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## NUISANCE

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### Abstract

The economics of nuisance disputes was one of the initial areas of work in the field known as law and economics. Commencing with Coase's seminal article on 'The Problem of Social Cost', the field went on to consider many of the most fundamental issues at the base of the discipline - the problems of legal frameworks, property right allocations, bargaining costs, information costs and asymmetries, institutional costs, endowments and invariance results - many of these issues were raised first by Coase in his landmark article. For good reason each of these issues now constitutes a field of research in itself. The economics of nuisance is important primarily because it provided the framework within which many of these important issues were first raised and considered.

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### 1. Definition

The etymology of the term *nuisance* comes from the Latin *nocere* - to do harm, to inflict injury. In strict legal terms nuisance has been commonly defined as 'a condition or activity which unduly interferes with the use or enjoyment of land' (Clerk, 1989, p. 889). Fifoot (1949) notes that nuisance is one of oldest branches of law dating back to the early assizes and that its 'very name - *nucumentum* - suggests the damage which he [that is the property owner] had suffered by conduct which nevertheless fell short of an actual dispossession'. The courts have identified nuisance disputes as involving a 'noxious' or 'offensive', 'unauthorised' and 'unreasonable' use of one's property that interferes, in a 'continuing way', with the use and/or enjoyment of another's property (Buckley, 1996). In economics terms, nuisance disputes may result when the choices of independent agents impact upon the outcomes affecting others, that is they are one of the possible legal consequences of *externalities*. Nuisance can be of two kinds: private and public. A *private nuisance* occurs when the externality appears in the utility function of one consumer or the

production function of one firm. If the externality affects many consumers or producers, then it is a *public nuisance*. Examples of such disputes include emissions from a factory that pollute a neighbouring property, noise that interferes with a person's sleep or unpleasant smells from one's use of his land. Generally, most cases of pollution and incompatible uses of land can be classified as nuisances, and could give rise to nuisance disputes.

## 2. Traditional Legal Approach to Nuisance

Scholars have identified the traditional approach to nuisance law as originating in thirteenth century England (Brenner, 1974; Buckley, 1996; Ellickson, 1973; Fifoot 1949; Lewin 1986). In its English development, nuisance law was founded on property law and offered *absolute* protection to plaintiffs: either the nuisance existed and an injunction was granted or courts avoided granting an injunction by deciding that no nuisance existed.

The nineteenth century in the US brought about a significant change in the foundations of nuisance law. This reformulation of nuisance law involved the introduction of the concept of 'reasonableness' that resulted in the abolition of the absolute rights enjoyed by property owners and the adoption of the 'reasonable use' criterion. The 'reasonableness test' was employed to determine whether a specific use of land constituted a nuisance in the particular context (Lewin, 1986, p. 780). It considered the nature of the activity that brought about the nuisance suit, the character of the neighbourhood, the frequency of the activity, the 'hypersensitivity' of the plaintiff, and the defendant's motive (Buckley, 1996). Thus the 'reasonableness test' limited the scope of the pre-existing nuisance doctrine since courts could now find that certain interferences with the use and enjoyment of land were not actionable. Yet, courts still retained an absolutist attitude in their decisions regarding remedies. If a nuisance was proven, an injunction was granted routinely.

Subsequently, however, this imbalance was gradually redressed by American courts, by incorporating the 'utility' of the defendant and society within the reasonableness test. In the first *Restatement of Torts* (X, 1939) the American Law Institute (ALI) adopted the 'balancing of the equities or utilities' test. Under the 'balancing of the equities' test a nuisance would be established 'only if its harmful consequences outweighed its benefits to society' (Lewin, 1986, p. 780). However, the test was soon found to be defective in that it rendered any activity with sufficient social value absolutely immune from liability for interference with the use and enjoyment of nearby land (Lewin, 1986, p. 781).

A less drastic judicial solution to the problem of the disproportionate impact of injunctive relief was to ignore the utility of the activity in determining *liability* and consider it only in determining the appropriate *remedy* after

liability was established (Ellickson, 1973; Lewin, 1986, p. 781). Hence, the courts would first apply the reasonableness test to establish the nuisance and then apply the 'comparative hardship' or 'balancing of the conveniences test' to determine the nature of the relief. The court would then grant an injunction to the plaintiff only if the harm she experienced from the nuisance outweighed the social cost of abatement. This less drastic solution was also introduced in the first *Restatement of Torts* (X, 1939). However, the co-existence of both the balancing of the equities test and the balancing of the conveniences test was found to be contradictory and confusing, and consequently judicial practice has been confined primarily to the use of injunctive relief (Lewin, 1986, p. 782). Nevertheless, the ALI's approach to the law of nuisance as expressed in the *Restatement (Second) of Torts* (X, 1969) was not radically different than that in the first Restatement (Ellickson, 1973; Lewin, 1986; Polinsky, 1980).

