

Pollution of air and water, the erosion of scenic beauty, and the growing intrusion of noise and over-crowding have afflicted Japan as they have other countries. In recent decades, these assaults on the Japanese environment have provoked lawsuits and have led to the enactment of taxes on polluters to compensate victims and subsidies for pollution abatement. In considering Japan's environmental policies, though, one should not overlook the many ways in which environmental problems are resolved in the economy without a need for expanding the scope of government authority. Examples include the evolution, in Japan, of a legally recognized "right to sunshine," rules set not by government but by profit-seeking proprietors of restaurants, owners of rail lines, and landlords, and limitations on fishing that are self-imposed and self-enforced by private fishermen's cooperatives.

Some of the above examples have involved litigation. Japan has fewer lawyers per person and less litigation than the United States. In spite of these differences, the court system of Japan seems to have provided an adequate basis for resolving a lot of the environmental issues in a rather *laissez-faire* manner. Unfortunately, the *laissez-faire* approach occasionally fails horribly. Only after four widely publicized environmental disasters produced a political outcry did the government of Japan seriously intervene in the control of industrial pollution.

Four environmental crises

Mercury poisoning in Minamata

The name of Minamata, a small fishing village in the south of Japan, will forever be linked with the horrors of mercury poisoning—irreversible symptoms including tremors, paralysis, and dementia, in severe cases resulting in death. Minamata disease first showed up in cats and birds as early as 1953, and by 1959 was common in humans including congenital cases. We now know that the fertilizer company Chisso caused Minamata disease by discharging compounds of mercury into the sea where they were bioconcentrated in fish which were eaten by humans and animals. This was first learned in 1957 by researchers from nearby Kumamoto University and was confirmed through experiments on cats by a doctor in the employ of Chisso itself in 1959. In a pattern that was to be repeated elsewhere in Japan, Chisso executives sought to suppress knowledge of the company's culpability, stonewalling and dissembling in spite of growing protests by local fishermen and residents whose livelihoods and health were ruined. A negotiated settlement between Chisso and its victims included nominal compensation and an agreement (later invalidated by a court) precluding further claims against Chisso.

Mercury poisoning in Niigata

Mercury poisoning appeared again in 1965 in Niigata prefecture on the middle of the western coast of Japan, this time caused by the toxic effluent of Showa Denko, an industrial rival of Chisso using the same process as Chisso to produce nitrogen fertilizer. Fish taken from the Agano River and eaten by humans transmitted organic mercury to the unfortunate victims. Emboldened by the previous history of Minamata and by the defiant proclamations of the president of Showa Denko, thirteen victims filed suit in 1967. In 1971 the victims won the suit, which precipitated further litigation against Chisso, also ultimately successful.

Cadmium poisoning in Toyama

Itai-itai disease is the name for the painful effects of cadmium poisoning: decalcification that leads to brittle bones, acute sensitivity to pain, loss of appetite, and in severe cases death. In Japanese "Itai-itai!" is the cry of one in physical pain. Itai-itai disease appeared in the environs of Toyama on the western coast of Japan as early as the 1920s, but only in 1964 was it fully understood to be the result of cadmium poisoning caused by effluent of the mining and smelting of zinc and lead by the Mitsui Metal Mining Company. The cadmium toxins leached into the streams and eventually settled into the irrigated rice paddies where they were uptaken into the rice and soybeans which the people harvested and ate. In 1968 a group of twenty-eight victims sued and won an award for damages in 1971, and on appeal—by Mitsui—won an even larger award the following year. Mitsui promptly settled other claims out of court and agreed to alter its operations to prevent future contamination.

Industrial pollution in Yokkaichi

Yokkaichi is a city on the Ise peninsula south of Nagoya which after 1955 became re-established as a center for petroleum refining and processing. A number of companies established facilities in close proximity to one another including Shoseki (oil refining), Mitsubishi Monsanto (vinyl chloride), Mitsubishi Yuka (ethylene), Mitsubishi Kasei

(chemicals), Ishihara (chemical fertilizer), and Chūden (electric power). By 1960 local residents began to experience asthma-like symptoms which were clearly the result of air pollution by these companies including emissions of sulfur oxides. Fish in the surrounding waters had ceased to be fit for consumption. Local fishermen correctly associated this threat to their livelihoods with the discharge into the waters of untreated industrial effluent. In 1968, following inconclusive reports on the problem, half measures by local government, and stonewalling by the companies, nine of the many sufferers of Yokkaichi asthma filed a suit against the six companies and in 1972 won a sizable award.

