

C187 CAMPBELL, F. Electromagnetic radiation, trespass to land...

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Electromagnetic Radiation, Trespass to Land, and the Shelfer Test.

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## **I INTRODUCTION**

There is an argument that cell phones, and particularly the transmitters that serve them, emit some sort of dangerous radiation that has the potential to cause cancer in the human body. In New Zealand this issue has been confronted in the Environment Court under the Resource Management Act 1991. The *Shirley* case concerns a primary school in Christchurch.<sup>1</sup> The school management objected to Telecom's application to erect a cell phone transmitter on a property adjoining the school. The school's appeal to the Environment Court was unsuccessful. This paper will investigate how cell phone transmitters work, whether electromagnetic radiation from transmitters might constitute a trespass, and what remedies are available to the Court if an actionable trespass is established.

## **II CELLSITES**

Cell phones operate by receiving signals from a transmitter known as a 'cellsite'. Cellsites are basically an antenna array connected to a transmitter (to send the signal) and a receiver (to receive the signal sent back from the phone). The cellsite is fed by the local power supply and is connected to the local telephone exchange.

Cellsites are dotted all over the country to provide a continuous signal to anyone wanting to use a cell phone. Each cellsite services one 'cell'. This is the term for the geographic area that serviced by one cellsite. These areas form what can be described as a mosaic pattern. The aim is for each cell area to touch up against another one, but not to overlap.

Most cellsites normally operate fifteen channels, one channel per conversation. Each channel transmits on a different frequency to ensure that the conversations do not interfere with one another.

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<sup>1</sup> *Shirley Primary School & Telecom Mobile Communications Limited v Christchurch City Council* (14 December 1998) unreported Environment Court, Christchurch C136/98, Judge Jackson [*Shirley*].

In densely populated urban areas there are many cellsites across the city. To picture why so many cellsites are needed, imagine if there was only one to serve the whole of Wellington. The result would be that only fifteen conversations could be carried on at any one time. In order to increase the number of possible conversations, the network operators (for example, Telecom) install many cellsites.

Across the city the same frequencies are duplicated in each cellsite. To avoid interference from neighbouring cellsites, each cellsite is carefully designed to transmit its signal only as far as the edge of its cell. There is sophisticated software which allows one to move across the city, served by many different cellsites, while maintaining a continuous conversation.

Interestingly, despite the fact that there are more cellsites in urban areas than in rural regions, the urban cellsites use less power than their rural counterparts. Out in the country there are fewer people using cell phones at the same time, thus, fewer channels are required. The network operators can afford to install fewer cellsites as long as they pump the signal out as far as people require it. So, out in the country you can be served by the one cellsite with a strong signal over a very large area, compared to the city, where there are hundreds of small cellsites that each use only a small amount of power, with a correspondingly small coverage area.

There is evidence which suggests to some people that the signal from cellsite transmitters increases a person's chance of developing cancer.<sup>2</sup> In particular, people are concerned that the risk is greater when the signal is more powerful.

### III ELECTROMAGNETIC RADIATION

The cellsite transmits signals to the various cell phones within its area. This signal is sent using electromagnetic radiation. It is important to accept at this stage that it is only energy which is 'sent' through the air; no particles travel from the transmitter to the cell phone.

2 Shirley above n 1, 30-46, 72-90.

Electromagnetic radiation is created when there are fluctuations in the electromagnetic field. This field is composed of an electric field, and a magnetic field. An 'electric field' is simply the term used to describe the pull that a positively charged electron exerts on the negatively charged electrons around it; the closer the positive charge, the stronger the pull. Magnetic fields are created when electricity flows in a circuit. This is how magnetic doors work. By running electricity through both the plates on the door and on the frame, a strong magnetic field is created in each plate. The door 'locks' when the plates stick together like magnets.

It was observed in the mid 19<sup>th</sup> century that electric fields create magnetic fields, *and* magnetic fields create electric fields.<sup>3</sup> So, the flow of electrons in the antenna circuit creates a magnetic field around the antenna. This magnetic field then creates an electric field, and so on. This effect continues on forever through space and time. In this way a disturbance in the electromagnetic field is propagated out from the cell site.

The electromagnetic wave created when the circuit is first turned on will travel out forever. The equipment in the cell site is designed to quickly turn the electric current on and off. This creates fluctuations in the magnetic field closest to the antenna, because as soon as the electrons stop flowing in the circuit, the magnetic field ceases. This fluctuation then affects the electric field. This technique creates 'waves', just like waves of pressure; first strong, then weak. By altering how fast the current is turned on and off, the frequency of the wave is altered. It is this subtle change in the frequency of the waves (literally how quickly they are created), that is detected by the cell phone and then translated into a voice pattern.

The cell phone network operates on a frequency of around one thousand million cycles per second ( $10^9$  Hertz). This is known as radio frequency radiation (RF radiation).

Different frequencies create different effects. The range of frequencies and effects is known as the electromagnetic spectrum. Other effects include visible light, ultraviolet light (about twice the frequency of RF radiation), and x-rays.

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3 Carl Sagan *The Demon-Haunted World* (2 ed, Headline Book Publishing, London, 1997) 362.

It is important to distinguish between RF radiation and other types of radiation created at different frequencies. This paper is only concerned with the risk posed by RF radiation.