### 3. The Law and Economics Approach to Nuisance Law

The new 'law and economics' paradigm which emerged in the 1960s recognised that traditional nuisance law faced several doctrinal and practical shortcomings. It had been characterised as 'unsystematic', 'neglected' and in a state of dismay and confusion (Brenner, 1974; Coase, 1960; Ellickson, 1973; Epstein, 1979; Newark, 1949)). Prosser (1971) comments that '[t]here is perhaps no more impenetrable jungle in the entire law than that which surrounds the word "nuisance"' (p. 516). This new approach to nuisance law can be viewed as an attempt to reformulate and systematise the traditional approach to nuisance. It is also the field in which many of the first attempts to marry law with economics occurred.

#### 3.1 General

The 'law and economics' paradigm analyses the nuisance dispute as a case of informal joint activity arising out of conflicting land uses (Calabresi and Melamed, 1972; Coase, 1960; Kaplow and Shavell, 1996; Michelman, 1971; Polinsky, 1980; Posner, 1972). Nuisance may also be viewed as a form of externality that interferes with the enjoyment or use of another's property. These externalities are a form of inefficiency which in turn can be corrected through the *internalisation* of these external effects. Hence, nuisance laws are the framework within which this cost internalisation occurs (Cooter and Ulen, 1988, p. 170). Equivalently, nuisance laws may be seen as the framework within which joint activities by independent agents are co-ordinated.

### 3.2 Coase (1960)

The literature acknowledges the beginning of the modern approach to nuisance law as being R. Coase's celebrated article 'The Problem of Social Cost'. The fundamental question raised by Coase was whether allocative efficiency was invariant to the initial assignment of property rights. The answer Coase gave to this problem has been referred to as the (simple) Coase Theorem (Polinsky, 1983, p. 12): In the absence of transaction costs, the efficient outcome *will* inhere *irrespective* of the assignment of rights.

Coase's article has been viewed as a reaction to the Pigouvean approach. This approach involved the identification of the agents imposing costs on others and then requiring these agents to compensate the injured parties in the amount of the full cost of their actions (that is, to internalise the external costs). Coase emphasised the reciprocal nature of this problem - in that both of the parties to a nuisance *cause* the nuisance. In Coase's framework a nuisance dispute arises as the result of the interaction of two or more conflicting property uses, not as a cost inflicted by one onto another.

Coase's pioneering article dealt with a more general or fundamental issue in economics - the effect of the property right distribution on allocative efficiency. It was pure happenstance that many of the examples used to illustrate his innovative ideas involved nuisance and trespass disputes. In analysing these disputes under the assumption of zero transaction costs, Coase showed that the assignment of entitlements was irrelevant to the attainment of allocative efficiency. Under the zero transaction costs assumption, the party that incurs the costs from conflicting uses may acquire the entitlement to these uses from the other party at a price that is less than the costs she would suffer, if those uses of the resources are inefficient. Hence, where co-operation is not costly, the efficient allocation of resources will be achieved through private co-operation between the parties acting to maximise the value of their joint activities.

Obviously, much of the impact of this framework depends upon the usefulness of the assumption of zero transaction costs. The term 'transaction costs' includes the costs of identifying and assembling the parties involved in the negotiations, the costs of the actual negotiations and the costs of enforcing the outcome of the negotiations. Coase acknowledged that transaction costs are in reality positive. He used the examples involving nuisance disputes not to describe actual behaviour but to illustrate a point. Coase noted that in the presence of positive transaction costs the initial distribution of property rights does affect allocative efficiency, and that the courts may be in a position to assign property rights in such a way as to promote efficient outcomes. 'In a world in which there are costs of rearranging the rights established by the legal system, the courts, in cases relating to nuisance, are in effect, making a decision on the economic problem and determining how resources are to be employed'.

And the 'economic problem' in cases of nuisances 'is how to maximise the value of production' (Coase, 1960, p. 15).

### 3.3 Calabresi and Melamed's Framework

Following Coase's pioneering work, Calabresi and Melamed (1972) offered the next notable contribution in the evolution of the modern approach to nuisance law. They furthered the Coasean ideas to construct a *unified framework* for the analysis of entitlements in property and torts. Their breakthrough was that they stressed that property and tort laws have a common objective: *the protection of entitlements*. However, the two systems differ in the *rules* used to enforce the entitlements: *property rules* for property entitlements and *liability rules* (negligence or strict liability) for torts. The novelty of their approach lies in that they recognised that these rules can be applied even in the cases where the entitlement is given to the defendant.

Calabresi and Melamed (1972) suggest that the resolution of a nuisance dispute involves two steps: first, a decision must be made to determine who should receive the entitlement (choice of entitlement) and second, a decision must be made on how to protect that entitlement (choice of remedies). Within this general framework, Calabresi and Melamed (1972) noted that courts have traditionally considered the following rules or solutions in nuisance disputes: (i) the plaintiff is awarded the entitlement which is protected by a property rule (that is an injunction is awarded). The defendant must halt its nuisance-generating use of the property, unless the plaintiff agrees a price at which it will transfer its entitlement to the defendant; (ii) the plaintiff is awarded the entitlement which is protected by a liability rule. The defendant, on payment of the court-determined damages, may continue the use of his property in the manner that brought about the nuisance dispute. In effect, the court determines the price at which the entitlement may be transferred; (iii) the defendant is awarded the entitlement which is protected by a property rule (that is the defendant has thus the right to pollute and no injunction against its use will be granted). The defendant may continue its use of the property, unless the defendant agrees a price at which it will transfer its entitlement to the plaintiff.