The sad events just recounted galvanized the national government to act. In 1970 a special government agency for coordinating environmental policies was established and in subsequent years new environmental legislation was enacted. Two major policies merit attention: the establishment and continual strengthening of environmental controls, and the enactment, implementation, and eventual retrenchment of a law that established taxes on polluters to compensate individuals for their pollution related health injuries.

Policies for meeting environmental standards in Japan

Environmental quality standards were first established in Japan for ambient sulfur oxides in February 1969 and for water pollution in April 1970. These standards represent goals or targets for government policy-makers in Japan. They do not in themselves bind the decisions of businesses in any way. But there exists in Japan a constellation of policies that have induced firms to abate their toxic emissions and effluents. Since 1970 the standards have been steadily increased as environmental quality has improved in Japan. In this sense the standards represent moving targets. The policies that precipitated these improvements in air and water quality include a somewhat confusing mix of controls, subsidies, and government guidance.

With regard to sulfur oxides, the root cause of acid rain and a major component of air pollution,

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the government has established maximum allowable volumes of emissions according to formulae that impose tougher controls on facilities with lower stack heights, or that are in more densely inhabited or more polluted regions. And these so-called "*k*-value" controls (for *k* is the parameter of the formula that varies from area to area) are in some instances superseded by more strict controls imposed by prefectural governments. To meet these various controls, which apply to as many as 150,000 industrial boilers in Japan, firms have switched to fuels having lower sulfur content, have increased stack heights, and have installed scrubbers that remove toxins prior to emissions.

Nitrogen oxide emissions, a major component of photochemical air pollution, have also been the object of government controls in Japan. But the dramatic reductions in ambient levels of sulfur oxides in Japan since the early 1970s have not been duplicated for nitrogen oxides. Possibly this is because diesel truck engines are a major and growing source of nitrogen oxide emissions in Japan. Automotive emission controls are severe in Japan but will remain largely ineffective at reducing ambient nitrogen oxide unless and until technology affords a workable substitute for the diesel engine.

Water quality, as measured by the oxygen content of lakes, rivers, and streams, has steadily improved in Japan. Higher oxygen content indicates the greater presence of living organisms unable to coexist with high levels of toxins. The improving water quality reflects both the application of effluent controls to private businesses and the expansion of public investments in water and sewage treatment since the early 1970s.

Economic incentives for pollution abatement

Many commentators emphasize the role of administrative guidance in inducing firms in Japan to reduce their toxic discharges, but it is unlikely that government jawboning and cajoling would have been effective had firms not been convinced that the steps were in their own narrow interest. The Japanese environmental policy has provided economic incentives for pollution abatement, including extensive subsidies and tax credits contingent on the installation of abatement devices or

upon relocating to less populated areas. Where these incentives are lacking, as in the case of nitrous oxides, the results have been noticeably less. The lion's share of private investments in coal scrubbers were by Japan's ten regulated electric power companies. Government influence in this instance is unsurprising, as price regulation has afforded a way of rewarding compliance with environmental goals. In broad terms, the environmental policies of Japan combine elements of both subsidy and direct control.

The *subsidy* policy, which provides firms with positive rewards for abating air and water pollution, and the *control* approach, which requires firms to meet set levels of environmental performance or else face penalties, both substitute command and control mechanisms for the price system. Subsidies will guide firms to the least-cost method of reducing toxic discharges only if policymakers are able to deduce what that method is. Often this is not possible. For instance, subsidies may be provided for installing specific abatement devices, even when relocating or some other action would attain equal reductions in pollution at lower cost. The control approach allows firms to choose their own methods of compliance, but generally fails to take full account of the differing costs of compliance of differing firms and industries. Any particular global level of pollution reduction is achieved at lower cost if those having low incremental costs of pollution reduction are held to higher standards than others.

