Introduction

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In March 2012, the Legal Philosophy Research Group and the Institute of European and Comparative Private Law, both of the University of Girona, jointly organised a workshop on 'Causal Uncertainty in Tort Law'. This book includes a revised version of most of the papers presented on that occasion. The final outcome has a comparative law component, although the nature of the subject matter places some of the contributions in the middle ground between the legal perspective and the philosophical views that are at stake when it comes to the resolution of tort law cases in a context of causal uncertainty.

Over the last two decades, the main tenets of tort law in the continental and common law traditions have been called into question by the increasing number of cases in which courts have to assign the mass losses created by certain risky but lawful activities. Known examples, to name but a few, are the development of new medicines and the pollution caused by the use of nuclear energy. At the same time, certain illegal activities, such as the forbidden use of toxic substances in the production of goods and services, cause all kinds of losses, spread over time and among victims in a way that most of the time it is impossible for claimants to prove who in particular caused their losses. In fact, several contexts can be distinguished. Sometimes, claimants are unable to show that the substance to which they were exposed caused their loss, even when there is a strong statistical association between the exposure to the suspected substance and the kind of loss that claimants have suffered. That is, there is uncertainty at the general causation level. In some other cases, however, while general causation is scientifically established, there are problems in the proof of specific causation, because what is specifically unknown is whether a particular defendant harmed a particular victim. Moreover, on some other occasions it happens that a group of

defendants impose risks on the victim, but it is impossible to determine who among them harmed the victim or, when it is known that more than one defendant contributed to the harm, it is the magnitude of each contribution that is still unknown.

In all these situations, just to mention a few, claims for compensation should be rejected according to the traditional basic principles that have generally governed adjudication in tort law so far. However, in different European countries and in the United States, courts have sought to provide compensation by changing the prevailing patterns of legal reasoning, relaxing the factual causation requirements, admitting the introduction of statistical evidence in litigation or presuming, in certain circumstances, that the legal requirement of cause in fact was satisfied.

The purpose of this book is to provide a general overview of the different strategies followed in each legal tradition, and to make explicit the philosophical and epistemological questions that are at stake in each case. Moreover, some papers discuss normative and procedural alternatives that are not yet in force in any jurisdiction, but that might provide a plausible solution to the problem of causal uncertainty.

As to the content of each specific contribution, in Chapter 1, Jean-Sébastien Borghetti discusses the way in which French courts have handled the claims brought by victims suffering from demyelinating diseases allegedly caused by the hepatitis B vaccination. In France, the vaccine has been mandatory for workers of the health care system since 1991. Additionally, in 1994 the government launched a general immunisation campaign against hepatitis B, especially focused on teenagers. Unfortunately, shortly after receiving the vaccine, some of the recipients showed symptoms of demyelination, which is the source of very severe diseases such as multiple sclerosis. Claimants, depending on their particular situation, had at least three legal grounds for seeking compensation: (1) compulsory vaccination compensation scheme; (2) labour accidents compensation legal rules, and (3) product liability rules. However, proof of causation is necessary for awarding compensation based on any of these three legal alternatives. The problem for claimants is that several studies were conducted, but no causal link or statistical correlation could be found between the hepatitis B vaccine and demyelination. Of course, the fact that no investigation could establish a causal link between both events does not warrant a conclusion that such a link does not exist. Therefore, in this context of scientific uncertainty, and under the pressure of the victims and some of the legal scholars

specialised in the field, courts had to decide whether to grant compensation to the alleged victims or not.

It is important to note that, in these cases, the difficulty lies in the fact that the very existence of a general causation between the hepatitis B vaccine and demyelination is contested; and in our ordinary reasoning, we cannot think of singular causation statements that are not supported by general ones. In other words, we need general causation in order to conclude specific causation, which in turn is a necessary element of tort liability. In this scenario, scientific uncertainty seems to be an insurmountable obstacle for compensation. Borghetti's lucid and (in this respect) somewhat pessimistic analysis is in accordance with this basic idea. After criticising the French case law for offering unconvincing arguments based more on distributive considerations than on corrective justice ones, he explores other more promising alternatives, like the creation of special compensation schemes. This alternative social response has a great advantage, he claims, since it does not need to bend tort liability rules in order to meet the demands of distributive justice.