However, for 'reasons of symmetry' they introduce an additional fourth rule: (iv) the defendant is awarded the entitlement which is protected by a liability rule. In this case, the plaintiff may acquire the entitlement from the defendant at a judicially determined price. Stated differently, the plaintiff may obtain an injunction against the defendant's activities only if he pays 'damages' to the defendant at a judicially determined price.

Lewin (1986) notes that this is the first explicit and thorough presentation of the concept of the 'compensated injunction', an injunction that the plaintiff could obtain only by paying damages to the defendant (p. 790). The fourth rule is also commonly referred to as the 'reverse liability rule' (for example Kaplow

and Shavell, 1996) and has been the subject of extensive commentary and research (Ellickson, 1973; Rabin, 1977; Polinsky, 1983; Ayres and Talley, 1995; Kaplow and Shavell, 1995). Remarkably, the first judicial application of this rule appeared shortly after the time of the submission of their article, in the case of *Spur Industries, Inc. v. Del. E. Webb Development Co.* (Lewin, 1986, p. 790).

### 3.4 *The Importance of Transaction Costs*

Within the framework established by Coase (1960) (that is, assuming zero transaction costs), efficiency will result irrespective of which entitlement-remedy combination is chosen (that is, no matter which of the four rules is chosen) (Posner, 1972; Polinsky, 1980, 1983). However, it is equally acknowledged that transaction costs are in reality not zero and, thus, the assignment of property rights must have serious implications for allocative efficiency (for example Calabresi 1970; Calabresi and Melamed, 1972; Michelman, 1971). The subsequent literature has tried to analyse the impact of various forms of transaction costs on the efficiency of the outcome, and the implications of these impacts for the efficiency of various rules.

Echoing these lines, Polinsky (1983) notes that 'if there are positive transaction costs, the efficient outcome may not occur under every legal rule'. In these cases, 'the preferred legal rule is the rule that minimises the *effects* of transaction costs' (Polinsky, 1983, p. 13). The idea is to advance legal rules that work well in the world of the 'second-best': a world in which perfect bargaining in the context of perfect information is unlikely to occur.

The initial development of these ideas came from Calabresi (1970), Calabresi and Melamed (1972) and Michelman (1971), who put forth the criterion of 'the least cost abater' as a means for promoting allocative efficiency when transaction costs hinder (Coasean) bargaining between the parties. The rationale for this criterion is that, by assigning the responsibility for abatement to the party who can do so at the least cost, the need for Coasean bargaining is made redundant. Calabresi (1970) and Michelman (1971) show how allocative efficiency is promoted by the use of the 'least cost abater' criterion since it both eliminates the transaction costs of bargaining and also the risk of the failure of that bargaining process (that is, its failure to reach the efficient solution).

A follow up to the 'least cost abater' criterion is what commentators have referred to as the 'best briber criterion' (Calabresi and Melamed, 1972; Lewin, 1986). This criterion has been proposed as a second best option when imperfect information and strategic behaviour do not allow the determination of the least cost abater. Under such circumstances, transaction costs might still be reduced and efficiency attained if the party who can least expensively bribe the other party is made liable (Calabresi, 1970; Calabresi and Melamed, 1972; Michelman, 1971).

In essence, the conclusion of the 'classical' literature on nuisance was that the design of legal rules does in fact matter. In a second-best world redolent with market imperfections and transaction costs, the best criterion for rule selection will be either to attempt to circumvent the (costly) bargaining process altogether (least cost abater criterion) or to attempt to reduce its costliness (least cost briber criterion). Much of the remainder of the literature in this area concerns the impacts of various forms of costliness on the choice of the legal rule.

#### 4. The Magnitude of Transaction Costs and the Choice of Remedies

The optimal choice of remedies (judicially-set damages or assigned entitlement) will depend upon the relative costliness of using centralised (judicial) or decentralised (bargaining) methods for price determination. Kaplow and Shavell (1996) and Krier and Schwab (1995) observe that there is a trend in the literature that holds that 'property rules are best when transaction costs are low - assumedly because the use of property rules will induce parties to bargain and reach desirable outcomes - whereas liability rules are best when transaction costs are high - supposedly because the use of liability rules will induce injurers to act desirably, mimicking the outcomes that would otherwise have been reached through bargaining' (Kaplow and Shavell, 1995, p. 718).

##### 4.1 High Transaction Costs

When the costs of bargaining are high, the implication is that the centralised approach to conflict resolution might be preferred; however, this must depend upon the nature and magnitude of the costs of centralised decision making. This will depend upon *inter alia* the availability of information to that decision maker, or the costs of resolving informational asymmetries (between the regulator and the regulated). The enquiry to the costs of centralised decision making in the context of informational asymmetries resulted in the development of an entirely distinct field of economics, known as the problems of 'principal-agent' theory. Within the nuisance literature, the issue has been focused on the question of the amount of information required by the judiciary in order to make an informed determination of the dispute.

