

The Innocent Bystander Problem in the Patenting of Higher Life Forms

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1	Introduction	1
2	Anatomy of the Problem: Four Categories of Cases	6
3	CBAC Report	13
4	Remedial Innocent User Provisions in Other Jurisdictions	16
5	The Problems	20
	5.1 Introduction	20
	5.2 The Patent Incentive Problem	21
	5.3 The Problem of Farmer Autonomy	26
6	Innocent Bystander Defence	38
	6.1 Introduction	38
	6.2 Availability of the Defence	39
	6.3 “Depth” of the Defence	43
	6.4 Substantive Trigger for Defence	48
	6.5 Legal Scope: Tangible Property Claims	51
	6.6 Summary	54
7	Conclusion: Desirability of an Innocent Bystander Defence	54

1 Introduction

The innocent bystander problem is one of the key issues in the controversy over the patenting of higher life forms. As the Federal Court of Appeal explained in its recent decision in *Monsanto Canada Inc. v Schmeiser*¹ the problem arises when a patentee sues for patent infringement when the patented plant “[has] come fortuitously onto the property of a person who has no reason to be aware of the presence of the characteristic created by the patented gene.”² In the *Schmeiser* case in particular Monsanto is suing Percy Schmeiser, a Saskatchewan farmer, for infringing Monsanto’s patent on its Roundup Ready® (herbicide tolerant) canola by growing the patented canola from seed which apparently originally blew onto his property. Schmeiser himself was clearly an intentional infringer; though the seed may have entered adventitiously, when Schmeiser discovered it, he intentionally selectively harvested the patented seed and used it in planting the next year’s crop.³ Nonetheless, the Court of Appeal was sufficiently concerned about the innocent bystander problem that it suggested that lack of intent should be made a defence in a case in which the defendant had no knowledge of the nature of the crop, even though it has long been clear law that intent is not an element of patent infringement.⁴ Similarly, although it recommended patenting of higher life forms, the Report on Patenting of Higher Life Forms prepared by the Canadian Biotechnology Advisory Committee (“CBAC Report”) proposed that the *Patent Act* be amended to provide protection from patent infringement claims for such “innocent bystanders.”⁵ The innocent bystander problem was also cited as a concern by the Supreme Court in its holding in the *Harvard Mouse* case that higher life forms *per se* are not

¹ 2002 FCA 309, leave to appeal to the Supreme Court of Canada granted 8 May 2003 (Supreme Court File #29437).

²*Ibid* at para. 57.

³*Ibid* at para. 58.

⁴See *infra* footnote 19 and accompanying text.

⁵Patenting of Higher Life Forms and Related Issues: Report to the Government of Canada Biotechnology Ministerial Coordinating Committee, June 2002, Recommendation 4,

patentable.⁶

Despite the holding in *Harvard Mouse* that higher life forms *per se* are not patentable, the innocent bystander problem remains a live issue. In part this is because of the possibility of legislative change to allow for the patentability of higher life forms. More immediately, patents related to higher life forms, such as gene patents, are apparently valid,⁷ and such patents raise the innocent bystander problem just as directly as patents for higher life forms *per se*.⁸

This article presents a policy analysis of the innocent bystander problem. In particular, it analyzes the desirability of a substantive intent-based exemption to patent liability, exemplified by the CBAC recommendation and the suggestion of the Court of Appeal in *Schmeiser*. This article deals only with adventitious entry of patented life forms which *benefits* the bystander, resulting in an action by the patentee against the bystander. Escape which harms the bystander, resulting in a suit by the bystander against the patentee or other party responsible for the escape, is an entirely distinct question which would be a matter for negligence, trespass or nuisance law. In particular, the innocent bystander defence should be distinguished from a possible duty to prevent escape. The latter would be at issue in the case of escape resulting in harm and is not

⁶ *Harvard College v Canada (Commissioner of Patents)*, 2002 SCC 76, esp. at para 171.

⁷ While the Patent Office initiated the litigation in the *Harvard Mouse* case by refusing to grant a patent for a mouse *per se*, the Patent Office does allow patents on specific genes and individual cells containing those genes (see e.g. the patent at issue in *Schmeiser*, Patent No. 1,313,830 for Glyphosate-Resistant Plants). The Supreme Court accepted this distinction, at it accepted that a genetically altered egg, and by implication other individual cells, would be a patentable “composition of matter” even though the higher life form to which it gives rise is not: see *Harvard College v Commissioner of Patents*, *ibid* at para 162.

⁸ For convenience this article will refer to “patents for higher life forms” to encompass both patents related to higher life forms and patents for higher life forms *per se*, as there are no functional differences between the two types of patents which are relevant to the innocent bystander problem. Similarly, a plant or seed carrying a patented gene will be referred to as a “patented plant” or “patented seed.”

dealt with in this article.⁹

This article assumes that the overarching goal of the law should be to deliver the greatest net social benefits. This is of course the traditional approach to patent policy, which considers patents to be justified only to the extent that the innovation they foster brings benefits to society at large.¹⁰ This article argues that farmer autonomy should be treated in the same manner; farmer autonomy is not valued for its own sake, but because respecting the autonomy of the farmer allows for socially efficient allocation of resources. Thus we will not ask whether the farmer's right is inherently superior to that of the inventor, but rather which combination of rights will bring about the greatest net social benefit. More particularly, the analysis is primarily from a law and economics perspective, buttressed by insights from related areas of law, in particular property law and the law of unjust enrichment.¹¹

⁹A strict duty to prevent escape which could be relied upon by a farmer as a defence to a patent action would simply reduce to an innocent bystander defence, and need not be considered separately. A negligence based duty which could be similarly relied upon would not aid the farmer as most escape is non-negligent.

¹⁰This has been express in the law of patents since the earliest times: see e.g. *Darcy v Allin* (1602) 11 Co. Rep. 84, *Clothworkers of Ipswich Case* (1615), 78 E.R. 147, expressing the view that the grant of a patent monopoly is justified only by the good that the patentee brings to the country as a whole. The same view is express in Art. I, § 8, cl. 8 of the U.S. Constitution, which gives the federal government the authority to grant patents in order to “promote the Progress of Science and useful Arts.”

¹¹Apart from the issue of the desirability of an innocent bystander exception to liability, the analysis assumes that encouraging inventions related to higher life forms is desirable and that patents are necessary to this end. If this were not true then the appropriate response would be to bar patents related to higher life forms entirely and the innocent bystander problem would be moot. Of course individual inventions may be potentially harmful for health or environmental reasons, but patents are only a right to exclude others and do not give a positive right to practice the invention, and health and safety concerns issues are regulated under separate legislation: see e.g. Part V of the *Seeds Regulations*, C.R.C., c. 1400, made under the *Seeds Act* R.S. 1985, c. S-8, s. 4, regulating release of seeds of plant with novel traits into the environment; Division 28 of the *Food and Drug Regulations* C.R.C., c. 870 made under the *Food and Drugs Act*, R.S. 1985, c. F-27, s. 30, regulating food safety of genetically modified foods.

Because the innocent bystander problem is most likely to arise in the agricultural context¹² this article uses farming as the main exemplar of an activity which implicates patents on higher life forms. Similarly, the licensee/infringer of a patent related to higher life forms is taken to be a farmer. It should nonetheless be understood that the general discussion applies equally to horticulture, aquaculture, forestry or any other industry based on higher life forms.

The article proceeds as follows. The next Part sets out the anatomy of the problem under existing law. In particular, we will see that the generally applicable liability rule addresses the most pressing concerns regarding the escape of higher life forms, since under existing law only *benefitting* innocent bystanders will be liable for substantial damages. Thus the problem only really arises in respect of innocent *non-benefitting* farmers. While there is an autonomy based argument to be made that even benefitting farmers should be relieved of liability if the use is innocent, the argument is not nearly as compelling as it would be if non-benefitting farmers were also liable under existing law. Parts 3 and 4 deal with potential sources of insight, namely the CBAC Report and remedial innocent user provisions in other jurisdictions, which turn out to be unhelpful. Part 5 sets out the fundamental tension raised by the problem of innocent benefitting bystanders, namely the need to protect patent incentives on the one hand while respecting the farmer's autonomy on the other. This sets the stage for Part 6, which describes the innocent bystander defence that would best address this tension. We will see that any innocent bystander defence would have to be relatively limited in scope in order to reduce the scope of abuse. Part 7 concludes by addressing the ultimate question: is an innocent bystander defence desirable? Even the best possible innocent bystander defence is not necessarily the best possible solution to the innocent bystander problem, as it raises some problems at the same time that it solves others. To make the case for introducing an innocent bystander defence, we must assess whether the patent incentive problems the defence would create are worse than the farmer autonomy problems it

¹²Escape of patented animals is foreseeable, as in the case of escape of farmed salmon, but the innocent bystander problem requires that the life form escape into the custody of someone who benefits thereby, such as another farmer or aquaculturist. This is less likely in the case of animals than in the case of plants, where proximity of fields makes escape of genetic material through natural mechanisms of seed spread or cross pollination quite likely.

would solve. In other words, is the cure worse than the disease? The article concludes that the net benefits provided by an innocent bystander defence would be minimal and would not justify the additional legal complexity and costs of patent enforcement which it would entail.

2 Anatomy of the Problem: Four Categories of Cases

A proposed innocent bystander exception to patent liability is, as the phrase indicates, an exception to the general liability rule. In order to decide whether such an exception is warranted we need to define both the exception and the general rule to which it is an exception. A proposed innocent bystander defence must be assessed in the context of the best possible general rule, or the inadequacies of the general rule rather than the merits of an intent-based defence will drive the analysis. At present it is clear law that intent is not an element of patent infringement, so that an even an innocent bystander will be an infringer. The situation is more subtle at a remedial level, since a technical infringer will not always be liable for substantial damages.

This article takes the general remedial rule to be that the farmer will be liable, at most, to the extent of the benefit she derives from the patented crop, regardless of knowledge or intent. The benefit is determined by a test of “but for” causality, so that the farmer is liable only to the extent of profit made which is over and above that profit she would have made but for the use of the patented crop. So, suppose an entire field were planted with a patented crop. If the farmer would have made \$100 per hectare profit if the field had been planted with non-patented seed, and she in fact made \$120 per hectare profit, the patentee would be entitled to no more than \$20 per hectare, as that is the amount of the profits causally attributable to the use of the patented seed.¹³

¹³The full \$20 might be awarded if an accounting of profits were granted. Damages would normally be less as the patentee and a licensee would negotiate a licence fee which would split the profit attributable to the use of the invention between them: see generally N. Siebrasse, *A Remedial Benefit-Based Approach to the Innocent User Problem* (forthcoming, 2003) 20(1) *Canadian Intellectual Property Review*. An award of damages rather than the harsher remedy of an accounting of profits would usually be more appropriate in the case of an innocent bystander, but for the purposes of this article nothing turns on this. The key point is that the patentee would not in any event be entitled to more than the profits which are causally related to the use of the

This will be referred to as the “‘but for’ benefit-based approach”, or “benefit-based approach” to liability.

This benefit-based approach is taken as the general rule for two reasons. First, in my view, it represents the best statement of existing law. It should be acknowledged that considerable uncertainty exists on this point as a result of the decision of the Federal Court of Appeal in *Schmeiser*. In that case the Court of Appeal awarded the patentee the entire profit made from the use of the invention, not just the “but for” profit – \$120 per hectare, rather than \$20 per hectare, in the terms of our simple example. I have argued at length elsewhere that the Court of Appeal’s decision is wrong as a matter of existing law because it ignores the causation requirement which is fundamental to private law liability.¹⁴ Presumably the current state of the law will be resolved when the appeal in *Monsanto v Schmeiser* is heard by the Supreme Court. In any event, the second and more important reason for positing this general rule is that it is directly responsive to the primary purpose of patent law, which is to provide appropriate incentives to produce socially valuable inventions. A rule which gives the patentee either more or less than the benefit which is caused by the use of the invention will provide too much or too little incentive to invent.¹⁵

For its part, the proposed innocent bystander defence would relieve a user from liability for patent infringement based on factors related to the intent or knowledge of the user. For this reason it may be referred to as an “intent-based” approach to the innocent bystander problem. The nature of the proposed defence will be defined more precisely in Part 6 of this article. For now, these descriptions of the general liability rule and the innocent bystander exception, though cursory, are sufficient to allow us to organize the discussion by dividing cases according to whether the use is intentional or innocent, and whether the farmer does or does not benefit. The possible scenarios then fall into four broad categories, depending on the combination of intent

patent.

¹⁴N. Siebrasse, A Remedial Benefit-Based Approach to the Innocent User Problem, *ibid.*

¹⁵See *infra* Part 5.2.