In Chapter 2, Miquel Martín-Casals discusses proportional liability's uneasy fit in Spanish tort law. One key aspect to understanding why proportional liability is hard to incorporate within the pattern of legal reasoning in Spain is related to the standard of proof. In many countries where proportional liability is accepted the standard of proof is fixed by the balance of probabilities, so a factual statement regarding causation has to be taken as true only if *it is more likely than not* that the defendant caused the harm suffered by the victim. But in Spain, as in other continental law countries, the standard of proof is much higher, since courts require the claimant to prove causation with *reasonable certainty*, which some authors express (just for comparison purposes) as a probability of no less than 80%. Given this difference in the standards of proof, the effects of proportional liability in Spain are much more profound than in countries where the balance of probabilities defines the standard.

After reviewing how Spanish courts decided the issue of causation in some important mass tort cases, like the famous colza oil case or asbestos litigation, Martín-Casals turns his attention to other cases where causation problems arise. First, he addresses what has been called 'alternative liability'. In these cases, the claimant is not able to identify among a group of tortfeasors whose action caused (or contributed to) the harm she suffered. Unlike other legal systems, Spanish tort law does not

have a general provision for alternative liability cases, but courts apply solidary liability. Some authors deemed that this, together with other doctrines such as comparative negligence, intervention of the third party, and force majeure, mean that proportional liability is already embodied in the Spanish legal system. However, Martín-Casals points out, it is wise to distinguish apportionment of liability from proportional liability, especially because the role that uncertain causation plays in each of them is quite different.

Finally, the chapter ends by considering the possible link between the doctrine of loss of chance and proportional liability. Martín-Casals suggests that this doctrine can be misused as a discretionary device to provide compensation for victims in all sorts of cases. Well understood, he thinks, loss of chance covers cases where the impact of the tortious omission on the prevention of harm is uncertain, not merely unknown. This is an essential difference between loss of chance and proportional liability. In other words, the former doctrine is not supposed to operate in any situation where there is an epistemological gap in the sense that the actual cause of the harm remains unknown, for that would allow 'endless liability without causation'.

In Chapter 3, Bernhard Koch provides an analysis of proportional liability in cases of causal uncertainty under the Austrian law. The conventional view of Austrian tort law makes cause in fact a necessary component of any liability judgment, despite the fact that the Civil Code does not incorporate any fundamental notion of causation. Still, there is one exception: according to §§1301 and 1302 of the Austrian Civil Code, when multiple tortfeasors contribute to the harm, and it is not possible to establish who is responsible for what, then, they are jointly liable. The idea is to shift the burden from the victim to the defendants, who have better access to the facts and can provide valuable information about what really happened, which is of great importance in identifying their proper share of damages.

As Koch notices, this solution does not cover the classic cases of alternative causation, because in these cases at least one of the individuals that created the risk in fact did not contribute to the harm suffered by the victim. However, after many years, Austrian tort theorists began to admit that under §§1301 and 1302, when each defendant's contribution to the harm is uncertain, liability is imposed without the requirement of causation. In this sense, analogical reasoning could be used to solve alternative causation cases. This was Franz Bydlinski's influential proposal. The next logical step, explains Koch, was to substitute proportional

liability for joint and several liability, at least in cases where the defendant acted with gross negligence. This solution, Bydlinski thought, achieved a proper balance of the parties' interests, and was applied in the case law.

Koch remains unconvinced by doubts raised by some critical authors who question the benefits of Bydlinski's solution. With these ideas in mind, Koch ends his chapter by discussing two opposing drafts for tort reform in Austria, focusing in particular on the rules governing causation.

