§3.8 Pollution: Nuisance and Easement Approaches

A factory smokestack belches smoke that blackens laundry and drapes in a nearby residential area and increases the incidence of respiratory diseases. As in the spark example, the challenge to the legal system is to allocate rights and liabilities in such a way as to minimize the sum of the costs of the smoke damage and of

avoiding that damage. Among the possible adjustments, the factory could install smoke-suppression equipment, it could shut down, or the affected homeowners could install air-cleaning equipment or move farther away from the factory. The question which of these or other methods of resolving the conflict in land uses is cheapest is more difficult than in the spark case, primarily because the effects of pollution on human health are not clearly understood and the aesthetic costs of pollution are difficult to measure.\textsuperscript{1} And the choice of the correct initial assignment of rights is critical; high transaction costs probably will make it impossible to correct a mistaken initial assignment through subsequent market transactions.

It is time we inquired more closely into the sources of high transaction costs. The factor stressed by economists, and mentioned earlier in this chapter, is a large number of parties to a transaction, though other factors, such as mental incapacity, figure importantly in particular legal settings (see §4.9 \textit{infra}). But farness of parties does not guarantee low transaction costs. If there are significant elements of bilateral monopoly in a two-party transaction — that is, if neither party has good alternatives to dealing with the other — transaction costs may be quite high. Negotiations to settle a lawsuit are an example.\textsuperscript{2} Because the plaintiff can settle only with the defendant, and the defendant only with the plaintiff, there is a range of possible settlement amounts within which each party will prefer settlement to the more costly alternative of litigation. Ascertaining this range may be costly, and the parties may consume much time and resources in bargaining within the range. Indeed, each party may be so determined to engross the greater part of the potential profits from the transaction that the parties never succeed in coming to terms. Each party may even be reluctant to be the one to initiate discussion of settlement (why?). And each may endeavor to commit himself to a “firm” offer at or near the top of his bargaining range (why and how?). Do you see the analogy to the game of “chicken”?\textsuperscript{3}

The frustration of a potentially value-maximizing exchange is the most dramatic, but not the usual, consequence of bilateral monopoly. Usually the parties will bargain to a mutually satisfactory price. But bilateral monopoly still is a social problem, because the bargaining costs incurred by each party in an effort to engross as much of the profit of the transaction as possible are a social waste. They alter the relative wealth of the parties but do not increase the aggregate wealth of society. A major thrust of common law, as we shall see, is to solve, or at least reduce the seriousness of, bilateral-monopoly problems.

Transaction costs are highest when elements of bilateral monopoly coincide with a large number of parties to the transaction. If homeowners have a right to be free from pollution, the factory that wants to have a right to pollute must acquire that right from every homeowner. If only 1 out of 1,000 refuses to come to terms, the rights that the factory has purchased from the other 999 are worth nothing (why?). Because the holdout (or, as we called him earlier, the hold-up — by holding up the project, he “holds up” the factory) can extract an exorbitant price, just as in our right-of-way example in the previous section, each homeowner has an incentive to

\textsuperscript{1} If the level of pollution varies geographically, the cost can be estimated by comparing property values, holding other factors that might affect those values constant. See, e.g., Timothy A. Deyak & V. Kerry Smith, \textit{Residential Property Values and Air Pollution: Some New Evidence}, 14 Q. Rev. Econ. & Bus. 95 (1974); K. F. Wleand, \textit{Air Pollution and Property Values: A Study of the St. Louis Area}, 13 J. Regional Sci. 91 (1973). Are there any objections, besides difficulty of estimation, to this approach?

\textsuperscript{2} Discuss in detail in §21.4 \textit{infra}.
delay coming to terms with the factory, in the hope of being the holdout. As a result, the process of negotiation may be endlessly protracted.  