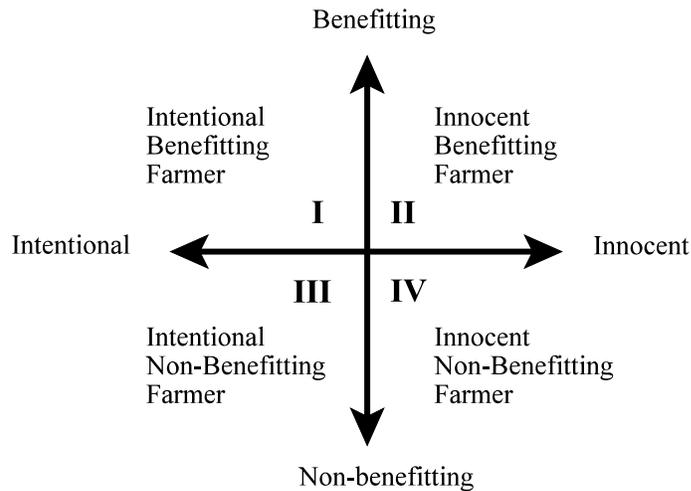


Figure 1

and benefit, as shown in Figure 1.

Two of these quadrants represent easy cases where the correct answer is intuitively clear. It is important to recognize that the benefit-based general rule gives the same result as an intent-based exception in both of these categories.

Quadrant I is the case where a farmer actively introduces the patented crop onto his property without a licence and thereby benefits. In this case the result is the same regardless of whether the innocent bystander defence is available; the general rule would hold the farmer liable for the benefit gained, and the defence does not apply because the use is intentional.

Quadrant IV represents an equally easy case, but one which is much more germane to our discussion. This is the case where a farmer's field is contaminated with patented seed but the farmer neither knows of nor benefits from the contamination. This is likely to be a very important scenario in practice. Many types of patented plants will require special treatment to take advantage of their properties. Herbicide tolerant canola, such as was at issue in *Schmeiser*, for example, permits better weed control by allowing the farmer to use herbicide to kill weeds

after the canola has emerged. Using this weed control technique on ordinary canola would kill the canola itself, and so this method would never be used by a farmer who was unaware of the nature of the crop.¹⁶ More generally, in any case in which the patented plant requires special treatment to provide a benefit an innocent bystander will also be a non-benefitting user, since she would not know to adjust her farming techniques to take advantage of the patented plant. And even inventions intended to provide an advantage without special treatment are likely to provide little or no benefit when present as a small number of plants in a field dominated by a different variety.¹⁷

Again, the general benefit-based remedial rule gives the same result as would the intent-based defence in this category of cases. While the innocent bystander defence would be available, it would not be needed, since under the benefit-based approach the farmer would technically infringe, but would not be liable for more than nominal damages, as the “but for” benefit from the use of the invention is zero.

The two remaining quadrants represent much harder cases. The case of the innocent benefitting bystander (quadrant II) arises when the user did not intentionally bring the patented product onto his land, yet the nature of the invention is such that the user would benefit nonetheless. This type of problem is likely to arise in respect of inventions which do not require special treatment in order to provide a benefit. An example would be a crop engineered to give an unusually high yield under normal growing conditions. This type of case presents a conflict between the need

¹⁶Similarly, a pest resistant plant will not provide any significant benefit if the farmer is not aware of its nature, as she will use pesticides in the usual amount and get very little cost reduction. So called “Bt” crops are engineered to incorporate a gene derived from the microorganism *Bacillus thuringiensis* (B.t.) which causes the production of an insecticidal protein: see e.g. U.S. Pat. No. 5,608,142 “Insecticidal cotton plants”; Cdn Pat. App. No. 2348755: “Polypeptide Compositions Toxic to Diabrotica Insects, Obtained from *Bacillus Thuringiensis*; CryET70, and Methods of Use.” There may be some benefit from the extra pest resistance provided by the gene.

¹⁷See *infra* Part 5.2 at 000[paragraph beginning “The adventitious entry which....”]

for patent incentives and the desire to preserve the autonomy of the farmer. While there is a case for relieving the farmer from liability, it is not nearly as intuitively compelling as is the case of the innocent non-benefitting farmer.

Suppose that the invention is such that individual plants or animals have a high value in a specific market. An example might be a pig genetically engineered to have organs which are immunologically compatible with humans, so that the pig organs can be transplanted into humans and are very valuable for this purpose.¹⁸ At the same time, the meat tastes like that of any other pig and is worth exactly the same in the meat market. If the farmer never discovered the unique properties of the pig and sold it in the ordinary market for meat, we have seen that neither approach would hold him liable (quadrant IV). But suppose the farmer had discovered the unique properties just at the time that the animal was ready for market and sold it in the specialized market (for organ transplant), for the same purposes and in the same market as the patentee? Here the farmer would have benefitted directly and substantially from the patentee's efforts. In these circumstances the view that the farmer should be relieved from liability, though not indefensible, is not nearly as compelling as if the farmer had sold the pig for meat.

¹⁸While pig are generally thought to be the animal most suitable for use for xenotransplantation of organs into humans, immunological problems are a concern: see e.g. Horvath-Arcidiacono JA, Tsuyuki S, Mostowski H, Bloom ET., Human natural killer cell activity against porcine targets: modulation by control of the oxidation-reduction environment and role of adhesion molecule interactions. (2003) 222(1) Cell Immunol. 35-44. Fear of inter-species disease transmission is the main barrier to xenotransplantation: see e.g. Chmielewicz B, Goltz M, Lahrmann KH, Ehlers B. Approaching virus safety in xenotransplantation: a search for unrecognized herpesviruses in pigs, (2003) 10:4 Xenotransplantation 349-56. Adventitious entry of a pig might seem unlikely, but it might occur if the farmer inseminated his sow with purchased semen which was inadvertently derived from a pig with a patented gene. Similar examples may arise with plants engineered to produce commercially valuable molecules such as vaccines. This is known as "plant molecular farming": see the Interim Report of the Canadian Food Inspection Agency, Multi-stakeholder Consultation on Plant Molecular Farming, October 31- November 2, 2001, available at http://www.inspection.gc.ca/english/plaveg/pbo/mf/mf_communique.shtml. Fish can also be engineered to produce valuable proteins: see plans by Aquagene LLC at <http://www.aquagene.com/> A less exotic example of a life form which is unusually valuable in a particular market is naturally decaffeinated coffee: see S. Ogita, Uefuji, H., Yamaguchi, Y., Koizumi, N. & Sano, H. Producing decaffeinated coffee plants. Nature, 423, 823, (2003).

This example is not a conclusive argument, nor is it intended to be. The point is simply that the case for relieving even an innocent farmer from liability is much stronger when the farmer does not benefit than when the farmer does benefit. It would be wrong to allow the appeal of relieving an innocent non-benefitting farmer from liability to lead us into a broad rule which would also relieve an innocent benefitting farmer from liability. This point deserves emphasis; when calls are made to relieve the innocent bystander from liability, the implied context is often that of a non-benefitting innocent bystander. Consider the example given by the Federal Court of Appeal in *Schmeiser*:

[I]t seems to me arguable that the patented Monsanto gene falls into a novel category. It is a patented invention found within a living plant that may, without human intervention, produce progeny containing the same invention. It is undisputed that a plant containing the Monsanto gene may come fortuitously onto the property of a person who has no reason to be aware of the presence of the characteristic created by the patented gene. It is also reasonable to suppose that the person could become aware that the plant has that characteristic but may tolerate the continued presence of the plant without doing anything to cause or promote the propagation of the plant or its progeny (by saving and planting the seeds, for example). In my view, it is an open question whether Monsanto could, in such circumstances, obtain a remedy for infringement on the basis that the intention of the alleged infringer is irrelevant.¹⁹

The Court of Appeal's suggestion that in this case the user should not be liable is intuitively appealing. But note that no express mention is made of whether the person in question benefitted from the fortuitous presence of the patented gene. Since the particular invention in question in *Schmeiser* was herbicide tolerant canola, so that an innocent farmer would not derive any benefit

¹⁹*Supra* n.1 at para. 57. With respect, it is *not* an open question as to whether Monsanto could obtain a remedy for infringement against a *benefitting* farmer in such circumstances. As the cases cited by the Court of Appeal itself *ibid* at para. 56 make abundantly clear, intent is not an element of a patent infringement action. The Court's remark is better understood as a suggestion for patent reform than as a statement of existing law.

from the invention, the implicit context of the Court of Appeal's remarks was that of an innocent non-benefitting farmer. We should not infer that the Court would have made the same suggestion in respect of a benefitting farmer.

On its facts *Schmeiser* apparently falls within quadrant III, the intentional non-benefitting farmer.²⁰ This is another difficult case. The general rule of benefit-based liability would not result in substantial liability in such a case, yet there is considerable appeal to the view that intentional infringement of a patent should not escape unpunished. A farmer who intentionally grew the patented seed might intend to benefit from it by selling it illicitly to other farmers, instead of taking advantage of its unique properties himself. Since the propagation is much easier to detect than the illicit sale, and there is no obvious legitimate reason for intentional infringing use, it might be sensible to impose a fine or other punitive sanction for intentional propagation, rather than requiring to the patentee to detect the actual sale. On the other hand, it may be that injunctive relief, which in effect imposes punitive sanctions for *repeated* intentional use, is adequate.

Whether punitive sanctions for intentional use are desirable is beyond the scope of this article. At this point we should recognize that the issue of the innocent non-benefitting infringer and the intentional non-benefitting infringer are closely connected in the Court of Appeal's decision in *Schmeiser*. The Court of Appeal in *Schmeiser* wanted to impose liability on the intentional non-benefitting farmer, while relieving the innocent non-benefitting farmer from liability. Both these positions are defensible, but the Court's approach was problematic. In depriving Schmeiser of all his profit, regardless of the proportion which was causally related to the use of the patent, the Court asserted a punitive general rule of liability. Given this general rule, the Court then had to suggest grafting an intent-based exception onto it in order to deal with the innocent bystander.

²⁰The defendant in *Schmeiser* was clearly an intentional infringer, but it is not clear from the facts whether he benefitted. Since the issue of benefit was held to be irrelevant both at trial and in the Court of Appeal (see the decision of the Court of Appeal *supra* n.1 at para. 79-80) it is clear that the result would have been the same had there been an express finding that the defendant had not benefitted.

The better approach is to begin with a benefit-based general rule and, if desired, graft a punitive rule onto it to deal with the intentional user.

This illustrates the importance of assessing the intent-based exception to liability in the context of the correct general rule. The Court of Appeal's suggestion that an exception to the background liability rule might be needed to deal with the innocent (non-benefitting) infringer was driven by the fact that it had set out a punitive general rule. Since punitive damages in the absence of intent is contrary to general legal principles, it is no wonder the Court felt that an exception from liability might be needed in the case of an innocent bystander. But if a compensatory general rule is applied rather than a punitive one, the need for an exception is much less compelling.

In summary, while there is a strong case for relieving the innocent non-benefitting farmer from liability, there is no need for an intent-based exception to do so. It is important that the case of the innocent non-benefitting user not be invoked in favour of the intent-based exception from liability, as doing so makes the argument for such an exception seem more compelling than it really is. The analysis in this article is premised on a compensatory benefit-based background liability rule and asks whether intent-based deviations from this rule should be implemented in the case of escaped higher life forms. There is no need for such an exception in the easy cases: the intentional benefitting farmer and the innocent non-benefitting farmer, as the general rule gives substantially the same result as would an innocent bystander defence. The innocent benefitting farmer of quadrant II represents a much harder case, which is analyzed in the balance of this article.

3 CBAC Report

The most obvious starting point in our policy analysis of a possible innocent bystander defence is the CBAC Report, which recommended that such a defence be introduced into Canadian patent

law.²¹ Unfortunately, the Report’s analysis is fundamentally flawed and in consequence it is of no assistance in analyzing the problem.

The entirety of the CBAC Report’s argument for an innocent bystander defence is found in the following paragraph:

Currently, patent law does not require a patent holder to prove that an alleged infringer knew or even ought to have known about the reproduction of a patented invention. This situation places individuals without knowledge of the reproduction of a patented plant, seed, or animal on their property or in their care in a difficult situation. That individual (the “innocent bystander”) may face a patent infringement suit – one of the most difficult and expensive legal actions against which to defend – and damages for infringement without a countervailing remedy against the patent holder. While in theory such an individual may be able to sue for negligence for the adventitious spread of the plant or seed or the reproduction of the animal, the practical difficulties of doing so – proving a duty of care and a breach of that duty – may make this remedy illusory.²²

This paragraph has a number of problems, but the most serious is that the argument is a *non sequitur*. Suppose we were concerned, not with intellectual property rights in patented plants or animals, but physical property rights in ordinary animals. Asking whether a patentee should be entitled to sue for the benefit conferred by the escape of patented plants is analogous to asking whether a pig farmer should be entitled to sue for the return of pigs which escaped onto her neighbour’s land. Suppose the pigs did no harm at all (perhaps they foraged in the neighbour’s woodlot). In that case the neighbour would have no remedy against the pigs’ owner – simply because no harm had been done – but we would never suggest that because the neighbour had no

²¹*Supra* n.000CBAC.

²²*Supra* n.000CBAC at 14. This passage was echoed by the majority of the Supreme Court in the Harvard Mouse decision: see *supra* n.000Mouse at para.172.

remedy against owner, he should be entitled to keep the pigs.²³ Nonetheless, this is exactly the structure of the argument in the CBAC Report.

Now suppose that the escaped pigs did do some harm, perhaps by foraging in and destroying some growing crops. In that case, it is true enough that the neighbour should have a remedy against the pigs' owner, but again we would not suggest that the remedy should be that the neighbour can keep the pigs. This is because the harm to the neighbour and the proposed 'remedy' are entirely unrelated. Perhaps the value of the pigs is just compensation for the loss of the crops, but it is more likely that it is far too much or far too little.