The alternative to the subsidy policy and controls policy, which exploits the market principle most fully while nevertheless attaining given ambient reductions in pollution, is to issue pollution permits which firms can trade in the market. Those having the greatest cost of pollution abatement would be the highest bidders for the permits, and each firm would have an incentive to implement its own least-cost method of pollution abatement in order to minimize its outlays for permits. Such a policy is only now being introduced in the United States, but on a limited basis. There is little doubt that wider recourse to the tradable permits approach would greatly lower the costs of environmental improvement, yet there is little enthusiasm for it among politicians in the USA and perhaps even less in Japan. Why?

Subsidies shield firms from output restrictions and cause taxpayers to bear the cost of pollution abatement. Uniform controls force less efficient firms to shut down, which works to the advantage of surviving firms. Under the tradable permits policy, polluting firms and their customers would bear the costs of pollution. Relatively large firms that are likely to face output restrictions if tradable permits are issued, and are likely also to survive in competition with smaller firms if uniform controls are imposed, will favor both the subsidy policy and the controls policy over the tradable permits policy.¹ Environmental policy in Japan, and elsewhere, reflects the preferences of large and profitable firms, not those of taxpayers or of small marginal firms.

The 1973 Law for Compensation of Pollution-Related Health Injuries

Perhaps the most widely discussed response to the four major pollution crises was the enactment of a scheme that taxes polluters and compensates individuals who contract pollution-related diseases. Many outside observers have commented favorably on this law.²

The law establishing this policy, enacted in 1973, identified two classes of claimants. The first class included those residing in geographic areas designated by the government as subject to air pollution from non-specific sources and who later contracted respiratory diseases such as bronchitis, asthma, or emphysema. The second class included those residing in areas designated by government authorities as having been polluted by specific toxins and who contracted related illnesses including mercury poisoning (Minamata disease), cadmium poisoning (Itai-Itai disease), and PCB poisoning.

Designated claimants of both classes are entitled under the law to collect compensation from special funds financed through taxes levied on polluters. The compensation is according to a formula that is based on the age, sex, and severity of injury, and is to cover medical expenses and rehabilitation expenses and to compensate victims or their bereaved families for lost earnings resulting from disability or death.

The claims were financed through levies on polluters. (The costs of administering the levies and claims as opposed to the claims themselves have

been financed largely by general government revenues.) In the case of Class Two claims—claims associated with specific toxins—the companies responsible for releasing the toxins have been assessed annual levies to finance the claims. In the case of Class One claims, involving respiratory ailments of unspecific origin by residents of designated “high air pollution” regions, claims have been financed 20 percent from tonnage taxes paid by the owners of motor vehicles and 80 percent by taxes on large emitters of sulfur oxides. The base of the sulfur oxide tax is the firm’s annual emission of such toxins as judged by its usage of fossil fuels and degree of pollution abatement. Only large³ polluters have been taxed in this way, but these account for an overwhelming percentage of sulfur oxide emissions. Also, the tax rate per unit of toxic emission was stipulated to be nine times greater for facilities within the designated high pollution regions. The tax rates on sulfur oxides have been adjusted annually to assure that total collections are sufficient to meet all claims.

In 1986 the Compensation Law was greatly altered. First, the designation of further Class One claimants was permanently suspended as of March 1, 1988. Second, the tax rates on sulfur oxide emissions within designated regions and others were made equal to one another. Third, rather than only financing claims, the tax proceeds were now earmarked for research into pollution abatement, medical treatment of pollution-related illnesses, and dissemination of the results of such research. The Class Two claims, involving specific toxins and taxes on those responsible for having discharged the toxins, were left intact.

Economic analysis of the compensation law

Environmentalists and others lauded the 1973 law and sharply criticized its later alteration. But

¹ This is approximately the argument of James M. Buchanan and Gordon Tullock, “Polluters’ Profits and Political Response,” *American Economic Review*, vol. 65, no. 1 (March 1975), pp. 82–3.

² For example, Ezra Vogel described this policy as “imaginative” and noted that “Some Americans concerned with pollution are beginning to urge that America consider similar measures”: *Japan As Number One: Lessons for America*, London: Harper Colophon, 1979, pp. 82–3.

³ “Large” is defined as having maximal emission more than 5,000 Nm³/hr if the facilities are located within a designated high pollution region and more than 10,000 Nm³/hr if not.

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economics reveals two defects in the original law that the changes do in fact correct. The first is that, by providing compensation for pollution-related injuries, the law actually weakened the incentives of individuals themselves to avoid pollution sources. Continuing to tax sulfur oxide emissions but suspending the future designation of Class One victims entitled to compensation may actually result in an improved allocation of resources.