*High Transaction Costs with Perfect Knowledge of the Level of Damages* In the presence of high transaction costs, liability rules (damages) are superior to property rules (injunctions) when courts have knowledge of the actual level of damages resulting from the conflict (Calabresi and Melamed, 1972; Posner, 1992; Barnes and Stout, 1992; Kaplow and Shavell, 1996). The argument is that if damages are assessed perfectly, then the defendant will stop the nuisance and abate only when it is more costly to pay the (correct level of) damages. If

there was a property rule in effect (and high transactions costs prevented a negotiated resolution to the conflict) then the defendant would have to abate even if the abatement costs were greater than the damages (resulting in inefficiency).

*High Transaction Costs with Imperfect Information* Polinsky (1980, 1983) states that if the court lacks knowledge of both the damages to the plaintiff and the abatement costs to the defendant then no clear cut solution can be specified *a priori*. Kaplow and Shavell (1996), however, disagree with this view and demonstrate that 'even when courts are uncertain about the magnitude of harm, liability rules are superior to property rules' (p. 719). They demonstrate that when courts are faced with imperfect information when setting damages equal to an 'average' level of damages for cases characterised by similar facts, the outcome under the liability rule will be superior on average to that under the property rule (under the assumption that courts do not systematically underestimate or overestimate damages). This implies that courts do not require perfect information in order to establish an appropriate price for continuing nuisance, they only require sufficient information so as to allow them to determine an unbiased estimate of that price.

This criterion makes sense. It states that courts do not have to have perfect information in order to be a reasonable alternative to a costly decentralised price-setting mechanism; they will be as effective at price setting as the information that they have at their disposal. The more information that courts accumulate concerning a certain form of conflict, the more unbiased will be their estimate of its costliness and the more accurate will be their assessment of the appropriate price (damages). Talley (1994) also supports the proposition that liability rules with a 'properly' chosen level of damages are superior to property rules in the presence of high transactions costs. Therefore, the question of judicial efficiency as a regulator has to do with its unbiasedness as an estimator of damages, not the perfection of its information base.

#### *4.2 Low Transactions Costs*

Many commentators state that the decentralised mechanism (bargaining) is always the most efficient method for conflict resolution when transaction costs are low. Examples of this trend include Posner (1972), Calabresi and Melamed (1972). For example, Merrill (1985) argues that trespass law should be used when transaction costs are low while the law of nuisance (implying payment of damages) should be used when transaction costs are high. However several commentators (for example Ayres and Talley, 1995; Kaplow and Shavell, 1996; Polinsky, 1980, believe that this tendency is ill-founded. The general theme in this criticism is that even when transaction costs are low, *both* property rules *and* liability rules can induce bargaining and in fact in certain cases more efficient solutions can be attained under liability rules.

*Very Low Transaction Costs* Polinsky (1980) applies the Coase Theorem and shows that under zero transaction costs both property rules and liability rules lead to equally efficient outcomes. This reasoning is followed by several subsequent commentators (for example, Kaplow and Shavell, 1996). The reasoning is that, if bargaining is virtually costless, then the parties will be able to resolve the conflict irrespective of the process within which the bargaining is embedded. In short, institutional questions only become interesting when private cooperation is faltering as a coordination mechanism, that is when the costs of private transactions are significant.

*Low Transaction Costs and Imperfect Information* The invariance result of the Coase Theorem is not robust over a very wide range of institutional costliness. Once there are at least some transactions costs and information costs, the optimal choice of rule or criterion is more complicated. Polinsky (1980) argues that under imperfect information it is uncertain whether liability rules or property rules are superior.

Kaplow and Shavell (1996) state that liability rules may not be better than property rules under conditions of imperfect information but that (if constructed in an unbiased manner) they *tend* to be better. They base their argument on the idea of the court's unbiased estimation of damages set forth above, and the court's capacity to use accumulated information to resolve current conflicts. Ayres and Talley (1995) also argue that liability rules may be superior to property rules under imperfect information but offer a different basis for their argument. They argue that in cases of imperfect information and costly bargaining 'liability rules possess an "information-forcing" quality' that may induce and facilitate more efficient bargaining (pp. 1032-1033). In their approach the price announced by the court separates the pool of all plaintiffs into those adequately compensated and those inadequately compensated. This separation is the information-forcing characteristic of liability rules that facilitates bargaining (whereas such bargaining is not induced under property rules). In effect the plaintiff's response to the judicial price initiates the bargaining process by providing information on that party's bargaining position.

Therefore, judicial intervention has been portrayed as a potentially useful form of centralised activity, even when the costs of decentralised conflict resolution are low. It can be an efficient method for accumulating and applying information on previous similar conflicts to current ones (informational efficiency gains). Or, it can be an effective approach to initiating bargaining between parties where asymmetric information creates bargaining costliness (bargaining efficiency gains).

