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TIME PASSAGE AND THE ECONOMICS OF COMING TO THE NUISANCE: REASSESSING THE COASEAN PERSPECTIVE*

ROY E. CORDATO**

I. INTRODUCTION

The doctrine of coming to the nuisance, or “first come first serve,” in tort law suggests that the time sequence of events should be considered when making judgments in nuisance cases, i.e., cases involving harmful external effects. In the classic example of a railroad casting off sparks and setting fire to crops growing on adjacent farmland, a strict adherence to the doctrine suggests that if the railroad was there first, i.e., prior to the planting of crops by the farmer, then its owners should not be liable to the farmer for damages. In such circumstances, the plaintiff, in this case the farmer, has “come to the nuisance.”

The arguments both for and against invoking the criteria when considering defenses in nuisance cases have been made on fairness and economic efficiency grounds. This paper reexamines the efficiency arguments that are made regarding coming to the nuisance and argues that the entire discussion has been cast in an inappropriate analytical framework. A problem that by definition involves the passage of time has been forced-fit into a static equilibrium framework of analysis. It will be argued that time pas-

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sage automatically implies that the standard cost/benefit approach, an application and extension of Coase's classic 1960 article "The Problem of Social Cost,"¹ is inappropriate to this issue² and leads to the asking of fundamentally unanswerable questions.

A non-cost/benefit based alternative framework is offered which focuses on the efficiency of market activities as they unfold through time, rather than on static allocative effects. This alternative perspective is rooted in the works of F.A. Hayek³ and other economists of the Austrian school⁴ and gives rise to a unique set of conclusions with regards to the efficiency properties of first come first serve.

II. THE VIEW FROM COASEAN ANALYSIS

The most extensive and coherent discussion of the economics of coming to the nuisance was done by Donald Wittman. Wittman describes his task as follows:


3. F.A. Hayek won the Nobel Prize for economics in 1974. Much of his work focuses on the role of the price system in disseminating information to market participants. It is this analysis of Hayek's that forms the basis for much of the analysis in this paper. See Cordato, Knowledge Problems and the Problem of Social Costs, supra note 2.

4. The term "Austrian school" refers to a tradition in economics that developed first in the late 19th century and early 20th century in Vienna, Austria, with the writings of its founder, Carl Menger and several of his students. (See CARL MENGER, PRINCIPLES OF ECONOMICS (1981). The Austrian school of economics focuses on the implications of subjective preferences and expectations, imperfect knowledge, and the passage of time for understanding economic behavior. The modern Austrian school has developed primarily in the United States and to a lesser degree at the London School of Economics. Twentieth Century Austrian school economists have included Ludwig von Mises, F.A. Hayek, Murray Rothbard, and Israel Kirzner. (See KAREN VAUGHN, AUSTRIAN ECONOMICS IN AMERICA (1994); see also CORDATO, WELFARE ECONOMICS AND EXTERNALITIES IN AN OPEN-ENDED UNIVERSE: A MODERN AUSTRIAN PERSPECTIVE, supra note 2.
It is first necessary to establish the proper sequence of inputs into the productive process (including the production of negative externalities); one must consider who should have been first instead of who was first. Once the efficient sequence is determined, the next step is to determine the liability rule or property rule that promotes the efficient sequence.

The efficiency properties of a rule of coming to the nuisance as a guide to resolving disputes in tort law have generally been considered in terms of a "Coasean" framework of analysis. In evaluating guidelines for the implementation of tort law, the efficient or social welfare maximizing rules are those that would maximize the net social value of production, measured in terms of the pecuniary value of output. Within this context the criteria for evaluating coming to the nuisance described by Wittman, would be appropriate. The efficiency question that should be considered by a judge in evaluating a defense of coming to the nuisance is indeed "who should have been there first." In other words, whose use of the resource, the first or second user, would maximize the net social value of output? The factual question of who was there first only becomes relevant as a benchmark in determining whether the actual sequence of events was indeed the efficient sequence.

Wittman's approach is readily recognized as an extension of Coase's analysis to the area of coming to the nuisance. As Coase argued, in efficiently resolving conflicting resource uses of the kind that might give rise to a nuisance, what needs to be determined is the "arrangement of rights [that] may bring about a greater value of production than any other." In a clear application of Coase's prescription to coming to the nuisance, Wittman argues that "the determination of who should have the right depends on the costs and benefits of the entire income stream, not just those costs and benefits after the second party came." In this setting, a defense of coming to the nuisance should be recognized in cases where the defendant's use maximizes the income stream associated with the exploitation of the resource under consideration.