A second defect in the original law was the provision that the sulfur oxide tax be readjusted annually so that collections would match disbursements for compensation. The prospect that, if enough individuals located their residences near pollution sources, future tax increases would drive the polluters away further inured individuals from themselves avoiding harm, an added distortion in their calculations beyond that already induced by the prospect of receiving compensation. In fact, the tax rate on sulfur oxide emissions was increased dramatically from 1974 to 1977 by a factor of 33, reaching a whopping ¥536.63 per cubic meter in the designated high pollution zones (the equivalent of a 30 percent tax rate on fossil fuels). As emissions of sulfur oxides declined and the number of legally designated Class One victims increased, it became necessary to increase the tax rate simply to maintain receipts at the intended level. This undoubtedly afforded a significant economic incentive for firms to either relocate, install abatement equipment, or cease operations. But that does not establish the economic desirability of the policy. An enlightened policy not only reduces environmental toxins, but does it in the least-cost way, and also respects the brutal fact that some pollution is more costly to eliminate than is worthwhile. At the very least, Japan's pollution taxes and emissions controls have, indeed, resulted in cleaner air; one can quibble about whether this was achieved at the least possible cost, or whether it was worth the cost.

The "polluter pays principle"

In 1975, the research staff of the OECD argued in a series of monographs that firms should be taxed for polluting, not rewarded for abating pollution.⁴ Japan had just been admitted to the OECD, an

international organization dedicated to the study of economic policies in the developed countries, which was widely touted in Japan as further evidence—if any were still needed—of Japan's status as a developed nation. Perhaps for this reason, the so-called "polluter pays principle" immediately attained wide currency in the popular press in Japan and was heartily endorsed by influential politicians there.

As distorted through the prism of mass culture, the "polluter pays principle" became nothing more than a "punish polluters principle."⁵ In fact, the argument for pollution taxes rather than abatement subsidies is based on the idea that abatement subsidies may induce each individual firm to pollute less but, by encouraging new firms to enter, may draw resources toward polluting industries. In contrast, taxes on polluting industries induce firms to exit.

To call the tax policy a "polluter pays" policy is to label it falsely. As firms in an industry reduce their outputs in response to a tax, the industry supply shrinks and the product price rises. Ultimately, then, consumers of the products of polluting industries also bear the burden of a tax on pollution. Of course, to label the policy one of "consumers pay for pollution" is unlikely to generate wide support for it. In any case, Japan's sulfur oxide emission tax, automotive tonnage tax, and k-class controls do all exemplify the sort of policy that the OECD staff had advocated. No one seriously doubts that the policies have contributed to improved air quality in Japan, but, again, that may not be the decisive factor in evaluating the policies.

Spillovers

The serious pollution problems are examples of economic spillovers. There are many other examples. A spillover arises when one is oblivious to the effects on others of one's own actions. The

⁴ OECD, *The Polluter Pays Principle: Definition, Analysis, Implementation*, Paris: OECD, 1975.

⁵ Remy Prud'homme, "Appraisal of Environmental Policies of Japan," in S. Tsuru (ed.), *Growth and Resource Problems Related to Japan*, New York: St Martin's Press, 1980, pp. 193–208 at p. 205.

emission of toxic fumes by a manufacturing firm is an example of spillover, and the emission of tobacco fumes by a smoker on a crowded train may be another. Other instances might include the erection of a tall building that enshades the adjoining property owned by a sunshine-loving neighbor, a loud mah jong party that annoys neighbors, harvesting fish from the ocean and thus depleting the future catch of other fishermen, entering an already crowded freeway and thereby slowing the travel of others when an alternate route is available, and so on.

Disciplined thinking about spillovers has been greatly advanced by the insight of Nobel laureate Ronald Coase that the absence of saleable ownership rights is the necessary premise of all spillovers.⁶ If the right to smoke a cigarette in a crowded train were clearly assigned—to each person holding a seat, for instance—and could be easily traded, then smokers could not be described as oblivious to the effects of their smoking on others. If a person sitting nearby is offended by the smoke, she would offer a payment to buy the smoking right. Even if the offer is declined, the smoker has been made to consider the value of the harm his smoking inflicts—and has judged the value to himself of a relaxing smoke to be greater! A spillover is not present. For a spillover to arise, it must be that the one offended by the smoke declines to offer a payment, either because she believes the smoker should have to pay her for the right to smoke and the smoker thinks the opposite, or because such transactions are so unusual that the nuisance of reaching an accommodation through trading outweighs the likely benefits to either party.