## 5. Other Important Factors in Determining the Appropriate Remedy

The comparative costliness of centralised solutions (judicially-determined prices) versus decentralised solutions (negotiation-determined prices) depends upon factors other than simply the costs of bargaining. There are also the costs of the institution, the costs of implementation and enforcement, and the impacts on other legitimate societal objectives. A substantial literature surveys the range of costs that must be considered when the resolution of a nuisance conflict is being undertaken.

### 5.1 Enforcement

When the defendant cannot pay assessed damages then Kaplow and Shavell (1996) show that the 'liability-related incentives to take precautions [to reduce or avoid nuisance] will be compromised'. Hence, a property rule solution protecting victims would be preferable. 'Alternatively, it may be possible to retain the advantages of the liability rule in some contexts by requiring injurers to pay in advance for *expected* harm rather than to pay for *actual* harm after it occurs.' Finally, another way to overcome the judgement proof problem is to require potential injurers to offer proof that they have the ability to pay the damages before any damage has occurred (for example, by purchasing insurance) (Kaplow and Shavell, 1996, pp. 740-741).

### 5.2 Numbers: Public versus Private Nuisances

The principal reason public nuisances are dealt with separately is because they involve 'free-rider' and 'hold out' problems. Regarding remedies, Calabresi and Melamed (1972) imply that injunctions are more efficient than damages when there is only one victim and one injurer. When there is a public nuisance (that is, many victims) Calabresi and Melamed (1972) argue that damage remedies tend to be more efficient. Ellickson (1973) has disputed this argument. Posner (1972) argues that damages should be awarded when transaction costs are high and injunctions should be assigned in the opposite case. Yet, Posner states that transaction costs could be high in both the public nuisance and private nuisance disputes (in the latter case due to due to strategic behaviour). Michelman (1971) also suggests that the damages remedies should be used in the case of one injurer and many victims unless the injurer is the 'cheapest cost avoider'. For other commentators, however, the public nuisance case is seen as a less serious theoretical challenging since, it can be reduced to a private nuisance analysis by aggregating the parties in a class action (for example, Polinsky 1980, 1983).

### 5.3 Institutional Costs

Institutional costs mean the costs of the chosen approach to governance. In the context of nuisance disputes, the institutional costs are the costs to the judiciary

of its involvement in the resolution of the dispute. Clearly, one of the most significant advantages to property-based resolutions is that the judiciary's involvement is minimised. It needs only identify which party to the dispute holds the entitlement. This is the reason that any movement toward increased judicial intervention must be justified by balancing the benefits of that intervention against the costs that they entail.

This is the essence of the approach taken by Calabresi and Melamed (1972) who argued in favour of injunctions when administrative costs were low (p. 1118). They argued that a property-based resolution avoided two costs: (a) the administrative costs of judicially valuing the damages and (b) the costs of enforcing the judgement against plaintiffs who have to exchange their right at prices to which they may not consent. But Ellickson (1973) argues that Calabresi and Melamed (1972) fail to see that a combination of rules may entail lower administrative costs than a simple injunction (even when administrative costs are low). He argues that injunctions may involve three additional administrative costs: 'the costs of difficult searches for subjective values, delays in initiation of cost-justified nuisance activities, and added administrative costs in determining what remedies are in a specific case' (p. 747).

#### *5.4 Entitlements and Wealth Effects*

Much of the analysis thus far has assumed that the externality was unilateral in nature, whereas Coase had pointed out that most nuisances are best conceived of as situations of reciprocal externality. If plaintiffs are able to elect behaviour that exposes themselves to a nuisance (as in cases of 'coming to the nuisance') or able to mitigate the effects of a nuisance (for example, through the use of an air purifier), then the externality is best thought of as a joint cost determined by the joint activities of the two parties. In this case, it is probably inappropriate to think of the remedy as simply the framework for determining the price at which a unilateral transfer is effected. It is more appropriate to think of it as the framework within which the parties must work to move away from the non-cooperative outcome and toward the cooperative outcome. In this light, the important issue becomes the differential wealth effects of different entitlement rules. That is, irrespective of the remedy used to enforce the rule and the ultimate achievement of allocative efficiency, the choice of entitlements will effectively endow one party rather than the other with the wealth represented by the joint use. These wealth effects may have many other impacts within society, and on society's goals other than allocative efficiency. This is the essence of the *bonus payment argument* in favour of damages remedies, summarised by Polinsky (1980) as follows: once damages have been awarded then 'it is possible to pursue additional distributional goals by making the defendant's liability more or less than the plaintiff's actual damages' (for example, Calabresi and Melamed, 1972; Ellickson, 1973). For example, if the

plaintiff is less well off than the defendant and a more equitable distribution is desired, then the damage awarded could be augmented by a bonus payment by the amount that will bring about the distribution preferred (Polinsky, 1980, p. 1078). 'Under the injunctive remedy, on the other hand, distributional outcomes are uncertain' (Polinsky, 1980, p. 1078).