In Chapter 4, Jane Stapleton discusses the most recent developments in the field of asbestos litigation in the United Kingdom. As is well known, exposure to asbestos can cause three types of diseases: asbestosis, lung cancer, and mesothelioma. In the United Kingdom, asbestosis has not generated big controversies in litigation, because it is a cumulative disease, and courts and insurers both accept a way of establishing a particular defendant's contribution to the total harm, depending on the victim's exposure history. Things are different regarding mesothelioma, since unlike the former this is not a cumulative disease: the more the victim is exposed, more chances she has of getting ill; yet, the severity of her disablement is independent of the quantity of asbestos to which she was exposed.

Inspired by the normative appeal of cases like *Summers v. Tice* (1948), the House of Lords relaxed the orthodox requirement of factual causation in the case *Fairchild v. Glenhaven Funeral Services Ltd.* (2002), and allowed claimants to establish a causal link showing that the defendant's exposure increased the risk of mesothelioma. Later, in *Barker v. Corus* (2006), the House of Lords stated that this doctrine applied even when the victim had contributed to the harm by carelessly exposing herself to asbestos. This decision departs from the *Summers* rationale, because under *Baker* liability can be imposed on the defendants even when none of them in fact caused the harm. Finally, the UK Supreme Court was called upon to further clarify the *Fairchild* doctrine in *Sienkiewicz v. Greif (UK) Ltd.* (2011). In *Sienkiewicz* the defendants exposed the victims to a significant quantity of asbestos, but the victims in turn had been exposed to a much greater quantity of asbestos from other sources. *Sienkiewicz* raised a number of important issues, which Stapleton analyses in detail. As she explains, there are some basic related questions that have to be answered, such as, which is the proper use of risks estimates based on epidemiological data? Moreover, in what circumstances does the double-of-the-risk approach constitute a valid proof of causation? The Supreme Court refused to accept the double-of-the-risk approach as evidence of factual causation where there was only one tortious exposure or many

potential causes of mesothelioma. Elementary statistical principles, Stapleton suggest, endorse the rejection of both propositions. The chapter ends by pointing out some important implications of *Sienkiewicz* that should be examined.

In Chapter 5, Tsachi Keren-Paz applies an instrumental view of tort law, and argues it can serve as an unconventional tool for addressing compensation for sex-trafficking victims. The argument is straightforward: since an indiscriminate demand for paid sex contributes to the future recruitment of victims, followed by sexual exploitation, clients should be made liable on the grounds of negligence law. Keren-Paz is well aware that his claim is as novel as controversial. However, he thinks that a solid argument can be built for it. To begin with, he explains, this cause of action would allow victims of sex-trafficking to recover from clients who did not have contact with them or any other victim. This is so, because indiscriminate demand does not always lead to victims of sex-trafficking on the supply side. Moreover, according to negligence law, the defendant's fault needs to be factually linked to the harm for which the claimant seeks repair.

The argument is confronted with both conceptual and epistemological challenges. On the one hand, each client contributes, through his demand, to the trafficking of many victims; on the other hand, each victim is trafficked because of the demand of many clients, none of which added on their own a necessary nor a sufficient condition for the harm suffered by the victim. Even if we accept this form of causation by indiscriminate demand, there are many uncertainty problems to overcome, some partly epistemic and partly normative. Thus, among other questions, how can we determine who has in fact contributed to the victim's harm? And, more significant for Keren-Paz's purposes, who should be deemed the *legal cause* among the many individuals factually linked to the victim? How should we assess the relevance of each defendant's contribution to the trafficking in order to define the scope of his liability?

Once the obstacles for the argument are displayed, Keren-Paz promises a principled solution based on the imposition of liability that is easy to litigate, and more important, fair both to victims and defendants.

In Chapter 6, Michele Taruffo discusses the proof of complex facts in mass tort litigation. From the start he acknowledges the difficulties in defining the very concept of 'a fact'. Despite these difficulties, he points out that facts can be complex in several ways. To begin with, more than

one description can be true of the same fact. On these bases, it is obvious that the structure of facts varies from the micro to the macro level of the object that is being described. It is also clear that a given narrative can be more or less detailed, including more or less facts in the sequence of events that constitute the factual premise and, of course, that there are no fixed criteria for assessing the relevancy of these details. Accordingly, it seems that there is no way to define a priori how a fact can be complex. However, some approaches can be more useful than others in the enquiry that triggers our need to define the idea of factual complexity.