If instead of the homeowners having the right to be free from pollution, the factory has the right to pollute, the homeowners must get together and buy the factory's right if they wish to be free from pollution. Transaction costs will again be high. Each homeowner will again have an incentive to drag his feet in negotiations with the factory. He will say to himself, "If I refuse to contribute my fair share of the purchase price, others, who care more deeply about pollution than I do, will make up the difference. The factory will be induced to stop polluting. I will benefit along with the others, but at zero cost." The costs of overcoming this foot-dragging by negotiations among the affected homeowners will be high if there are many of them.

In the presence of high transaction costs, absolute (unqualified) rights, whether to pollute or to be free from pollution, are likely to be inefficient. The factory that has the absolute right to pollute will, if transaction costs are prohibitive, have no incentive to stop (or reduce) pollution even if the cost of stopping would be much less than the cost of pollution to the homeowners. Conversely, homeowners who have an absolute right to be free from pollution will, if transaction costs are prohibitive, have no incentive to take steps of their own to reduce the effects of pollution even if the cost to them of doing so (perhaps by moving away) is less than the cost to the factory of not polluting or of polluting less.

The alternative to absolute rights is balancing, and is the approach taken by the most important common law remedy for pollution, which is "nuisance," the tort of unreasonable interference with the use or enjoyment of land. The standard of reasonableness involves comparing the cost to the polluter of abating the pollution with the lower of the cost to the victim of either tolerating the pollution or eliminating it himself. This is the efficient standard, but nuisance law has never had much impact on the amount of pollution. Freedom from pollution is a superior good, meaning that proportionately more is demanded as income rises; so until recently the demand for pollution abatement was small, as it still is in poor countries. More important, often both the polluters and the victims of pollution are numerous, small, and difficult to identify, and the medical, aesthetic, and other harms of pollution are difficult to measure. Unmanageably massive class actions, involving huge classes on both the plaintiffs' and the defendants' side of the litigation and daunting problems of measurement and remedy, would be required to abate automobile air pollution, for example. It is no surprise that extensive statutory regulation of pollution (examined in Chapter 13) has displaced the nuisance remedy with regard to the most serious pollution problems.

Suppose the nuisance predates the arrival of the complaining victims. Maybe a factory finds itself in a neighborhood that has gradually turned residential, and the pollution from the factory reduces the value of the residential property by more than the cost of discontinuing the factory's operations. Under the doctrine aptly named "coming to the nuisance," the newcomers would be barred from suing to shut down the factory. But most states reject the doctrine, and they are right to do so because transaction costs may prevent the market from adjusting to the change in

3. Why would this be less likely in the right-of-way case even without eminent domain?

4. How does nuisance differ from trespass, discussed briefly in the preceding section? Trespass is an unpermitted entry onto one's land as opposed to an interference with its use or enjoyment, but this is a nominal rather than a real difference. Rarely (though not never) will there be an interference with the use or enjoyment of land that does not involve the entry onto the land of waves or particles of some kind.
relative values of industrial and residential use. Should the rejection of the doctrine be thought "unfair" to the factory owner? Not necessarily; the price he paid for the land in the first place may have been discounted to reflect the possibility that the factory might someday be shut down as a nuisance (see §3.14 infra).

Of course, to sound a frequent note in this book, there is always a risk of error when a court undertakes to determine market values. In one nuisance case, the court made an ingenious attempt to minimize that risk.\textsuperscript{5} The defendants' feedlot emitted odors that reduced the value of a nearby residential development which had been constructed after the feedlot was in operation. The court, at the suit of the developer, ordered the feedlot shut down as a nuisance — but on condition that the plaintiff pay the lower of the feedlot's costs of shutting down or of relocating. If, knowing that this would be the rule, the developer had anticipated that it could locate the development elsewhere at lower cost than the feedlot could move or shut down, the costs created by the conflicting land uses would have been minimized. This is not a perfect solution, however, because an entitlement to shutting-down costs or relocation costs will reduce the incentive of feedlot owners to locate their feedlots optimally with respect to the expected development of the surrounding area.