Coase's analysis of spillovers directs attention to the many instances in which environmental problems are resolved by the creation of new saleable ownership rights rather than through taxation or government administration. One curious example of this is the Japanese "right to sunshine."

Right to sunshine

As a result of court cases decided in Japan in the 1960s and 1970s, sunshine rights are now among the tradable economic goods there. In 1960, a resident of Tokyo named Suzuki added a second storey

to his house. The new construction at midday completely enshaded the home of his neighbor named Mitamura. Because of the blockage of sunlight, Mitamura sold his home and moved elsewhere but sued Suzuki for damages. In 1972 the Supreme Court of Japan ruled in favor of Mitamura. There have been a number of similar cases in the years since. The result is that the outcome of such litigation has become rather predictable, though it is likely to depend upon details such as the changing angle of the sun's rays through the annual change of seasons, whether the building is in a densely populated or more rural setting, the purpose of the offending construction, and so. Nevertheless, as the outcome of these cases has become predictable—whether it is an award of compensation or an injunction against building—litigation has become unnecessary in many instances. For instance, if new construction is expected to infringe on the sunshine rights of the owners of adjoining property, then the builder will first purchase a waiver of those rights before proceeding. The right to sunshine is, in effect, a saleable good. Now that private tradable rights to sunshine are clearly assigned in Japan, there remains little further possibility that those undertaking new construction in residential areas will be oblivious to sunlight blockages. But this is also true in the United States, where the courts, generally speaking, have adopted a rule of never issuing injunctions against new building that enshades neighboring property and never awarding damages for deprivation of sunlight.⁷ Builders in the USA will still not fail to consider the deprivation of sunshine that their building imposes on owners of adjoining property, because they are confronted with bids from those owners to forgo their offending construction. (Notice that this does not mean that the building will be suspended!) The crucial role of the court cases such as *Suzuki vs. Mitamura* is that they clearly assign sunshine rights to one party or the other; it matters little to the ultimate outcome of such disputes which one

⁶ Ronald H. Coase, "The Problem of Social Cost," *The Journal of Law and Economics*, vol. 3 (1960), pp. 1–44.

⁷ For a closer comparison of the two countries' laws on this issue, see Steven S. Miller, "Let the Sunshine In: A Comparison of Japanese and American Solar Rights," *Harvard Environmental Law Review*, vol. 1 (1976), pp. 578–600.

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wins. Once a property right is assigned unambiguously to one person, market trading—if unimpeded by transactions costs—will then allocate the right to whoever values it the highest, a proposition known as “Coase’s Law.” But the transactions cost, which includes the cost of negotiating and enforcing private agreements, often does seriously impede trade. This is particularly so in trades that involve large groups of persons collectively. Even in these instances, government administration has occasionally introduced new distortions rather than offsetting existing ones.

Shinkansen noise

A large number of persons living next to the tracks of Japan’s high speed bullet trains, the *shinkansen*, have sought through private entreaties and litigation to slow the trains to quiet the noise and vibration. In a series of court cases decided in the 1980s, the Japan National Railways (now Japan Railways) was ordered to slow the speed of its *shinkansen* in the heavily populated cities such as Nagoya. It is quite likely that the many passengers of the *shinkansen* would, as a group, be willing to pay far more to prevent delays in their travels than would be necessary to induce the relatively few who live next to the tracks to permit the trains to move speedily. But the costs of the railroad’s reaching an agreement with the residents are prohibitive in this case because of the difficulties in obtaining the unanimous consent of the residents. The court decisions will therefore not be overridden by private agreements as in the sunshine cases.

Private versus public administration of spillover disputes

The *shinkansen* noise case indicates that administered “solutions” to spillover disputes can themselves cause new misallocations of economic resources. This is less likely to be true when rules are administered by private owners than when administered by judges or government employees. Consider, for instance, the calculations of the owner of a private rail line in setting no-smoking rules for passengers. If nonsmokers’ willingness to pay for an expansion of no-smoking cars is greater than smokers’ willingness to pay for smoking cars, then the rail line’s profits are increased by ex-

panding the no-smoking cars. Of course, smokers and nonsmokers may reach their own accommodations with one another that override the proprietor’s designations, but the costs of such negotiations are apt to be prohibitive and are at the least troublesome.