#### IV TRESPASS

By the laws of England, every invasion of private property, be it ever so minute, is a trespass. No man can set his foot upon my ground without my licence, but he is liable to an action, though the damage be nothing ...<sup>4</sup>

Historically, the tort of trespass was designed to protect an occupier's exclusive right to possession. This begs the question, possession of what? Land includes soil, grass, and trees. It also includes the fixtures on the land. Does 'land' include the airspace above the soil as well?

##### A The Meaning of 'Land'

*Davies v Bennison* provides an amusing illustration of the rule that applies to your airspace.<sup>5</sup> In that case, the defendant shot at the plaintiff's cat, which promptly died with the bullet still lodged inside. Because the bullet did not make contact with the ground it was argued that there was no trespass. Chief Justice Nicholls found there was a trespass by reference to the maxim *cujus est solum ejus est usque ad coelum*, which is the notion that you possess that column of earth and air that extends from the centre of the earth up to the heavens.<sup>6</sup> However, he noted that there were probably restrictions on this maxim,

4 *Entick v Carrington* (1765) 19 ST TR 1030; 95 ER 807 (CP) per Camden LJ, in William C Hodge and others *Torts in New Zealand* (2 ed, Oxford University Press, Oxford, 1997) 49.

5 *Davies v Bennison* (1927) 22 Tasmania LR 52 (HCA).

6 *Davies v Bennison* above n 5, 55.



and resolved the case by saying "I can see no doubt whatever that an owner's rights extend to a height sufficient to cover the facts of this case".<sup>7</sup>

The case of *Bernstein v Skyviews* echoes this doubt about the maxim.<sup>8</sup> Justice Griffiths found that an airplane which flew over the Baron's land at a height of several hundred feet above the ground did not amount to a trespass. The rule seems to be that "the rights of an owner in the air space above his land [are restricted] to such height as is necessary for the ordinary use and enjoyment of his land and the structures upon it ...".<sup>9</sup>

Electromagnetic radiation constitutes a trespass to land because it invades that space which is necessary for the ordinary use and enjoyment of land. The fact that signals can be received inside houses, and outside on people's lawns, shows very clearly that the radiation invades that space which is reasonably used by landowners.

### **B The Definition of Trespass**

The tort of trespass is not easy to define. However, it can be described as an intentional, direct, invasion, of land possessed by another. Electromagnetic radiation can satisfy all these elements. This test will be applied to a hypothetical couple who are concerned about the effects of electromagnetic radiation on themselves and their young family. They attempt to sue a network operator in trespass. The fact scenario is essentially that of the *Shirley* case, except that the issue of private land rights is isolated by removing the public school as plaintiff.

#### **1 Intention**

The transmission of this radiation is intentional. Network operators intend that the radiation will leave the transmitter and radiate out across the local area. The system could

<sup>7</sup> *Davies v Bennison* above n 5, 57.

<sup>8</sup> *Bernstein of Leigh (Baron) v Skyviews & General Ltd.* [1978] 1 QB 479 [*Bernstein v Skyviews*].

<sup>9</sup> *Bernstein v Skyviews* above n 8, 488.

not work any other way. The intentional transmission of cell phone signals is the only use of the defendant's land is put to. This is the sole purpose of the transmitters.

## 2 Directness

Some have said that directness lies at the heart of the distinction between trespass and private nuisance.<sup>10</sup> But the meaning of directness is somewhat hard to discern. In *Southport v Esso Petroleum* Denning LJ canvassed the old cases that turned on directness and noted that directness distinguished whether the damage to the plaintiff's interest was the immediate or consequential result of the defendant's actions.<sup>11</sup>

It might be argued that cancer is only the indirect consequence of RF radiation. But it is not the cancer which is complained of; rather it is the invasion of plaintiff's boundaries which is the 'damage'. That invasion is immediate result of the defendant's activities.

Indeed, if 'immediate' is also to be coloured by the notion of instantaneously, then it is quite clear that RF radiation satisfies the directness requirement because cell phone conversations occur without delay.

## 3 Invasion

Does this radiation constitute an invasion of airspace? 'Invasion' denotes some undesirable entry. This radiation certainly enters the property. This is easily proven by the use of a cell phone; where it is able to receive a signal, the radiation must be present.

When the tort of trespass was first defined it was almost certainly believed that the invasion had to take the form of a group of particles. This was because centuries ago they had no concept of energy in the form of electromagnetic radiation. However, the mere fact that they did not contemplate such a phenomenon does not render the trespass cause

10 Stephen Todd (ed) *The Law of Torts in New Zealand* (2 ed, Brooker's Wellington, 1997) 473.

11 *Southport Corporation v Esso Petroleum Co Ltd* [1954] 2 QB 182, 195-196 (CA).

of action inapplicable. In fact, it is interesting to note that the action was already defined in such a way that it could comfortably encompass electromagnetic radiation. The essence of the tort is the interest that it protects, not the substance of the invasion.

#### 4 Does trespass require proof of damage?

Historically, trespass has been actionable per se, that is, that it is not incumbent upon the plaintiff to show that there has been any actual damage to their land. It is enough that their exclusive right to possession has been injured. *Entick v Carrington* is the classic authority for this proposition. Chief Justice Lord Camden stated that "every invasion of private property ... is a trespass ... though the damage be nothing ..."<sup>12</sup> Theoretically, plaintiffs do not need to show that the electromagnetic radiation has actually caused any damage to themselves or to their land to establish that an actionable trespass has been committed. It remains to be seen, whether in fact they would need to show damage to ensure that the Court awards an injunction.