5. "Negative externality" is the term in economics for costs that are imposed on third parties as a result of production or consumption processes. A typical negative externality problem would be air pollution.
7. COASE, supra note 1.
8. Id. at 16.
9. Wittman, supra note 6 at 558.
A. An Economic Analysis of Pendoley v. Ferriera

Wittman illustrates the procedure with a 1963 case, *Pendoley v. Ferriera*.10 While a defense of coming to the nuisance was not part of this case, it does provide an effective scenario for an economic analysis of the issue. *Pendoley*11 involved a conflict between an established pig farmer, in what was initially a rural area, and members of a subsequently established residential community located nearby. The complaint regarded the smells associated with the pig farm.

Wittman assumes two locations, one of which is categorized as “good” and the other as “bad.” He then examines the use of these locations by the residents and the farmer over two periods, with the presence of the farmer on one of these locations in period one and the arrival of the residents in period two.

From this Wittman derives four scenarios, exhausting the possible efficient sequences of the use of “good” and “bad” land in the two periods.12 The actual efficient scenario depends on assumptions that are made regarding the relative magnitudes of the farmer’s profits and the residents’ utility functions13 with respect to the use of the good and bad land. Property and liability rules are then examined to determine how the application of these rules would promote the efficient sequence of events, i.e., the efficient use of the two categories of land over the relevant time frame.

B. Problems with Coasean Methodology

For our purposes there is no need to delve more deeply into Wittman’s analysis. The problem is with the Coasean methodology and not this particular application. These problems are general in that they plague much if not most of the analysis in law

11. *Id.*
12. “(1) The Polluter is on the good land for both periods and the pollutee is on the bad land for period 2. (2) The polluter is on the good land for both periods and the pollutee is on the good land for period 2. (3) The polluter is on the bad land for both periods and the pollutee is on the good land for period 2. (4) The polluter is on the good land for period 1 and on the bad land for period 2 and the pollutee is on the good land for period 2.” Wittman, *supra* note 6 at 560. Wittman rules out scenarios involving the possibility of moving in the middle of one of the time periods as always being less efficient.
13. A utility function is a mathematical representation of a person’s preferences. The assumption behind this kind of representation is that individual preferences are objective, specifiable, and measurable.
and economics. They stem from fundamental methodological assumptions that were made by Coase that have been inappropriately carried forward into discussions of many real-world negative externality problems. While Wittman poses a two period scenario, his analysis is completely static in that it abstracts from all of the economically relevant problems associated with the passage of time. This is necessary if one insists on staying within the traditional Coasean framework of analysis, which assumes a state of the world that is always in a perfectly competitive general equilibrium, i.e., that all observed prices are competitive prices.\textsuperscript{14} Coase’s methodology is inappropriate to the task at hand.

### III. TIME PASSAGE, MARKET PROCESSES, AND GENERAL EQUILIBRIUM ANALYSIS

As soon as we permit time to elapse, we must permit knowledge to change. . . . The state of knowledge of society cannot be the same at two successive points of time, and time cannot elapse without demand and supply shifting. The stream of knowledge produces ever new disequilibrium situations, and entrepreneurs continually manage to find new price-cost differences to exploit.\textsuperscript{15}

The essence of time passage is change; change in preferences, change in technology, change in population, etc. The significance of these changes for economics is that they are either the product of, or they lead to, changes in human knowledge. Furthermore, the process by which knowledge changes is an imperfect one of trial and error, which itself, is time dependent. By implication, then, at any point in time some actions will be taken that are based on erroneous information. In other words, people will make plans that are inconsistent with the goals that they are pursuing. In a market setting, such actions are penalized with losses. These losses provide incentives to discard erroneous information and reassess and redesign plans in hopes that future activity will be based on accurate information and be rewarded by profits. This is an ongoing process of plan formulation and revision in light of new information. Knowledge is never perfected. As problems are fixed new ones are revealed by the continuous generation and flow of new information.

\textsuperscript{14} Coase makes this assumption throughout the analysis in his classic 1960 article, \textit{see} Coase, \textit{supra} note 1.