Property-based rules disallow any consideration of these other objectives, that is, the distributional effects of the entitlement. The court only decides which party will receive the entitlement, and leaves it at that. A liability-based system of remedies allows the court to balance these other objectives, when determining the price at which the entitlement may be transferred. In effect, the court is better able to 'balance the equities' of the situation in determining both issues of entitlement and its price.

#### **6. Determining Entitlements: The 'Coming to the Nuisance' Doctrine**

Most often the allocation of an entitlement within a nuisance dispute rests on the relative impact of one use of land on the other, that is, on the degree of interference with the reasonable uses of another parcel of land. When a specific use of one parcel of land disqualifies many other reasonable uses of another parcel, then the offending use is deemed to be the 'nuisance'. Equivalently, the other landowner is deemed to hold an entitlement to pursue a reasonable range of uses on its land without interference. The exception to this rule has been where the landowner is deemed to have 'come to the nuisance'. This doctrine involves a defendant who has used his property in a specified way for a prolonged period of time without complaint, and then receives a complaint when the plaintiff introduces a new use on a neighbouring parcel of land. In this case, the defendant may claim that it is entitled to its use by reason of prior appropriation, while the plaintiff is not entitled to its new use of the neighbouring land.

'Coming to the nuisance' has been considered as a defence in nuisance disputes. The doctrine of coming to the nuisance has very old roots in the general ancient maxim of *volenti non fit injuria* (no legal wrong is done to him who consents). 'The person coming to the nuisance implicitly consents by his voluntary choice of establishing a residence or business in the neighbourhood of a pre-existing producer of negative externalities' (Wittman 1980). Yet, it is considered that the influence of the coming to the nuisance principle has gradually diminished in modern judicial decision making (Epstein, 1979; Tromans, 1982; Wittman, 1980).

Several proponents of the law and economic paradigm argue that the weight of 'being first' ought to be considered in judicial practices since it has implications for allocative efficiency (Posner, 1972; Wittman, 1980; Rob, 1986;

Snyder and Pitchford, 1996). If entitlements are allocated on the basis of being first, there is an efficiency cost associated with establishing oneself 'there' first. For example, unnecessary or inappropriate timing of investment may occur in order to establish prior rights (Posner, 1972; Wittman, 1980).

A notable contribution on the issue is that by Wittman (1980). Wittman suggests that in order to avoid such strategic behaviour a two-staged procedure must be followed in cases of coming to the nuisance: first, the court must establish, based on efficiency criteria, who *should* have been first instead of who *was* first and then, once the efficient sequence is determined, the court must 'determine the liability or property rule that promotes the efficient sequence' (p. 559). In searching for the most efficient sequence the court must take under consideration the costs and benefits of the two parties involved (the 'first party' and the 'newcomer'). Wittman (1980, p. 561) points out that no efficient sequence would allow for the compensation of relocating the 'first' party if that party *should* not have been first.

Another concept related to issue of coming to the nuisance is that of 'foreseeability': in certain cases, the party that is first can, based on the characteristics of the location, foresee that the location is prone to generate a nuisance dispute. Consequently, that party *should* not have been there first and their prior appropriation should not give rise to an entitlement (Wittman, 1980).

In essence, the law and economics analysts agree that the timing of the use should not dictate the allocation of an entitlement. The object of allocative efficiency will only be advanced if the person who arrives first happens to pursue the use that is best from the social perspective. This can only be determined by reference to social costs and benefits, not timing of arrival. In addition, the rule of 'first come, first served' entails its own costliness because it provides incentives for inefficient races and contests for appropriation. Therefore, the allocation of entitlements should not be based upon notions of prior appropriation, but rather on broader considerations of social welfare and efficiency.

## **7. Alternative Approaches to the Resolution of Nuisance Disputes**

The law and economics literature on nuisance has focused on a fairly limited (but fundamentally important) institutional choice, between judicially-determined damages and party-negotiated outcomes. There are - of course - an entire range of possible institutions, ranging from free markets in all sorts of securitised property rights to wholly centralised regulatory institutions. A few commentators have pointed to these alternatives, and the overall limitations of the classic approach to nuisance disputes.

### 7.1 *More Decentralised Approaches*

Knetsh (1983, ch. 10) argues that the case-by-case approach adhered to by the law and economics literature to resolving nuisance disputes increases the uncertainty associated with investment in property since the maximisation-efficiency doctrine may grant an entitlement or choose a remedy 'depending on the circumstances' (Polinsky, 1983) that maximise efficiency. Uncertainty of these 'circumstances' and of how the court will react to these, reduces the security in investment in property. Knetsh (1983) proposes an alternative market-based approach that aims to reconcile security in investment with allocative efficiency whereby the nuisance-causing party would be required to buy off the 'easements' from neighbouring landowners so as to compensate them. Future purchasers of land would have to 'buy back' the easement if they required the termination of the nuisance. Such a system, Knetsh argues, brings about certain and unambiguous entitlements. Another example of a private mechanism for the resolution of nuisance disputes is the use of *restrictive covenants* (for example, Ellickson 1973).