#### 5 The United States vibration cases

There has been significantly more litigation about intangible substances constituting a trespass in the United States, than there has been in New Zealand, or even in England. This is due, in part, to the fact that some States have barred actions in private nuisance for vibrations. This has forced plaintiffs to frame their action in trespass. The courts have generally been happy to recognise vibrations as a trespass in return for imposing the additional requirement of damage.<sup>13</sup> While it is encouraging to read the more liberal judgments on what may constitute a trespass, the cases are of little value in New Zealand because of their damage requirement. It must also be remembered that the

<sup>12</sup> *Entick v Carrington* above n 4, 50.

<sup>13</sup> See generally *Wilson v Interlake Steel Co* (1982) 649 P 2d 922 (Cal S Ct).

distinction between trespass and private nuisance in the United States is not drawn by directness like it is in the Commonwealth countries.

*Bedell v Goulter* was a case where the defendants were engaged in blasting operations which caused vibrations to travel onto the plaintiff's land and cause damage to the actual land.<sup>14</sup> Justice Lusk noted that the law recognised trespasses where debris had been cast onto the plaintiff's land, and he saw no reason why the rule of liability should be any different where the same blast had instead caused vibrations.<sup>15</sup> Later in his judgment, Lusk J reviewed the rule in *Rylands v Fletcher*<sup>16</sup> and concluded that<sup>17</sup>

It requires very little extension of this doctrine to apply it to the facts of the present case. And there is slight difficulty in holding that one who engages in blasting operations which set in motion vibrations and concussions of the earth and air which reach to another's land - no matter how far distant - and shatter his dwelling, commits a trespass no less than one who accomplishes the same result by the propulsion of rocks or other material.

*McNeill v Redington* concerned a drop forging plant which used industrial hammers 24 hours a day; the vibrations caused damage to the plaintiff's houses.<sup>18</sup> The plaintiffs were barred by statute from claiming private nuisance. Instead they tried to claim trespass. The court did not evaluate the facts of the case, it simply said that "[t]he evidence and findings sustain the allegations [of trespass]."<sup>19</sup>

*Wilson v Interlake Steel Co* was a case of factory working around the clock, creating sufficient noise to annoy the neighbours, but with no evidence of damage.<sup>20</sup>

14 *Bedell v Goulter* (1953) 261 P 2d 842 (Ore S Ct).

15 *Bedell v Goulter* above n 14, 844.

16 *Rylands v Fletcher* (1868) LR 3 HL 330 (HL).

17 *Bedell v Goulter* above n 14, 850.

18 *McNeill v Redington* (1944) 154 P 2d 428 (Cal Dist Ct App).

19 *McNeill v Redington* above n 18, 430.

20 *Wilson v Interlake Steel* above n 13.

Justice Richardson, quoting from *Estate of McDill*<sup>21</sup> noted that in cases of noise, vibrations, or gas emissions, “[trespass has] been predicated upon the deposit of particulate matter upon the plaintiff’s property or on actual physical damage thereto.”<sup>22</sup>

#### 6 *Can energy constitute a trespass?*

United States case law has also canvassed the possibility of energy alone constituting a trespass. However, implicit in the following case is the fact that actual damage was done to the plaintiff’s interest.

The plaintiff in *Martin v Reynolds Metals Company* complained that the nearby aluminium manufacturer had caused fluoride compounds to settle on his land, thereby poisoning cattle, and damaging vegetation.<sup>23</sup> The defendant tried to argue that the Court should apply a dimensional test, in essence, that the fluoride compounds were invisible to the naked eye, and as such, were too small to constitute a trespass. The Court rejected that test, choosing instead to appreciate that energy may constitute a trespass. Justice O’Connell noted that *McNeill v Redington* was an instance of trespass by the transmission of energy, “nothing more than the movement of molecules one against another”.<sup>24</sup>

The Court recognised that the old cases of trespass only dealt with collections of particles of a visible size, not because there was some unwritten rule that only visible things could constitute a trespass, but because the courts back then did not know of the atomic world. “In fact, the now famous equation  $E=mc^2$  has taught us that mass and energy are equivalents and that our concept of ‘things’ must be reframed”.<sup>25</sup> Justice O’Connell went on to note that energy is the vital test, not dimension.<sup>26</sup>

21 *Estate of McDill* (1975) 537 P 2d 874 (Cal Dist Ct App).

22 *Wilson v Interlake Steel* above n 13, 924.

23 *Martin v Reynolds Metals Company* (1959) 342 P 2d 790 (Ore S Ct).

24 *Martin v Reynolds Metals Company* above n 23, 793.

25 *Martin v Reynolds Metals Company* above n 23, 793.

26 *Martin v Reynolds Metals Company* above n 23, 794.

If, then, we must look to the character of the instrumentality which is used in making an intrusion upon another's land we prefer to emphasize the object's energy or force rather than its size. Viewed in this way we may define trespass as any intrusion which invades the possessor's protected interest in exclusive possession, whether that intrusion is by visible or invisible pieces of matter or by energy which can be measured only by the mathematical language of the physicist.