A parallel difficulty doggs another common law approach to the problem of pollution, one illustrated by the legal treatment of airplane noise. Owners of airplanes that fly at very low altitudes are liable to the owners of property below the flight path for the diminution in market value brought about by the airplane's noise, whether or not that diminution exceeds the benefits of flight. The property owner cannot enjoin the invasion as a trespass, and so he cannot compel the airline to negotiate with him, but he can compel the airline to condemn an easement to continue its overflights. The airline will condemn if the cost of noise- abatement procedures is greater than the noise damage to the property owners; if less, it will adopt the procedures. Conceivably, should the cheapest method of noise abatement happen to be soundproofing the subjacent houses, the airline would pay the owners to soundproof, since by hypothesis that cost would be less than the airline's liability for noise damage. High transaction costs may preclude this result, and if so the eminent domain approach may be less efficient than a nuisance approach (why?). But it is better than a trespass approach. If the subjacent owners had property rights against airplane noise that they could not be forced to sell — if, in other words, they could enjoin overflights — then the efficient solution would not be attained if it was for the airline to continue making noise and the property owners either to tolerate it or to soundproof their houses. Each owner would have an incentive to act the holdout. Unable to purchase at a reasonable price all the rights of subjacent owners to be free from noise, the airline would have to either discontinue its flights or adopt noise-abatement procedures — both, by hypothesis, inefficient solutions.

A problem with the eminent domain approach, however, is that once the airline concludes that the costs of noise-abatement procedures are greater than the benefits in reduced liability to the subjacent owners and therefore acquires easements that authorize a high level of noise, it will have no incentive to reconsider the adoption of such procedures when and if their cost falls or their effectiveness increases; for the benefit of a lower noise level in the future would inure entirely to the property owners. This problem could be solved by creating time-limited noise

easements. But the solution would create a fresh problem. Property owners who grant perpetual noise easements have thereafter every incentive to adopt any noise-reduction measure that costs less than it raises the value of their property. They do not have that incentive under a system of time-limited easements, because any measure taken by a property owner that reduces noise damage will reduce by an equal amount the price that he will receive for the easement in the next period.

§3.9 Other Solutions to the Problem of Incompatible Land Uses: Merger and Restrictive Covenants

Attaining the efficient solution in the spark case, the factory smoke case, and our other examples of conflicting land uses would have been much simpler if a single individual or firm had owned all the affected land. A single owner of both the factory and the residential property affected by its smoke would want to maximize the combined value of both properties. This is the correct economic goal and the effort to reach it would not be burdened by the costs of obtaining the agreement of many separate owners.

So why are such mergers so infrequent? First, buying all the affected property would entail heavy transaction costs because it would require negotiating with many individual rights holders. Second, a single firm may not be able to operate efficiently in unrelated markets — factory production and residential real estate, railroading and farming, airport management and real estate. Sheer size may be a source of costs too, because there are diseconomies as well as economies of scale. The added costs of single ownership may offset the savings from solving the problem of conflicting uses.

The single-ownership solution is approximated by those oil and gas states — the majority — that allow compulsory unitization, by which the vote of a substantial majority (usually two-thirds) of the owners of an oil or gas field to operate the field as under common ownership will bind the minority. (Why would a requirement of unanimity be inefficient?) Owners of oil and gas rights often pump from the same underground pool. Each has an incentive to drill many wells in order to pump as much oil or gas as fast as possible, even though the total cost of production for the field as a whole could be reduced, and the total yield of oil or gas increased, by drilling fewer wells and depleting the resource more slowly. Any oil or gas that one driller leaves in the underground pool will be pumped by another.

A related solution to the problem of conflicting uses of land is the restrictive covenant. The developer of a tract who wants to maximize the value of the property but not to administer it can include in each deed of sale restrictions against land uses that would reduce the value of the tract as a whole. Such restrictions "run with the

6. As proposed in William F. Baxter & Lillian R. Altree, Legal Aspects of Airport Noise, 15 J. Law & Econ. 1 (1972). If the easement is limited (say) to 10 years, the airline will periodically review the state of the art in noise abatement in order to determine whether adopting noise-abatement procedures would save it more money by reducing its expected easement costs than the procedures would add to its capital and operating costs.