### 7.2 *More Centralised Approaches*

Burrows (1980) offers a more general attack on the mainstream framework developed from Coase (1960) and Calabresi and Melamed (1972). Burrows argues that more centralised methods of intervention are required in nuisance disputes, such as pollution control (see Burrows, 1980, 1985). He argues that (a) it is contradictory to resort to the best briber when by assumption bargaining is difficult and (b) (in the case of imperfect information regarding the efficient level of nuisance), identifying the least cost abater is an insufficient criterion. Burrows (1980) further argues that the Calabresian criteria are *irrelevant* if transaction costs are considerably low. In fact, under such a situation there is no need for *any* criteria since the 'efficient decentralised process will ensure that the least cost avoider does the abating, and that he does so to an efficient level' (Burrows, 1980, p. 156). If transaction costs are high (or other obstacles to bargaining exists) then Burrows argues that the criteria are ambiguous. In this case, the transaction costs are 'too high to allow decentralised transactions whichever of the four legal rules is selected' (1980, p. 156). Burrows concludes that 'if progress is to be made in the direction of efficiency and justice in the pollution context, we must look to more *centralised* policies of pollution evaluation and control' (p. 163) and proposes that future research should focus on the development of a 'systematic statutory approach' to nuisance control (p. 164).

### 7.3 *Ellickson on Zoning*

Influenced by Coase (1960) and Calabresi and Melamed (1972), Ellickson (1973) argued for decentralised mechanisms to deal with conflicts among

neighbouring landowners. Ellickson criticised the system of zoning 'as an ideal model for highlighting the economic consequences of all mandatory [centralised] regulation' (p. 691). Other notable contributions that critically examine centralised mechanisms for resolving conflicting land uses in the manner of Ellickson (1973) include Crecine, Davis and Jackson (1967), Davis (1963), Note (1969) and Siegan (1970, 1972).

Ellickson (1973) notes that the usual practice in traditional nuisance law (to resort to the property rule solution) resulted in the belief that zoning was necessary. In his view zoning is not desirable on efficiency grounds since it fails to reduce the costs of the nuisance, but also increases the preventive and administrative costs associated with it. With respect to equity, zoning does not correct the changes in the wealth distribution it causes (p. 699). Hence zoning as a means of controlling nuisance is seen as neither efficient nor equitable as compared to other alternatives. Ellickson thus concludes that other less centralised remedies must be used.

Ellickson (1973) proposes the use of covenants (consensual agreements among landlords that limit the uses of one's property) as a means to deal with nuisance disputes. Again, he argues on efficiency grounds: 'Covenants negotiated between landowners will tend to optimise resource allocation among them. In other words, the reduction in future nuisance costs to each party will exceed the sum of the prevention and administrative costs each agrees to bear, with all costs discounted to present value' (p. 713). Though Ellickson acknowledges that '[n]ot all conflicts between neighbours can be solved by covenants', covenants 'generated by market forces will tend to promote efficiency' (p. 714) and that 'assuming equal bargaining power and information, consensual covenants will not involve inequitable gains or losses to any party' (p. 714). Covenants are problematic 'when they impose external costs on *third* parties, creating suboptimal resource allocation and unfairness' (p. 714) (for example when certain racial minorities are excluded from specific zones). Though old judicial practices and high transaction costs of the past have limited the use of covenants, Ellickson (1973) urges that the new emerging judicial attitude (influenced by the new 'law and economics' school) and the standardisation of legal procedures can bring about the reduction of transaction costs and thus facilitate the use of covenants.

More recently, Ellickson (1991) has advanced these ideas and has further argued for the use of informal mechanisms as effective means for resolving nuisance disputes. He shows how non-legal informal social controls are likely to supplant legal rules when transaction costs are high. He argues that in certain cases of conflicting uses of property, individuals often resort to such informal means of settlement not only because they tend to be administratively cheaper but also because they are more likely to promote efficiency (social wealth maximisation).

Where the application of covenants or other non-formal legal mechanisms are not feasible, due to high administrative and information costs, then a remedy for nuisance dispute can be found by altering the property rights amongst landowners. Ellickson (1973) held that a remedy settling a nuisance dispute will be efficient to a party if its preventive costs (the costs to avoid the nuisance) and administrative costs (the costs of litigation and bargaining) are less than the costs from reduction in nuisance. Legal rules cannot affect preventive costs, since the latter are affected only by technological innovations. Legal rules, however can affect administrative costs involved in the execution of a specific measure and thus property rights ought to be assigned so as to minimise administrative costs that will lead to the increase in the number of preventive measures that the parties perceive to be in their self interest. Ellickson (1973) developed a framework comprised of four guidelines for the choice of a nuisance remedy: (a) assign the entitlement to the party with the greater *knowledge* of the risks involved; (b) assign the entitlement to the party with the better *organisation* for dealing with the risk; (c) assign the entitlement to the party with the better *control* over implementing the most efficiency preventive measures; (d) use the most *simple* rules of liability since they are less costly than complex rules.