In *San Diego Gas & Elec Co* the plaintiff alleged trespass by electromagnetic fields that surrounded the power lines of the defendant.<sup>27</sup> The Court held that the rule in *Wilson v Interlake Steel* applied. The electromagnetic radiation was classed with "all intangible intrusions, such as noise, odor, or light alone, [which] are dealt with as nuisance cases, not trespass".<sup>28</sup> To establish a trespass, the plaintiff needed to demonstrate that the electromagnetic radiation had caused some actual damage to their property, not just a risk of harm to the property's occupants.<sup>29</sup> The plaintiffs tried to argue that the loss in the house's value was sufficient damage, but the Court found that did not satisfy the test of physical damage.<sup>30</sup>

The United States cases are useful for the responses they give to allegations of intangible trespass, but ultimately they are of little assistance because they turn on the issue of damage, which in New Zealand is immaterial to establishing liability.

## V THE REMEDY FOR TRESPASS

Electromagnetic radiation from cellsites can found a claim in trespass. It is an intentional, direct, invasion of private property. But what remedy are the plaintiffs entitled to? *Shelfer v City of London Electric Lighting Co* is authority for the rule that, in the

27 *San Diego Gas & Elec Co v Superior Court* (1996) 920 P 2d 669, 695 (Cal) [*San Diego*].

28 *Wilson v Interlake Steel* above n 13.

29 *San Diego* above n 27, 695.

30 *San Diego* above n 27, 695-696.

event of an ongoing trespass, there is a presumption that the plaintiffs should be awarded an injunction.<sup>31</sup>

### **A     *The Effect of Granting an Injunction***

While the plaintiffs obviously want an injunction, to grant one would be quite disruptive to the rest of New Zealand. It would take only one citizen in each major city of New Zealand to be awarded an injunction to render the cell phone network unworkable. This would be an enormous step backwards for New Zealand business, and for New Zealanders themselves.

More and more people use cell phones every year. All sorts of businesses use cell phones to keep in touch with their customers. Financial services, like EFT-POS, can now be maintained anywhere in the country by using a cell phone link between the bank and the vendor. Access to the internet through a combination of cell phones and laptops is an exciting area of development for New Zealand businesses.

Cell phones are also increasingly being used as a safety backup in the outdoors. These days many people carry a cell phone in case their car breaks down. Or they take a cell phone when tramping or sailing.

It seems preposterous that one private property owner could bring a stop to all that. And it is not only the cell phone network which could be stopped. Radio and television signals work on exactly the same principles, and could equally be a target for an action in trespass. Surely the courts would not award such an injunction. But do they have any choice?

### **B     *Issues that are Immaterial to the Granting of an Injunction***

The courts are bound only to consider certain issues when they consider granting an injunction. First, the public benefit derived from the trespassory action of the defendant

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31 *Shelfer v City of London Electric Lighting Co* [1895] 1 Ch 287 (CA) [*Shelfer*].

is wholly immaterial to the Court's deliberations. Secondly, the Court is not free to 'sell' the plaintiffs rights to the defendant simply because the defendant can afford to pay a considerable sum for them. Thirdly, Parliament is the only body that can authorise the expropriation of interests in privately held land.

### 1 *Public benefit is immaterial*

The very reason why an injunction should not be awarded is the very reason that the courts can take no cognisance of. Private property is considered by the Common Law to be so important that its protection will not depend on what is best for the general public. William Blackstone wrote in the 18<sup>th</sup> century that<sup>32</sup>

So great moreover is the regard of the law for private property, that it will not authorize the least violation of it; no, not even for the general good of the whole community.

This principle is also reflected in the fact that the tort of private nuisance also does not afford the courts the right to refer to public benefit as a reason not to award an injunction. There is one notable exception to this rule; the case of *Miller v Jackson* concerned a nuisance created by a local cricket club hitting balls into the neighbour's property.<sup>33</sup> Lord Denning found that no injunction should be granted because it would harm the cricket club, and therefore, harm society. His reasoning has not been followed in New Zealand. In *Bank of New Zealand v Greenwood*, Hardie Boys J recognised "the valiant efforts of the cricket-loving members of the Court in *Miller v Jackson*", but found that the authorities (including *Shelfer*) prevented the Court from putting the public interest

32 William Blackstone *Commentaries on the Laws of England* Robert Malcolm Kerr (ed) (3 ed, John Murray, London, 1862) Book I, 139 (page numbers refer to Blackstone's original work) [*Commentaries*].

33 *Miller v Jackson* [1977] 3 All ER 338 per Lord Denning MR.



before that of the plaintiff's.<sup>34</sup> Private nuisance is less strict than trespass; if that action cannot take into account public benefit, then the action of trespass surely cannot, either.

*Shelfer* makes it clear that the effect of an injunction on the public is not a factor that the courts may consider. Lord Justice Lindley said that "[t]his case is accordingly authority to shew that an injunction would not be refused on the ground that the public might be inconvenienced if an injunction were granted".<sup>35</sup>

## 2 *Rights shall not be sold*

For the Court to award damages instead of granting an injunction, is to allow the defendant to buy the plaintiff's rights, and continue trespassing indefinitely. Property rights are not for sale except at the direction of the plaintiff. Lord Halsbury recognised this principle in *Shelfer*.<sup>36</sup>

[T]he effect of [refusing] an injunction in a case like the present would necessarily operate to enable a company who could afford it to drive a neighbouring proprietor to sell, whether he would or no, by continuing a nuisance, and simply paying damages for its continuance.