The point here isn't that the neighbour shouldn't have a remedy, but that the remedy should be tailored to the harm suffered by the farmer. Even if the neighbour did not have a remedy in the case where the pigs destroyed his crops, the obvious law reform response is to provide a remedy which compensates for the harm done, not to allow him to keep the pigs.

The analogy with the pigs is a close one. In the vast majority of cases a farmer will not suffer any harm by the adventitious entry of patented plants. Herbicide tolerant canola grows as well as ordinary canola, so having some mixed into the crop will not harm the farmer. In some cases a farmer may be injured by contamination from the patented crop. The most obvious case would be that of an organic farmer who might not be able to market contaminated crop as organic. It is true that the organic farmer in this case will find it difficult to recover in negligence because of the difficulty in establishing a breach of duty. But this is hardly fatal to the farmer's claim, since the obvious cause of action is nuisance.²⁴ Admittedly a nuisance action might also fail, since success in nuisance depends on the reasonableness of the claim.²⁵ But it is not clear that there is

23

²⁴Trespass would probably fail on the fault requirement: see John G. Fleming, *The Law of Torts*, 9th ed. (1998, The Law Book Company, Sydney), Ch. 3 "Intentional Invasion of Land: Basis of Liability" at 46.

²⁵See Fleming *ibid* Ch.21 "Nuisance: Unreasonable Interference." at 466.

anything wrong with this result. It is far from obvious that a farmer who decides to set up an organic farm in the midst of neighbours who uniformly use genetically modified crops should be able to sue his neighbours or the seed supplier for the contamination of his field. In any event, the fairness of recovery in nuisance is directly the province of the law of nuisance. If, as a policy matter, we were to decide that the existing law of nuisance is unsatisfactory in this respect, surely the appropriate response is to modify nuisance law rather than introducing a radically new doctrine into patent law.

4 Remedial Innocent User Provisions in Other Jurisdictions

The law in other jurisdictions is another potential source of insight. While intent is irrelevant in Canadian patent law, this is not universally the case. The U.K., Australia, New Zealand and the U.S. all have provisions which prevent a patentee from recovering damages and/or an accounting of profits against an infringer who did not have notice of the patent.²⁶ It might be thought that these provisions could shed useful light on the innocent bystander problem. Unfortunately, that is not the case.

The remedial innocent user provisions are of no direct aid to the innocent bystander for two reasons. First, the defendant must establish lack of knowledge of the existence of the patent.²⁷ Since the farmer typically knows of the patent, though he may not know that he is using the invention, the farmer would not be able to take advantage of the provision as it stands. More substantively, an injunction remains available to the patentee.²⁸ Since the innocent bystander has

²⁶ *Patents Act 1977*, c. 37, Pt. I, s. 62 (U.K.); *Patents Act 1990*, s.123 (Aus.); *Patents Act 1953*, s.68 (N.Z.); 35 USC §287.

²⁷For example, the *Patents Act 1953*, s.68(1) (N.Z.) provides “damages or account of profits shall not be awarded against a defendant who proves that at the date of the infringement he was not aware, and had no reasonable ground for supposing, that the patent existed.”

²⁸This is express in the Australian and New Zealand Acts: *Patents Act 1990*, s.123(3) (Aus.), *Patents Act 1953*, s.68(4) (N.Z.) and implicit in the U.K. Act, which refers only to damages and an accounting of profits.

no control over adventitious entry, if the patentee did obtain an injunction, the farmer might be unable to refrain from breaching it, and so would suffer punitive sanctions for something beyond her control. Eliminating the injunction, on the other hand, amounts to eliminating liability entirely, and so reduces this remedial provision to the complete innocent bystander defence, which will be analyzed below.

While these provisions would not be helpful to the innocent bystander, they at least suggest that the notion of incorporating intent into patent law is not entirely without precedent. The requirement that the farmer be ignorant of the patent might be only an artifact of the way in which innocence was expressed. And while leaving the injunction in place as a remedy is not satisfactory in the case of the innocent farmer, it might be said that it is only a short step to extend this type of provision by eliminating liability entirely rather than relieving the innocent user of monetary liability only. Thus we might hope that these provisions and the rationale behind them might shed some light on the innocent bystander problem. It turns out that this hope is not realized, as the U.S. provision is quite irrelevant to our problem, while the policy rationale of the other Commonwealth provisions is hopelessly obscure.

The policy underpinning the U.S. provision is quite clear. It bears some resemblance to an innocent user defence, as in some cases it requires the patentee to give the infringer actual notice of the patent before damages are available. This appearance is misleading. It is a marking requirement, intended to encourage copying of unpatented aspects of a new product by allowing the copier to identify exactly which aspects are patented and which are not. If the product is marked as required, the user's knowledge or lack thereof is irrelevant, so that damages are available even if the user had never seen the product and had no knowledge of the patent.²⁹ The section is also inapplicable as a defence to a claim for damages if the invention is such that it is

²⁹This is clear on the face of the provision and is affirmed by *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.* 297 U.S. 387, 395 (1936).

not capable of being marked, as in the case of a process or method,³⁰ or if the product is never sold at all.³¹ The innocence of the user is incidental; the goal of the provision is to encourage the patentee to mark the product, and the user is relieved from liability only to provide an incentive to this end.

The U.K. and New Zealand provisions were also plausibly intended by the legislature as marking provisions.³² In the U.K., at least, the provision has been more generously interpreted, so that the issue is the knowledge of the defendant, and innocence is only one factor to be considered.³³ The Australian provision is clear on its face that it is open to the defendant to establish that it was not aware of the patent, even if the product is properly marked and openly marketed.³⁴ Thus the U.K. and Australian provisions are truly innocent infringer provisions, as marking is not determinative but is only a factor to be taken into account in determining whether the infringer was in fact innocent.

³⁰See e.g. *American Medical Sys. v. Medical Eng'g Corp.*, 6 F.3d 1523, 1538 (Fed. Cir. 1993).

³¹See *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.* 297 U.S. 387 (1936).

³²The *Patents Act 1953*, s.68(1) (N.Z.) provides that “a person shall not be deemed to . . . have had reasonable grounds for supposing [the patent existed] only of the application to an article of the word “patent”, “patented”. . . unless the word or words are accompanied by the words “New Zealand” or the letters “NZ” and by the number of the patent” (emphasis added). The U.K. *Patents Act 1977*, c. 37, Pt. I, s. 62(1) is substantially the same. The “unless” in each of these provisions suggests that when the requisite marking is present the user shall be deemed to have had reasonable grounds for supposing the patent existed, regardless of the user’s actual state of knowledge. This is characteristic of a marking provision.

³³See *Lancer Boss Limited v. Henley Forklift Co. Ltd. and H. & M. Sideloaders Limited* [1974] F.S.R. 14 (Ch.D) at 27 (though the infringer in that case was a copier and consequently was not permitted to take advantage of the defence). There is some suggestion in New Zealand law to the same effect, though the point is by no means clear. *Ashmont Holdings Ltd v Jurox Pty Ltd*, [2001] 2 NZLR 130; 2000 NZLR LEXIS 164, (H.C.) at para.25-26.

³⁴See *Patents Act 1990*, s.123(2) (Aus.).

Unfortunately, cases applying the provisions in the U.K., Australia and New Zealand are few, and there is no judicial discussion of the rationale for the defence. Those cases which do apply the provision interpret it in a textual fashion, with no reference to the underlying policy.³⁵ No criticism of the courts is intended, but the result is that we have no guidance as to the substantive policy considerations which gave rise to the provisions. At most we can say that these provisions indicate that there may be some room for intent in patent law, but we have already accepted as much, and these provisions provide no additional insight.

³⁵There is some suggestion in the case-law that the provision would not be available to someone who directly copies the patentee's invention. This would support the view that rationale may have been to protect those who did not benefit from the patentee's efforts. However, these are mere hints in the cases which are not sufficient to establish the rationale for the provision. See e.g. *Lancer Boss Limited v. Henley Forklift Co. Ltd. and H. & M. Sideloaders Limited* [1974] F.S.R. 14 (Ch.D) at 27; *Texas Iron Works Inc.'s Patent* [2000] R.P.C. 207 at 235, para. 8.4 suggesting that copying weights against the availability of the defence. In *TK Valves Ltd v Hindle Cockburn Ltd* (1989, Ch.D., unreported), the defence was held to be available on the facts and it appears that the defendant's product was developed independently, though this is not entirely clear from the facts. In *Wilderman v. F. W. Berk and Company, Limited*. [1925] Ch. 116 it was held that the defence was available on the facts, but the case was decided on the basis that infringement was not made out in any event. In *Benmax v. Austin Motor Co.* (1952) 70 R.P.C. 143 (Ch.D.) the defence was held not to be available on the facts, as the defendant should have been aware of the possible existence of a patent. In *Lux Traffic Controls Limited v. Pike Signals Limited* [1993] R.P.C. 107 (Pat. Ct.) the defendant successfully argued innocent infringement and even though it appears that the defendant may have copied the invention from the patentee (though this is by no means clear). However, this aspect of the defence was not contested, and the trial judge noted, at 144, that "I therefore do not need to resolve any dispute as to fact or law on the application of s. 62 of the Act." There is almost no relevant case-law construing the equivalent Australian and New Zealand provisions. In the unreported decision in *Woodbridge Foam Corporation v AFCO Automotive Foam Components Pty Ltd* [2002] FCA 883 (Fed. Ct.) (Aus.) the only question was whether innocent infringement was sufficiently pleaded. The respondent pleaded innocence on the basis that the infringing product had been supplied to it by a third party and it had no notice of any complaint. The Court held that sufficient material facts had been pleaded in support of the defence though the Court remarked that "To be frank, I doubt whether the respondent could make out the statutory defence on those "facts" even if they are true."

5 The Problems

5.1 Introduction

Intent is not at present an element of patent infringement. To decide whether this should be changed by introducing an innocent bystander defence, we must define both the problem the defence would be intended to address and the problems it may create. That is the aim of this Part.

This Part will first address the basic argument against introducing an innocent bystander defence. The difficulty arises from the patent incentive problem. To provide socially appropriate incentives for invention, the patentee should be entitled to retain the entire benefit from the use of the patent, regardless of the user's intent. Some departure from this strict principle is acceptable, and indeed inevitable. Further, the distortion of incentives which would result if truly innocent bystanders were entitled to retain the benefit of the use of the patent would not be serious in practice. Thus the fact that an innocent bystander defence would relieve innocent bystanders from liability for infringement is not objectionable from a patent incentive perspective. But this does not mean that an innocent bystander defence is unobjectionable. The real problem is more subtle. The main difficulty with an innocent bystander defence, as we will see, is that it may create evidentiary problems which make it difficult for the patentee to enforce its rights against *intentional* users. The difficulty is not in the direct intended effect, but in the unintended consequences.

The discussion then turns to the other half of the equation. The argument in favour of the innocent bystander defence is founded on a concern for farmer autonomy. The notion of farmer autonomy will be unpacked and recast in terms of respect for the farmer's property rights, which will allow us to assess the problem in terms of our overarching goal of improving the overall social welfare. We will see that the real threat to farmer autonomy is not the obvious one, that she may be liable for the benefit gained from innocent use, as liability for a benefit which was

never earned or anticipated does not trench on one's autonomy. The problem is more subtle; it is *errors* in the assessment of the benefit which can potentially have an impact on farmer autonomy. But while such errors could pose a real threat to farmer autonomy, in practice they are unlikely to be serious and similar errors are tolerated in other areas of law.

5.2 The Patent Incentive Problem

The justification for holding a user liable to the extent of any benefit obtained from the use of a patent, whether the use is innocent or otherwise, is straightforward: to do otherwise will undermine the incentives for innovation established by the *Patent Act*. The *Patent Act* provides incentives to develop new inventions by allowing the patentee to reap the benefit of the invention for a limited period of time.³⁶ It is significant that the *Patent Act* does not grant a fixed reward to the patentee. Instead, the inventor is given a property right, which allows the inventor to reap the benefit of the use of the patent by exacting licence fees. This makes the reward from the invention proportional to the social benefit conferred by the invention; the more useful the invention, the more people are willing to pay for it, and the greater the incentive to invent. To the extent that the patentee cannot capture all of the benefit flowing from the invention during the term of the patent, the incentives will be distorted, as resources will be directed to inventions with the highest privately appropriable benefit rather than the greatest social benefit.

Conversely, the same rationale implies that liability should not be imposed on any non-benefitting user, whether innocent or intentional. Patent incentives which are too great are just as socially harmful as inadequate patent incentives. If the patentee is entitled to damages which exceed the benefit causally related to the invention, inventors will have an inefficiently high incentive to invent and patent new plants and animals as the private benefit will be greater than the social benefit. Excessive investment in inventive activity means that resources will be

³⁶The term of a patent in Canada is twenty years from the filing date: *Patent Act*, R.S.C. 1985, c. P-4, s.44.

devoted to marginal inventions that are not worthwhile as compared with alternative uses for those resources. At the same time, if non-benefitting users are liable, then costs in the users' enterprise will be greater than the true social cost of the activity and incentives to engage in that enterprise will be inefficiently low. Just as the inventors will have inadequate incentives to invent if they cannot capture the full social benefit of their labour, so farmers will have inadequate incentives to farm if some of the fruits of their labour are transferred to patentees. In short, making a non-benefitting farmer liable will result in too many worthless inventions and not enough worthwhile farming.