This is the nature of economic activity as it proceeds through time. It is a process that is never in general equilibrium. Furthermore, from the perspective of market participants, it is a never ending, open ended process. The economic assessment of any time dependent phenomena needs to make this process the central focus of its analysis. To abstract from the process by assuming that the world is in a perfectly competitive general equilibrium or that the state of knowledge is "perfect" or simply "given" is to move to a level of abstraction that bears little resemblance to the real world which, consequently, yields non-operational conclusions with respect to public policy.

This is why Coasean analysis is fundamentally inappropriate to the task of assessing the efficiency properties of coming to the nuisance. The cost-benefit approach derived from Coase's work only becomes intelligible as a guide to rule making within the context of a static, competitive equilibrium. Once the analyst steps out of this framework and into the world of imperfect knowledge that serious consideration of time passage implies, much of what Coase's analysis, and by implication Wittman's analysis, pre-ordains must be done cannot be done.

IV. THE IMPLICATIONS OF TIME PASSAGE AND OPEN-ENDEDNESS FOR SOCIAL COST-BENEFIT ANALYSIS

The use of social cost-benefit analysis as an analytical tool is contingent upon making the simplifying assumption that all markets, not just those under consideration, are in a perfectly competitive general equilibrium (PCGE). While Wittman, and others who discuss the economics of coming to the nuisance much less extensively, do not make this assumption explicit, it is necessarily implied.16

The PCGE assumption allows several key analytical stumbling blocks to be finessed. As Buchanan17 and others18 have sought to emphasize, opportunity costs and benefits are subjective

16. This is not unusual. As is typically the case, when such simplifying assumptions are consistently made in a particular analytical framework, after a period of time they simply become a part of the implicit background information. Such assumptions tend to be made explicit only in text books in the field and in the earlier, seminal articles. See Coase, supra note 1.
and therefore unquantifiable. Both costs and benefits are concepts rooted in individual satisfaction. Benefit is the satisfaction received from the taking of a particular action while cost is the satisfaction foregone by choosing not to take other actions. Strictly speaking, costs and benefits are intrapersonally perceived. There is no interpersonal scale upon which they can be unified and ranked and therefore they cannot be interpersonally aggregated. There is no economically meaningful way to talk about costs and benefits to society, apart from the individuals who experience them. Yet all social cost benefit analysis, by definition, makes this abstraction.

To get around this problem, economists typically assume that all markets are in a PCGE. In such a setting, prices equate both marginal social cost and marginal social benefit and therefore can be invoked as a means of making objective the non-objective and measuring the unmeasurable. But this assumption, invoked in abstract analysis, does not change the nature of real world costs and benefits. Since an efficiency analysis of coming to the nuisance involves the assessment of behavior through time, the possibility that we are dealing with a general equilibrium world should be ruled out. Furthermore, even from the perspective of static analysis, the assumption that there is a nuisance problem in the first place, i.e., an externality problem, is by definition an assumption that a competitive equilibrium is not being obtained. Therefore, to assume a PCGE, a world that is free of externality problems, poses an internal contradiction in the theory.

The answer to “who should have been their first,” in terms of social costs and benefits, can only be arrived at if interpersonal cost-benefit comparisons can legitimately, i.e., scientifically, be made. As Wittman noted, “the efficient sequence cannot be established without assigning relative magnitudes to profit and utility functions.” The assumption is that utility functions can indeed be specified and aggregated and furthermore that it is scientifically meaningful to make comparisons between utility functions and profit functions. But utility functions, in principle, cannot be specified. Furthermore, profit functions can only be specified in terms of accounting costs and not utility based opportunity costs. In reality no meaningful comparison between profit and utility functions is possible.

19. Wittman, supra note 6 at 560.
If the PCGE assumption is not made then a host of new problems arise for both the economic analyst and any policy maker attempting to implement the efficiency enhancing solution. In order to ascertain a property rights or liability rule that would facilitate the efficient sequence of events, the relevant PCGE would first have to be identified. From the perspective of social costs-benefit analysis the efficient solution is the one that would occur in a competitive general equilibrium. Coase’s efficiency criteria is only intelligible within this context.\textsuperscript{20} Consequently, in evaluating coming to the nuisance the sequence of events that would arise under conditions of competitive general equilibrium must be known. In reality though, empirical identification of such an equilibrium is impossible for even a point in time. Once it is made clear that a judge or jury considering a defense of coming to the nuisance is attempting to determine the efficient allocation of resources through time, the PCGE efficiency benchmark loses its relevancy even as a conceptual guide.