Using these guidelines, Ellickson (1973) proceeds to generate efficient remedies for nuisance dispute. He strongly advocates the use of damages over injunction. He proposed the elimination of traditional injunctive relief in nuisance disputes. In the context of the framework established by Calabresi and Melamed (1972) he proposed that only rule ii (that is, damages) and rule iv (compensated injunction) were granted (Ellickson, 1973, pp. 115-122). Ellickson argued against the use of injunctive relief on the basis that the balancing of equities or conveniences tests were uncertain and costly and hence allow the possibility of inefficiency arising from granting an injunction that poses costs to the defendant greater than the benefits gained from the plaintiff. A novelty in Ellickson's (1973) work is that it implies that compensated injunctions could be granted to a plaintiff that would *not* have been entitled to damages. For example, in the cases where the plaintiff would not be entitled to damages on the grounds that they were 'hypersensitive to injury' or had 'come to the nuisance', the plaintiff could nevertheless purchase a compensated injunction in cases 'involving personal safety or fundamental freedoms' (Ellickson, 1973, p. 740). What is more, a plaintiff that has been protected by a liability rule could also purchase a compensated injunction (rule iv) if they were not satisfied with the damages awarded (rule ii) (Ellickson, 1973, pp. 745-746). Ellickson is thus seen by commentators as proposing a remedy that is a 'hybrid of Rule Two and Rule Four remedies' (Lewin, 1986, p. 796).

#### 7.4 Merrill on Trespass

Merrill (1985) discusses *trespass* and *nuisance* law and how they differ in the remedies that can be effective. He considers trespass and nuisance law in the context of the *right to exclude intrusions* by others. He argues that this right is not one right but a 'bundle' of rights. In case of intrusion in the form of trespass the strict liability rule readily applies. Intrusion as a nuisance, however, is more complex in both establishing the nuisance (actionability) and to decide on the appropriate remedy. Whereas in nuisance law deciding on actionability and remedy involves weighing cost and benefits, this is not required in the case of trespass. Merrill (1985) further develops the 'mechanical-judgmental' distinction: trespass law as entailing limited judicial discretion in the determination of remedies (they are determined 'mechanically'). Nuisance law involves discretion and entitlements are established judgmentally. Merrill further analyses the economic underpinnings of the difference between nuisance and trespass law. His main thesis is that 'when the costs of transacting are low, the legal system will gravitate towards rule that determine entitlements at a low cost - such as the strict liability rule of trespass ... In contrast, when the costs of transacting are apt to be high, the legal system will incline toward rules for the determination of entitlement that are more expensive - such as the balancing or cost-benefit approach of nuisance'. That is, in the presence of high transaction costs market transactions are more prone to fail and thus 'these more expensive entitlement-determination rules are necessary in order to give judges the needed discretion to adopt what they perceive as the best 'compromise' solution (the efficient solution) to land use disputes' (Merrill, 1985, p. 14).

### 8. Comparative Nuisance: Differing Systems in Different Jurisdictions

Regarding the relative trends in the *application* of injunction and damages remedies, most commentators hold that damage remedies have been used increasingly by American courts (Ellickson, 1973; Note, 1979; Rabin, 1977; Polinsky, 1980) over the past four decades. On the other hand, courts in England have traditionally shown a preference for injunctive relief based on the high esteem they have held for private property, despite the fact English law prescribes that injunction is a discretionary remedy (Atiyah, 1980; Brenner, 1974; Tromans, 1982). Yet, it has been argued that there may be '[s]ome easing in the judicial attitude' regarding this preference (Ogus and Richardson, 1977, p. 310).

For comparison of English and UK judicial treatments of nuisance see Stephen (1998), while Lang (1979) offers a comparative discussion of the development and application of private law in cases of harmful externalities in England, France and Germany. Ogus and Richardson (1977) examine certain

judicial practices in the area of nuisance law and how they compare to the economic models developed by the law and economics tradition.

### **9. Conclusion: the End of Nuisance?**

Much of the literature in the area of nuisance is now quite dated, and this is for good reason. Many of the most important issues of law and economics arose out of the article by Coase, and hence by happenstance they arose within the context of the nuisance dispute. The problems of legal frameworks, property right allocations, bargaining costs, information costs and asymmetries, institutional costs, endowments and invariance results - all of these issues were raised first by Coase in his landmark article on social cost. For good reason each of these issues now constitutes a field of research in itself. Some of it could continue to occur within the confines of the nuisance dispute, but most of the issues are far more fundamental and far-reaching than this one context. For this reason the law and economics literature on nuisance is incredibly rich at its outset, and incredibly limited at present. It is a field of research far more notable for its past than it could ever be for its future.

Nevertheless nuisance disputes continue to provide a context for substantial analysis and academic interest. The fundamental nature of the nuisance dispute - individual activities with joint outputs by reason of physical proximity - raises many of the interesting issues involved in the coordination of society. The alternative approaches to their resolution - centralised or decentralised pricing and transfers - raises many of the most fundamental questions of governance. The field will continue to provide an interesting context for the consideration of these fundamental issues.

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