In the mass tort context, as Taruffo explains, there is a subjective complexity related to the number of claimants, since these cases involve a large number of victims and it is not always clear when they constitute a class or whether particular individuals meet the criteria to be included in the class. This is easy to see in a gender-discrimination case among the employees of a certain firm. Taruffo wonders which is the relevant fact here: the aggregation of multiple individual cases of discrimination or the regressive effects of a general discriminatory policy implemented by the firm? Solving this problem is essential for the second description, as it allows statistics to play a significant role in proving causation, whereas the first one does not.

Additionally, in the mass tort context there is a structural complexity regarding facts. Among other alternatives, the relevant fact can be constituted by a number of circumstances specified in the norm that regulates the case, or can be complex because the loss suffered by claimants is the result of a very long chain of events, or it is the result of more than one cause, and so on. The subjective and structural complexities are present in mass tort litigation, and legal systems around the world –Taruffo concludes – have a hard time dealing with them.

In Chapter 7, Susan Haack examines the frequent use of the so-called Bradford Hill criteria by causation experts to establish general causality in toxic tort cases. As she argues, Hill was trying to elucidate when a statistical association in a population between exposure to a given substance and the development of a certain disease indicates causation. Accordingly, he suggested nine factors that, to his mind, constituted no more than fallible indicia of causation. The list includes strength of the association, consistency between different studies, specificity, temporal precedence (the exposure has to occur before the harm), biological gradient (dose-response curve), biological plausibility, coherence with the rest of the facts about biology (which Haack correctly deems redundant with the previous factor), experiment, and analogy with another

disease or substance. Despite his efforts to the contrary, quite often Hill is taken to have provided a list of necessary and/or sufficient conditions to conclude that evidence of a causal claim is probative or, sometimes, reliable enough to be admissible.

After showing why the nine factors are best understood as mere indicators of causation, not as *criteria*, Haack turns her attention to the misunderstandings around Hill's nine factors present in legal practice. The most extreme case, in our view, is that of experts claiming to have used the 'Bradford Hill criteria' in the absence of any epidemiological study that shows an association between the exposure to the suspected substance and the disease. This is precisely so because – as Haack notices – Hill's nine factors are supposed to be used to establish *causation* when a *positive association* is shown in the epidemiological study.

In the remaining of the chapter, relying on her own contribution to epistemology, Haack focuses on the incidence of Hill's nine factors in determining how well a particular piece of evidence warrants a conclusion that the exposure to a substance S caused the disease D. She concludes with some thoughts on why Hill's ideas were so poorly understood in the US legal system.

In Chapter 8, Michael Green and Joseph Sanders argue that many of the problems regarding how trial courts should conceive the decision of whether to admit or reject expert testimony are due to a lack of clarity in the relationship between admissibility of expert testimony, on the one hand, and the sufficiency of scientific evidence to support a given factual statement, on the other. After reviewing the development of admissibility tests in common law in US decisions from *Frye* to *Daubert*, they offer a different interpretation of the practice that emerged around *Daubert* in toxic tort litigation. As it is well known, *Daubert* required for the admissibility of scientific evidence an 'assessment of whether the testimony's underlying reasoning or methodology is scientifically valid and can properly be applied to the facts at issue'. In this sense, many considerations are relevant: (1) whether the theory or technique in question can be (and has been) tested; (2) whether it has been subjected to peer review and publication; (3) its known or potential error rate; and (4) whether it is generally accepted within a relevant scientific community. The United States Supreme Court did not mean to set this list as a strict test, but to display general guidelines for admissibility. According to Green and Sanders, when it comes to toxic substances litigation, these guidelines provided amorphous standards for evaluating 'the sufficiency of the scientific evidence proffered by the plaintiff's expert or the entire

body of scientific evidence in the record'. In their view, there are two readings of *Daubert* and its subsequent decisions. Chapter 8 tries to explain the evolution from *Daubert* as a test for assessing the expert's methodology and reasoning to *Daubert* as a standard for a scientific record to allow a reasonable inference of causation. This unconventional reconstruction of the operation of courts, they argue, is illuminating in many ways and reveals several usually unnoticed theoretical implications.