The analytical issue centers around what has come to be called “the knowledge problem,” which is the central theme of F.A. Hayek’s theoretical case\textsuperscript{21} against the possibility of efficient resource utilization under central planning.\textsuperscript{22} In order to identify a PCGE for a point in time one must have access to information that is fundamentally unobtainable. This includes utility functions for all market participants together with complete knowledge of all resource scarcities and production functions, including the economic significance of all technologies. This information must be known for the economic system as a whole. Clearly this task is beyond human capabilities, if not comprehension.

To complicate matters, when dealing with events taking place through time, an analyst trying to construct an equilibrium solution is faced with a moving target. Even if a PCGE could be identified for a point in time, its relevance would only be historical. As indicated by Lachmann’s observations, continuous changes in

\begin{itemize}
  \item \textsuperscript{20} See Cordato, Welfare Economics and Externalities in an Open-Ended Universe: A Modern Austrian Perspective, supra note 2 at Ch. 5.
  \item \textsuperscript{21} The implications of the knowledge problem for Coasean type analysis in law and economics have been extensively analyzed in Cordato, Knowledge Problems and the Problem of Social Cost, supra note 2.
\end{itemize}
knowledge, i.e., preferences, scarcities, technologies, etc., dislodge the relevance of any particular general equilibrium from moment to moment.

With regards to coming to the nuisance, if one could determine who "should have been there first" in light of the relevant data, i.e., utility and profit functions, for the beginning of time period one, there is no justification for concluding that the data and therefore the solution will not change by the beginning or the end of time period two. In fact, the most reasonable assumption to make is that it will change. It will be argued below that it must in order for the nuisance problem even to arise.

V. TIME PASSAGE AND EFFICIENCY

When considering a time dependent issue such as coming to the nuisance, efficiency analysis based on the normative benchmark of a PCGE is not useful. To assume that observed market prices are competitive equilibrium prices as a means of circumventing the problems associated with subjective costs and benefits is to make an assumption that cannot be true. In fact, to do so is to assume away the most fundamental efficiency problem associated with the passage of time, namely how best to deal with changing circumstances in a world of imperfect information. Furthermore, to try and construct the competitive equilibrium solution from empirical data is also a futile and ultimately an inappropriate undertaking.

A. Efficiency Problems in Time Dependent Settings

In a time dependent setting the efficiency problem facing market participants is not simply one of allocating resources to their highest valued use with all the relevant knowledge given. First, from the individual's perspective, efficiency relates to the accomplishment of one's goals under conditions where the relevant information can never be known completely and, furthermore, where the state of that information is changing. The passage of time implies the addition of information that did not previously exist and the discarding of information that has become irrelevant. As noted earlier, this leads to a market process that is characterized by trial and error, with activities based on both accurate and erroneous perceptions being brought to light by the system of profit and loss. This process is generated by the experiences of all market participants—consumers, entrepreneurs, workers, pig farmers, and home builders.
Given the nature of this process, "efficient" outcomes of the type that are typically pursued in the law and economics literature cannot be identified. Since aggregation of costs and benefits across individuals is not conceptually possible, people's individually determined goals must be taken as given when assessing social welfare. Social cost benefit analysis as a judicial decision making tool is an attempt to decide whose goals are relatively more important to society. But the concepts of social costs and social benefits, as typically invoked, are, from the perspective of economic analysis, neither operational nor conceptually meaningful. Therefore, efficiency must be construed strictly in terms of the welfare of individual members of society, as they, and not some outside observer, perceive it.

B. Social Efficiency

The relevant question for "social efficiency" is what institutional setting would best allow individual market participants to discover, assimilate, and act on accurate information that will be useful in the accomplishment of their goals. As this author and others have argued, this requires a legal environment where individuals are allowed the widest possible latitude for pursuing their own interests while not being allowed to violate the similar rights of others.

Maximum possible social efficiency, in this regard, requires that individuals have exclusive rights to resources and the fruits of their labor. The pursuit of goals and the formulation of plans cannot proceed without access to the physical means necessary for this process to take place. The implication, first, is that property titles need to be clearly defined and strictly enforced. In such a setting, conflict over the use of resources by two or more individuals with inconsistent plans with respect to the same resource, will be minimized. Such conflicts are an important source of inefficiency and serve as the fundamental source of all negative externality problems.