§3.9 1. It may be possible to offset some of the costs of underspecialization by leasing, but the coordination of the lessees may be almost as costly as the market — as we shall see shortly. Loss of control in organizations is discussed in the next section of this chapter and also in §14.1 infra.
land," which means that if recorded in a registry of land titles they are enforceable against any future owner of the land, as well as the present owner, and enforceable by successors to the original buyers. A mere contractual obligation on the buyer and his successors to the developer would not be good enough. Once he completed developing the tract, he would have little or no (why the hedge?) further interest in enforcing the obligation. Anyway, such a contract would not bind a buyer from the original buyer; the second buyer might not even know about the contract that his predecessor had made with the neighbors. And the second buyer couldn't be counted on to observe the restriction voluntarily. For although by assumption the restriction increases the value of the entire tract, if everyone else observes the restriction then the land of the owner who does not observe it will be even more valuable (why?). So the buyer will observe the restriction only if paid to do so. But he will not be paid— not much, anyway. The other property owners, if numerous, will have difficulty overcoming the problem of holdouts in their ranks. And they will gain little if they do, since, if the present owner sells, the other owners may have to transact all over again with the buyer (why "may"?).

There are limitations on the type of promise (often called an easement or a servitude) that runs with the land (that is, one that is enforceable as a property right). Suppose the seller of a piece of land promises the buyer that he will not sell goods or services in competition with the buyer, or that he will sell the buyer firewood at a low fixed price every year for 20 years. Will these promises run with the land? The common laws say no; they do not "touch and concern" the land. But if the seller (who in this example retains a neighboring lot) promised not to build a fence that would cut off the buyer's view, this promise would run with the land—that is, would be enforceable against the seller's successors in interest even if they did not know about the promise—because the promise involves an actual land use.

Why the distinction? One reason is that having too many sticks in the bundle of rights that is property increases the cost of transferring property. Another is that promises that do not deal with the use of the land itself are hard to keep track of in the absence of a recording system, which England did not have. The seller in our first two examples might have moved away from the buyer's neighborhood; it would be difficult for people negotiating for the purchase of the seller's property to determine whether he had obligations that would bind them, despite their lack of knowledge or reason to know of those obligations, because the obligations were the property right of someone else. Can you see an analogy to the discussion of why property rights are not recognized in basic research? Might we say that efficiency requires that property rights be in some sense open and notorious? How can this suggestion be reconciled with the protection of trade secrets? And does the "touch and concern" requirement make any sense if property rights must be publicly recorded in order to be enforceable?

The law of intellectual property has an interesting parallel to the restrictive covenant. Under the Continental European doctrine of "moral right," which has been making headway in American law (in part because of U.S. commitments arising out of the Berne Convention on copyright), an artist has the right to prevent the mutilation, destruction, or misattribution of his paintings or other works of art even after he has sold the work, perhaps to a dealer who then resold it to a collector or...

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museum. The right survives the artist's death, becoming an asset of his estate. In effect, the artist's right to the integrity of his art runs with the work, just like an easement in land. The economic rationale is that the value of the artist's future or unsold work, as well as his works owned by other purchasers, may be reduced by acts that impair the value of a particular work of his. Just as with the real estate easement, the artist could not obtain this protection by contract. (Why is it important that the right survive the artist's death? And should anyone else besides the author or his estate be permitted to sue to enforce the author's moral right?)