Lord Justice A L Smith recognised the same.<sup>37</sup>

Many judges have stated, and I emphatically agree with them, that a person by committing a wrongful act ... is not thereby entitled to ask the Court to sanction his doing so by purchasing his neighbour's rights, by assessing damages in that behalf, leaving his neighbour with the nuisance ....

<sup>34</sup> *Bank of New Zealand v Greenwood* [1984] 1 NZLR 525, 535 (HC).

<sup>35</sup> *Shelfer* above n 31, 315.

<sup>36</sup> *Shelfer* above n 31, 311.

<sup>37</sup> *Shelfer* above n 31, 322.

### 3 *Only Parliament may expropriate property*

Similar to the idea that Courts do not have the authority to sell the plaintiff's rights to the defendant, is the rule that only Parliament may expropriate property. For example, where land is required for a motorway the local authorities can only acquire the land through the authority conveyed by statute. In *Entick v Carrington* Camden LJ recognised that it was possible to dispossess individual's of their land, but only by positive law.<sup>38</sup>

The great end, for which men entered into society, was to secure their property. That right is preserved sacred and incommunicable in all instances, where it has not been taken away or abridged by some public law for the good of the whole. The cases where this right of property is set aside by the positive law, are various. Distresses, executions, forfeitures, taxes, etc are all of this description; wherein every man by common consent gives up that right, for the sake of justice and the general good.

An ongoing trespass infringes the plaintiff's interest in their land, in effect it lessens their interest in favour of the defendant. The court cannot authorise such an expropriation without some positive law provided by Parliament.

### 4 *Conclusion*

The very reason why it seems obvious that courts should not award an injunction in this situation, is the very reason the courts have no authority to consider. The public benefit derived from a comprehensive cellular network is immaterial to the Court's decision whether to grant an injunction or not.

However, it is still possible to argue within the law that the plaintiffs should not be awarded an injunction. While keeping within the strict boundaries of the *Shelfer* test, it can be demonstrated that damages are a suitable substitute for an injunction.

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<sup>38</sup> *Entick v Carrington* above n 4, 50.

## VI THE SHELFER TEST

The case of *Shelfer* concerned an ongoing nuisance created by the vibrations emanating from the defendant's plant, making the upper level of the plaintiff's house uninhabitable.<sup>39</sup> The Court held that the plaintiff was prima facie entitled to an injunction, but that this presumption could be rebutted, and damages might be awarded instead.<sup>40</sup>

In my opinion, it may be stated as a good working rule that—

- (1.) If the injury to the plaintiff's legal rights is small,
- (2.) And is one which is capable of being estimated in money,
- (3.) And is one which can be adequately compensated by a small money payment,
- (4.) And the case is one in which it would be oppressive to the defendant to grant an injunction:—

then damages in substitution for an injunction may be given.

Before any analysis of these four steps is undertaken, it is important to understand where the burden of proof lies, what the standard of proof is, and to which elements of the test the burden attaches.

### A The Burden and Standard of Proof

#### 1 The burden of proof

Once a plaintiff has made out a case for an actionable trespass, there is a presumption that they will be granted an injunction. This presumption can be rebutted by satisfying the *Shelfer* test. Clearly, it is the defendants who must rebut the presumption, and consequently, the burden of proof lies with them.

<sup>39</sup> *Shelfer* above n 31.

<sup>40</sup> *Shelfer* above n 31, 322.

The burden of proof, however, does not attach itself to all the steps in the test. Logically, the burden of proof can only apply to questions of fact. In this hypothetical scenario the only facts that are relevant to the test are those regarding the probability that the defendants caused an adverse consequence, the nature of any adverse consequence, the cost of installing the cellsite, and whether or not the defendant had received good value for that expenditure. These facts relate only to parts of steps one and four. All the other elements of the *Shelfer* test are evaluations which the court must make. "The balance of probabilities test applies to (i) the primary facts of a case; (ii) the secondary facts – inferences drawn by the Court from the primary facts; but not to (iii) *evaluations* ... which are not facts at all".<sup>41</sup>

## 2 *The Standard of Proof*

Usually in civil trials the standard of proof is 'on the balance of probabilities'. When speculating about events yet to occur Diplock L had this to say about 'the balance of probabilities'<sup>42</sup> —

[T]he phrase is inappropriate when applied not to ascertaining what has already happened but to prophesying what, if it happens at all, can only happen in the future. There is no general rule of English law that when a Court is required ... to take account of what may happen in the future ... it must ignore any possibility of something happening merely because the odds on its happening are fractionally less than evens.

President Cooke has also recognised that a balance of probabilities test is inapplicable in cases of future risk, and has articulated the idea that ultimately the courts must use their judicial discretion as to what constitutes an unreasonable risk. In *Commissioner of Police v Ombudsman* the Police were withholding documents requested

41 D L Mathieson *Cross on Evidence* (5 ed, Butterworths, Wellington, 1996) 155 (emphasis in the original).

42 *Fernandez v Government of Singapore* [1971] 2 All ER 691, 696 (HL) (emphasis added).

by the Ombudsman under the Official Information Act 1982.<sup>43</sup> The court had to decide the meaning of "likely" in the context of section 6, whether the release of the information "would be likely ... (c) to prejudice the maintenance of the law ... ."