25. Id.
C. Property Rights and Efficiency

In a general sense, from this normative perspective the content of property rights can be specified. The individual resource owner should be allowed to utilize his property in any way he perceives to be consistent with his own ends. This ensures that the full force of people's preferences, perceptions of resource scarcities, and knowledge will come to bear on the utilization of resources. As a subset of this general principle, and particularly important to the enhancement of market and therefore social efficiency, is the right to contract and freely exchange property. This ensures not only that people will be able to mutually pursue otherwise conflicting plans through the exchange process, but it is also a necessary condition for the price system to perform its information enhancing functions. In this setting where property rights are clearly defined, strictly enforced, and freely exchangeable, relative prices will capture as much information about preferences and relative scarcities as possible, while weeding out erroneous information through the system of profit and loss, i.e., trial and error.

1. Institutional stability requirement

An additional requirement, one that is particularly relevant to the issue of coming to the nuisance, institutional stability, argues that a dynamic market process requires that rules defining the scope of legitimate activity be stable. If efficiency, as discussed here, requires that individual market participants have accurate information regarding the relationship of means to ends, then a fundamental cause of inefficiency is error. Indeed, to assume perfect knowledge is to assume away the entire efficiency problem that individuals face in a time dependent setting. Uncertainty with respect to property rights can be an important source of error in the plan formulation process.

Again, this is an issue that arises because of the passage of time. Plans are made and executed sequentially through time. Plans that are made with respect to the use of resources of any kind cannot be implemented unless one has the "right" to do so at some point in the future. Uncertainty about what one's rights may be with respect to the use of resources at different points in the future, or false certainty in the face of future alterations of

one’s rights (and obligations), will generate errors and therefore inefficiencies.

2. Certainty of legal rights

Furthermore, uncertainty with respect to legal rights and obligations will have a negative impact on markets as a whole. In a time dependent setting, expectations about the future are incorporated in relative price movements. In implementing plans, market transactions are made which affect price movements. To the extent that exchanges are made based on erroneous expectations, relative prices will reflect inaccurate information, sending false signals to other market participants. False price signals can facilitate the formulation of inefficient plans in a far flung and unpredictable manner.

Since market processes take place through time, it is necessary to consider the impact of institutional instability on economic efficiency. Economic analysis of coming to the nuisance has disregarded this entire issue by assuming a world devoid of any of the characteristics of real time passage. Because of this, rules that appear to be efficient within the traditional static framework could generate a great deal of inefficiency when imperfect knowledge and institutional uncertainties are considered.

3. Predictability for efficiency in planning future activities

Wittman, for example, argues that the conclusions he reaches regarding allocative efficiency also have efficiency enhancing incentive effects with regards to planning future activities. In a footnote he points out that “the court case is more important in its precedent-setting effects than in the effect on this particular set of actors.”27 He claims that implementation of the efficient rule “can serve as a useful guide for the future.” Concluding that:

cost-benefit calculations in . . . legal rulings . . . will encourage those who come first to predict the probable uses of the land in the future. If the most efficient alternative is for the farmer to use the inferior land from the beginning, the farmer will in fact make this choice if he can reasonably predict the future uses of the land.28

This analysis calls on potential first users to have prospective information regarding relative utility and profit functions concerning people they do not know and situations that have yet to

27. Wittman, supra note 6, at 561.
28. Id. at 562.
occur. From this information they are to draw conclusions about the efficient allocation of resources. As we have argued, all this is conceptually unknowable even retrospectively. Furthermore the first user is called upon to have probabilistic information regarding “future uses of the land” by people other than himself which must be based on unknowable information about the efficient allocation of resources.

This prescription calls on the first user of a resource to play “central planner” with respect to not only the area that he is occupying directly but all of the relevant surrounding resources. Since the first user of a resource cannot possibly know the most productive pattern of resource use over time he is simply being asked to make guesses about what the cost-benefit analysis invoked by some future court might conclude regarding a yet-to-materialize externality problem. Neither the first user nor the future court could objectively determine the “efficient” resource allocation as defined in the standard analysis. In reality, the entire scenario simply calls for one person to guess what a future court will guess at some unspecified point in the future.