In spite of the greater profits that efficient smoking rules would confer, the number of no-smoking cars on *shinkansen* has in fact been the subject of acrimonious dispute. At first, none of the sixteen cars on each *shinkansen* was so designated. Following public complaints, first one and then two cars were designated no-smoking. Why the controversy? Perhaps the prospect of greater profit was not a sufficient inducement to the national railways (JNR), a government enterprise, to seek efficient smoking rules. Added JNR profit (actually a smaller loss) need not have meant greater rewards for the managers of JNR, but rather an enrichment of Japanese taxpayers. The lack of controversy surrounding smoking rules on the many private rail lines in Japan is an instructive contrast to the JNR experience in setting no-smoking rules on *shinkansen*.

Foreign visitors to Japan and others have remarked upon the extensive rules that owners of apartment complexes set for their tenants. Rules vary from landlord to landlord and might prohibit the flushing of toilets at certain hours for instance, or the playing of mah jong which is a game often accompanied by the loud sounds of tiles clacking together. The rules often pertain to behavior that is apt to have spillovers. As with the no-smoking example, the profit motive is an inducement to set efficient rules. Competition among landlords is a counterbalance to individual mistakes. For instance, if all landlords were to prohibit mah jong, then there would be a great profit for any that allowed it and attracted the few tenants willing to pay a great premium to clack the mah jong tiles in their own abodes rather than only at a mah jong parlor.

A final example of private resolution of a spillover dispute in Japan is the management of offshore fishing rights by co-ops. The harvest of fish from the ocean depletes the biomass, and diminishes the possibility of future harvest. Where many are fishing in the same area, each may be inclined to ignore the effects of his behavior on the others’

future harvest, and may wastefully overfish. This sort of spillover has been offered as the justification for government limits on fish harvest. An analogous principle underlies the international treaties, to which Japan is a party, limiting the harvest of whales. But the Japanese fishery is a famous example in which individuals have evolved sophisticated rules of behavior that prevent overfishing without government regulation. These informal rules include *de facto* exclusive rights in particular fishing grounds, and self-imposed limits on harvest, agreed upon and enforced among fishermen themselves.⁸

Law and lawyers in Japan

Infrequency of litigation in Japan

The four environmental crises mentioned before, the sunshine disputes, and the *shinkansen* noise dispute are all exceptional in Japan in that they involved litigation, which is generally a lot less frequent in Japan than in the United States and elsewhere. There are two reasons for the infrequency of litigation in Japan. First, litigation is more costly than in other countries because of the artificial scarcity of attorneys. Second, the outcome of litigation is more predictable than in other nations because Japanese law is based on a civil code rather than a common law, and because Japanese court cases are decided by judges rather than by juries.

Many have commented upon the cultural trait of the Japanese people of avoiding conflict and seeking consensus. But avoidance of conflict is a universal goal not a uniquely Japanese one. John Haley was among the first to question whether the infrequency of litigation in Japan demands a cultural explanation.⁹ He conceded that litigation is infrequent in Japan, compared with other countries, but argued that this might just reflect the fact that the number of bar certified attorneys is far less in relation to the population in Japan than in other nations, and so attorney fees are higher there. Certification of attorneys in Japan is by competitive examination and as many take the bar exam in Japan each year as do in the USA, but the pass rate is drastically lower in Japan. Consequently, in 1994 there were about 18,400

bar certified attorneys in Japan compared to 840,000 in the USA. Limited supply of court attorneys implies a higher price for the services of such attorneys, and therefore lower demand. Of course, the scarcity of legal services is a government policy and would probably not be tolerated if it imposed extremely large social costs. Perhaps it does not impose large costs. Lawyers in Japan do not enjoy spectacularly large earnings compared with lawyers in the USA. A lot of legal work in Japan is performed by persons with legal training but without bar certification. In any case, infrequency of litigation in Japan has a more fundamental reason than the artificial scarcity of attorney services.