To require a threat to be established as more likely to eventuate than not would be unreal. It must be enough if there is a serious or real and substantial risk to a protected interest, a risk that might well eventuate. ... Whether such a risk exists must be largely a matter of judgment.

This view corresponds with the notion that risk is composed of two variables, the probability of an occurrence, and the severity of the occurrence. The first variable can be objectively determined by recourse to scientific evidence. The second variable can only be judged by intuition, it is a subjective test. The defendants must prove the objective element of the risk, but the final evaluation of the reasonableness of the risk rest with the court.

### 3 *A damage requirement by the back door*

When the court assesses the injury to the plaintiff's legal rights, theoretically the only evidence they will have before them is that adduced by the defendant. It is possible that in the absence of any contradictory evidence, the court might easily find that there had been only a small injury to the plaintiff's rights. Perhaps the *Shelfer* test actually admits a damage requirement into trespass by the back door. Ostensibly trespass is actionable without proof of damage, but the practical necessity of adducing evidence as to the risk created by the defendant's activities suggests otherwise.

43 *Commissioner of Police v Ombudsman* [1988] 1 NZLR 385, 391 (CA).

## *B 'Legal Rights'*

The first step of the test is to establish that the injury to the plaintiff's legal rights is small. What do the words 'legal rights' mean in this context? One answer could be that they mean the right not to have one's boundaries invaded intentionally. While this might be an obvious answer, it is not a helpful one because it reduces the test to a simple inquiry into the physical size of the invasion, or alternatively an inquiry into the degree of the defendant's intent. In effect, this just repeats the inquiry whether there was an actionable trespass in the first place. This answer does not elucidate what rights are protected by the trespass cause of action. 'Legal rights' represent much more than just the boundaries of the actual property.

### *1 The notion of private property*

Private property is an artificial construct. As William Blackstone put it – "there is no foundation in nature or in natural law, why a set of words upon parchment should convey the dominion of land..."<sup>44</sup>

Blackstone formulated four reasons why private property exists. First, the Bible stated that God had given to man 'dominion' over the earth and everything in it.<sup>45</sup> Secondly, increasingly scarce resources push people to stake a private claim to that which has previously been held in common.<sup>46</sup> Thirdly, private property rights encourage people to invest their labour and resources in their own land, certain in the knowledge that they can not be dispossessed.<sup>47</sup> Finally, Blackstone drew on the example of well-regarded

<sup>44</sup> *Commentaries* above n 32, Book II, 2.

<sup>45</sup> *Commentaries* above n 32, Book II, 2.

<sup>46</sup> *Commentaries* above n 32, Book II, 6.

<sup>47</sup> *Commentaries* above n 32, Book II, 4, 7.

classical peoples, like the Greeks and the Phoenicians, who had rightly colonised new lands for their increasing populations.<sup>48</sup>

Blackstone's second and third points are still valid today. Essentially, private property rights are a social construct designed to facilitate peaceful relations between citizens. Property rights function not just between the owner and the land itself, but rather more importantly between the owner and everyone else in the world; for it is against others that rights are enforced.

'Property' is not technically the thing itself which is owned but the condition of being owned. A complex view of property shows it to be a set or bundle of relationships constituted by notions like rights, powers and duties. The relationships are obviously not solely between the owner and the 'thing' in question but include also other persons.<sup>49</sup>

## 2 *Rights are not absolute*

Before the content of private property rights is analysed, we must examine the extent to which any of the traditionally accepted rights can be enforced against another. Blackstone wrote that—<sup>50</sup>

There is nothing which so generally strikes the imagination, and engages the affections of mankind, as the right of property; or that sole and despotic dominion which one man claims and exercises over the external things of the world, *in total exclusion of the right of any other individual in the universe.*

Blackstone used that statement to illustrate the underlying philosophy of private property rights, but even he admitted that rights are relative.<sup>51</sup> It is obvious that not everyone can maintain absolute rights all the time. Landowner A cannot maintain a right to play the

48 *Commentaries* above n 32, Book II, 7.

49 William N R Lucy and Catherine Mitchell "Replacing Private Property: the Case for Stewardship" (1996) 55 CLJ 566, 567.

50 *Commentaries* above n 32, Book II, 2 (emphasis added).

51 *Commentaries* above n 32, Book III, 212-213.

bagpipes all night, while Landowner B insists on perfect silence day after day. One's rights only extend to that point where they meet one's neighbour's rights coming the other way. This is a reasonable proposition, it allows people to live amicably side-by-side. It recognises that individuals are actually just part of a larger group. As John Donne put it "No man is an Island, entire of itself..."<sup>52</sup>

### 3 *The content of private property rights*

What then, is the content of these rights? It is very difficult to give a comprehensive definition of property rights, they are perhaps best illustrated by examples. They include both positive rights and freedoms. Positive rights include the right to build structures on your land, the right to grow crops and harvest them, the right to make a noise on your own land. Negative rights include the right to be free from people walking on your lawn, and the right to be free from loud noises created by your neighbour.