This is why the causation link which is fundamental to liability generally is particularly appropriate in the patent context. By ensuring a causal link between the use of the invention and the remedy, incentives to invent are made to correspond to the social benefit conferred by the invention. Equally, this is why the remedial calculation used by the Court of Appeal in *Schmeiser* is wrong from a policy perspective; awarding the patentee an amount greater than the benefit which flows causally from the invention – perhaps many times greater – distorts patent incentives just as seriously as would a denial of liability.

To summarize, the “but for” benefit-based approach provides *appropriate* patent incentives, which are neither too little nor too great. For this reason this article takes the benefit-based approach to be the appropriate general rule which would apply in the absence of an innocent bystander defence.

With that said, the need to preserve patent incentives is not an absolute imperative. For a number of reasons the benefit which can be captured by a patentee is always less than the full benefit to society. Most obviously, the limited term of a patent means that the social benefit accruing after the expiry of the patent is not appropriable by the patentee. And limitations in the ability of the patentee to price discriminate means that many users will value the patent at more than its cost. This “consumer surplus” means that the patentee cannot capture the full social benefit of the

invention even during its term.³⁷ This is not to say that because some distortion of incentives is inevitable, any distortion is acceptable. But it is clear that some departure from full capture of all social benefit is acceptable. The seriousness of the patent incentive problem depends therefore on how significant these incentive effects are. If, in practice, the innocent bystander defence results in the loss of only a small proportion of the patentee's potential revenues, incentives will not be greatly affected.

How significantly would patent incentives be affected if innocent bystanders were not liable to disgorge any benefit they gained? There are a number of ways in which patented higher life forms might enter adventitiously onto the property of a bystander, depending on the precise nature of the life form. Seed might simply fall out of a torn bag and fly off a passing truck which is carrying patented seed. Gene flow is possible, with the incidence depending on the species.³⁸ In the case of canola, a relatively weedy species which depends in part on wind-borne and insect pollination, gene flow by cross pollination is possible.³⁹ All of the most likely sources of adventitious entry will result in relatively low levels of contamination. Even gene flow from

³⁷The "consumer surplus" is the difference between the price a consumer would be willing to pay for the product and the price charged by the vendor. "Price discrimination" occurs when the vendor charges different prices to different groups of consumers (for example, airline discounts for advance bookings, or senior discounts for movie tickets) in order to capture some of the consumer surplus. "Perfect price discrimination" occurs when the vendor is able to charge each consumer the maximum which they would be willing to pay. Perfect price discrimination is never administratively possible. See generally Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions* (1988, John Wiley & Sons) Vol.I at 131-133.

³⁸Adventitious entry is probably generally less likely in the case of animals as opposed to plants, since more secure containment methods are likely to keep escapees out. So, in the case of salmon aquaculture, while escapes certainly occur, they are generally the result of some gross mechanical failure in a particular net pen, and escaped salmon will generally not be able to enter neighbouring pens which remain secure.

³⁹See Canadian Food Inspection Agency, Plant Products Directorate, Plant Biosafety Office, Decision Document DD95-02: Determination of Environmental Safety of Monsanto Canada Inc.'s Roundup® Herbicide-Tolerant Brassica napus Canola Line GT73, esp Part IV.2 "Potential for Gene Flow to Wild Relatives Whose Hybrid Offspring May Become More Weedy or Invasive."

outcrossing of plants with wind or insect borne pollen will normally be restricted to the immediate physical area of the patented plants. So, in the case of canola, most cross-pollination occurs within 50-100m of the plants in question, with cross pollination reduced to negligible levels beyond 200m.⁴⁰ Thus only the portion of the fields immediately bounded by a field planted with patented canola would be affected.

The adventitious entry which does occur will not often deliver a significant benefit. Many kinds of engineered crops require the farmer to adopt special farming methods if any benefit is to be realized, and adventitious entry of these varieties will provide no advantage. Differences between the volunteers and the dominant variety plant may mean that an engineered plant will provide no benefit even if it would be capable of delivering benefit under normal conditions if it were the dominant variety – volunteer canola in a field of barley is a weed no matter how desirable the particular variety of canola might be when planted on its own. Even a difference between varieties of the same crop might also rob the volunteer of any benefit. Crops have long been bred for specific traits such as time to maturity, or disease resistance, which may vary significantly between different varieties of the same crop. Patented genes for traits such as higher yield or herbicide tolerance are introduced into a number of different varieties, to allow farmers a similar choice of varieties as would be available for ordinary plants. Volunteers of a patented type engineered, for example, for an exceptionally high yield, would provide no benefit if the volunteer plants reached maturity at a different time from the planted crop, since the patented plants would be under- or over-ripe at harvest.⁴¹ Further, if the entry of the gene occurred by cross-pollination, rather than by entry of the patented seed itself, the progeny will not generally have desirable traits. Half of the offspring will carry the patented gene, but this is not

⁴⁰Philip MacDonald, National Manager for Environmental Release Assessment Plant Biosafety Office, Canadian Food Inspection Agency, personal communication with the author.

⁴¹It is true that a variety planted in one field is more likely to be compatible with a variety planted in a neighbouring field than with another variety planted at random. But the point remains that many chance variables must be aligned in order for volunteer plants to provide any significant benefit.

enough to deliver benefits since the general characteristics of the plant in which the gene appears must also be desirable; a high yield gene in a disease susceptible plant may be less advantageous than a lower yielding plant with disease resistance. A cross between two different varieties will not normally have a desirable combination of characteristics. It may sometimes occur that the two cross-pollinating varieties are the same, except for the patented gene, since some varieties are more suited to specific geographic regions and there is therefore some likelihood that neighbouring farmers will be growing exactly the same variety. But even then, many desirable varieties into which an engineered gene is inserted are first generation (F1) hybrids.⁴² First generation hybrids do not breed true, so the offspring will not have the same desirable characteristics as the parents.

In summary, most instances of truly adventitious entry will provide little or no benefit to the farmer, and it follows that the loss of this benefit is unlikely to have any significant effect on patent incentives. It would be wrong to conclude that an innocent bystander defence is unobjectionable from the patent incentive perspective. All that we can conclude is that a perfectly tailored and completely enforceable innocent bystander defence would be unobjectionable. But no legal rule is perfectly defined or perfectly enforceable. The problem with an innocent bystander exception is not that it exempts truly innocent bystanders from liability, but that it opens up legal space which would allow room for illicit intentional propagation. Intentional use, where a farmer systematically uses and profit from patented seeds, could undoubtedly have a serious effect on patent incentives. In other words, the key question in considering the innocent bystander defence does not involve innocent bystanders at all. The question is whether an innocent bystander defence can be crafted in a way that does not unduly facilitate intentional propagation. It is not coincidence that the only litigation to date, *Monsanto v Schmeiser*, has been in relation to intentional propagation. This is consistent with the view that it will rarely be worthwhile for a patentee to sue for benefits from truly adventitious entry and that the main goal of the patentee is to prevent intentional propagation, which poses a much

⁴²This depends on the crop. Most corn varieties are F1 hybrids, for example, while this is true of only some varieties of canola.

greater threat to patent incentives.

5.3 The Problem of Farmer Autonomy

The argument for relieving the innocent benefitting farmer from liability is based on a concern for the farmer's autonomy. If liability can arise simply because pollen blows into the farmer's field, without any volitional act on the part of the farmer, liability may be unavoidable. While concern for autonomy undoubtedly identifies a key aspect of the problem, it is an unsatisfactory resting place analytically. If we leave the argument in that raw form we will be faced with the task of balancing incommensurable factors, namely the need to provide incentives for new inventions on the one hand and respect for autonomy and property on the other. In this section we will try to unpack this concern for property and autonomy and recast it into terms which are more amenable to comparison with the patent incentive problem.

Autonomy is generally thought to be concerned with freedom of action – it is essentially prospective, concerned with the ability to plan and carry out one's plans.⁴³ More specifically, the autonomy problem is manifested in interference with the farmer's property rights. If liability attaches to unintentional use, the farmer will have partially lost the right to determine the use of her own land.

How then does liability for innocent benefitting use constrain the farmer's ability to plan? Under the general "but for" liability rule the farmer will be liable only for the benefit which he gained over and above that profit he would have made without the use of the patented crop. Assume for the moment that the benefit to the farmer from the escaped plant can be perfectly quantified. On this assumption the autonomy problem disappears. If adventitious entry occurs and the farmer is

⁴³See e.g. Joseph Raz, *The Morality of Freedom* (1985, Clarendon Press, Oxford) Ch.14 "Autonomy and Pluralism" esp at 373 where Raz remarks that for a person to enjoy an autonomous life, in addition to the mental capacity to plan actions, he must have "an adequate range of options for him to choose from [and] his choice must be free from coercion and manipulation by others."

made to disgorge the benefit gained from the use of the invention, he will be placed in exactly the same position he would have been in had the entry not occurred at all. This means that the farmer should make exactly the same plans whether or not he considers the possibility of adventitious entry. Similarly, there is no hardship to the farmer is requiring him to give back the excess attributable to the patent as he is made no worse off than he would have been had he not used the patent.

This is not to dismiss the autonomy argument, as the above argument rests on the assumption that the benefit gained by the farmer can be perfectly quantified. This assumption is false. The benefit gained will depend on the farmer's particular circumstances.⁴⁴ While a court using the benefit-based approach to liability will attempt to quantify the benefit as accurately as possible, a court can never quantify the benefit as accurately as can the farmer herself, as the farmer has better information regarding her own circumstances. Not all relevant information can be proven at a reasonable cost. If a farmer purchased a licence, we know that the farmer believed, on the basis of his own intimate knowledge of his farming operations, that the benefit was greater than the licence fee.

In other words, the autonomy problem arises, not because of the prospect of liability for innocent use *per se*, but because of the prospect of errors in *quantification* of liability. This argument is essentially a reprise of Calabresi and Melamed's famous analysis of property rules and liability rules in *One View of the Cathedral*.⁴⁵ In their analysis, because a property right is protected by

⁴⁴In the case of pest resistant crops, for example, a farmer whose field are pest free will benefit less than a farmer whose fields are infested. Further, there are many different varieties of any given crop, and different varieties are suitable for different conditions and even different harvesting techniques.

⁴⁵Guido Calabresi & A. Douglas Melamed, Property Rules, Liability Rules, and Inalienability: One View of the Cathedral, 85 Harv. L. Rev. 1089 (1972). The article has spawned an enormous body of commentary (see e.g. the Symposium in the Yale Law Review: Property Rules, Liability Rules, and Inalienability: A Twenty-Five Year Retrospective (1997) 106 Yale L.J. 2081-2213). A particularly clear analysis is provided by Richard Epstein, A Clear View of The Cathedral: The Dominance of Property Rules (1997) 106 Yale L.J. 2091.

injunctive relief, it gives an individual the right to keep an entitlement unless he chooses to part with it voluntarily at a price which is satisfactory to him. A liability rule, on the other hand, allows another individual to take the entitlement on payment of its fair value – damages – as determined by the court.⁴⁶ Property rules are to be preferred to liability rules when bargaining is possible, because an individual is better able to value an entitlement for herself than is a third party such as a judge. In short, we know voluntary exchanges are beneficial to both parties, and we should be suspicious of charging someone for a benefit which they did not request.

This is not the end of the story. As Kaplow and Shavell have pointed out in an important refinement, this argument for property rights is not persuasive if judicial assessment of value, even though less accurate than those of the parties, is correct *on average*.⁴⁷ In that case there will be no adverse *ex ante* incentive effects on the behaviour of defendants. Farmers as a group will not be discouraged; even though some will be faced with excessive damage awards, others will receive net benefits when the damage award is less than the benefit received. Similarly, an individual farmer might be harmed in one season but benefit the next. In planning, the farmer will have no reason to expect that any award against her will be too high or too low, so she will have no reason to change her planting decisions. Prospectively, a potential award which is expected to be accurate has the same effect as an award which is in fact accurate.⁴⁸ Conversely, though, if errors in judicial assessment of damages tended to favour the patentee, the adverse incentive effects would be the same as if punitive sanctions were imposed explicitly.

In other words, the main threat to autonomy arises not from the prospect of liability for innocent use *per se*, nor even from the prospect of judicial error in quantification of liability, but from the

⁴⁶Calabresi & Melamed, *ibid* at 1092.

⁴⁷Louis Kaplow and Steven Shavell, Property Rights and Liability Rules: An Economic Analysis, (1996) 109 Harv. L. Rev. 713.