Compared with other nations, the outcome of litigation is more predictable in Japan, so that out-of-court settlement is more likely; this achieves approximately the same result but avoids court costs.¹⁰ In Japan, as in Germany and other nations that have legal systems based upon a civil code, tort cases, including cases involving spillover disputes, are decided by judges according to statutes. In the United States and Great Britain tort cases are decided according to the common law, that is, according to the precedent cases rather than according to a statute. Statutory law affords a narrower scope for judicial interpretation. To the extent that this renders the outcome of torts more predictable, it promotes out-of-court settlements that avoid litigation costs. A further factor contributing to the predictability of litigation in Japan is that cases are decided by judges rather than by juries there. Judge's decision rules are more apt to

⁸ For more on this topic, see Kenneth Ruddle and Tomoya Akimichi, "Sea Tenure in Japan and the Southwestern Ryukyus," and Kevin MacEwen Short, "Self-Management of Fishing Rights by Japanese Cooperative Associations: A Case Study from Hokkaido," chs. 11 and 12, respectively, in John Cordell (ed.), *A Sea of Small Boats*, Cultural Survival, 1989, pp. 337-87.

⁹ John O. Haley, "The Myth of the Reluctant Litigant," *Journal of Japanese Studies*, vol. 4, no. 2 (Summer 1978), pp. 359-90.

¹⁰ This line of argument is developed by J. Mark Ramseyer, "Reluctant Litigant Revisited: Rationality and Disputes in Japan," *Journal of Japanese Studies*, vol. 14, no. 1 (Winter 1988), pp. 111-23; and J. Mark Ramseyer and Minoru Nakazato, "The Rational Litigant: Settlement Amounts and Verdict Rates in Japan," *Journal of Legal Studies*, vol. 28 (June 1989), pp. 263-90.

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be formulaic and predictable, not idiosyncratic and manipulable as with juries. Again, predictability of the outcome of litigation promotes out-of-court settlement.

The upshot of this discussion is that there are no cultural peculiarities or biases that render the court system of Japan incapable of performing its essential role in tort cases of enforcing clear assignments of property rights to one party or another. A final example in which they have done exactly that is in liability for defective products.

Product liability law

Until the enactment by the Diet of the Product Liability Law, which took effect in July 1995, the rule in tort cases involving liability for damages arising from product defects in Japan was one in which the plaintiff was obliged to demonstrate negligence on the part of the manufacturer. The new law shifts that burden of proof to the manufacturer. The plaintiff is still obliged to demonstrate the existence of a defect, that there was damage, and that the damage was a result of the defect, but under the new law she is no longer required to demonstrate negligence on the part of the product manufacturer or that the negligence caused the defect.

Under the earlier regime, because of the inherent difficulties for a consumer to prove negligence on the part of a manufacturer, very few consumers were awarded compensation for damages. This meant, in effect, that consumers were generally liable for damages resulting from defective products, though there were some notable exceptions. In some widely publicized cases consumers did succeed in proving negligence and collected damages. These cases included ones involving the drug thalidomide, the mistaken admixture of arsenic into infant powdered milk by the Morinaga Milk Company, PCB (polychlorinated biphenal) contamination of cooking oil produced by Kanemi Rice Oil, and a diarrhea remedy that produced a neurological disorder known as SMON (subacute-myelo-optico-neuropathy). Except for these cases and a few others, all of which were long in settlement, consumers were liable for damages arising from defective products.

The publicity surrounding these cases was the original impetus for new legislation, which was

discussed and debated for two decades before its eventual enactment in 1994. Under the new law, because consumers are no longer obliged to prove negligence, manufacturers are more likely than before to be held liable for damages resulting from defective products. But the placement of the rule of liability actually matters less than one might have supposed. This is a further instance of Coase's law.