Wittman’s analysis rejects out-of-hand any of the information problems discussed here. He asserts that, except for the level of certainty (in a probabilistic sense), no distinction should be made regarding ex ante and ex post knowledge. He states that it is a “fallacy” to argue that “since the homeowners knew the pigsty was there, they are the responsible party as they willingly accepted the conditions of the sty when they initiated building.” 29 This is because “the farmer knew (in a less certain way) that the homeowners would want to build there. Therefore he is equally at fault.” 30

In putting the burden of accomplishing what is fundamentally an impossible task on first users of resources, a great deal of additional uncertainty is introduced into the formulation of plans, which detracts from efficient decision making. The probability that the first user will make decisions that enhance allocative efficiency, *ex ante*, would be decreased. The first user of a resource would be more uncertain about his future rights and obligations. This, in turn, would increase the probability that his expectations regarding future resource utilization will be erroneous. Uncertainty with regards to future rights must be considered when

29. *Id.*

30. *Id.*
assessing the efficiency properties of coming to the nuisance. It has been ignored because it does not exist in the traditional Coasean framework of analysis.

VI. THE ROLE OF COMING TO THE NUISANCE

What would be the role of coming to the nuisance in this time dependent setting where efficiency dictates that property rights be stable, clearly defined, and provide for the widest possible range of resource utilization by owners consistent with the same rights of others? The question "who should have been there first?" is conceptually flawed and non-operational.

Furthermore it requires that the analyst make comparative value judgments between the conflicting ends of market participants. It does not take people's ends as given but suggests that we must decide whose goals, in Wittman's example, the pig farmer's or the home owners', are more important to society. As discussed, cost-benefit analysis cannot be scientifically invoked as a criterion for making this decision.

Ultimately, the assessment must be based on a question that is not even recognized in most of the standard literature, namely, who has title to the resources under dispute? This is consistent with the conclusion reached above, that market efficiency in a change laden, time dependent setting, requires that property rights be clearly defined and strictly enforced. In this setting, not only is it irrelevant to ask "who should have been there first" but it is equally unhelpful to ask "who was there first." If we assume that all property titles are clearly defined and had been throughout the relevant time period, the question of who was there first becomes muddy at best and possibly vacuous. This question only becomes meaningful in the absence of clearly delineated property titles.

A. Question of Ownership

With respect to the pig farmer in Wittman's example, we assume that he initiated the farming activity on land that he had legitimate title to, i.e., that he legally acquired (purchased, inherited, etc.) from someone else. Over some period of time the farmer

31. Implicitly, this is the same question asked by Richard Epstein in his article, Defenses and Subsequent Pleas in a Theory of Strict Liability, III J. LEGAL STUD. 197-201 (1974). However his concern was one of corrective justice and not economic efficiency.
makes use of adjacent property (by allowing the spillover of odors) that someone else has title to. For whatever reason, the owner of the adjacent property did not mind that the farmer made use of his property in this way and either implicitly or explicitly gave the farmer his blessing.

Given this arrangement, it is simply not accurate to say that the farmer was there first. The farmer was there with his smells only because of the implicit or explicit permission of the owner. So long as the adjacent property was owned by somebody when the farm was built, it was the owner of the adjacent property who was there first and continued to be there, making use of his property in such a way that allowed the farmer to emit the pig odors onto it. The plans of the adjacent property owner with respect to the use of his property were consistent with the presence of the odors. He felt no conflict with respect to the use of the resource during the relevant time frame and therefore continued to allow the farmer to enjoy what was essentially a windfall use of his property.

When Wittman's example is viewed as a sequence of activities through time it is clear that plans that were made with respect to the use of the adjacent property, by its owners, have changed. This might be because the same owners simply have had a change in their preferences or the market has changed in such a way that the land became more valuable in alternative uses. Also, it may be because new owners, who prefer alternative uses of the land, have acquired the property.

In either scenario there is no efficiency case to be made in support of allowing a defense of coming the nuisance in a tort action that may be brought by the owners of the adjacent land.32 In the first instance, it would be difficult to argue that the farmer was even there first. By assumption the adjacent land was owned at the time that the pig farm was built and the smells started leaking onto the adjacent property. The owner simply did not mind if his neighbor, the farmer, made use of his property in that particular way. There is no way to argue from an efficiency perspective that, having made that decision in the first place, he forfeits the right to change his mind at future points as personal preferences and external circumstances may warrant. To argue

32. Economic analysis of this scenario that takes into account the implications of time passage leads to a conclusion also reached by Epstein. In examining the ethical implications of this same issue, Epstein argued that "[t]he enjoyment of a past windfall does not create the right to enjoy one in the future." Id. at 198.
otherwise is to make the specifically anti-efficiency argument that markets and the price system should not be allowed to respond to such changes and reallocate resources accordingly.