This discussion highlights the economic difference between property rights and contract rights. A property right excludes (in the limit) the whole rest of the world from the use of the property except on the owner's terms. A contract right excludes only the other party to the contract. Freedom to make and enforce contracts but not to create legally enforceable property rights would not optimize resource use. If A buys from B the right to work B's land, but B's right does not include the right to exclude others from working it, A (like B before him) will not have an incentive to exploit the land optimally. Similarly, without property rights, the problem of excessive grazing in our common pasture example would not be solved even if the farmers using the pasture sold their rights to a single individual or firm. After the new owner had reduced congestion by charging the farmers who had sold him their rights an appropriate fee for continuing to use the pasture, other farmers would begin to graze their cows on the pasture; they would have no obligation to pay a fee.

As a solution to conflicting land uses, restrictive covenants have two limitations. First, they generally are feasible only in the rather special setting of initial single ownership of a large area. They provide no solution to the typical pollution problem, for it is rare that an area large enough to encompass a factory and all or most of the residences affected by its smoke will be under common ownership. [Why not force the factory to condemn those residences?] Second, they are inflexible in the face of changes that may alter the relative values of conflicting land uses. The owner who wants to put his land to a use forbidden by a restrictive covenant must get the consent of all the property owners in whose favor the covenant runs; if there are many of them, the costs of transacting may be prohibitive. Some covenants provide therefore that they will expire after a certain number of years unless renewed by majority vote of the affected landowners. And courts may refuse to enforce a restrictive covenant on the ground that it is obsolete, that the forbidden land use is now clearly more valuable than the use protected by the covenant. This is like the cy pres doctrine of charitable trusts, which we will meet in Chapter 18.

The problem of the obsolete covenant would be less serious if courts refused to enjoin breaches of restrictive covenants and instead limited victorious plaintiffs to damages. Damages liability would not deter a breach that increased the value of the defendant's property by more than it diminished the value of the other properties in the tract, since, by hypothesis, his liability would be smaller than his gain from the breach. In contrast, an injunction places the prospective violator in the same position as the airline that is enjoinable by subjacent property owners or the railroad that is enjoineable from trespassing on property that it needs to complete its right-of-way: To get the injunction lifted the prospective violator will have to negotiate

with every right holder, may have to pay an exorbitant price to a few holdouts, and may even fail to complete the transaction. The inflexibility of restrictive covenants has led increasing numbers of developers to establish homeowners' associations empowered to modify the restrictions on the uses to which they may put their property. This method of coping with the problem of high transaction costs resembles another, the business firm. Besides these private solutions to the problem of conflicting land uses, there is a public solution — zoning. Two types of zoning should be distinguished. Separation-of-uses zoning divides a city or other local governmental unit into zones and permits only certain land uses in each zone, so that there are separate zones for high-rise apartment houses, for single-family homes, for businesses, for factories, and so on. Exclusionary zoning (a term often used pejoratively, but here neutrally), ordinarily adopted by smaller units than a city or county, tries to exclude certain land uses altogether; a suburb that requires minimum lot sizes would be engaged in exclusionary zoning. The main question about separation-of-uses zoning is whether it makes much difference, especially given the alternative of restrictive covenants. One is unlikely to find a house and a factory cheek-by-jowl even if there is no zoning. Residential real estate usually commands a higher price than real estate used for industrial purposes (why?), and therefore a factory owner would not want to build his factory in a residential area unless his purpose were extortion, which nuisance law should be able to deal with effectively.

Exclusionary zoning is more likely than separation-of-uses zoning to affect the use of land. A large lot might be worth more if used for a high-rise apartment building than for a single home — at least if the effects on other homeowners in the community are neglected, as the developer often would do (why?). These effects may include highway and parking congestion and burdens on municipal services such as public schools. Notice, however, that:

1. If the residents of the high-rise are charged for the extra costs they impose through use of public schools and the streets, there will be no externality justifying exclusionary zoning.
2. Even though exclusionary zoning may be efficient in principle, the practice may be quite different. The incentives of public officials — the people who draft zoning ordinances and enforce them — may lead them away from the goal of efficiency, as we shall see in Chapters 19 and 23.
3. Exclusionary zoning is apt to redistribute wealth from poor to rich (why?).