.

It may also be the case that the method of a discipline leads to the same results for (almost) everybody, even though there is no mind-independent reality. Then the discipline may be a science too. It is unclear whether the methods of the law guarantee that the results will be the same for everybody. Dworkin famously claimed that they do, with his 'one right answer'-thesis.[22] Others, such

[22] Cf. chapter 13 of R. Dworkin, *Taking Rights Seriously*.

as the Dutch legal scientist Smits, disagree.[23] Whether the discipline of law can be a true legal science may depend on the outcome of this disagreement.

[23] Jan Smits, *Omstreden rechtswetenschap*, Den Haag: BJu 2009, par. 37.