The second scenario is, in principle, the same. The original owner, who didn't mind the smells from the pig farm, sells the property to someone who, for whatever reason—possibly because he plans to build a home or housing development on the property—does mind. What has happened is that the relative value of the property to the original owner has declined and he decides to sell. Again, from an efficiency perspective, there has been some change in circumstances and relative evaluations of the property.

The efficiency of the market process should be gauged by the extent to which prices can accurately incorporate the new information regarding these changes, reflected in the sale price of the property. Furthermore, it seems safe to presume that when selling the property it was offered for sale publicly and that the farmer had the right to put in his bid. In other words, he could have secured his future rights to emit smells onto the property by outright purchase. Indeed, the farmer could have made offers at any point prior to the property officially going on sale to secure similar future rights. In a general sense, the efficiency of a market process to incorporate information regarding preferences, scarcities etc., depends on the extent to which resource owners are allowed to bring their utility functions and perceptions of the world to bear on decisions regarding the exchange of their property. Restrictions on this right will impair the extent to which prices can perform their knowledge communicating functions. Ultimately, without this fundamental right there is no market process.

Viewing the pig farmer-home owner example from this alternative perspective, reinforces earlier arguments regarding the relationship of coming to the nuisance to dynamic disequilibrium analysis. It should be clear that the reason a problem arises for the farmer is that with the passage of time, something—preferences, resource scarcities, etc.—has changed. If there were no change from the original set of circumstances, there would have been no conflict to resolve.

It is the passage of time that instigates this change. Static, general equilibrium analysis is, therefore, inherently inappropriate to the problem at hand. To assume that there is a "given" cost-benefit scenario at the beginning of "t₁" that remains constant to the end of "t₂" is inconsistent with any conflict ever arising.
B. Implications when Ownership is in Question

An efficiency justification can be made for considering a defense of coming to the nuisance when, unlike the previous scenario, title to the resource involved in the dispute is unclear or when the resource has been previously unowned. In this instance, one of the criteria for an efficiently functioning market process is not present. That is, property rights are not clearly defined. The question then is who should have the right to use a previously unowned resource. If the time sequence of use is detectable then it can be argued that an allocation of rights based on first use, if consistently applied, would enhance market efficiency.

1. The first use rule

In the example, as unlikely as this scenario would be in modern times, let's assume that the farmer built his pig farm on property that was adjacent to unowned, virgin wilderness, possibly in the 19th Century when parts of the country were still being homesteaded. At some future point, new arrivals stake a claim on the adjacent property and begin to build houses. As part of this the new arrivals claim that the smells from the pig farm are a nuisance and ask for either an injunction or damages from the farmer.

In this case it is clear who arrived first in time. Furthermore, if generally invoked as a well understood and consistently applied rule, application of the "first use" principle would enhance efficient plan formulation and the overall efficiency of markets and the price system. First, such a rule would remove a great deal of uncertainty and therefore reduce error in the formulation and execution of individual plans. In the example at hand, the pig farmer, by being first to "use" the adjacent property, can be confident that his continued right to do so for the established purpose (emit odors) will be upheld in the face of future nuisance claims. This will increase the probability that his perceptions of the future are accurate and that plans that are currently being made will ultimately be fulfilled.

Such a rule would send important signals to potential comers to a nuisance. In the example, those considering making use of the adjoining property would do so in full knowledge that the farmer has preceded them and, as such, has certain rights with respect to its use. This knowledge, and the certainty about future rights and obligations that it would generate, would be factored into any decisions that are made with respect to the use of the
adjacent land, ex ante. Anyone planning to build a house on the land would do so in full knowledge that they would either have to put up with the odors from the pig farm, incur the costs of insulating themselves from the odors, or negotiate a "Coasean" type bargain with the farmer.

With regard to the price system and market efficiency, all of this information regarding the farmer's property rights and obligations, and the rights associated with the use of the adjacent land would tend to be accurately reflected in relative prices. Any transactions that are part of plans made for future use of the adjacent land would be based on expectations of returns that incorporate the farmer's right to emit odors from the farm onto the land.