⁴⁸If the awards were grossly inaccurate this would increase the risk to the farmer, and so might affect decision making, even if the awards were accurate on average. However, there is no particular reason to believe that judicial decisions will generally be grossly inaccurate.

prospect of *systematic* judicial error. Kaplow and Shavell develop this argument to show that the case for a property rule is strongest in the case of things which have idiosyncratic or subjective value. This is for two main reasons. First, the difficulty of accurately assessing subjective value leads courts to tend to limit damages to objective value rather than risk wildly inflated subjective value or absorb large amounts of court resources in attempting to quantify the unquantifiable.⁴⁹ Secondly, it is likely that the current owner of the thing values it more than a potential taker. The reason the owner acquired the property in the first place is that she especially liked it.⁵⁰

This theoretical argument is consistent with our ordinary intuition that property rights are most important in respect of personal effects; as Richard Epstein asked rhetorically, “Do we allow one person to take the wedding ring of another simply by paying its market value?”⁵¹ The likelihood of systematic judicial error is much less in the case of fungible goods like crops. Canola is not like a wedding ring. A farmer values canola for its cash sale value, and not out of special emotional attachment. While judicial assessment of the value will usually be less accurate than assessment by the farmer in any given instance, since the court does not have the same information regarding the specific farmer’s costs and methods, it is likely to be reasonably accurate on average, because the value depends entirely on objective factors.

Thus the case for applying a true property rule to protect the farmer’s right to place a value on the patented crop is relatively weak. There is one important condition required to support this conclusion. Kaplow and Shavell’s argument that property rights should be favoured if the current owner of a thing is likely to value it more than the average person has a parallel in the innocent bystander context. Farmers who licence the technology are likely to derive more benefit than non-contracting farmers, since one reason that farmers may choose not to licence is that they do not expect to benefit, for whatever idiosyncratic reason. If the benefit received by the

⁴⁹Kaplow and Shavell *supra* n.41 at 730-731.

⁵⁰*Ibid* at 761-762.

⁵¹*Supra* n.39 at 2093.

defendant farmer were simply measured by reference to the royalty payments made by licencing farmers this would introduce a major source of systematic bias into the assessment of damages. Fortunately, it is relatively easy to avoid this problem. The standard licencing payment is the *prima facie* measure of damages due to lost licencing,⁵² but it is clear law that this is only presumptive and special factors which may reduce an individual farmer's benefit must be taken into account.⁵³ Most obviously, if a farmer had only one-quarter of her field planted to a higher-yielding patented variety, she should only be liable for one-quarter of the standard royalty. More generally, other individual factors which may also reduce the benefit of a patented variety – for example, insect resistant crops are less valuable if a field is pest free because of its favoured location – and these must also be taken into account. The more fundamental point here is that in the examples discussed by Kaplow and Shavell, the additional value placed on the thing by the owner is the result of subjective value, which is difficult to measure in any individual case, even if it is possible to determine a correct average value. The reduced benefit gained by an innocent bystander is due to objective factors which can be assessed by the court. There will be errors, but there is no reason to think that these will be systematically biased, so long as the court does not mechanically apply a rule that damages are equal to the standard royalty.

These conclusions from the economic theory of property are consistent with general legal principles. Most obviously, the problem that judicially awarded damages can never perfectly reflect the value of the right in question is hardly unique to patent law, and it is a well-established rule that the difficulty of assessing damages is no reason they should be denied.⁵⁴ Even in the most difficult cases, where the harm is subjective in nature, the law now grants damages, albeit

⁵²See *Meters Ltd v Metropolitan Gas Meters Ltd* (1911) 28 RPC 157, 164-165.

⁵³*General Tire & Rubber v. Firestone Tyre & Rubber Co. Ltd.*, [1975] F.S.R. 273, 279 (H.L.). And see Siebrasse, A Remedial Benefit-Based Approach to the Innocent User Problem *supra* n.12, Part 3 “Damages.”

⁵⁴See e.g. *Wood v. Grand Valley Railway* (1915), 51 SCR 283, 289; *McRae v Commonwealth Disposals Commission* (1951) 84 C.L.R. 377, 411 (H.C.).

with some restrictions.⁵⁵ This emphasizes the strength of the general rule in cases, such as patent cases, where damages are assessed by completely objective evidence.

The law of unjust enrichment provides an even more directly relevant comparison with the economic analysis. It developed to deal with situations in which a defendant benefitted at the plaintiff's expense when alternative claims were unavailable or inadequate. This is closely analogous to our problem of the innocent benefitting bystander; a classic example of unjust enrichment is mistaken payment of money, which might as well be termed "adventitious entry of money" into the defendant's pockets. Unjust enrichment is particularly pertinent not only because the patentee's claim for return of a benefit conferred on the defendant echos the typical claim in unjust enrichment, but also because the law is couched in terms of broad principles which highlight the basic considerations of justice at issue.

We have seen that the central tension in the innocent bystander problem is that between rights of the person conferring the benefit and the autonomy of the defendant. Exactly the same problem has been recognized by the Supreme Court in the unjust enrichment context:

The third set of tensions lies on the philosophical-policy level. The traditional reluctance of the law to permit recovery to a plaintiff who had provided non-contractual benefits to another was founded on a philosophy of robust individualism which expected every person to look out after his or her own interests and which placed premium on the right to choose how to spend one's money. . . . The new approach of general principle, on the other hand, questions the merits of this view and the quality of justice which it entails. It

⁵⁵At one time the common law refused compensation for emotional distress because its subjective nature made it difficult to quantify (see Allen M. Linden, *Canadian Tort Law*, 7th ed.(Markham: Butterworths, 2001) at 53-54) but recovery is now allowed in the case of intentional infliction of emotional distress resulting in physical symptoms or an identifiable mental illness: see *Wilkinson v. Downton* [1897] 2 QB 57. Conversely, awards for non-pecuniary loss were capped by the Supreme Court in *Andrews v. Grand & Toy Alberta Ltd.* [1978] 2 S.C.R. 229 because of the subjective nature of the loss (see esp. 261), but they are not denied altogether.

shrinks from the harsh consequences of individualism and seeks to effect justice where fairness requires restoration of the benefit conferred.⁵⁶

This tension in the law of unjust enrichment is faced most clearly in the first element of the claim, which is the need to show a benefit to the defendant.⁵⁷ This factor is *prima facie* satisfied in our context as we are concerned only with cases in which the farmer benefits from the presence of the patented seed. But the law of unjust enrichment also reflects the economist's concern with preserving the autonomy of the defendant in assessing whether he has benefitted from the use of the invention. The law of unjust enrichment parallels the economic analysis in that the defendant's intention is not taken into account directly. Subject to any defences "liability is strict. . . . even the totally innocent recipient has no ground for suggesting that he should keep the enrichment."⁵⁸ Nor is it relevant that the plaintiff could have taken measures to prevent the enrichment, even if he was careless.⁵⁹

⁵⁶*Peel (Regional Municipality) v Canada* [1993] 3 S.C.R. 762 at 785-86, citations omitted

⁵⁷The other elements are a corresponding detriment to the plaintiff, and the absence of any juristic reason for the defendant's retention of the benefit: see *Peel (Regional Municipality) v Canada* *ibid* at 784, citing *Pettkus v. Becker* [1980] 2 S.C.R. 834. These elements are arguably satisfied by the loss of licencing revenue and the need to maintain patent incentives, respectively. We need not go into these elements in detail, as the point here is not to establish that the patentee would be entitled to relief as a matter of unjust enrichment law, but simply to examine the way that it deals with the tension between the plaintiff's property rights and the defendant's autonomy.

⁵⁸ P. Birks & C. Mitchell, "Unjust Enrichment" in P. Birks, ed., *English Private Law* (Oxford: Oxford University Press, 2000) 547, §15.59. Similarly, M. McInnes, *Enrichments and Reasons for Restitution: Protecting Freedom of Choice*, 000 McGill L.J. (forthcoming) at 000[at fn 138 in draft] "Liability in unjust enrichment *prima facie* is strict. . . . Assuming proof of an enrichment and a corresponding deprivation, the grounds for relief normally proceed without reference to the recipient's participation, acquiescence or knowledge." As discussed in the text, this is subject to any defences, in particular the defence of change of position.

⁵⁹See e.g. *Kelly v Solari* (1841) 152 ER 24; Goff & Jones, *The Law of Restitution* (London, Sweet & Maxwell, 1993) at 126-27. There is an exception if the benefit was conferred with conscious disregard for the consequences, as when the plaintiff has entered into a compromise of a claim: Goff & Jones *ibid* at 50.

The defendant can nonetheless argue that the “benefit” received, though perhaps a benefit to most people, is not a benefit to the defendant:

The central problem [in the measurement of enrichment] is easy to understand. It turns on subjectivity of value. While money is the very measure of enrichments, benefits in kind have different values to different people. Some people have their poodles permed, other abhor permed poodles. If C mistakenly pays D £100, D is unequivocally enriched. If C mistakenly perms D’s poodle, D can object that it is impossible to affirm that his has been enriched without infringing his right to value benefits in kind according to his own priorities. There is a market, and a market price, but D must be free to dissociate himself from the demand that sets that price.⁶⁰

This is now known as a plea of “subjective devaluation,”⁶¹ and the tension between the plaintiff’s right to disgorgement of the benefit and the defendant’s autonomy is balanced by the responses to this plea of subjective devaluation. There are two ways of overcoming the plea of subjective devaluation, namely by showing (i) an incontrovertible benefit, or (ii) a request or free acceptance.⁶² Request or free acceptance is not relevant in our context except in the easy case where the farmer took active steps to bring the patented seed onto his land.⁶³ “Incontrovertible benefit” on the other hand, is directly relevant. When the benefit is incontrovertible the plea of subjective devaluation is defeated and the plaintiff may recover the benefit, because, as it is said,

⁶⁰Birks & Mitchell *supra* n.52 at 539, §15.38.

⁶¹The phrase was apparently coined by P.B.H. Birks, *An Introduction to the Law of Restitution*, rev. ed. (Oxford: Clarendon Press, 1989) at 109. See the extensive discussion in M. McInnes, *supra* n.52 esp. at Part B Subjective Devaluation, pp.000ff.

⁶²See McInnes *ibid* [McGill at fn 48 in draft “Properly analyzed, the element of enrichment..”]

⁶³It might be suggested that free acceptance might be invoked if it could be shown that the farmer had actually observed the patented seed entering onto his land. But in that case acceptance does not evidence a subject belief that the farmer will benefit, since it could equally evidence a disinclination to take burdensome steps to eliminate a harmless nuisance.

the problem of subjective devaluation does not arise: “While the principle of freedom of choice is ordinarily important, it loses its force if the benefit is an incontrovertible benefit, *because it only makes sense that the defendant would not have realistically declined the enrichment.*”⁶⁴ Money is the best example.⁶⁵

In unjust enrichment law the requirement of incontrovertible benefit raises difficult problems in the context of services, since it is difficult to assess the value of personal services. It also arises when the plaintiff paid money to a third party in circumstances where it is questionable whether the defendant would otherwise have made the payment,⁶⁶ or where the defendant has received a realizable financial gain which is not actually realized.⁶⁷ In contrast, our case is easier than any of these. Crops are a commodity, almost as fungible as money. Even if the farmer has not actually realized the benefit at the time the action is commenced, she certainly will do so in the near term. Thus our case falls into the category of an actually realized financial gain; the benefit is essentially monetary, and the authorities are clear that recovery by the plaintiff should be allowed in such circumstances even under the most stringent test.⁶⁸

⁶⁴Gautreau, "When Are Enrichments Unjust?" (1989), 10 *Advocates' Q.* 258 at 270-271, cited by the McLachlin J. in *Peel supra* n.51 at 795, emphasis added by McLachlin J. And see generally McInnes *supra* n.52, Part C Tests of Enrichment: 1. Incontrovertible Benefit, p.000ff.

⁶⁵“For example, choice is not a real issue if the benefit consists of money paid to the defendant or paid to a third party to satisfy the debt of the defendant that was owing to the third party.” Gautreau *ibid*; and see McInnes *ibid*.

⁶⁶This was the main issue in *Peel supra* n.51.

⁶⁷See McInnes *supra* n.52, C. Tests of Enrichment: 1. Incontrovertible Benefit; (b) Services; (ii) Realization of a Financial Gain.

⁶⁸Birks, *An Introduction to the Law of Restitution, supra* n.55 at 116-117 notes that the most stringent approach to rebutting the plea of subjective devaluation is the “no reasonable man” test, which asks whether the benefit is such that no reasonable man would say that the defendant was not enriched. He contrasts this with the less stringent “objective” test which merely asks whether there is an ordinary market value for the benefit in question. Birks notes at 117 that “It hardly needs to be added that the commonest example of a benefit which is proved to be an enrichment by the ‘no reasonable man’ test is the receipt of money itself.” McInnes *supra*

In summary, the autonomy problem can be characterized at three levels of increasing severity: at the first level the farmer may lose the ability to choose whether to plant the patented crop; at the second level the farmer may lose the ability to place a value on the patented crop; and at the third level the patented crop may be systematically overvalued.

The first level of impairment is present but trivial under any measure. A farmer never has complete control over the nature of his crop. Adventitious entry of various plants is inevitable, whether it is volunteer barley from the neighbour's property in a wheat field, or simply weeds such as wild oats, which can be controlled but never eradicated. No reasonable theory would demand autonomy at this level.⁶⁹ The second level of impairment of autonomy is also present. While it is a more serious concern than the first level of impairment, it is unlikely to have a significant economic impact or affect autonomy in a strong sense as it will not change the farmer's planning decisions. The third level of impairment is most serious, as it would affect the farmer's ability to plan. Farming decisions would be different, and less efficient. However, given the nature of the property in question, there is no particular reason to think that the farmer's autonomy will be impaired at this third level.