Having established that rights are relative, we can now analyse whether there exists a right to be free from the increased risk of adverse health effects. The tort of private nuisance provides the answer. Private nuisance protects a person's use and enjoyment of land. Land can only be enjoyed if there are no adverse health effects suffered while one lives on the land or uses the land. For example, imagine if your neighbour had been removing asbestos insulation from her building and had left it out in the open where the wind then carried asbestos particles over your boundary. That is clearly a nuisance, it disturbs your enjoyment of land. It might be argued that the actions of trespass and private nuisance protect different interests in land; trespass protects one's right to exclusive possession, and nuisance protects one's use and enjoyment of land. But these are just two sides of the same coin. The distinction between nuisance and trespass is delineated by directness and intention, not by the interest involved. Title to land confers both the right to exclusive possession, and the right to undisturbed use and enjoyment.

52 John Donne "Meditation XVII" *Devotions upon Emergent Occasions* (1624) in Angela Partington (ed) *The Oxford Dictionary of Quotations* (Oxford University Press, Oxford, 1992) 253.



To recap in light of the *Shelfer* test, this means that plaintiff's legal rights include the right to be free from risk that is increased because of the defendant's activities. But, because rights are relative, this is only the right to be free from unreasonable risk.

#### 4 What constitutes an unreasonable risk?

All human activity involves some element of risk. It is impossible to say with absolute certainty that some adverse consequence will never occur in the future as a result of the defendant's activities. So, if all activities necessarily involve some risk, then all landowners have the right to cause their neighbours some degree of increased risk. At what point, though, does the risk become unreasonable? To answer this question, one must have an appreciation of the two variables denoted by 'risk'.

##### (a) The probability of the risk

This is an objective inquiry into the likelihood that an event will occur; one in ten, or one in ten thousand? It is not sufficient to simply state an acceptable probability factor for risk. Probability is only meaningful in the context of the nature of the consequence.

##### (b) The nature of the risk

This is a subjective inquiry. It relies on one's perception of the severity of the consequence of the risk. For example, the consequence might be a stubbed toe, or it might be an amputated foot. Both risks could be equally likely, but both will not be equally acceptable. When the severity of the risk is perceived to be less, the risk becomes more reasonable.

In this hypothetical, the risk of developing cancer from "RF radiation emitted by the cellsite is extremely low".<sup>53</sup> So, the probability is very low, but the nature of cancer makes one think that it is a risk best avoided. The Environment Court in *Shirley* evaluated

<sup>53</sup> *Shirley* above n 1, 89.

many recent scientific studies adduced by both the primary school and Telecom, before ruling that the increased risk of cancer was so small that it was acceptable.

5 *The difficulties involved in assessing risk*

The probability of risk is not always easily determined. This is due to a number of reasons. The first is that often the scientific studies are not exactly on point. They might have been conducted in another country, or under conditions that vary from those experienced by the plaintiff.

An assessment of the increased risk necessarily requires some statistics of the situation before the defendant began their activities. These may not be available, or they may be out of date. It would certainly be difficult nowadays to find a control group that is not currently subject to any RF radiation, and has never been subject to RF radiation.

The studies that were presented in the *Shirley* case do not prove or disprove that RF radiation causes cancer. At most, the studies demonstrate that there might be an association between the two phenomena. This is to say, where an increased rate of cancer was discovered, it was also noted that the community was subject to RF radiation. Most of the studies agreed that it was not possible draw any conclusions beyond an association between cancer and RF radiation.

Because the human body is so complex, it is very difficult to establish exactly what causes cancer. There are three different possible causal relationships. Mutual exclusion: the cancer is wholly the result of only one factor; either the RF radiation, or another factor like genetics, but not both. Independent sufficiency: both genetic and RF radiation are present in the community, either factor would be enough to produce the cancer on its own. Necessary contribution: neither factor is enough on its own to cause cancer, but together they produce the cancer.<sup>54</sup> It will take some considerable time before we understand which relationship is at work with RF radiation. The defendant ought only to be found responsible for the extra cases of cancer that its activities generate.

54 Bruce Pardy "Risk, Cause and Toxic Torts: a Theory for a Standard of Proof" (1989) 10 *Advocates' Quarterly* 277, 280.

Regardless of the actual causal relationship, a crude assessment of the number of extra cases can be calculated by looking at cancer rates before and after RF radiation was introduced into the plaintiff's community.

There is also the complicating factor of which types of cancer the RF radiation might trigger in humans. Also rates of incidence in the community will change over the years. Breast cancer rates might decline, while lung cancer cases increase.

The difficulties in assessing risk will vary from case to case. These points simply illustrate the fact that the courts face considerable difficulties in assessing the actual risk that the defendant's activities pose.

## 6 Conclusion

The first step of the *Shelfer* test can be satisfied. The injury to the plaintiff's legal rights is small because the defendant does have the right to inflict a small degree of increased risk on his or her neighbours, and the Environment Court in *Shirley* found that the increased risk of cancer was "extremely low".<sup>55</sup>

### C Is the Injury Capable of Being Estimated in Money?

The second step of the *Shelfer* test assesses whether the injury to the plaintiff's legal rights is capable of being estimated in money. Many ongoing trespasses might be very easily estimated in money. For example, if the paintwork on a house has been damaged, a quote for its repair is easily obtainable. The same can not be said of damage to the human body. Usually, no amount of money can repair the damage that is done.