For example, if someone planned to lay claim to this previously unowned land and build homes on it with the expectation of selling these homes to future residents of the area, his expectations about the potential market price of those homes would probably include some discount for the odors. This discount would be included in the price he is willing to pay for labor, construction materials, etc. In this manner, the certainty that is generated by a consistently applied first use rule would enhance the efficiency and orderliness of the entire market process. Furthermore, such a rule would reduce the extent to which nuisance suits in such cases are even brought. In the example, with the knowledge that the farmer would probably win in court based on a defense of coming to the nuisance, it is more likely that the housing developer or home owners would never file suit.

2. Modern applicability of the first use rule

As already noted, the scenario presented in this example is not a likely one, given that nearly all land is owned by someone and the days of homesteading land are long over. On the other hand, this analysis does suggest that if a case similar to the pig farm example were to arise, even within a context where titles to property seem to be clear, it would be important to investigate the history of those title claims before dismissing a defense of coming to the nuisance. For example, if the pig farm, or maybe another kind of farm that emitted foul odors, was established 125 years ago and the adjacent land was homesteaded and titles began changing hands 100 years ago, a defense of coming to the nuisance might indeed be appropriate. Beyond this example, the analysis suggested here could have other modern applications. For example, conflicts regarding users of rivers, streams, or the air, where
rights to these resources have not been clearly defined, could possibly be resolved based on a principle of first use.

The point to be emphasized here is that from the perspective of a time dependent market process, the only setting where a defense of coming to the nuisance will have efficiency enhancing attributes is where titles to property have not been previously established. In such cases, if applied as a general rule it would reduce uncertainty in both individual plan formulation and in market-oriented entrepreneurial activities.

VII. Conclusion

The efficiency properties of "coming to the nuisance" are intricately tied to the economic analysis of disequilibrium market processes as they unfold through time. In light of this, it is clear that the perspective from which the issue has traditionally been analyzed is inappropriate. Social cost-benefit analysis cannot be meaningfully applied in a world where no general equilibrium solution can be identified, where knowledge is imperfect and errors are made, and where information is in a continuous state of flux. Yet, this is the context in which coming the nuisance should be assessed. Standard analysis examines an issue that is dependent on the time sequence of events and assumes away the essential characteristics of time passage.

As many economists who have sought to emphasize the passage of time in their analysis have argued, the efficiency problem facing both the individual and society in this setting is a "knowledge problem." As Hayek suggested:

the economic problem of society is . . . how to secure the best use of resources known to any members of society, for ends whose relative importance only these individuals know. . . . It is a problem of the utilization of knowledge that is not given to anyone in its totality.

Where the "relative importance of ends" cannot be known by any outside observer, cost benefit analysis, when examining a conflict over the use of resources, has no role. The answer to who should have been there first, when the normative standard refers

35. See F.A. Hayek, The Use of Knowledge in Society, supra note 32, at 77-78.
to the sequence of events "that may bring about a greater value of production than any other," is unknowable.

Efficiency analysis in this setting should focus on the overall institutional setting that governs the plan formulation process which, in turn, impinges on the overall ability of the price system to utilize and disseminate accurate information. As a general principle, in this setting property rights should be clearly defined and strictly enforced, but beyond this the nature of those rights can also be specified. Efficiency from this perspective requires the maximum possible freedom with respect to the use of one's property in the plan formulation and implementation process. The only restraint is that the individual not violate the same rights of others.

If this is the starting point for the economic analysis of coming to the nuisance then a unique set of conclusions are reached with regards to its efficient implementation. If all property titles are clearly delineated and had been so throughout the time period under consideration then there is no argument for allowing a defense of coming to the nuisance. Indeed, in this setting it is not clear as to what it means for one or the other party to claim that they had "been there" first. The only time that a rule of coming to the nuisance would be useful is when property titles are not clearly delineated. As an example one might consider conflicts over the use of "publicly owned" waterways such as rivers, streams, or lakes.

The overall purpose of this article has been to assess the traditional framework for analyzing the issue of coming to the nuisance and to suggest and draw out some conclusion of a possible alternative approach. The fact is that this alternative analysis has implications that run much wider than the analysis of coming to the nuisance. All economic analysis of issues in tort law is essentially analysis of events that happen through time. Furthermore, time elapses from the period over which the nuisance takes place to the period over which a claim is brought and a judgment is rendered. Given this, the appropriateness of static, general equilibrium analysis for many other issues related to the economics of tort liability is questionable.

37. See Kirzner, supra note 22, at Ch. 2.