There are some caveats to these conclusions. First, even though accurately assessed damages will not affect the farmer's planning, the transaction costs associated with the legal action or settlement negotiations are an undesirable deadweight social loss. This will not be a problem if in practice the benefit conferred on the farmer is so minimal that it is not worthwhile for the patentee to pursue, but it might be a concern if adventitious entry resulted in large benefits. Secondly, even if damages are accurately assessed on average, variation due to inaccuracy in the

n.52 at 000 elaborates that in the case of a realized benefit, "having turned the plaintiff's services into money, it is as if the defendant received \$2000 in cash from her. And, as always, money is immune to subjective devaluation." Note that in the law of unjust enrichment the question of subjective devaluation is normally raised in respect of services, as the value of services is most likely to vary according to the taste of the recipient.

⁶⁹As Raz *supra* n.37 notes at 373, "no one can control all aspects of his life."

assessment of benefit from adventitious entry will increase uncertainty. To the extent that farmers are risk averse this may lead to an undesirable change in farming practices. Again, this effect will be minimal if the benefits from adventitious entry are small in practice, as this source of uncertainty will be swamped by the multitude of other sources of uncertainty in farming most notably the weather. Finally, while there is no particular reason to expect systematic judicial bias in assessing damages, it is possible that such a bias might arise in practice for unforeseen reasons. While the bias might favour the farmer, but it is also possible that it would favour the patentee, in which case there would be undesirable incentive effects. The larger the volume of damage awards, the more likely it is that there will be some significant systematic bias in those awards.

All of these secondary factors will be more important as the quantum of damages claimed against innocent bystanders increases. We have seen that at present benefits from adventitious entry are likely to be small, so that it is not worthwhile for the patentee to sue. This reflects the current reality, where the only litigation, in *Monsanto v Schmeiser*, has been in respect of intentional propagation. The autonomy problem would be more serious if adventitious entry gave rise to greater benefits. This might potentially come out for two reasons: intentional release by the patentee, or new forms of inadvertent gene spread.

Just as intentional propagation is the greatest threat to patent incentives, so also, it might be suggested, intentional release by the patentee poses the greatest threat to farmer autonomy. While the threat to autonomy from truly adventitious release is small, in the absence of an innocent bystander defence, a patentee might intentionally release patented seed and then sue farmers to collect the benefit conferred.⁷⁰ While this would indeed be a serious impairment of farmer autonomy, it is not a realistic concern. In the first place, a patentee who intentionally

⁷⁰Note that current environmental regulations related to plants with novel traits are also inadequate in this respect, since these regulations are intended to prevent harm to the environment by spread of *undesirable* traits, such as weediness. See e.g. Regulatory Directive Dir94-08: Assessment Criteria for Determining Environmental Safety of Plants With Novel Traits under the Seeds Regulations, Part V, C.R.C., c. 1400, made under the authority of the *Seeds Act*, R.S. 1985, c. S-8.

released its product in the manner suggested would almost certainly be found to have granted an implied licence to use the patent. It is clear law that a sale of a patented product is accompanied by an implied licence to use the product.⁷¹ It follows that giving a product away, as for promotional purposes, is similarly accompanied by an implied licence to use the product. Restrictions on the scope of the implied licence must be express at the time of transfer;⁷² the terms of the implied licence cannot be modified by the secret intention of the patentee.

More importantly, a strategy of intentional release is unlikely to be profitable for the patentee. If the invention is meritorious farmers will be willing to licence voluntarily, and this is much more profitable for the patentee than lawsuits. If the invention is not meritorious, “but for” damages will be minimal, and even residual legal costs will swamp any potential profits.⁷³ The position of the farmer is very different from that of the patentee; while intentional unlicensed propagation by the farmer will reduce the farmer’s costs by avoiding licence fees, intentional release by the patentee will increase the patentee’s costs by increases transaction costs associated with collecting royalties. This is why intentional propagation is a realistic concern, while intentional release is not.

Similar reasoning indicates that new forms of inadvertent gene spread are unlikely to seriously exacerbate the problem of adventitious entry. The concern is that the characteristics of some future patented organism might be such as to increase the likelihood of adventitious spread of the patented gene. Perhaps a future organism would be susceptible to gene transfer to viruses, which

⁷¹See *Incandescent Light Co. Ltd. v Cantelo*, (1895) 12 R.P.C. 262, 11 T.L.R. 381 (Q.B.); *Badische Anilin Und Soda Fabrik v Isler*. [1906] 1 Ch 605.

⁷²The implied licence extends beyond mere use to e.g. resale, and a patentee might wish to restrict the right of resale by express terms: see for example *Betts v Willmott* (1871) L.R. 6 Ch. 239).

⁷³Note that this point is valid only on a “but for” benefit-based approach to remedies. On the approach adopted by the Court of Appeal in *Schmeiser*, in which any use of a patented plant, even one which confers only a marginal benefit, would entitle the patentee to recover all of the farmer’s profit, this problem might be a real concern.

would acquire the patented gene and spread it by “infecting” other organisms. Because of the cost and difficulty of recovering the benefits conferred by such uncontrolled spread, it would be in the interest of the patentee to develop biotechnology to prevent this type of release.⁷⁴ This is not a conclusive argument. Biological organisms are complex and not entirely predictable, and even though it is in the patentee’s interest to minimize adventitious spread, technology may not always be able to control biology. However, this argument does indicate that there is reason to expect the patentee to make efforts to prevent this type of undesired release, and given the difficulties of an innocent bystander defence, discussed below, it would be wrong to shape policy based on this perceived problem unless and until it actually materializes.

⁷⁴One possibility would be a variation of the “terminator gene” technology, discussed *infra* at n.86 and accompanying text.

6 Innocent Bystander Defence

6.1 Introduction

We are now in a position to define the innocent bystander defence more precisely. The best version of the innocent bystander defence will be as responsive as possible to the problem of farmer autonomy while minimizing adverse effects on patent incentives. In particular, we have seen that the primary concern from the patent incentive problem stems from the possibility that the innocent bystander defence will be used to shield intentional propagation. The key problem in designing the innocent bystander defence is therefore to ensure that its bounds are sufficiently enforceable to effectively control intentional propagation.

6.2 Availability of the Defence

The first question is who can take advantage of the defence? As we noted in the outset, the proposed innocent bystander defence is not a general intent-based defence, available to all innocent users. It would apply only to a subset of innocent users, in those cases where the patented invention had entered adventitiously onto the user's property. Precisely how is this limit to be defined?

The proposed innocent bystander defence is a limited exception to the general rule that intent is not relevant to patent infringement. That general rule finds its most important application in the case of independent inventors. An independent inventor may well be unaware of a prior patent, so that her infringement by implementation of her own invention may be entirely innocent.⁷⁵

⁷⁵In competitive R&D intensive industries, competitors may monitor each other's patent portfolios closely, and so would be aware of relevant patents soon after they are laid open. But in other cases a workshop innovation that a company develops for its own purposes, such as internal process improvement, may turn out to have been patented by another party. In any event, patents are not laid open for 18 months after the application (*Patent Act* s.10(2)(3)), so that a competitor may have priority despite the junior inventor's best efforts to monitor the patent

Lack of intent cannot be a defence in such circumstances or patent law would be reduced to a form of copyright, as the key substantive element distinguishing copyright from patent is that independent creation is defence to under copyright law but not in patent law. The innocent bystander defence must therefore be crafted to exclude independent inventors, or patent protection would be reduced to a form of copyright. Another category of potentially innocent user is the ultimate customer for a product who purchases it from an infringing producer. On existing law the end-user infringer will herself be an infringer, notwithstanding that it never occurred to her that the product might not have been manufactured under a valid licence.⁷⁶

These categories of innocent user cannot be distinguished from the innocent bystander on the basis of intent, as these users may be as innocent as any bystander. The distinction between the innocent bystander and other innocent users must instead be founded on the issue of adventitious entry, which we have already identified in general terms as being central to the innocent bystander defence. The distinction is that both the independent inventor and the unsuspecting end-user use the invention through their own conscious act, whereas the innocent farmer uses the invention without volition or knowledge. Put another way, an independent inventor knows what she is doing, but does not know the patent exists. The innocent bystander on the other hand, normally knows the patent exists, but does not know what she is doing, in the sense that she does not know the nature of the crop. This absence of a volitional act is directly relevant to the

database. And indeed, in patent system, as in Canada, in which the patent is granted to the first applicant to file the independent inventor may actually have developed the invention first.

⁷⁶The *Patent Act* on its face provides that an unauthorized user is liable for infringement, regardless of the provenances of the infringing device (see s. 42). Reported cases are few, presumably because it is rarely worthwhile to pursue an end-user, rather than a distributor or manufacturer. Nonetheless the principle is well established in the cases: “If a person innocently uses a patented invention, not knowing that there is a patent, he is none the less an infringer, and if a person innocently buys a patented invention from a licensee and uses it not knowing that there are limits on the licence, I conceive that he is equally an infringer.” *Badische Anilin Und Soda Fabrik v Isler*. [1906] 1 Ch 605. See also *Microbeads AG v Vinhurst Road Markings Ltd*. [1975] 1 All E.R. 529 (C.A.) and *Hanson v. Alpine Valley Ski Area, Inc.* 718 F.2d 1075 (1983) for cases in which the innocent end-user was found liable for patent infringement.

principled issue of autonomy, and it also leads to a functional difference in the steps which innocent users can take to protect themselves.⁷⁷ An independent inventor can in principle protect herself from infringing by searching the patent register, and an end-user can also search the register, or, more plausibly, can obtain a warranty from the vendor that the product does not infringe.⁷⁸ The innocent bystander could at best monitor her fields, and would in any event be unable to prevent the initial entry.

While the requirement of adventitious entry does place limits on the practical scope of the defence (discussed below), there is an important point of principle here as well. Innocent intent is not in itself sufficient to relieve a user from liability in patent law. Indeed, the independent inventor in particular has in some ways a stronger claim to be relieved of liability than does an innocent bystander. Not only is the independent inventor likely to be as innocent as the bystander, but the independent inventor did not derive any benefit from the efforts of the patentee, while the innocent bystander's excess profits derive directly from the efforts of the patentee. Thus the innocent bystander defence cannot be justified simply because the farmer, being innocent, derives from his innocence a right superior to that of the patentee. If that were the case the independent inventor would have just as good a claim to a defence. To the extent that innocence justifies an exemption from liability, it is as a reflection of other policy considerations. Even ability to protect oneself is not the sole criterion for relieving a user from liability. An independent inventor might spend large amounts on development only to discover, when a rival's patent is laid open, that its efforts have been pre-empted and it will be unable to recoup its costs. Ultimately, it is evidentiary concerns, and not some broader matter of principle such as innocence or ability to avoid the loss, underpins the liability of an independent inventor

⁷⁷I am indebted to Raman Balakrishnan, a student in my Advanced Intellectual Property course in the spring of 2003, for emphasizing this argument.

⁷⁸The warranty of quiet possession and in most cases also the implied warranty of the right to sell which are implied by the various Sale of Goods Acts (see e.g. *Sale of Goods Act* R.S.O. 1990, c. S-1, s.13(a),(b)) would give protection in such a case even in the absence of an express warranty: see *Microbeads AG v Vinhurst Road Markings Ltd.*, *supra* n.70.

and distinguishes patent from copyright. The considerations of evidence and enforceability which will be raised below in respect of the innocent bystander defence are no weaker in principle than the similar considerations which lead to the liability of an independent inventor.⁷⁹

The more immediate point is that volitional use of the thing which is the subject of the patent is the key functional difference between the innocent bystander and other innocent users on which any justification for the innocent bystander defence must rest. The defence should therefore be restricted to cases in which the patented invention entered onto the defendant's property without the assistance of the defendant.

Consider how this principle would operate in some salient cases. The paradigmatic case of adventitious entry is when a patented seed blows off a passing truck into a farmer's field. Another central case is when cross-pollination occurs between the patented crop in a neighbouring field and the farmer's unpatented variety. Some seed will inevitably fall between the cracks and escape harvest and some of this seed will carry the patented gene. In both of these core cases the defence will apply.

In contrast, suppose the farmer's claim is that he bought common seed from another farmer and, unbeknownst to him, the seed was contaminated with patented seed. The innocent bystander defence should not be available in this type of case. From the patent incentive perspective it raises very serious enforcement concerns, since the claim that the farmer did not know the nature of the seeds is essentially unverifiable. It is likely that the vendor will have informed the purchaser of the true nature of the seed, in order to be able to charge a premium because of the presence of the improved seed. Allowing the purchasing farmer to make this claim will force the patentee to focus its enforcement efforts on the vendor. Nor is there a serious concern from the

⁷⁹Note that the liability of the independent inventor is contrary to the principle, discussed above in Part 5.2, that the patentee should only be able to recover the fruits of their labour, and no more. For an detailed discussion of the evidentiary concerns which override this principle see N. Siebrasse, *A Property Rights Theory of the Limits of Copyright*, (2001) 51 U.T.L.J. 1 esp. Part III.D: *The Patent Copyright Boundary*, at 38ff.

autonomy perspective. We noted above that the innocent bystander is distinct from the broader innocent user problem only because in the case of adventitious entry that user has no control over his own use of the patented invention. In the case of purchase of seed, in contrast, the farmer is voluntarily bringing the seed onto his property. It is true that the farmer generally cannot tell from inspecting the seed whether it is of a patented variety, but the voluntary nature of the act of purchase puts the farmer in the same position as a purchaser who buys patented goods from an unlicensed manufacturer. Higher life forms do not raise any novel problems in this respect and if the innocent bystander exception were extended to purchasers of seed, it would be necessary to extend a similar exception to innocent purchasers of goods generally.