It is faintly obscene to suggest that if someone was guaranteed to develop cancer, then this injury could be estimated in money. Therein lies the problem for the plaintiff. They cannot prove that their cancer is caused by the RF radiation produced by the defendants. It may be that they do not even have cancer yet, but have simply brought an

<sup>55</sup> *Shirley* above n 1, 89.

action in trespass as a preventative measure. Really the plaintiff is concerned about the increased risk of developing cancer. It is this extra risk which is the injury to the plaintiff's legal rights, and it is this extra risk which can be estimated in money.

If there is already a 2 per cent risk of developing cancer, and then this risk grows to 7 per cent after the introduction of RF radiation in the community, the defendants are responsible for an extra 5 per cent risk. Damages could be estimated at 5 per cent of the total compensation that would be paid out to someone who had actually developed cancer. In this case, if the usual compensation were \$100,000 then 5 per cent of this would be \$5,000.<sup>56</sup>

Courts themselves are also capable of estimating the injury to the plaintiff's right. Damage to human health that has already occurred is often compensated by a monetary payment. Courts have ample experience in estimating the value of good health to humans. It may be unpleasant to put a monetary value on disease, but it is certainly possible to do.

Step two of the *Shelfer* test is thus satisfied. In situations of increased risk damages reflect the extent to which the defendant is responsible for the risk present in the community. Increased risk lends itself to a monetary payment because it is easier for the court to express a proportional response in money than it is in an injunction. Finally, the court is experienced in putting a value on harm to human health.

#### **D Adequate Compensation by a Small Money Payment**

The third step of the *Shelfer* test requires that the injury to the plaintiff's legal rights can be adequately compensated by a small money payment. We have already seen that it is right that the defendant should only be liable for the extra cases of cancer that its activities cause. The actual number of extra cases will necessarily be very small or else the risk would have been classed as unreasonable, and the defendant would never have passed the first step of the test. Paying out a proportion of the total cost of compensating a case of cancer which relates to the proportion of extra cases caused by the defendant will result

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<sup>56</sup> See generally Pardy, above n 54.

in a small monetary figure. For example, if the compensation for cancer is \$100,000 and the extra risk of developing cancer was one in ten thousand, the defendant would be liable for only \$10.

Because a reasonable risk in situations of cancer will necessarily involve very small probabilities, the quantum of damages will always be very small. Therefore, step three of the *Shelfer* test is satisfied.

### *E Oppressive to the Defendant to Grant an Injunction?*

In this fact scenario, this is the most easily satisfied element of the test. It would be enormously oppressive to the network operator to award an injunction. They cannot operate their business in any other way; it is not just a matter of finding quieter machines.

The case of *Kelsen v Imperial Tobacco Co* concerned a sign which had been attached to the wall defendant's building, but that overhung only a matter of inches into the plaintiff's airspace.<sup>57</sup> Justice McNair, in considering whether it was oppressive to the defendant to award an injunction, implied that if the defendant had received good value from the trespassing sign, then it was immaterial that considerable expenditure had been incurred in erecting the sign initially.<sup>58</sup>

It was true that considerable expense...was incurred some seven years ago in erecting this sign, but I have no evidence at all as to whether the defendant company have not had good value for that expenditure.

Turning to cellphone networks in New Zealand, the network operators (like Telecom) have presumably made a very large investment in the hope that over the next few decades the investment would pay itself off. It began its cell phone network a little over ten years ago. The cost of developing a comprehensive network throughout the

<sup>57</sup> *Kelsen v Imperial Tobacco Co* [1957] 2 QB 334 [*Kelsen*].

<sup>58</sup> *Kelsen* above n 57, 346-347.

country that can handle the increasing number of calls must be enormous. It is doubtful that Telecom has received good value for its expenditure yet.

The last step of the *Shelfer* test is easily satisfied. It would be very oppressive to a defendant in this type of case to grant an injunction to the plaintiff.

All four steps of the *Shelfer* test can be satisfied, the defendants have rebutted the presumption for an injunction. Court is now free to award damages in substitution for an injunction.

## VII CONCLUSION

Electromagnetic radiation emitted from cellsites can constitute an actionable trespass. The plaintiff is prima facie entitled to an injunction. But, it would be intolerable to the public of New Zealand if the courts granted one. Television and radio services could also be threatened by actions in trespass. This puts the courts in a difficult position. While they might appreciate the disruption that would be caused to the public; it has long been held that public benefit is immaterial to the granting of an injunction. As Sophocles, the 5<sup>th</sup> century BC Greek dramatist, wrote "[n]obody has a more sacred obligation to obey the law than those who make the law".<sup>59</sup> The courts may only refuse to grant an injunction if they can base their reasoning on precedent and principle.

The *Shelfer* test sets out a four step process to determine those cases in which it would be appropriate to award damages in substitution for an injunction. This test can be satisfied in the scenario of RF radiation from cellsites. It is both possible for the courts recognise that the radiation does constitute an actionable trespass, while still finding that an award of nominal damages is justified by law. This test allows the integrity of the trespass cause of action to be maintained. The court need not twist the test to ensure that an injunction is not granted.

59 Bruce Nash and Allan Zullo (eds) *Lawyers' Wit and Wisdom* (Running Press, Philadelphia, 1995) 101.

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