In Chapter 9, Andrea Giussani deals with the proof of causation in group litigation. According to his view, group litigation is either used as mechanism for aggregating individual claims – on the bases of judicial economy or some other reason – or as an instrument specially designed to enforce collective rights. Depending on the legal system, group litigation can perform both functions at the same time. It is very important to bear in mind this functional distinction, for whereas in the collective rights settings some facts regarding the group as a whole are relevant, these same facts can be insufficient to back up individual claims. Taking up a gender-discrimination case again, suppose a firm's employment policy proves to produce adverse effects on their employed women. Statistical evidence regarding the causal link between the policy and the general disadvantage suffered by women might be relevant to obtain an injunction, but in order to make her case in a damages lawsuit, a particular female worker would have to prove some more specific facts regarding her particular situation. It would not be enough to show how the policy was disadvantageous to the group's legitimate interests. She would have to prove her individual suffering instead. Giussani argues that the use of statistics to prove causation in court reflects this fundamental distinction between collective and individual facts related to collective and individual claims. When they satisfy the scientific criteria, statistics may suffice as evidence of general causation, but individual awards of damages need to be grounded on particular evidence in order to be justified. With these ideas in mind, Giussani goes on to present an insightful discussion of the complexities of class actions.

Finally, in Chapter 10, S.I. Strong considers whether arbitration is a good mechanism for handling redress in mass tort cases. As she points out, over the last few decades our way of life has allowed for massive causation of harm. In reaction to that trend, legal systems have shaped a wide range of procedures in order to provide a collective answer for noncontractual injuries. Moreover, since in the age of economic integration some of those harms have a cross-border nature, many international and regional organisations have started to pay attention to this problem.

Traditionally, collective arbitration has been used where there was a preexisting contractual bond between claimants and defendants. This puts the possibility of mass tort arbitration in an awkward position, because transaction costs, among other things, can make it impossible to obtain consent from every party to the dispute. However, Strong suggests that recent developments in the field of international investment arbitration show that arbitration in mass tort cases is not as troublesome as it might seem at first glance. She relies on the case *Abaclat v. Argentine Republic*, which is an investment arbitration case litigated under the ICSID rules (International Centre for Settlement of Investment Disputes). On that occasion, about 60,000 Italian bondholders presented a case against Argentina. Although international investment arbitration is regulated by public international law, Strong argues that *Abaclat* provides very important insights into arguments for the possibility of mass tort arbitration.

The chapter draws a detailed picture of the procedural complexities of mass tort arbitration, but also aims at assessing whether, and to what extent, arbitration is possible and desirable in these contexts. Certainly, not all kinds of mass torts are akin, and therefore it is important to determine, as Strong does, which kinds of mass torts are more amenable to arbitration. Once this task is accomplished, Strong compares the advantages and the shortcomings of arbitration vis-à-vis other (judicial) forms of collective relief in cross-border disputes. While arbitration solves many of the problems of the judicial alternative, it creates some new obstacles, mainly related to the issue of consent to arbitration. Notwithstanding, arbitration might provide a fair and efficient mechanism for solving the victims' claims in a single forum, at a single time. The chapter concludes with some remarks on the future of arbitration in mass torts.

Summing up, the volume addresses normative, epistemic, and procedural aspects of causal uncertainty in tort law. Covering these three dimensions of the problem – we think – is necessary for a full understanding of one of the most serious difficulties faced by modern tort theory and the identification of plausible solutions. We hope the ideas contained in this book contribute to the on-going debate, obviously not by ending it, but by making good progress in the field.

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