Another source of “volunteer” plants in ordinary farming practice is seed which is inadvertently carried over on farm machinery. So, in a case where a farmer was using a patented variety in one season and then discontinued its use in the next season, some patented seed might remain on the machinery. Autonomy considerations do not favour an exemption from liability in this case, as the farmer knew of the presence of the use of the seed in the previous season and can protect himself from contamination in the subsequent season by cleaning his machinery thoroughly. At the same time, an exemption in this case would offer considerable scope for intentional withholding of seed which would be defended as having been retained on the farm equipment. Intentional retention in this manner would be on a modest scale, but the inconvenience of cleaning the equipment thoroughly is also modest, and given the lack of autonomy concerns, the balance tips against allowing the defence in this case.

6.3 “Depth” of the Defence

The next question is the “depth” of the defence. What benefits is the farmer entitled to retain when the seed enters adventitiously onto his property? At a minimum farmer would be entitled to retain the excess profit from the sale of the crop in the “ordinary” market, as for example in the case of a high yield crop, or the innocent bystander defence would disappear. Should the farmer be entitled to retain seed for his own use the next year? Should he be entitled to sell the

seed to other farmers? Would the farmer be allowed to sell the crop in a specialized market, available only to the patented crop, for example if the crop produces vaccines? The answers to these questions are crucially important to the patent incentive problem.

In suggesting the possibility of an innocent bystander defence, the Court of Appeal in *Schmeiser* made it clear that the defence would not extend so far as to entitle the farmer to intentionally replant patented seed, even if it entered adventitiously onto her property.⁸⁰ On its face this limitation accommodates the problem of farmer autonomy. Negotiation prior to the initial adventitious entry is not possible, but negotiation over the licensee fee prior to intentional replanting is possible. The same argument applies equally if the farmer wishes to sell the saved seed to other farmers.

There are nonetheless some difficulties with this position. Consider a farmer who normally saves seed for replanting. If the innocent bystander defence does not permit replanting, an innocent farmer whose crop had been contaminated with patented seed would be required to sell the part of his crop which he would normally have retained for seed, and then incur the additional expense of purchasing new seed. Similarly, a farmer who normally sold common seed to other farmers would be prejudiced if his crop were contaminated. These considerations suggest that in order to fully protect farmer autonomy, the innocent bystander defence should extend to replanting and even resale of patented seed if the initial entry was adventitious.⁸¹

However, extending this defence to this extent would create unacceptable patent incentive problems. If replanting were permitted, selective replanting of only the patented seed would also be permitted, since no practical distinction could be drawn. This means that a farmer who had

⁸⁰*Supra* n.1 at para. 57, quoted in full *infra* in the text accompanying footnote 18.

⁸¹The argument can be taken even further. Full protection of the autonomy of the farmer would require that any farmer who purchased patented seed from the farmer who initially had the seed enter adventitiously on their property would also be permitted to save seed and sell the progeny, since the initial farmer's market would otherwise be reduced.

experienced adventitious entry could magnify his yield of patented plants by selectively harvesting patented plants for seed. For example in the case of herbicide resistant seed this could be done simply by spraying the affected area with herbicide to kill all the unpatented plants and then selectively saving seed from the patented plants at the end of the season for sowing the next season's crop.⁸² Within a season or two, depending on the degree of initial contamination, the farmer could develop a crop consisting entirely of patented seed. Allowing resale would then allow a farmer who had experienced adventitious entry to concentrate the seed set himself up as a competitor to the patentee in the sale of the seed. This type of large scale sale by a competitor who is not required to pay normal royalties would completely undermine the patent monopoly. The effect would be little different than if patent protection were denied entirely, except that the competitor would have to wait for adventitious entry before going into competition. Since some degree of adventitious entry is almost inevitable, this is not a significant distinction. Given our assumption that patent incentives are necessary for the development of desirable new seeds (otherwise the optimal policy would be to deny patents altogether) it is clear that this rule would be unacceptable.

Even if only replanting and not resale were allowed, there would still be a very serious patent incentive problem. In the first place, farmers who did not normally save seed might do so on discovering adventitious entry of a desirable patented variety. Considerations of seed quality which lead most farmers to purchase seed rather than save their own would provide some disincentive, but the appeal of avoiding the licence fee would likely compensate for this in many cases. The problem would be substantially exacerbated by intentional propagation. If replanting were permitted, then a farmer could gain a significant long term advantage by intentionally introducing an amount of patented seed sufficiently small that the defence could plausibly be

⁸²This is what Schmeiser appears to have done: see the trial decision in *Monsanto Canada Inc. v. Schmeiser* (2001) 12 C.P.R. (4th) 204 esp para. 38-40. Other types of patented plants might require more effort, but selective harvesting would generally be possible if it was worthwhile. Of course it is possible in some cases, depending on the crop or the patented features, that technical considerations would prevent this type of selective replanting, but in that case the question of whether the defence extends to permit replanting would be moot.

claimed, and then concentrating it over a number of seasons. Indeed, even a farmer who intentionally planted an entire field at the outset using black market seed might claim that the seed was obtained by concentration over the course of a number of seasons, and this might be difficult to disprove.

More importantly, extending the defence to permit replanting would create a serious risk of a black market in the patented seed, even if resale were not allowed. A farmer who experienced adventitious entry could concentrate the seed and sell it illegally as common seed, while verbally informing the purchaser of its true nature. While this resale would be illegal, it would be difficult to prevent as the patentee would have to detect the actual sale transaction, as opposed to simply monitoring for the presence of the patented seed in the growing crop. This is not to say that the patentee's rights would be completely illusory. Resale would certainly be reduced as compared to the scenario in which it was permitted. But it would also certainly be more prevalent than if replanting were prohibited. Further, requiring the patentee to enforce by detecting sales rather than plantings would increase the patentee's enforcement costs, and these would be passed on to legitimate purchasers in the form of higher prices.

Thus the line suggested by the Court of Appeal is sound, even though it impairs farmer autonomy to a degree. While allowing replanting or resale would respect farmer autonomy most fully, it would create unacceptable patent incentive problems.

It should be recognized that even the minimal innocent bystander defence which permits the farmer to retain profits from adventitious entry creates significant problems in preventing intentional propagation. The most obvious form of evidence as to intention is the planting pattern; adventitious entry will never result in an entire field full of the patented crop, for example. But if the intentional infringer is careful to plant in a manner which is consistent with adventitious entry, for example by mixing a relatively small amount of the patented seed into the seed mix, it may be difficult to establish intentional propagation by direct evidence. To prevent this kind of activity with a purely intent-based defence, the patentee would have to show that the

acquisition of the seed was intentional. This presents significant enforcement problems, as the farmer would presumably acquire the seed as ostensibly common seed with a verbal assurance that it is patented seed. It is certainly not impossible to detect and restrict this kind of transaction, but is much easier to detect growth of patented crops. The patentee might also pursue the farmer who sold the seed, knowing it was mixed with patented seed. But the seller would presumably grow the seed on relatively small plots, since he would seek to make a profit from the sale of the seed for planting, and not for grain, and these plots could be hidden far from the roads in ways which would make gathering evidence difficult. Again, detecting this type of infringement is not impossible, but it is significantly more difficult than simply detecting the growing of patented crops.

Turning then to our final question, if the farmer is entitled to retain the benefit from the sale of the crop in the ordinary market, should she also be entitled to retain the benefit from the sale in a special market which is available only for the patented crop? This is our hard case of a pig which is engineered to produce organs which are immunologically compatible with humans and very valuable for that purpose, or a plant engineered to produce human hormones. Permitting sale in the specialized market is not defensible from the farmer autonomy perspective, since the farmer would never have intended to sell an ordinary pig in this specialized market. But the defence probably cannot be tailored to prohibit this type of sale, as there is no way of distinguishing this case from those where the crop provides a benefit even when sold in the ordinary market. The benefit is present in either case, and the farmer does not need to take special steps to realize that benefit. The only distinguishing factor is that in one case the product is sold in the same market as ordinary crops of that kind, and in the other it is sold in a specialized market. It is not practical to draw a distinction on this basis. Distinguishing between different kinds of markets would be very difficult, and even if it could be done, it would only invite arbitrage. The farmer would sell in the ordinary market, but let the buyer know the quality of the goods. The buyer would then pay a premium, knowing that he could segregate that purchase and resell it in the specialized market. The result would be the same, except that the benefit would be split between the farmer and the first buyer. Attempting to control this arbitrage process would almost certainly be

prohibitively cumbersome.

6.4 Substantive Trigger for Defence

The next question concerns the substantive trigger for the defence. In proposing an innocent bystander exception to patent liability, the CBAC Report recommended that persons “without knowledge of the reproduction of a patented plant, seed, or animal on their property” should not be liable for patent infringement.⁸³ This statement is not sufficiently precise to define the rule, as knowledge falls along a continuum. The extremes are clear enough. A farmer who never discovered the true nature of his crop would not be liable, while a farmer who knowingly took active steps to bring the seed onto his property would be. But there is a range of possibilities between these extremes. The farmer might have been aware of the nature of the crop from the outset, even though he did not cause it to enter his property, if, for example, he happened to be in his field when the seed blew from a passing seed truck. Or he might discover the nature of the crop only after it was sold; for example, if the crop was wheat engineered to deliver a higher yield, the farmer might realize this only on receiving a larger cheque than anticipated for the grain. In between these extremes, he might discover the nature of the crop at almost any time after the initial contamination, but before sale, either on being informed by the patentee, or by his own observation.⁸⁴

We saw in the preceding section that making the innocent bystander defence available so long as the patented seed entered adventitiously would create significant patent enforcement problems, as the patentee would have to focus on showing intentional acquisition rather than on simply detecting the use of the patented crops. One way to reduce that problem would be to provide that the farmer will be liable not only for intentional propagation, but also if knowledge of

⁸³*Supra* n.4 at 14. The term “innocent bystander” is nowhere expressly defined.

⁸⁴As when Schmeiser apparently noticed the survival of some canola after he sprayed his ditches with herbicide: see *Schmeiser supra* n.1 para.22. Some patented life forms might be obviously different, as salmon with a higher growth rate.

propagation is gained before some specified time. Liability would be triggered not only by intent, but also by knowledge, which would normally be acquired by the patentee giving notice to the farmer that the field contained the patented crop. The patentee would then be able to focus its efforts not just at the point of sale, but also on detecting infringing crops in the field.

There are two problems with this modification to the intent-based rule. The first problem is that such a rule introduces significant arbitrariness, as a day's difference in the time of discovering the nature of the crop would make a difference of tens or hundreds of thousands of dollars in liability. Secondly, the effectiveness of such a change in improving enforceability depends on how late in the season knowledge can be acquired and still trigger liability. If the cut-off point which triggers liability is the day after planting, there is little advantage over a purely intent-based rule. At a minimum the cut-off point must be late enough that field samples can be tested. Enforceability is improved as the cut-off time moves beyond this minimum towards harvest, but then the rule itself becomes tantamount to the benefit-based rule. Under the intent-based rule the patentee must discover the nature of the crop and inform the farmer in order to trigger liability, while under the benefit-based rule, liability is not, in principle, conditioned on the farmer's knowledge. But as a practical matter, in order to enforce its rights, even under the benefit-based rule, the patentee must discover the nature of the crop, and once this is done informing the farmer follows easily. Thus a rule under which the farmer will be liable at any time up to the sale is almost equivalent to a benefit-based rule, with the only difference coming in those cases in which the patentee does discover the nature of the crop, but only after the sale. (If the rule is that the farmer is liable if he ever discovers the true nature of the crop, even after sale, then the knowledge-based rule reduces exactly to the benefit-based rule, since a farmer who benefits will or should always know the nature of the crop after the sale brings in more money than expected.) There is no obvious point between these extremes which is more satisfactory. As the cut-off point moves from planting towards harvest the enforcement problem decreases but the arbitrariness problem increases.⁸⁵

⁸⁵The only plausible intermediate point at which to draw the line is if the farmer acquires knowledge at a point at which it would be possible to remove the crop at minimal cost. But this

In sum, if acquisition of knowledge at any time up to the sale will trigger liability, an intent-based rule is almost indistinguishable from the benefit-based rule, except that it introduces an extra element of arbitrariness. An intent-based rule in this form clearly cannot be justified in comparison with the benefit-based rule. Thus in its most attractive form the defence would relieve the farmer from liability so long as he did not intentionally bring the patented seed onto his property. Knowledge acquired after entry would not trigger liability.