As demonstrated by Hamada,¹¹ and by Demsetz,¹² if potential damage from defective products can be avoided when the manufacturer incurs an added cost, and if the consumers and the manufacturer are fully and accurately informed as to whether the manufacturer has incurred the added costs, and are informed also as to the extent of those costs and the likelihood and extent of damages thereby prevented, then placement of the rule of liability has no economic effect whatsoever. If the consumers are liable, then their willingness to pay for the presumptively safe products is greater than for unsafe ones by precisely the amount of the expected damages arising from the use of unsafe products. The manufacturer will decide to incur the added costs of producing a safe product if and only if the added value to consumers warrants it; that is the economically efficient criterion. In the opposite case, in which the manufacturer is liable, consumers' willingness to pay is no greater for the presumptively safe product than for the unsafe one, but now manufacturers factor into their calculations their own expectation of greater costs resulting from compensation for damages in use of the unsafe product—just as, under the rule of strict consumer liability, the manufacturer incurs the added cost of producing a safe product only if the expected avoidance of damages warrants it, the economically efficient rule. In other words, if unsafe products are offered under the regime of consumer liability, then unsafe products will also be offered under the regime of producer liability, and it is economically efficient in each case. Since the enactment of the product liability law in

¹¹ Koichi Hamada, "Liability Rules and Income Distribution in Product Liability," *American Economic Review*, vol. 66, no. 1 (March 1976), pp. 228–34.

¹² Harold Demsetz, "Wealth Distribution and the Ownership of Rights," *Journal of Legal Studies*, vol. 1 (1972), pp. 223–32.

Japan, manufacturers have hastened to purchase liability insurance. There is little evidence that products have been either redesigned or withdrawn from the market.

Conclusion

An environment free of toxins is one among the multitude of scarce goods. For society, more of any good necessarily requires the sacrifice of others. The upshot is that some pollution is indeed more costly to eliminate than is worthwhile. The challenge for governments everywhere is to enact policies that assure both that environmental degradation is actually permitted wherever its avoidance would entail the sacrifice of more highly valued other goods, and that whatever level of environmental quality is attained is conjoined with the maximum possible output of other goods. In other words, the goal of an enlightened policy is an economically efficient allocation of resources, not the elimination of pollution.

If property rights were of infinite scope, were clearly assigned to specific individuals, and could be traded costlessly, the only environmental policy capable of achieving an economically efficient allocation of resources would be one of complete *laissez-faire*. That is not the world in which we live. In Japan, four highly publicized and outrageous cases of industrial pollution in the 1950s and 1960s were so obviously inconsistent with economic efficiency that the nation insisted upon a government response. The government-administered controls, subsidies for pollution abatement, and taxes on toxic emissions enacted in the 1970s may not have been perfect, but they are widely regarded as improvements.

Less profound departures from economic efficiency that are of the same fundamental nature as the problem of toxic emissions and effluents have been dealt with in Japan by expansions of the domain of private property rights. The right to sunshine is the most famous example. Broadly conceived, the environmental policy of Japan includes the nation's legal system.

FURTHER READING

- William J. Baumol and Wallace E. Oates, *The Theory of Environmental Policy*, 2nd edn, Cambridge: Cambridge University Press, 1988. The standard textbook for courses in environmental economics.
- Ronald H. Coase, "The Problem of Social Cost," *Journal of Law and Economics*, vol. 3 (1960), pp. 1–44. The original application of Coase's law to tort cases, one of the most cited articles ever written by an economist.
- J. Gresser, K. Fujikura, and A. Morishima, *Environmental Law in Japan*, Cambridge, MA: MIT Press, 1981. Legal scholars discuss a wide variety of Japanese court cases and statutes, including all of the ones mentioned in this chapter and many others.
- Koichi Hamada, "Product Liability Rules: A Consideration of Law and Economics in Japan," *Japanese Economic Review*, vol. 46, no. 1 (March 1995), pp. 2–22. Economic analysis of the Product Liability Law that took effect in Japan in 1995.
- Norie Huddle and Michael Reich, with Nahum Stiskin, *Island of Dreams: Environmental Crisis in Japan*, 2nd edn, Cambridge, MA: Schenkman Books, 1987. The details of Japan's four most infamous environmental crises, written by journalists.
- J. Mark Ramseyer, *Odd Markets in Japanese History*, Cambridge: Cambridge University Press, 1996, ch. 3, pp. 43–53. Argues that late nineteenth-century and earlier twentieth-century Japanese courts established rules for dealing with tort cases that were probably economically efficient, even though they permitted environmental abuses that would not be tolerated today.

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■ Kimio Uno, *Japanese Industrial Performance*, New York: North-Holland, 1987, ch. 16, pp. 271–310. Documents the air and water pollution abatement expenditures of Japanese industries, 1960–80, and relates these to government regulations and subsidies, and to measured improvements in environmental quality; includes numerous tables and a floppy diskette with quantitative data.