One exception to this strict intent-based approach is desirable. Suppose the invention requires special methods to take advantage of its properties and the farmer, though she did not intentionally bring the invention onto her property, observes the crop on her property at a time early enough to take the appropriate special steps to benefit from the invention. The farmer be liable for the benefit obtained in such a case. The distinction should be easy to implement in practice, as it should be entirely uncontroversial as to whether the crop in question requires special methods to take advantage of its properties.

Such a limitation on the scope of the innocent infringer exception is also substantively acceptable from the perspective of farmer autonomy. Recall that the basic problem is that we want the farmer to be able to negotiate over the value of any benefit. On this basis, crops which require special steps to provide a benefit are entirely distinguishable from those which do not, since the farmer will necessarily have knowledge of the nature of the crop before any special steps are taken and so will be able to negotiate over the value of the benefit. If the farmer considers the licence fee demanded by the patentee to be excessive, she can refrain from taking the special steps and thereby avoid any substantial liability.

would be very early in the planting season, so the enforcement problem would remain severe and this approach has no advantages over a benefit-based approach where an order for delivery up will not be made after it is too late to replant. Further, the nebulous nature of such a rule would encourage expensive litigation.

6.5 Legal Scope: Tangible Property Claims

A final but important question concerns the legal scope of the defence. The Court of Appeal and the CBAC Report proposals for an innocent bystander defence focused on patent liability. In at least some cases this will not be sufficient to protect the innocent bystander. Patented life forms embody two forms of property at once: the patentee's intellectual property rights and the personal property rights of the owner of the particular chattel. If Farmer A buys seed, and, on his way home some of that seed escapes through a tear in the bag and flies out of the back of the open pickup truck onto the land of Farmer B, then it is perfectly clear that Farmer A is entitled to the recovery of the seed or its value.⁸⁶ It is no defence to the claim that Farmer B was not at fault, nor is it a defence that Farmer A was careless.⁸⁷ In many cases the trifling value involved will mean that this type of action will not be a practical concern. However, there may be instances in which the value of the property itself will be sufficient to make the action worthwhile. This may be because large numbers are involved, perhaps if numerous escaped fish happen to end up in a nearby pen, or because the life forms involved are individually valuable, such as the pig which is

⁸⁶By an action for conversion: see generally John G. Fleming, *The Law of Torts*, 9th ed. (1998, The Law Book Company, Sydney), Ch.4 "Intentional Interference with Chattels: Conversion" at 60ff. This is apart from any issue as to the triviality of the claim.

⁸⁷On intent of the defendant see *Marfani & Co. Ltd. v. Midland Bank Ltd.*, [1968] 1 W.L.R. 956, 970-71 per Lord Diplock: "At common law, one's duty to one's neighbour who is the owner, or entitled to possession, of any goods is to refrain from doing any voluntary act in relation to his goods which is a usurpation of his proprietary or possessory rights in them. Subject to some exceptions which are irrelevant for the purposes of the present case, it matters not that the doer of the act of usurpation did not know, and could not by the exercise of any reasonable care have known, of his neighbour's interest in the goods. The duty is absolute; he acts at his peril." This statement was approved and applied in *Simpson v. Gowers* 121 D.L.R. (3d) 709 (Ont. C.A.) and cited with approval in *384238 Ontairo Ltd. v. Canada* 8 D.L.R. (4th) 676, 684 (F.C.A.) leave to appeal denied [1984] 1 S.C.R. v. On negligence of the plaintiff, see also *Marfani* per Lord Diplock at 577-78, cited with approval in *Boma Manufacturing Ltd. v. Canadian Imperial Bank of Commerce* [1996] 3 S.C.R. 727, para. 31: "...the moral concept of fault in the sense of either knowledge by the doer of an act that is likely to cause injury, loss or damage to another, or lack of reasonable care to avoid causing injury, loss or damage to another, plays no part."

immunologically compatible with humans.

The potential for a claim based on tangible property rights raises two questions. Most obviously, should the innocent bystander defence be extended to provide protection against these proprietary claims? Secondly, if not, why not? On what principle can the patentee's intellectual property right be distinguished from the tangible property right of the owner of the escaped property?

From the perspective of the innocent bystander, there is no reason to distinguish the claim of the owner of the specific property from the claim of the patentee. The patentee's claim is the same in principle as that of Farmer A: Farmer B has received valuable property from the claimant and the claimant seeks return of the property, or, if the property itself cannot be returned, return of the value. Indeed, the patentee's claim will be monetarily less, since the patentee can claim only for the value of the patented seed which is over and above that of the same unpatented variety, while Farmer A will claim for the entire value of the seed. Both claims interfere equally with the farmer's autonomy. In either case Farmer B will be asked to pay for a benefit which she never requested. Thus in order to protect the farmer's autonomy, the innocent bystander defence must extend to every type of claim which might be made against the bystander, whether it is a patent claim or a property claim, or an unjust enrichment claim.

Are there any relevant differences between the patentee's claim and the claim of the owner of the tangible property (the seeds themselves)? It is not relevant that the patentee seeks the value of the property rather than the thing itself, since the normal order in an action for conversion is damages.⁸⁸

The CBAC Report suggested that the reason for denying recovery to the patentee was that

⁸⁸At common law the defendant in an action for detinue had the option of whether to return the property itself or its value: see Fleming *supra* n.80 Ch. 4 "Conversion: Specific Restitution" at 81. Specific restitution may now be ordered, but this is in the discretion of the courts: *ibid.*

Farmer B might be harmed by the presence of the patented seed.⁸⁹ But this simply reinforces the analogy with chattels; if the seeds themselves somehow harmed Farmer B, perhaps by contaminating a wheat crop with canola, Farmer B would have a potential action in nuisance against Farmer A just as a farmer might have a potential action against a patentee. In ordinary property it is quite clear that the fact that the escape of Farmer A's property has harmed Farmer B would not prevent Farmer A from recovering that property, but would simply expose Farmer A to liability for the harm caused. The obvious reason for this is that there is no necessary or even likely proportionality between the harm caused and the value of the property, so that allowing the Farmer B to retain the property as "compensation" for the harm caused is entirely arbitrary.

One possible difference is that in a contest between Farmer B and the patentee, Farmer B has a property interest in the seeds themselves and the plants which grow from them which is superior to that of the patentee, whereas in the contest between the two farmers, Farmer A's claim is clearly superior to that of Farmer B in all respects. But the fact that the defendant has mixed his property with that of the plaintiff is not a defence to a proprietary claim. It may affect the remedy, so that the owner may be restricted to recovery of the value of the property rather than recovery of the property itself,⁹⁰ but recovery of the value is all the patentee is asking for in any event. Similarly, the claim that the patentee should not recover because it allowed the seed to escape is no stronger than the claim that the neighbouring farmer allowed the physical seed to escape, and this, as we have noted, is irrelevant to the claim for the return of chattels.

We can only conclude that the claim for the return of the value of the tangible property is indistinguishable in principle from the claim for the return of the value of the intellectual property. Certainly this is true from the perspective of the farmer's autonomy. This implies that the innocent bystander defence must be extended to apply equally to claims to for the return of tangible personal property which embodies the intellectual property.

⁸⁹*Supra* n.4 at 14.

⁹⁰Fleming *supra* n.80.

6.6 Summary

Though the above analysis incorporates a number of potentially contentious matters of judgment, I have argued that the best form of the innocent bystander defence would have the following features. It would be restricted to cases in which the patented life form had entered onto the user's property without any volitional act on the part of the user.⁹¹ So long as that condition was satisfied, subsequent discovery of the true nature of the crop would not affect the availability of the defence, except that the user would not be entitled to take advantage of subsequent knowledge to gain a benefit which she would not have gained had she remained ignorant. The user would be entitled to retain only those benefits which flowed directly from the adventitious entry, with no right to replant or sell the seed to others for planting. As well as relieving from liability for patent claims, the defence would extend to protect the bystander from claims made by the owner of the physical chattel which embodied the patented invention.

7 Conclusion: Desirability of an Innocent Bystander Defence

We are at last in a position to answer the central question: would the implementation of an innocent bystander defence, in its best form, be a desirable reform of patent law? While there is some merit to the proposal, overall, the answer is no.

It is certainly true that a farmer should not be liable to the patentee simply for the adventitious entry of patented crops into her field. But it is essential to recognize that adventitious entry will not generally give rise to liability under the general liability rule. The general rule imposes liability only to the extent of excess profit caused by the use of the patented crop, and

⁹¹Note that while the innocent bystander defence is motivated by patented higher life forms, the exception itself would not need to be expressly restricted to higher life forms. By restricting the applicability of the defence to cases of escape means that the problem is restricted largely to cases of patented higher life forms, since it is this type of invention which is most likely to escape from the user.

adventitious entry of patented crops will rarely benefit the farmer. This is because many types of patented crops require special treatment to realize their advantages, and an innocent bystander will not know to use these special methods. Even when special treatment is not required, patented crops scattered in a field of a different variety will often not provide benefit. This is because farming methods must be tailored to the majority (non-patented) variety, and differences in any of a range of characteristics, such as time to maturity, can negate the benefits of the patented variety.

With this in mind, the unfairness in requiring the innocent farmer to disgorge the excess profits he obtained from the fruits of the patentee's labour is minimal, as the farmer is made no worse off than he would otherwise have been. An innocent recipient of ordinary tangible property in similar circumstances is required to return it, or its value, to the owner, and there is no obvious reason why the innocent recipient of intellectual property should be treated differently. Indeed, a complete innocent bystander defence would have to extend to abrogate this rule of property law, in addition to creating a defence to a patent claim. Nor is it clear that the innocent bystander is in any stronger position to resist the patentee's claim than is an independent inventor; the innocent bystander profited from the patentee, while the independent inventor did not, yet sound evidentiary reasons necessitate that the independent inventor be considered an infringer.

With that said, farmer autonomy is impaired to some extent when a patentee recovers the value of the benefit conferred by adventitious entry of patented crop, but the impairment is not serious. A serious threat to autonomy would arise if judicial assessments of damages were systematically biased against the farmer, but there is no reason to expect this type of bias. The reasons which justify a strong property right for personal goods such as a wedding ring do not apply in the case of fungible goods like crops. There will be some impairment of autonomy as the farmer loses the right to place a value on the benefit, but this type of impairment is relatively minor as it does not affect the ability to plan. Neglecting this type of loss of autonomy is consistent with general principles of law, including the law of unjust enrichment and the rule that difficulty of assessing damages is no reason that they should be denied.

Thus, the substantive case in favour of the innocent bystander defence is relatively weak. And on the other side of the coin, the innocent bystander defence, even in its best form, would have a number of shortcomings. An innocent bystander defence could not completely cure the autonomy problem. In order to avoid unacceptable patent incentive problems the defence would have to be restricted to permitting the farmer to keep only the benefits of the direct fruits of the adventitious entry. This is both too narrow and too broad from the autonomy perspective. It is too narrow because the farmer would not be permitted to save or sell seed, as he might have done in the absence of contamination. And it is too broad because the farmer would be permitted to retain a benefit gained by selling the life form in a market in which it is unusually valuable, even though this is not defensible from an autonomy perspective.

More importantly, it is not possible to craft an innocent bystander defence which does not to some extent facilitate intentional infringement. Allowing a farmer to retain the profit so long as the initial entry was adventitious means that prevention of trade in unlicensed seed would have to focus on detecting sale transactions, rather than by monitoring fields for unlicensed crops. The discrete nature of these sales would make enforcement of the patentee's legitimate rights significantly more difficult. Without an innocent bystander defence the patentee can still pursue the initial illicit sale of patented seed, and it can also recover the benefit after sale from the purchasing farmer, thus reducing the farmer's incentive to buy illicit seed in the first place. This is not to say that enforcing legitimate rights would be impossible if an innocent bystander defence were implemented, but it would be more difficult and more costly.

Finally, we should recall that legal and technical defences are complementary. If an innocent bystander defence makes enforcement of the patentee's rights more difficult, the patentee will respond with technical measures to protect its property. Most obviously, this might take the form of inserting a so-called "terminator gene" into the patented seed. This technology allows plants to be engineered so that specific genes are turned on only in the presence of a chemical inducer. If the gene in question is essential to plant growth, the plant will grow only when sprayed with the required inducer. In effect, this technology could be used to turn all patented

crops into “special methods” crops which would require a special trigger to grow, so that only intentional users would ever derive a benefit.⁹² While this would eliminate the problem of adventitious entry, it would also increase costs to farmers generally, who would be required to buy the chemical inducer. This increase in farming costs would at least partially offset the benefit obtained from the use of the patented crop. Allowing control of illicit use by legal as well as technological means can reduce costs and increase food supply.

The appeal of an innocent bystander defence to patent infringement is understandable, but the need is not pressing. The general liability rule addresses the most pressing concerns regarding the escape of higher life forms and the residual impairment of farmer autonomy is minimal. An innocent bystander defence would lead to increased legal and technological costs in order to control the consequent enforcement problems, and these costs would be passed on to farmers and thence to consumers. The minimal benefits of the innocent bystander do not warrant these costs. At some day in the future technological change may result in a more pervasive problem of uncontrolled escape, in which case an innocent bystander defence may be desirable. That day is not now, and it may never come.

⁹²See U.S. Patent No. 5,723,765 “Control of Plant Gene Expression.